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ELECTRODERMAL ACTIVITY, COGNITIVE SCRIPT, AND SEX DIFFERENCES IN A SINGLE BLIND STUDY

By

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Introduction

The detection of deception is a subtle phenomenon which is significantly related to a number of psychological variables. The psychophysiological measurement of skin-resistance, as a subset of electrodermal activity, was utilized in this single-blind laboratory investigation of lie detection. Eighty subjects, forty males and forty females, were randomly assigned to equal groups of experimental and control conditions. Blind predictions were correctly made by the author as to the subject's sex, condition (experimental or control) and detection of both lies and truths. The hypotheses of interest in this study were: 1) Using a cognitive script reading task, compete with an interruptive startle segment, skin resistance/conductance will detect lying. 2) Males will exhibit a greater skin resistance response than females. Both hypotheses were supported. Implications for field applications are discussed.

Accurate behavioral measurement is essential to the practice of applied psychology, but it has proven to be an elusive objective (Lord, 1985). Much attention has been recently directed to lie detection. This technique is controversial in part due to its questionable validity. The use of physiological recordings to make inferences about the veracity of a person's statements is known as the "physiological detection of deception" (Honts, Hodes, & Raskin, 1985; Podlesny & Raskin, 1977). D.T. Lykken, in an open letter to the membership of the Society of r Psychophysiological Research that this is "... psychophysiology in the real stated world." Psychophysiological Research stated that this is "... by far the most important application of psychophysiology in the real world." What should be of considerable interest to applied psychology is the understanding of why many significant results have been reported in laboratory lie detection experiments incorporating skin resistance measures, but have not been reported in "field" applications using these same measures.

This study investigated (a) differences in skin-resistance recordings between the sexes, (b) how cognitive scripts can be utilized as the startle response in the lying situation, and (c) how predictions can be made about the sex of the subject and the instant at which the lie occurred.

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The psychophysiological measurement of skin-resistance, as a subset of electrodermal activity, is utilized both in laboratory and professional settings for the determination of deception. If one places two electrodes on the skin's surface and drives current through them, the skin behaves as a resistor. A voltage develops across these electrodes and by application of Ohm's law (Voltage = Amperage times Resistance) the apparent resistance is measured. A sudden noise, a statement made by the subject or a question asked of him/her will, to varying degrees, be followed about two seconds later by a rapid decrease in the measured resistance and an increase in voltage flow between the two electrodes. The voltage increase indicates a fall in skin resistance most likely due to a transient increase in perspiration. This transient response, commonly called the galvanic skin response (GSR), or psychogalvanic response (PGR), is a rudimentary aspect of electrodermal activity, which also includes the direct electrical responses of the skin sweat glands themselves.

While the most direct interpretation of the electrical behavior of the skin appears to be that it is a reflection of a sympathetic nervous system activation of the cutaneous area under observation, it is clear that more often than not the investigator in a psychophysiological experiment conceptually bypasses this particular sympathetic function and equates electrodermal activity with either the level of arousal or emotional activity (Grings, 1978). Such an abstraction is based on the assumption that there is a direct relationship between sympathetic activity and these affective behavioral correlates, an assumption which is unwarranted and too simplistic. This conceptualization does not take into account, "the complete array of inhibitory centers, some of which represent limbic areas well known to be related to emotional behavior" (Grings, 1978). the contention that arousal is a specific dimension of human behavior overlooks the fact that autonomic correlates of the arousal associated with anger are not the same as those in the arousal associated with joyful anticipation, elation, mania, or other affective states. Likewise, different reactions may accompany the same emotion in different people or even in the same person on different occasions, and these same bodily responses may accompany different emotions (Byrne, 1966).

Although the neural transmitter of the sweat glands is acetylcholine, normally the parasympathetic transmitter, the sweat glands are under sympathetic control (Grings, 1978). In the sympathetic part of the autonomic nervous system acetylcholine acts as the transmitter at all pre-ganglionic synapses, at the synapses in the adrenal medulla, and at the postganglionic synapses in the sweat glands (Schmidt, 1983). Sweat is the clear fluid exuded from or excreted by the pseudosudiferous glands. It possesses a characteristic odor and a salty taste; its pH is normally alkaline. It contains sodium chloride (Na+Cl-), cholesterin, fats, fatty acids, and traces of albumen, urea, and other compounds (Saunders, 1951). Early research on electrodermal activity suspected muscle activity, action with peripheral blood vessels, and a vascular theory, but it is now widely agreed that the neuro-mechanics of the sweat gland are largely responsible for skin resistance measures during "startle" responses, as in lying behavior. By way of the gray ramus, the postganglionic fibers then activate sweat glands (Netter, 1962). For present purposes it need only be recognized that the sweat duct, if partially, empty, tends to fill, that sweat may exit at the

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sweat pore and increase the hydration of the nearby epidermis, or that it may perhaps diffuse laterally through the duct walls into the corneum or be more actively re-absorbed.

Changes in the skin resistance/conductance of the skin can be produced by various physical and psychological stimuli. The momentary fluctuations of skin resistance/conductance that occur with stimulation have been termed phasic while the relatively stable background activity is referred to as the tonic level.

The use of physiological measurement as a reflection of cognitive events, especially lying, has a long history and has gained wide acceptance in applied fields such as criminal investigation (Bradley & Janisse, 1981). A potentially important determinant of lie detection that has not been investigated is the subject's processing of the stimulus information during the test. Recent research on the psychophysiology of the cognitive variables of attention and memory suggests that such processing might influence the detection of deception. Corteen (1969) reported that incidentally recalled words had produced significantly larger electrodermal responses during presentation than those that were forgotten. Presumably, the more intensely attention is focused on a stimulus, the greater the electrodermal response and the more likely its later recall.

Laboratory success with detection of lies using skin resistance/conductance does not generalize well to the real world or "field." This could be due in part to the differences in methodology in any number of field procedures which employ semi-objective methods of analyses. Field examiners typically report good results with criminal suspects using respiration and cardiovascular measures, and poor results with skin resistance response (Reid & Inbau, 1966).

Attempts to improve measurement have moved from focusing on rating formats, to rater training, and a recent emphasis on the cognitive processing of raters (Cooper, 1981; Feldman, 1981), memory discrimination (Graesser, Woll, Kowalski, & Smith, 1980) and signal detection theory (Swets & Pickett, 1982; Banks, 1970).

Given the disparity between laboratory and field findings with respect to the electrical properties of the skin and lie detection, a more systematic and universal method of detection is mandated. Investigations into this area should focus on how people understand and remember narratives, or information, so as to develop and employ more successful detection strategies.

Schank and Abelson (1977) proposed their "script theory" as part of human knowledge being organized around hundreds of stereotypic situations with routine activities. Examples of such situations are riding a bus, visiting a dentist, and asking for directions.

Through direct or vicarious experience, each person acquires hundreds of such cultural stereotypes along with inherent idiosyncratic variations. Schank and Abelson use the term "script" to refer to the memory structure a person has for encoding his general knowledge of a certain situation-action routine. The script theory is a specific elaboration of the frame theory of Minsky (1975).

Habituation of the GSR index of the orienting reflex (OR) in normal human adults is affected by prior instructions, current affective state of the subjects, and individual differences that vary along a variety of dimensions (Maltzman, Gould, Barnett, Raskin, and Wolff 1979). Habituation of the orienting reflex is not simply the consequence of changes in the parameters of a physical stimulus (e.g., lying variable). Instead, habituation is a function of stimulus changes and the state of the subject at that moment when this state is a function of the most complex cortical processes characteristic of human thinking.

Additional support for the importance of skin resistance/conductance as the most significant psychophysiological measure of deception in laboratory experimentation can be obtained by incorporating cognitive script within the lying paradigm. As a story script could include alleged and evidenced facts about the nature of a crime, skin resistance/conductance could be utilized as a more accurate measure of lying, that being the detection of the "startle" response.

One must remember that a script, in and of itself, may not make an interesting story. As mentioned, the success of laboratory GSR discrimination has been with memory of the event, the signal strength of the event (actual lie), and the minimization of "escape" strategies (irrelevant questions, yes/no answering, "mock" or paralleling stimuli, etc.). It is perhaps here that field procedures, incorporating skin resistance, could be made more valid if utilized in this proposed manner. Hopefully, a more concrete avenue which could bridge the gap between laboratory generalizability and actual field techniques will be found through more cognitive related designs.

Another aspect to the issue of lie detection is the role of sex differences and electrodermal activity, and how the implications of physiological differences between the sexes are interpreted. "Sex differences in cognitive abilities are reflections of differences in relationships between adrenergic activating and cholinergic inhibitory neural processes, which, in turn, are affected by the gonadal steroid sex hormones, androgens and estrogens" (Boverman, Klaider, Kobayashi & Vogel, 1968).

Examples of possible female/male differences follow. Two well-established differences between males and females in cognitive abilities have been reported as being (a) the superiority of females in tasks requiring relatively simple perceptual-motor associations (Feminine superiorities in both children and adults have been reported on the Digit Symbol Subtest of the WISC, WAIS, and Wechsler Bellevue Intelligence Test (Gainer, 1962). The Digit Symbol task also requires rapid perception and frequent shifts of attention) and (b) the superiority of males over females in certain tasks requiring suppression of responses to immediately obvious stimulus attributes of the task in favor of responses to other, not immediately obvious stimulus attributes, that is, inhibitory perceptual-restructuring tasks (Kimmel & Kimmel, 1965). For example, males are superior to females on the

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Rod and Frame Test which requires the subject to adjust a luminescent rod to the vertical in a darkened room within a tilted luminescent square frame.

Maltzman, et al. (1979) experimented with task instructions and sex differences with GSR and vasomotor measures of the orienting reflex induced by innocuous words. A sex difference, with males manifesting greater GSR Responsivity, was found in most phases of the experiment. Sex differences found in the Maltzman, et al. (1979) experiment appeared in the voluntary rather than involuntary GSR-OR. Presumably, the voluntary OR is to a greater extent under verbal regulation mediated by the frontal cortex than the involuntary OR induced primarily by novel and nonsignificant stimuli (Luria, 1973).

Since the voluntary GSR-OR shows a sex difference and not the involuntary GSR-OR, the various interactions obtained between sex and task in Luria's experiment as well as in other studies (Fisher & Kotses, 1974) are not completely puzzling. A basic, unresolved, problem is the nature of these different styles and kinds of thinking displayed by males and females that produce differences in the voluntary OR reflected as different kinds of GSR activity.

Smith, Ketterer, and Concannon (1981) looked at factors which contributed to bilateral stimulation, including preferred hand, sex, and familiar handedness. Results showed smaller mean nonspecific responses on the hand contralateral to the hemisphere for which stimulation was given. this particular study supported differential electrodermal responsiveness, in that further results showed that the effects of unilateral stimulation on bilaterally differentiated electrodermal activity were mediated by handedness and sex.

Briefly mentioned earlier, the adrenergic autonomic nervous system is often referred to as the sympathetic autonomic nervous system, while the cholinergic autonomic nervous system is frequently referred to as the parasympathetic nervous system. The sympathetic and parasympathetic autonomic nervous systems are frequently in competition and the final outcome responses then depends upon the relationship between the momentary activity of the two systems.

Sympathetic activity is considered to have a mobilizing function in preparation for action (fight-or-flight) while the parasympathetic system is thought to work towards protection, conservation, and relaxation of the organism when action is not required. Estrogens inhibit the activity of choline acetylase, the enzyme that synthesizes acetylcholine, while testosterone does not (Kobayashi, Kobayashi, Kato, & Minaguchi, 1964). This difference should tend to produce less sympathetic arousal in females than males.

Method

Two hypotheses were of interest to this study:

1. Using a cognitive script reading task, i.e., a story script with an interruptive segment, would skin resistance/conductance detect lying?

2. Would makes be detected lying more frequently than females given the previously evidenced physiologic sex differentials in cognitive ability and their respective skin resistance differences?

Contingency tables were constructed to organize and display the data. The four factors analyzed using chi-square were (a) predicted condition (experimental-lie or control-truth) by actual condition, (b) predicted sex of the subject (male or female) by the actual sex of the subject, (c) sex of the subject by detection of deception, and lastly (d) the sex of the subject by the sex of the assistant (controlling for the detection of deception).

Results

Table 1 displays the most significant finding in this research. Hypothesis 2 (H2), the prediction of the sex of the subject based upon skin resistance/conductance responses, was strongly supported with a p < .0001 using chi-square analysis. Males were predicted successfully 38 times out of 40 and females 39 times out of 40.

Table 1

Number of Correct and Incorrect Predictions of Sex of Subject by Actual Sex of Subject

Predicted Sex of Subject

Actual Sex of Subject	Male	Female	Marginal Totals
MALE	38	2	40
FEMALE	1	39	40
MARGINAL TOTALS	39	41	80

 $\underline{N} = 80$ Raw Chi-Square = 68.49281 (**p = .0001, l d.f.) Pearson's R = .92529 (**p = .0001)

Discussion

Iaboratory experiments produce certain advantages in all psychophysiology studies of deception, in that the setting allows for complete and certain determination of factual truth. Second, in a laboratory situation, it is possible to compare and evaluate different question techniques (test structure) and various physiological measures which may or may not have been extensively employed in previous studies.

The results of laboratory experiments are very useful in making generalizations to the field situation with criminal suspects. However, such

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inferences should be made cautiously and tested by research in the field setting. Furthermore, there are many questions concerning field practices which can be answered only by studies of field applications (Raskin, et al., 1978). A segment of this research was to refine the poor external validity between laboratory and field deception studies. Using skin-resistance/conductance measures, a new and more valid application of the galvanic skin response was offered to the lie detection community in the form of the "interruptive question" technique.

What is crucial for any scientific research is to objectively construct, quantifiable parameters. The assignment of numerical weights to specific psychophysiological responses can help to insure this necessary objectivity. Reliability can only manifest if a strict and universal code of weighting assignment is adhered to. And unless reliability is achieved, the validity of these measures cannot be addressed.

The numerical evaluation of polygraph recordings provides a basis for professional communication. Every profession has its own unique form of communication, consisting of particular word, phrases and symbols that prevent misunderstandings and provide clarity. The failure to learn and apply a professional communication standard will ultimately result in confusion among fellow practitioners and others who have a legitimate reason to understand what is going on.

The experimenter determined which question in the story script was the cognitive startle question based on this comparison. Reading an ordinary story script and then introducing a totally unrelated sentence produced dramatic skin resistance/conductance changes enabling the experimenter to detect deception. The second hypothesis, predicting the sex of the subject using only skin resistance/conductance data, was significantly supported. Skin resistance/conductance measures between males and females in both experimental and control conditions were correctly detected 77 times out of 80. This further supports Fisher and Kotse's (1974) and Luria's (1973) studies on the different kinds of GSR activity between the sexes and their respective cognitive mechanics and physiological interactions. The compelling results agree with past research on sex differences in skin resistance/conductance presented in the introduction to this investigation.

The galvanic skin response is utilized in the field with situations that are more difficult to control. Unless confessions, or admissions are obtained, the known truth can never be guaranteed. Even when deception is indicated, through the physiological recording and assignment of deceptive weights, how can science, seeking objectivity, be completely sure of total accuracy? The laboratory success with skin resistance/conductance measures as the most reliable discriminator between truthfulness and deception, is substantiated and perpetuated through controlled, known truth conditions. Research into the dynamics of psychological "set", the physiology of fatigue factors, semantics, pharmacology, abnormal psychology, organic disorders, and cultural disparities, all must be further researched to get a more valid measure of how skin resistance/conductance measures work. The dynamics of how the aforementioned factors affect the psychophysiology of electrodermal activity should be of considerable interest for researchers in the detection of deception.

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DEPARIMENT OF DEFENSE POLYGRAPH PROGRAM

Report to Congress for the fiscal Year 1987

Background Information

The Department of Defense (DoD) Personnel Security Program is designed to protect, in addition to straight classified information, certain especially sensitive resources vital to the security of our nation, such as:

- . defense communications nets
- . government-wide cryptographic systems
- . sensitive research and development projects
- . intelligence sources and methods

Basically, there is a three-pronged approach to providing security for these sensitive resources:

- . physical security (e.g., safes, guards, alarms, etc.);
- . information security (classification, accountability, restricted dissemination and reproduction; and
- . personnel security.

Historically, the goal of personnel security is to determine the trustworthiness of individuals prior to their being granted access to classified information or prior to their continuing eligibility afterwards. DoD does not take this task lightly--for both individual and national interests are involved. One can install the most comprehensive and sophisticated physical and information security systems--all to no avail--if the cleared and trusted employee decides to compromise our secrets to the opposition. Thus, people are central to the security issue.

The keystone to personnel security over the years, has been the personnel security field investigation; that is, checks of national and local law enforcement agencies, employment and credit references, and interviews with friends, neighbors, co-workers, and other persons who are in a position to comment on the individual's reliability and trustworthiness.

However, commencing in the 1970's, a number of events took place which seriously eroded DoD personnel security investigations. These events include:

- . an extraordinarily large DoD population holding security clearances (in 1985, the number was 4.1 million);
- . adverse impact of the Privacy Act of 1974 on the willingness of persons or organizations to provide information relevant to personnel security determinations;
- . limitations placed on accessibility of school records (most personnel security investigations involve young persons entering the service);
- . issuance of LEAA Regulations that caused local jurisdictions to severely limit access to law enforcement records; and

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. lastly, the increasing geographical mobility of the population as a whole, as well as socio-cultural changes wrought by the working spouse, making neighborhood checks of minimal or no value.

The consequences were:

- . a serious degradation in the Department's ability to conduct personnel investigations;
- . less relevant information available;
- . an increase in the backlog of investigations waiting to be conducted, and;
- . a generally less valid investigative product.

These events had an adverse impact on DoD operational readiness. This would have been serious enough if another ominous trend were not occurring-espionage against the U.S. was on the upswing. Since 1970, there had been over 100 serious incidents of espionage with better than half occurring after 1980!

In 1981, a DoD component responsible for an extremely sensitive R&D program developed a proposal to enhance the security of that program by augmenting the personnel security process through use of a counterintelligence-scope polygraph examination. This type of polygraph examination had been employed successfully by the National Security Agency (NSA) since about 1967. Predicated upon the extreme sensitivity of the program plus the demonstrated effectiveness of the CI polygraph in its application at NSA, the Deputy Under Secretary of Defense for Policy granted the component permission to proceed as an exception to policy. The component concerned developed and instituted an extremely high quality program which was initiated in 1982. In fact, this polygraph program eventually served as the model for development of the Department's Counterintelligence polygraph screening program as it currently exists.

Meanwhile, elsewhere within the Department the overall security posture continued to deteriorate. In light of the worsening situation, in 1982, the then Deputy Under Secretary of Defense for Policy, appointed a select panel composed of senior Defense officials who were charged with reviewing the DoD Personnel Security Program from top to bottom and developing recommendations for resolution of the problem. The panel, chaired by David O. Cooke, Deputy Assistant Secretary of Defense, issued a report in April 1982, which embodied a number of general recommendations which served to improve our security posture. One such recommendation called for the use of a counterintelligence-scope polygraph examination to assist in assessing the initial and continued eligibility of a limited number of individuals in positions for access to extremely sensitive classified information.

On 6 August 1982, Frank Carlucci, then Deputy Secretary of Defense, issued a memorandum entitled "Degradation of Operational Readiness/Mission Accomplishment Due to Personnel Security Investigative Shortfalls." The memorandum set forth a number of security improvements including a requirement that all persons with access to Sensitive Compartmented Information (SCI) be subject on a randomly selected basis, to an aperiodic, counterintelligence-scope (CI) polygraph.

Defense Polygraph Program

Use of the polygraph is now, and was then, extremely controversial. In particular, Congress expressed concern that the polygraph would be routinely applied across-the-board to large employee populations such as the DoD SCI community (some 125,000). Consequently, on 27 June 1983, the Defense Authorization Act, 1984, was passed including a provision prohibiting DoD's use of polygraph in any fashion that had not been authorized as of 1 August 1982. Though leery of the polygraph, Congress nevertheless expressed its continuing concern about the degradation of national security and the polygraph remained a viable recommendation if DoD could proposed an acceptable approach.

Nine separate Congressional hearings were held on the issue of DoD polygraph examinations. Finally, in the Defense Authorization Act, 1985, Congress authorized the Department to implement a CI-scope polygraph "test program" not to exceed a numerical restriction of 3500 examinations. The restriction did not affect DoD use of the polygraph in criminal investigations or any other use authorized by DoD policy as it existed as of 1 August 1982. Instead, the test program was structured to address persons who: 1) required access to specifically designated information within special access programs; 2) held Critical Intelligence Positions within the Defense Intelligence Agency; and 3) those who require emergency interim access to sensitive Compartmented Information. The CI-scope program was continued by the Congress for FYs 86 and 87 with quotas of 3500 and 7000 examinations respectively. Also in the Authorization Bills for those two years was direction by the Congress to include in the DoD polygraph test program those with TOP SECRET access. The Congress further included an exemption to those with sensitive cryptographic access.

The Defense Authorization Act, 1988 and 1989, grants the Department permanent authority to administer CI examinations to a numerical limit of 10,000 each year for FYs 88 through 90, and makes provisions for annual negotiations thereafter if necessary. Additionally, the FY 88/89 legislation exempts certain programs from the numerical limitations.

The counterintelligence-scope polygraph is unique in that it solely focuses on the deterrence and detection of espionage. It incorporates no questions concerning "lifestyle" issues such as alcohol abuse, morals, drugs, arrests, etc. Rather, questions focus on whether the examinee has:

- 1. Ever engaged in espionage against the United States.
- 2. Knows anyone who has.
- 3. Ever been approached to give or sell any classified materials to unauthorized persons.
- 4. Ever given or sold any classified materials to unauthorized persons.
- 5. Knows anyone who has.
- 6. Any unauthorized contact with representatives of a foreign government.

The Department recognizes that the polygraph is not infallible and makes no such assertion. Indeed, the varying claims (ranging from the toss of a coin to upwards of 97% accurate) are well known but not scientifically established. With the support of the Congress, the Department has embarked

upon an aggressive research program (reported later in this report) in an attempt to resolve these issues. However, the precise accuracy of the instrument would only assume overriding importance in the meantime if the Department relied exclusively on its readings. This does not happen. Α fundamental precept of the DoD program is that no adverse action may be taken based solely on the polygraph charts. A second precept of the DoD CI-scope program is that the polygraph is considered an investigative tool employed to augment all of our other personnel security procedures. As such, each person to be CI polygraphed has already been interviewed by a security professional, thoroughly investigated, and is in possession of a high level security clearance. A third precept of the DoD program is that a refusal to take a polygraph examination, in and of itself, shall not result in an adverse action. In this connection, a person may be denied access to the Special Access Program (SAP) requiring the examination but his or her collateral clearances shall not be disturbed. If the position requires the special access to perform the job, the component concerned must find the person another position of equal pay and responsibility. It is important to note that the Department has only had 12 refusals out of the approximately 20,000 CI examinations administered since 1982.

DoD has used the polygraph effectively since WW II. It has been used mainly in criminal investigations, counterintelligence cases, foreign intelligence and counterintelligence operations, exculpation when requested, and now, counterintelligence-scope screening. a somewhat recent historical perspective of the scope of the DoD Polygraph Program can be obtained through the review of the chart at Appendix A.

The Department recognizes that the value of the polygraph is largely dependent upon the quality, training and professionalism of the polygraph examiner. The Department maintains stringent standards for the selection, training and supervision of polygraph examiners. Training programs at the Defense Polygraph Institute, Fort McClellan, AL, are, without question, among the finest, if not the finest, in the world. The Department also maintains that the quality of our examiners is exceeded by none!

Given this, it should be emphasized that until such time as the "accuracy" of the polygraph is scientifically established, the Department chooses to rely upon illustrations of its utility. For example, the Army's Criminal Investigation Command, which is the greatest user of the polygraph for law enforcement purposes in the Federal Government, can statistically demonstrate a crime solving rate of at least three times the national average primarily due to use of the polygraph as an investigative tool. Additionally, the military services report a drug use confirmation rate of up to 98% during exculpatory examinations in support of urinalysis testing. Moreover, recently convicted spies, under professional debriefings during plea bargain agreements, have provided us with valuable insight into just how powerful a deterrent the CI polygraph is. The most recent example is convicted spy Jonathan J. Pollard who reports he was advised by his Israeli handlers to avoid the polygraph at all costs. He was even instructed to resign, if necessary, to avoid the polygraph.

This report sets forth numerous actual cases illustrating the utility of the polygraph. Most importantly, from the standpoint of these cases, is that the information provided simply could not have been obtained through any other legal investigation means. Moreover, consistent with all previous years, false positives were again non-existent, refusals were minuscule, and, from an overall management perspective, the program continues without problems or complaints of any magnitude.

FY 87 TEST PROGRAM RESULTS

The report which follows is as required in paragraph (f), section 1121, Defense Authorization Act, 1988.

A. Number, Purpose and Criteria of Selection for Examinations Conducted:

(1) Special Access Programs (SAPS)

(a)	Initial	3610	
(b)	Aperiodic	1546	
(C)	Termination	266	
	TOTAL for SAPS		5422

(2) DIA Critical Intelligence Positions (CIP)

(a)	Initial	199	
(b)	Aperiodic	-0-	
(C)	Termination	-0-	
	TOTAL for CIPs		199

(3) TOP SECRET (TS)

TOTAL for TS

1

(4) Interim Access to Sensitive Compartmented Information (SCI) -0-

DoD Test Program Total 5622

B. A statement of the number of persons who refused to submit to such an examination and a description of the actions taken as a result of the refusals:

In FY 1987, a total of six persons declined testing. Three out of the six were simply maintained in place but denied access to the special access program. One was voluntarily transferred to a position of equal pay, clearance level and responsibility. Action is still pending on the remaining two. However, it is anticipated that both individuals will be transferred to positions of equal pay and responsibility elsewhere within their respective organizations.

In addition to the above clear cut refusals, there is an additional case scenario within one of the military departments involving a person with extremely sensitive access who has repeatedly postponed examination for a variety of reasons and ultimately has obtained a deferral for a medical condition. This case is being carefully pursued to insure protection of both the person's interests and national security.

C. A detailed accounting of those cases in which more than two such examinations were needed to attempt to resolve discrepancies and those cases in which the examination of a person extended over more than one day.

(1) Out of the total examination population of 5622, 189 (3.4%) required more than two series (a series being defined as the running of at least three but no more than four charts on an individual). Of the 189, the vast majority (140) required only the administration of a third series. A complete breakdown is as follows:

Total population	5622	(100.0%)
Number requiring a third series:	140	(2.5%)
Number requiring a fourth series:	28	(0.5%)
Number requiring a fifth series:	10	(0.2%)
Number requiring a sixth series:	6	(0.1%)
Number requiring a seventh series:	3	(0.05%)
Number requiring an eighth series:	2	(0.04%)
Total requiring more than two series:	189	(3.4%)

In 42 instances out of the 189, multiple series were required due to the examinee reacting to relevant issues for relevant reasons. In particular, such cases account for all but four of the eleven cases which required more than five series. Essentially, all examinees in this category provided admissions in a piecemeal fashion. A full accounting of these cases are set forth in section D (4) below.

Three cases out of the remaining 147 remain categorized as "inconclusive" and all of these individuals are pending medical evaluation. The remaining 144 essentially required multiple series due to the examinees reacting to relevant issues for basically irrelevant reasons. These responses caused the examinees to be inconclusive thus requiring further testing to clarify the issues. Such responses were caused by various reasons to include being assigned to a location that was the scene of a terrorist act to working in close proximity to an individual who was convicted of espionage. Moreover, additional series also had to be scheduled for such reasons as fatique, hunger, or the effects of medication on the examinee. A rather extreme example of how the above factors can impact upon the examination process can be found in analyzing the examination of one of the two individuals who required eight series. the subject, a fairly senior government employee, is a naturalized citizen having been born and reared in an area which is now a part of the Soviet Union. The individual is strongly opinionated, elderly, overweight, suffers from high blood pressure and is on medication. The combination of these factors results in his fatiguing easily and, accordingly, each session with him was necessarily short. The subject remained inconclusive through seven series and could not be cleared until he finally made a number of "admissions" to the effect that he would have committed espionage for pre-1944 Germany which "put away 20 million Russians." However, he now considers West Germany to be "as weak as the

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U.S." but claimed that, despite the "weakness of the U.S.", he would not give anything away. The subject was finally cleared on all relevant issues during the eighth series.

Out of the 189, 145 were ultimately determined to be non-deceptive to the relevant issues.

(2) There were 225 instances where examinations had to be scheduled for a second day; 17 instances which required a third day; and 5 instances which required a fourth day. One reason this occurred is because Department policy dictates that only in rare instances will more than two series be administered to an individual on any one day. Other situations resulted due to scheduling problems, lateness of the hour and, or fatigue on the part of the subject.

D. Results obtained from the 5622 Examinations Conducted Under the DoD Test Program

(1)	No Opinion	6
(2)	Inconclusive	4
(3)	No Deception Indicated	5570
(4)	Deception Indicated	42

E. Uses of the Examination Results:

(1) <u>No Opinion</u>. All 6 individuals reported in this category were not examined when it was determined they each were using various medications. There has been no change in their security or employment status. Instead, all have been referred to competent medical authorities to determine their suitability for examination.

(2) <u>Inconclusive</u>.

(a) One examinee terminated his employment with the U.S. Government after initial testing was inconclusive.

(b) Another examinee remains inconclusive after initial testing and has declined further testing. The matter is currently under review.

(c) A government contract engineer with an SCI clearance appeared to be deliberately attempting to distort the polygraph readings during two separate series. A third series showed deception to various relevant issues. The contractor subsequently admitted to having attended meetings of two different communist party front groups and also having associated with at least two men known to be members of the Communist Party. According to the examinee, all of the contacts occurred some 40 years ago but he admitted to having concealed this information from all subsequent employment and clearance forms believing it would hinder or preclude his obtaining the employment or a security clearance. Subsequent attempts to resolve the issues through polygraph examination were unsuccessful due to the subject's deliberate and obvious physical distortions of the chart recordings. The final opinion rendered was "inconclusive." Further administrative review of the individual resulted in a revocation of his special access. However, the

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contractor has retained the individual in a position of equal pay and responsibility.

During a pre-test interview, a civilian engineer made a (d) spontaneous admission to being "heavy handed" and, in this way, responsible for a 20 year history of what he claimed were undetected "little accidents" in his work area. He refused to elaborate on these accidents, including "work delays", except to state one involved the destruction of a \$1,000.00 The engineer further advised that he had never reported any of the item. accidents and, in fact, had deliberately denied any knowledge of the \$1,000.00 incident when questioned by a supervisor. Subject would not provide any additional information or cooperate when questioned about work delays other than to maintain that none of his accidents were deliberate. Subsequent efforts to administer a counterintelligence-scope polygraph resulted only in inconclusive results due to the subject's apparent failure to cooperate. Subject was denied access to the special access program but was retained in his original position.

(3) No Deception Indicated (NDI) - All 5,570 persons who were adjudged to be NDI either retained the access they had or obtained the access they had been nominated for, depending upon which situation resulted in the requirement for undergoing a CI scope polygraph.

(4) Deception Indicated (DI) - Out of a total examination population of 5,622, 42 individuals were adjudged to be deceptive in their responses to the relevant counterintelligence-scope questions. These 42 individuals, as all others in the total population, had been previously interviewed by security professionals, thoroughly investigated, and granted high level security clearances. Concisely put, the results obtained through the CI scope polygraph process simply could not have been obtained under any other authorized manner. Moreover, as was the case in FY 86, false positives are not an issue as only one out of the 42 did not subsequently make relevant admissions. That person is currently under investigation. The remaining 41 are either highlighted or summarized as follows:

(a) A young military member working in communications was under consideration for a special access program. During an interview conducted with the aid of a polygraph, he showed deception to questions concerning unreported contacts with foreign nationals. Under questioning he disclosed having had a sexual encounter with a female who identified herself as a foreign national employed as a secretary at a Soviet Embassy located in the same European country in which the subject was assigned. The subject admitted he disclosed some classified information to the woman and she invited him to visit her at the Embassy. He denied visiting the Embassy. Further testing failed to completely clear the individual and he finally exercised his right to terminate the testing process. The matter remains under investigation.

(b) A military officer involved in extremely sensitive intelligence programs showed deception when questioned about unauthorized disclosure of classified information. He subsequently admitted to having made numerous unauthorized disclosures of classified information to his spouse and various friends. He further disclosed that on certain occasions, he had referenced and provided some details to various individuals about very sensitive Special access Programs plus aspects of his job which relate to the support of special intelligence operations worldwide. The matter is under investigation.

(c) A fairly senior civilian employee working in a special access program showed deception during examination and subsequently admitted to maintaining a close continuing relationship with a foreign military officer. He further advised of having discussed classified information with the individual plus providing the officer with the "political leanings" of unit personnel involved in the SAP. The subject declined to undergo further examination designed to confirm the completeness of his admissions. He has been removed from access and the matter remains under review.

(d) A fairly high ranking military officer showed deception during an examination and subsequently admitted that he had disclosed to a foreign military officer the test firing results of a specific weapon. The test firing data was classified SECRET. The foreign officer was allowed to view the material for about 20 minutes but was not permitted to take notes. The officer was removed from SAP access but retained his original position because an inquiry into the matter disclosed that several months after this incident, the foreign officer in question was accredited for limited access to U.S. classified material.

(e) A high ranking civil servant working in a SAP admitted during the course of an examination that some years earlier he had deliberately disclosed to an uncleared person TOP SECRET information concerning a special collection mission of an aircraft his unit employed. Examinee claimed that the disclosure had been made simply "for my ego." The inquiry to date has revealed that little or no damage to national security resulted because the recipient of the information kept it to himself.

(f) A high ranking military member assigned to a clandestine intelligence unit admitted during an examination that he had disclosed to family members and an uncleared associate many classified details of intelligence activities, to include linkage to current news events. Damage assessment is underway.

(g) A military member involved in a SAP ran deceptive to questions concerning knowledge of others engaged in espionage. The subject subsequently advised that at a previous overseas post, she had overheard a then co-worker threaten to disclose extremely sensitive SCI information the unit had collected. After this admission, the subject was able to successfully complete the examination process. A follow-up investigation has substantiated the person's account of the incident but it has not been established that sensitive information was, in fact, ever compromised.

(h) Information developed during criminal investigations of several members of the Marine Security Guard (MSG) Force led to the application of counterintelligence-scope polygraph examinations under the DoD Polygraph Test Program to other members of MSG, particularly those assigned to embassies located within "Bloc" countries. To date, ten such examinations have resulted in findings of DI. All ten MSG's subsequently admitted to unauthorized contacts with representatives from a Bloc country. The pattern developed indicates the individuals were being spotted and assessed with the goal of recruitment by hostile intelligence services. Seven of the individuals received non-judicial punishment and were returned to their duties. Three have been referred for criminal investigation.

The remaining 24 incidents of "deception indicated" fall under the category of "pillow talk" where disclosures of classified information were made to immediate family members and it has been adjudged that little or no damage to national security resulted. Some remain under review but, in general, no action is usually taken against the individual beyond the administering of administrative or non-judicial punishment.

<u>Utility of the Polygraph</u>

During fiscal year 1987, the utility and versatility of the polygraph in national security investigations was demonstrated over and over again. At appendix B are various categories of anecdotal accounts of interviews conducted with the aid of the polygraph. In all instances the polygraph examination process was able to produce data of important security or criminal significance which was not otherwise obtainable. It was also invaluable in helping to establish the innocence of persons confronted with serious accusations.

Plans to Expand the DoD Program

The Department remains committed to slow, controlled consolidation in the CI-scope polygraph program. Little has been done with respect to the Congressionally authorized use of the CI-scope examination for persons cleared for TOP SECRET or those having cryptographic access. Accordingly, all components are planning to either initiate such examinations or gradually expand current programs. It is forecast that a population of between 50,000 to 60,000 with cryptographic access would be subject to aperiodic application of a CI-scope examination. Progress to date has been somewhat hampered in that such persons are physically located in small pockets which are situated throughout the world. Limitations in travel funds will necessarily dictate the size of the cryptographic examination program.

Components also plan on reviewing various TOP SECRET programs in order to begin the CI-scope examination process for those warranting priority application. The Department has approximately 325,000 people with TOP SECRET access in contrast to our rather modest polygrapher support, so the programs will be selected carefully.

All polygraph expansion plans currently under consideration by DoD components for this fiscal year and the out years can only be considered speculative at best due to ongoing budget reductions and appropriations scrutiny. The Office of the Deputy Under Secretary is actively involved in the budget review process to help insure a proper balance is struck between budget realities and national security requirements.

The DoD Test Program was initially restricted to programs within DoD Components having their own, or available, polygraph resources. Now that the DoD program is stabilized on a statutory basis, all other components with sensitive programs will be able to seek CI-scope polygraph program support. As their requirements will be relatively small, a polygraph capability has been established in the Defense Investigative Service with the intent of providing such components with polygraph support. Consistent with DoD Policy, all components must obtain the prior approval of the Deputy Under Secretary of Defense for Policy for each specific program considered for inclusion. The head of the DoD Component concerned must certify in writing that the use of the CI-scope polygraph is consistent with the criteria established by DoD policy. For example, for SAPs, the Component head must certify that the unauthorized disclosure of the information in question could reasonably be expected to:

1. jeopardize human life or safety;

2. result in the loss of unique or uniquely productive intelligence sources or methods vital to U.S. security; or

3. would compromise technologies, plans, or procedures vital to the strategic advantage of the United States.

DoD Polygraph Examiners

DoD maintains very stringent standards for candidates for polygraph training. The Department considers the examiner to be key to program success. The DoD basic polygraph training program is the only one in the nation that has been both nationally certified and accredited as a graduate level program. Candidates selected for a DoD polygraph position must meet the following minimum requirements:

1. be a U.S. citizen

2. be twenty-five years of age

3. have graduated from an accredited 4-year college plus have 2 years as an investigator with a recognized U.S. Government or other law enforcement agency

4. be of high moral character and sound emotional temperament, based upon a background investigation

5. have completed a DoD-approved course of instruction

6. be judged suitable for the position after taking a polygraph examination designed to ensure that the potential examiner realizes the personal impact of such examinations.

Upon completion of the basic training program at the Defense Polygraph Institute, the person will undergo six months of on-the-job training and conduct some 50 examinations (or more) under complete supervision before being certified as a DoD examiner.

Virtually all polygraph components are understaffed with respect to authorized examination requirements and attrition of examiners remains a concern. While the DoD CI-scope program is early in its evolution, it is anticipated that the "burn out" rate for examiners involved exclusively in the daily conduct of CI-scope examinations will be higher than previously experienced in other DoD polygraph programs.

Expansion of the training capability has been achieved at the Defense Polygraph Institute to the maximum extent possible within the physical limitations of the existing facility, thereby allowing the department to train about 75 examiners annually. The demand for training is expected to continue to outstrip the availability of training billets for several years to come.

A statistical representation of DoD polygrapher employment and turnover for the last five years is set forth below.

<u>Year</u>	Average Number <u>of Examiners</u>	Number Decertified *	Percent <u>Attrition</u>
1983	100	11	11.0%
1984	109.5	12	11.0%
1985	115.5	15	13.0%
1986	141.5	8	5.7%
1987	168.5	25	14.8%

* Decertification denotes all persons released from polygrapher duties regardless of the rationale.

Polygraph Research

Fiscal Year 1987 saw the initiation of the Department of Defense Polygraph Institute (DPI) research program as directed by Defense Authorization Act, 1986. Dr. Gordon Barland was appointed DoD Polygraph Research Coordinator on January 12, 1987. Under his supervision, the Department has initiated a long term program of polygraph research. Some of the research will be conducted in-house; the rest will be contracted. The DoD research program essentially addresses ten areas.

1. <u>Technique validation</u>. The accuracy of current federal polygraph test formats must be determined in a variety of settings: criminal investigation, counterintelligence testing, pre-employment screening, and periodic/aperiodic security screening.

2. <u>Polygraph countermeasures (PCM) and polygraph counter-countermeasures</u> (<u>PCCM</u>). The effectiveness of potential countermeasures must be studied and practical counter-countermeasures developed.

3. Examinee factors affecting accuracy. Numerous factors may affect the accuracy of the polygraph, but they have never been systematically studied. These include the categories of persons being examined (suspect, vic-tim/witness, job applicant); the subject's personality (sociopathic, de-pressed, introverted); demographic factors such as gender, age, amount of sleep, intelligence, educational level, arrest record, prior experience with the polygraph; and ethnic and cultural factors.

4. <u>Optimized decision making</u>. The federal government uses several numerical systems for scoring control question tests. It is not known which scoring system is the best is any given situation. At present, only control question tests can be scored. Methods of objectively scoring other types of tests must be developed. Computer-aided chart analysis must be studied. The role that clinical information such as behavior or suspected countermeasures should play in the decision-making process must be assessed. Statistical approaches to decision-making must be developed.

5. <u>Basic research</u>. Thirteen theories of lie detection have been proposed (e.g., Fear of Detection, Cognitive Awareness, Conditioned to Crime, Dichotomization Theory, etc.), but none is able to explain all of the known facts. A program of basic research is needed to explore the roles of deception, guilt, fear of detection, attention, arousal, signal value, and other possible explanations. Central nervous system correlates of deception must be explored, and advanced lie detection methodologies developed.

6. <u>Improve current methodology</u>. Current methods of lie detection have evolved largely on the basis of practical experienced. These must be systematically fine-tuned to optimize the tests and reduce errors and inconclusives. Improved controls must be developed to minimize invading the examinee's privacy and avoid embarrassment.

7. <u>Grant program</u>. Much of the controversy about the polygraph's accuracy is caused by contradictory studies which contain serious design flaws. To ensure that future research is properly designed and executed, one approach would be to train selected graduate students and established polygraph researchers in federal polygraph techniques and provide them with grants to conduct research. Similarly, selected federal examiners must receive graduate level training in polygraph science. Written guidelines for the conduct of rigorously designed studies must be developed and agreed upon by the scientific community.

8. <u>Utility and disutility of the polygraph</u>. The utility of the polygraph in eliciting useful information has never been scientifically studied. Its use in deterring espionage must be investigated, analyzed, and optimized. Its disutility must also be defined, quantified, and investigated.

9. <u>Test and evaluation of new equipment and concepts</u>. Manufacturer's modifications of polygraph equipment and new concepts arising in the private sector must be systematically evaluated to determine if they offer an improvement over what is currently available.

10. <u>Curriculum and instructional research</u>. A program for tracking the learning curves of each student at DPI is needed for the continuous monitoring of the curriculum to optimize the sequencing and method of presentation of the subject matter. The qualities associated with highly successful examiners must be determined, and aptitude tests developed to screen out potential students who would be unlikely to be successful.

DPI Studies in Progress:

The Defense Polygraph Institute initiated four in-house research projects and studies in FY 87. More in-house projects are scheduled to start in FY 88. No research contracts were granted in FY 87, but several are planned for FY 88. The four studies begun in FY 87 are as follows:

1. <u>Validation study of four security screening techniques</u>. The polygraph screening examinations used by Military Intelligence, the Air Force,

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National Security Agency and the Central Intelligence Agency are being researched. Those four agencies provided 24 examiners and quality control personnel to the Institute in August 1987. Some 208 military members and civilians were examined at Ft. McClellan, some of whom had committed simulated acts of espionage. The data are now being analyzed and a final report is due September 30, 1988.

2. <u>Demographic variables affecting accuracy</u>. A demographic profile of the Subjects routinely being tested by the DPI polygraph students is being made. This is needed to compare the population available at Ft. McClellan with populations used by other polygraph researchers. A wealth of information is being obtained on factors such as educational levels or the amount of sleep, which might affect the accuracy of the polygraph.

3. The effect of stimulation tests demonstrating the accuracy of the polygraph. A study is in progress to determine if a demonstration of the polygraph's accuracy affects the outcome of the test. If it improves accuracy, at what point within the examination should it be conducted?

4. <u>The effectiveness of Movement Sensors</u>. Some people try to defeat the polygraph by contracting muscles which the examiner cannot readily observe. There are a number of methods for detecting that type of countermeasure. DPI is comparing several to determine which types of movements can be detected and which should be used by federal examiners.

National Security Agency Studies in Progress

1. <u>Comparison of PCQT and RT for Screening</u> - A study is comparing the validity of the Positive Control Question Technique with the validity of the Relevant-Irrelevant Question Technique in multiple issue formats. (Contract)

2. <u>Predetermining Question Arousal</u> - Methodology is being developed for predetermining the arousal value of irrelevant and control questions. Development of a method for predetermining the arousal value of specific scenarios and the related relevant questions prior to their use in research is also involved. (Contract)

3. <u>Effect of Repetition</u> - A study on the effect of repetition on arousal and reactions to irrelevant, relevant, and control questions. (Contract)

4. <u>Optimum Combinations of Questions</u> - A study investigating the most effective combinations of relevant, control, and irrelevant questions in polygraph formats by trying various groupings in laboratory research. (Contract)

5. <u>Plunging GSR Patterns</u> - A study of the causes, extent, and remedies of plunging electrodermal patterns. The study has both practical and theoretical considerations. (Joint study with DPI)

6. <u>Physiological Arousal in Laboratory and Field Polygraph Tests</u> - One of the major problems associated with evaluating laboratory research on polygraph techniques is that the level of arousal of subjects is unknown. If

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the level of arousal of subjects of laboratory tests is significantly below the level of arousal of subjects of real tests, the inferential value of validity, and the application of some of the other laboratory results to the field situation, is diminished. A current study is comparing heart rate and respiration rate data from research cases, training cases conducted in a polygraph school, and real cases conducted by federal examiners. In addition to providing information on arousal, which will help in evaluating research results, this study will provide information on the relative effectiveness of various research and training scenarios. there will also be information on the relative physiological arousal of deceptive and non-deceptive subjects.

Status of NSA Studies That Were in Progress at the Time of the FY 1986 Report to Congress

<u>Recording Covert Muscle Movement by Electromyography</u>. Preliminary studies involving five volunteers demonstrated that covert muscle movement can be easily detected by electromyography (EMG). However, it would require numerous electrodes and polygraph channels to record EMG activity from all possible muscles. The most important muscle groups could be covered by three polygraph channels, but subjects could move other muscles not covered by the electrodes. (Completed)

The remainder of the studies reported as pending in the FY 86 report are in progress, except for one which was tabled because there were insufficient personnel to complete the project.

DOD POLYGRAPH PROGRAM

<u>CY</u>	CRIMIN	AL (%)	EXCULPAT	ORY (응)	COUNTER- INTELLIGENC SCOPE ONLY	E- * (%)	ALL OTHER	S **(%)	TOTAL
1980	5754	(44.6)	1111	(8.6)	92	(0.7)	59 47	(46.1)	12904
1981	5267	(37.0)	1003	(7.0)	216	(1.5)	7761	(54.5)	14247
1982	5879	(31.1)	1035	(5.5)	1449	(7.7)	10517	(55.7)	18880
1983	5237	(24.7)	1622	(7.7)	4606	(21.7)	9726	(45.9)	21191
1984	4817	(21.8)	2344	(10.6)	4644	(21.0)	10261	(46.5)	22066
1985	4366	(17.5)	2922	(11.7)	6505	(26.1)	11146	(44.7)	24939
1986	3879	(14.6)	2742	(10.3)	7370	(27.7)	12588	(47.4)	26579

Includes examinations conducted for the DoD Counterintelligence-Scope Polygraph Test Program, military members being detailed to NSA, certain examinations internal to NSA and other approved special programs.

Includes examinations conducted by NSA, screening examinations on polygrapher applicants, specific issue investigations conducted in support of counterintelligence and intelligence operations. APPENDIX A

APPENDIX B

POLYGRAPH UTILITY IN FY 1987

Following are various categories of anecdotal accounts of interviews conducted with the aid of a polygraph which are in addition to those reported under the DoD Test Program. These examinations produced data of vital security importance or criminal significance which was not otherwise obtainable. There are also anecdotal accounts of individuals falsely but convincingly accused of the most heinous crimes who were ultimately absolved from guilt through application of the polygraph.

Throughout, the accounts are formatted to disguise the identities of the subjects and to sanitize data on sensitive intelligence sources, methods and specifics on contributing agencies.

Counterintelligence-scope Polygraph Examination Administered Under Exceptions to the DoD Test Program

1. an enlisted military member assigned to the National Security Agency (NSA) showed deception and subsequently admitted that she had been the target of a likely espionage approach by a hostile intelligence service. Subject had not previously reported the contact. A counterintelligence investigation is underway.

2. A military officer assigned to NSA showed deception and subsequently admitted that, while at his previous overseas assignment, he had, under orders from his commander and an intelligence officer, given classified access to a unit member whose security clearance had been revoked. The examinee also revealed that his former unit routinely provided classified (CONFIDENTIAL) communications encryption documents to uncleared foreign nationals working for the unit. This matter is under investigation.

3. Subject, an applicant for employment with a DoD Agency, was polygraphed and subsequently detailed extensive contacts with Communist Bloc nationals, some of whom are relatives. He further disclosed extensive travel through Communist Bloc nations. Through his recent employment with another federal agency, he has associated with several Soviet nationals whom he believes to be KGB agents.

4. An employee of a DoD agency with 12 years of service was examined as part of a sensitive access examination program. Subject admitted to providing his uncleared wife a tour of two sensitive facilities and discussing with her his duties which are highly classified. He also provided collateral information to the examiner concerning his supervisor, an employee of another Intelligence Community Agency, who, among other things, was once found passed out in a TOP SECRET facility due to alcohol consumption.

5. An employee of a DoD agency with over seven years of service was examined in conjunction with a reinvestigation polygraph program. She admitted to improperly removing classified information from Agency spaces and then storing it at her residence. Several classified documents were retrieved from her residence. 6. An employee of a DoD Agency was examined in conjunction with a reinvestigation polygraph program. He admitted to the repeated improper removal/couriering of classified information from secure spaces and the unauthorized disclosure of classified information to several uncleared persons. Furthermore, he improperly access an agency computer system to illegally check his supervisor's records and, while doing so, read compartmented information for which he was not cleared.

7. An employee of a DoD Agency was examined in conjunction with a reinvestigation polygraph program. Subject admitted to improperly removing classified equipment from secure spaces on 10 to 20 occasions for convenience purposes. He was also aware of other affiliates who improperly removed classified information/material which he never reported. He further admitted to knowing Agency contractors who had not accounted for classified material. Moreover, he advised that he had discussed compartmented information with an affiliate from the same agency who was not cleared for that specific compartment.

There were three other separate incidents where employees of a DoD Agency were interviewed with the aid of a polygraph and admitted to gross violations of established security procedures similar to those set forth above.

Utility Examples From Other Intelligence Applications

1. A U.S. civilian residing overseas reported an approach by a hostile intelligence service. Authorities considered the credibility of the individual to be questionable at best, but an interview conducted with the aid of a polygraph validated his claims. The examination also developed other important aspects of the approach and, as a result of the information obtained, US authorities were able to launch a special intelligence operation targeted against the hostile intelligence service involved.

2. A U.S. intelligence source in an overseas location showed deception during an examination and subsequently admitted to being an actual employee of a hostile intelligence service. The host country was notified and the subject was placed under arrest.

3. Subject, an applicant for employment with a DoD Agency, was examined and continually showed deception to the questions regarding his involvement with controlled substances. Subject ultimately identified a brother and two cousins as being involved in a cocaine dealing operation involving hundreds of thousands of dollars. The matter was referred to the proper law enforcement authorities.

4. A contractor nominee for sensitive access confessed during an examination that he was a dealer of illegal drugs while stationed at a military base. He also provided information relating to major cocaine trafficking in several states. The information was referred to the proper law enforcement authorities.

5. A contractor nominated for sensitive access admitted to extensive illegal drug involvement both during and subsequent to the time he held a

TOP SECRET clearance and had access. the subject has recently been involved in the personal use, sale, and distribution of marijuana, PCP, ISD, and cocaine. This information was referred to the proper law enforcement authorities.

6. An enlisted military reservist was alleged to have systematically removed highly classified material from a SCI facility while on active duty and to have provided that material to an uncleared person. She was interviewed during the course of an ensuing counterespionage investigation and denied the allegations. She agreed to take a polygraph examination concerning the allegations and, upon showing deception, made a full confession to all elements of the allegations. The military command having jurisdiction over her intends to bring criminal charges against her.

Examples of Utility in Personnel Security Investigations

1. During the course of a personnel security investigation, allegations were made that a naturalized citizen from an Eastern bloc country, who is an aerospace engineer, was suspected of providing classified information to his former countrymen. He denied the allegation and agreed to undergo a polygraph examination for exculpation. During the pre-test phase, Subject provided a written statement admitting that he discussed classified information with unauthorized persons, including foreign nationals, but denied that he ever engaged in espionage per se. During the polygraph examination, in which deception was indicated, it appeared that the subject was practicing countermeasures in an attempt to thwart the examiner. When he departed the examination room, he inadvertently left behind a note, apparently in his handwriting, which contained information about the DoD polygraph directive and allegedly effective polygraph countermeasures. Subject declined additional testing on advice of counsel. Investigation continues.

2. Subject, a former military pilot, now working as a civilian pilot for an air cargo line which couriers classified defense material, had accepted a discharge from the military in lieu of court-martial after drug sniffing dogs alerted to a package addressed to his residence. The package was found to contain two ounces of cocaine. During a recent investigation, subject claimed that the cocaine was actually destined for his wife without his knowledge or consent. He claims he simply attempted to cover for his wife and it cost him his military career. Subject agreed to a polygraph examination which indicated he was truthful in his denial of ever having, possessed, used, or trafficked in cocaine or other drugs. Subject obtained his clearance.

3. An administrative inquiry was initiated when information was received that Subject, a computer software engineer, had told a former co-worker of his having removed SECRET-COMSEC documents from his former place of employment. During an interview by investigative personnel, Subject claimed he had only been joking about removing the documents. Subject agreed to submit to a polygraph examination. When confronted with the examination process, the subject confessed to having taken the documents as alleged. He had planned to use the information from the documents to assist him in a new job he had obtained with another defense contractor. The documents were recovered and the subject resigned from his position. 4. During the course of a personnel security investigation, allegations were made that Subject had been involved in the trafficking of cocaine prior to his Army service. It was also alleged that Subject's father-in-law was the head of the drug operation while at the same time being a fugitive from justice. Subject denied the allegations and agreed to undergo a polygraph examination. During the examination, Subject admitted to having transported as many as ten kilos of cocaine at a time by automobile from Miami, Florida to Denver, Colorado. He also admitted to using cocaine while on active duty in the military. This information was provided to the proper authorities and the Subject was discharged from the military.

5. A military member was alleged to have provided classified information concerning the mission of a US unit involve3d in a highly sensitive SAP to another military member not authorized the information. Subject denied the allegation and agreed to a polygraph for exculpation. The examination indicated deception and the Subject admitted the possibility of his having committed the violation in question, but he stopped short of a full confession. A full inquiry resulted in the subject being debriefed and removed from sensitive duties within the SAP.

Polygraph in Exculpation

1. A day care worker on a military installation was accused of sexually molesting a small boy in her care. A polygraph was administered which revealed she was truthful when she denied sexually molesting the child. Further investigation revealed the child had a history of making this type of complaint, and had indeed made an identical complaint at another installation. The boy's story in the previous complaint paralleled this complaint almost verbatim.

2. An 18 month old baby was taken to a military hospital with severe injuries to the abdomen which ultimately necessitated the surgical removal of 40% of the stomach. Hospital officials reported the injuries were the result of a blow to the area which had to have occurred within the last 12 hours. The parents of the child became the prime suspects. During interrogation, the father, who was most distraught, appeared to admit culpability by stating, "If you say I did it, I did it." The father agreed to a polygraph which resulted in a finding of no deception when he denied having struck the child. The mother was administered a polygraph which resulted in the same finding. Further investigation revealed that the baby had been left with a baby-sitter during a portion of the previous 12 hours. The baby-sitter was administered a polygraph which also cleared her of the offense. The baby-sitter did state, however, that during the period in question, her husband had stopped by for an hour to eat lunch. The sitter's husband was administered a polygraph examination which showed deception. He ultimately confessed that he had indeed struck the baby to "shut it up".

3. A senior non-commissioned officer was accused of sexually molesting his 13 year old daughter. The NCO was relieved of his duties and ordered to "get off the installation." He requested and was administered a polygraph which revealed him to be truthful in his denial of the allegation. The 13 year old was reinterviewed and admitted to having fabricated the entire incident in collusion with her mother because of marital problems between her parents.

4. A U.S. soldier was accused of sodomizing his two month old son. A military doctor stated that the child's anus had been penetrated by an unidentified object. The soldier claimed the child had suffered from diarrhea for four weeks and the injuries were due to the diarrhea. Initial investigation did not disclose any visits to the hospital nor medical records indicating treatment of the child for diarrhea. A polygraph was administered which revealed the solder was being truthful when he denied inflicting any type of injury on his son. Subsequent medical examination by civilian state medical experts revealed no evidence of a penetration type injury. Further investigation eventually located the medical records which substantiated the soldier's story that he had indeed taken his son to the hospital on numerous occasions for treatment of diarrhea.

5. A military member gave a junior high school student a ride home from school and was subsequently accused of taking her to his barracks and raping her. The military member denied having raped the girl and requested a polygraph in exculpation. A polygraph examination disclosed he was truthful in his denials. The girl was reinterviewed and admitted she had fabricated the story in order to get back at the military man for refusing her sexual advances.

6. A U.S. Army colonel, under consideration for promotion to brigadier General, was alleged to have been provided advanced intelligence regarding the planned bombing of a U.S. installation in Lebanon which he "sat on". It was further alleged that because of his inaction, numerous U.S. lives were lost in the bombing. The colonel denied the allegations and a polygraph confirmed his truthfulness.

Polygraph Use in Fraud Investigations

The use of polygraph examinations during 1987 in fraud investigations resulted in the following:

1. The prosecution of three contractor employees in Florida for perpetrating construction fraud against the US Government in excess of one million dollars.

2. The development and substantiation of information that a firm under a five million dollar contract with the Army to manufacture M-60 transaxles was using substandard materials which malfunctioned when placed in field simulations. A criminal investigation is underway.

3. The prosecution of two military members who illegally diverted \$150,000 in government money which was used for gambling in Las Vegas.

Polygraph in Criminal Offenses

Set forth below is a representative sampling of criminal offenses which were resolved in 1987 through use of the polygraph.

1. The arrest and prosecution of several field grade and non-commissioned officered for diversion of \$300,000 of US funds for personal use, and other funds to purchase 280 commercial handguns, shotguns, rifles, holsters, and knives.

2. Three individuals confessed to breaking into an elementary school, robbing a soda machine, and starting a fire which caused a quarter of a million dollars damage.

3. A military officer confessed to damaging five cobra helicopters on the ground (one helicopter sustained damage in excess of one half million dollars), causing nine separate in-flight emergencies, starting two fires in a battalion headquarters, stealing an M-16 rifle, other government property, and falsely reporting two burglaries of his residence.

4. A soldier confessed to murdering his wife and two children.

5. An officer confessed to murdering his wife and two children.

6. A soldier admitted to killing another soldier.

7. A soldier confessed to sexually assaulting in excess of 50 young girls in the New Jersey and New York areas.

8. A military member confessed to killing a civilian female in North Carolina.

9. A military member confessed to raping an sodomizing a civilian female in Portland, Maine.

10. A male military member confessed to fondling a young boy.

11. A military member confessed to hiring two civilians to steal his truck and set it on fire in order that he could collect the insurance money.

12. The polygraph was effective in obtaining confessions in numerous drug related cases.

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APPENDIX_C*

UPDATE TO THE FISCAL YEAR 1986 REPORT TO CONGRESS

Following is an update the those cases or scenarios reported in the FY 1986 Report to Congress on the Polygraph which were pending action at that time.

Page 4, Para D (1) "No Opinion"

Situation - The examination of one individual was reported as having been suspected due to concerns about the health of the individual. The subject was referred for a medical evaluation.

Results - the individual was found fit for examination. The examination resulted in a finding of NDI.

Page 5, Para D (2) (c)

Situation - Multiple series resulted in a finding of inconclusive with the understanding that further examining would be conducted after a six month time period.

Results - The individual was examined and adjudged to be NDI.

Page 7, DI subject reported under caption of "Illegally providing U.S. Defense Information"

Situation - Investigation Agency with jurisdiction over subject was considering a possible reinvestigation.

Results - The matter is still pending. The investigative agency was forced to direct its limited resources toward resolving serious criminal and security allegations within another program.

Page 8, 1st para, "Blatant Disclosure of Highly Classified Information"

Situation - Subject rather blatantly ignored certain security procedures. An investigation was initiated.

Results - The investigation revealed little or no damage to national security. The subject and his supervisor received security awareness briefings.

* See Department of Defense Polygraph Program: Report to Congress for Fiscal Year 1986 Polygraph 16(1)(1987): 53-71.

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Page 8, 2nd and 3rd paragraphs, "Disclosure of Classified Information to Foreign Nationals" and "Unknown Circumstances"

Situation - Both individuals were deceptive and made limited admissions to contact with foreign nationals. One subject was almost completely uncooperative.

Results - Both subjects were employed in the same program which required their personal involvement in extremely sensitive "field" operations. During these operations, they were placed in positions which required snap decisions on their part about what information should be released and to whom. Both harbored concerns about whether they had made the right decisions. Moreover, neither would cooperate further as the examiners were not cleared for the program. The Defense agency involved reviewed the situation and determined that the two individuals had acted properly. Both subsequently were able to clear the examination process.

* * * * * *

THE USE OF POLYGRAPH IN THE WORKPLACE: THE AMERICAN POLYGRAPH ASSOCIATION'S VIEW

By

Joseph P. Buckley

Introduction

The business community has used polygraph testing for over 40 years to help screen out the potentially dishonest employee and to aid in the investigation of suspected acts of employee dishonesty. However, the use of polygraph testing for these purposes has become extremely controversial. This controversy has focused on several issues: the accuracy of such testing; the right of the employer to protect his or her property versus the employee's right to privacy; the alleged capricious use of polygraph testing to intimidate employees; and the utility of using polygraph testing to screen job applicants or to investigate suspected acts of employee dishonesty.

Unfortunately, however, much of the discussion is based on misunderstandings and misconceptions concerning the polygraph technique. In this brief outline the American Polygraph Association presents some basic facts about the polygraph technique, followed by a review of the most common arguments employed against the continued use of polygraph, and a reasonable remedy to the problem.

Who Uses Polygraph and Why

While exact figures are difficult to determine, several surveys indicate that approximately 20% of all major businesses in the United States use polygraph. In particular industries the figures are much higher: for example, approximately 50% of all commercial banks and over 60% of all retail operations use polygraph in some capacity.

In addition to private business, polygraph testing is widely used in state and local law enforcement, and almost all federal law enforcement, intelligence and counter-intelligence agencies. It is also in common use in many foreign nations.

One of the primary reasons that polygraph is used in the business community is to help combat employee theft. According to the U.S. Chamber of Commerce, "Business executives view employee theft as their most serious crime problem"; Fireman's Fund Insurance Co. estimates that one-third of all business failures are caused by employee theft; estimates of the cost of economic crime against business, including employee theft, range from \$67 billion to \$200 billion annually. The most effective deterrents against employee theft include thorough pre-employment screening procedures and a means to identify and apprehend those employees who do steal. Consequently, employers use polygraph to aid in the assessment of a job applicant's honesty before he is hired, and to investigate suspected acts of dishonesty by employees.

Benefits Realized

In a survey of over 1,200 businesses who have used polygraph ("Honestly, It's the Truth", <u>Security Management</u>, June 1986) they reported that they have realized the following benefits:

. Employee theft is reduced by over 10% for the majority of employers.

. Pre-employment polygraph provides a better quality employee.

. Polygraph provides a more accurate assessment of the job applicant's honesty than background and reference checks.

. Polygraph provides an effective way to clear suspicion from the innocent employee.

. Polygraph testing functions as a deterrent against future acts of dishonesty and helps to resolve issues other investigative means could not.

The majority of employers do not use polygraph test results as the sole basis on which to make an employment decision, but merely use it as an aid in conjunction with other screening or investigative procedures.

The Accuracy of Polygraph

In the last 15 years over 100 studies have been conducted on the accuracy of the polygraph technique. Since many different conditions and factors are involved in the research, and since the polygraph test involves a very complex process, it is difficult to draw from the data a precise figure for the accuracy of the polygraph in all settings. Nevertheless, the preponderance of available information indicates that when a properly trained examiner utilizes an established testing procedure, the accuracy of the decisions made by polygraph examiners is generally in the range of 85 to 95% for specific issue investigations. (See References listed at end of this statement.)

Why Critics' Figures Vary

One of the problems in discussing accuracy figures and the wide margin between the figures quoted by proponents and opponents of the polygraph technique is the way that the figures are calculated. At the risk of oversimplification, critics of the polygraph technique often-times classify inconclusive test results as errors. In the real life setting an inconclusive test result simply means that the examiner is unable to render a definite diagnosis - the polygraph records are not clear. Usually a second examination is conducted at a later date. To illustrate how the inclusion of inconclusive test results can distort accuracy figures, consider the following example: If 10 polygraph tests are administered and the examiner is correct in 7 of his decisions, wrong in 1 and has 2 inconclusive test results, we calculate his accuracy rate as 87.5% (8 definitive results, 7 of

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which were correct). Critics of the polygraph technique would calculate the accuracy rate in this example as 70% (10 tests with 7 correct decisions). Since an inconclusive test result is not the same as a deceptive or negative result, to consider them as errors is clearly misleading and certainly skews the figures.

Pre-Employment Test Accuracy

To date there has been only a limited number of research projects into the accuracy of the polygraph test in the pre-employment context, primarily because of the difficulty in establishing ground truth. However, since the same physiological measures are recorded and the same basic psychological principles may apply in both the specific issue test and the pre-employment test, there is no reason to believe that there is a substantial decrease in the accuracy rate for the pre-employment test. Studies which have been conducted on pre-employment testing (appear to) support this contention.

While the polygraph technique is not infallible, the research clearly indicates that when administered by a competent examiner, the polygraph test is the most accurate means available to determine truth and deception.

For an excellent book on the research involving validity and reliability including pre-employment screening, see <u>The Accuracy and Utility of</u> <u>Polygraph Testing</u>. Washington, D.C.: Department of Defense, 1984. Complete reprints may be purchased from APA Publications, P.O. Box 1061, Severna Park, Maryland 21146 for \$8.00 postpaid.

Polygraph Errors

While the polygraph technique is highly accurate, it is not infallible and errors do occur.

Polygraph errors may be caused by the examiner's failure to properly prepare the subject for the examination, or by a misreading of the physiological data on the polygraph charts. Errors are usually referred to as either false positives or false negatives. A false positive occurs when a truthful subject is reported as being deceptive; a false negative when a deceptive subject is reported as truthful. Some research indicates that false negatives occur more frequently than false positives; other research studies project the opposite conclusion.

Protective Procedures

In order to protect against the occurrence of errors, examiners utilize a variety of procedures to identify the presence of factors which may cause false responses, and to insure an unbiased review of the polygraph records:

. an assessment of the subject's emotional state

. medical information about the subject's physical condition

. specialized tests to identify the overresponsive subject and to calm the overly nervous

- . control questions to evaluate the subject's response capabilities
- . factual analysis of the case information
- . a pre-test interview and detailed review of the questions
- . quality control reviews

Furthermore, because of the possibility of error exists, the American Polygraph Association has taken the position that no one should lose a job or be charged with a crime solely on the basis of a polygraph test result. In fact, the majority of employers do not terminate an employee based solely on polygraph test results without supportive evidence.

Subject Remedies

If a polygraph subject believes that an error has been made there are several actions that may be taken including the following:

- . request a second examination
- . retain an independent examiner for a second opinion
- . file a complaint with the state licensing board

Scope of Test Questions and Dissemination of Test Results

In a pre-employment polygraph test the questions focus on such job related inquiries as the theft of money or merchandise from previous employers; falsification of information on the job application; the use of illegal drugs during working hours and criminal activities. The test questions are limited in the time span they cover, and all are reviewed and discussed with the subject during a pre-test interview. There are no surprise questions.

In a specific issue polygraph test the relevant questions simply focus on the particular act under investigation.

Prohibited Inquiries

Personal and intrusive questions have no place in a properly conducted polygraph examination. Many state licensing laws, as well as the American Polygraph Association, have so stated in language similar to the following:

No examiner shall inquire into any of the following areas during preemployment or periodic polygraph examinations:

- . religious beliefs or affiliations
- . beliefs or opinions regarding racial matters
- . political beliefs or affiliations

. beliefs, affiliations or lawful activities regarding unions or labor organizations

. sexual preferences or activities Release of Results According to the various state licensing laws and the American Polygraph Association standards and principles of practice, polygraph test results can only be released to authorized persons. Generally those individuals who can receive test results are limited to the subject and anyone specifically designated in writing by the subject; the person, firm, corporation or governmental agency which requested the examination; and others as may be required by due process of law.

Licensing

Currently there are 32 states which have laws requiring licensure or certification for polygraph examiners.* Most laws require formalized instruction, an internship training period and successful completion of a licensing examination. For example, the following are basic requirements for licensure in some states:

A person is qualified to receive a license as an examiner: (a) who establishes that he or she is a person of good moral character; and, (b) who has passed an examination conducted by the Examiner Committee, or under its supervision, to determine his or her competency to obtain a license to practice as an examiner; and (c) who has conferred upon him or her an academic degree, at the baccalaureate level, from an accredited college or university; and, (d) who has satisfactorily completed 6 months of study in detection of deception, as prescribed by rule ...

Prohibitive Legislation

To date there are 21 states and some municipalities, e.g., the District of Columbia, which have enacted legislation designed to regulate an employer's use of the polygraph.** No state prohibits polygraph testing in all settings. A typical "anti-polygraph" statute states: "No employer may require a prospective employee or employee to take a polygraph examination as a condition of employment or continued employment."

Most of these states make exceptions for certain occupations. Commonly exempted are law enforcement agencies and companies that manufacture, distribute or dispense drugs and controlled substances.

The American Polygraph Association has consistently supported licensing efforts throughout the country. Earlier this year, the American Polygraph Association introduced in the United States Congress legislation (H.R. 1536)

* Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia.

** Alaska, California, Connecticut, Delaware, Hawaii, Idaho, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Jersey, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, West Virginia.

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which would establish guidelines for the administration of polygraph tests. Our profession encourages efforts to establish proper qualifications for polygraph examiners and criteria for the testing procedures.

Admissibility

In the last 35 years, numerous courts have recognized the evidentiary value of polygraph evidence. Stipulated polygraph evidence is generally admissible in state courts; in California stipulated polygraph evidence is admissible under state law. New Mexico and Massachusetts have rules which, under certain conditions, allow polygraph evidence to be admitted over objection. A majority of the United States Courts of Appeals allow the admissibility of polygraph results into evidence at the discretion of the trial judge, either on stipulation or over objection. However, most federal district judges are rather conservative in ruling on admissibility. Only the Fifth, Tenth, Eleventh and District of Columbia circuits have prohibitions on the introduction of such evidence. The United States Supreme has not ruled on admissibility.

Representative case citations are provided for reference:

- Arizona: State v. Valdez, 91 Ariz. 274, 371 P.2d 894 (1962) State v. Molina, 117 Ariz. 454, 573 P.2d 528 (App. 1977) Holcomb v. State, 594 S.W.2d 22 (1980) Arkansas: California: People v. Houser, 85 Cal.App.2d 686, 193 P.2d 937 (1948) Robinson v. Wilson, 44 Cal.App.3d 92, 118 Cal.Rptr. 569 (1974)People v. Trujillo, 66 Cal.App.3d 547, 136 Cal.Rptr. 672 (1977)Florida: Moore v. State, 299 So.2d 199 (Fla. 3d DCA 1974) Codie v. State, 313 So.2d 754 (1975) Georgia: State v. Chambers, 240 Ga. 76, 239 S.E.2d 324 (1977) Ross v. State, 245 Ga. 173 (1), 263 S.E.2d 913 (1980) Indiana: Tope v. State, 266 Ind. 239, 362 N.E.2d 137 (1977) Owens v. State, 373 N.E.2d 913 (1978) Iowa: State v. McNamara, 104 N.W.2d 568 (1960) State v. Galloway, 167 N.W.2d 89 (1969) State v. Connor, 241 N.W.2d 457 (1976) Kansas: State v. Lassley, 218 Kan. 758, 545 P.2d 383 (1976) State v. Roach, 576 P.2d 1082 (1978) Massachusetts: Commonwealth v. A Juvenile, 365 Mass. 421, 313 N.E.2d 120 (1974)Commonwealth v. Vitello, 381 N.E.2d 582 (1978)
- Nevada: <u>Corbett v. State</u>, 584 P.2d 704 (1978)

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New Jersey:	<u>State v.</u>	<u>McDavitt</u> , 62	N.J. 36	, 297 <i>I</i>	A.2d 849) (1972)	
	State v.	Baskerville,	73 N.J.	36, 29	97 A.2d	849 (1972)	1

New Mexico: State v. Dorsey, 88 N.M. 184, 539 P.2d 204 (1975)

 Ohio:
 State v. Towns, 35 Ohio App.2d 237, 301 N.E.2d 700 (1973)

 State v. Souel, 53 Ohio St.2d 123, 372 N.E.2d 1318 (1978)

Oregon: <u>State v. Bennett</u>, 17 Or.App. 197, 521 P.2d 31 rev.den. (1974)

Utah: <u>State v. Jenkins</u>, 523 P.2d 1232 (1974) <u>State v. Abel</u>, 600 P.2d 994 (1979)

Washington: <u>State v. Ross</u>, 7 Wash.App. 62, 497 P.2d 1343 (1972)

Wyoming: <u>Cullin v. State</u>, 565 P.2d 445 (1977)

Critics Arguments

The arguments against the use of polygraph in the workplace, and the screening of job applicants, seem to primarily focus on the following points:

. People are denied jobs on the basis of polygraph test results.

. People are fired or lose their jobs, on the basis of polygraph test results.

. Some employers use polygraph as a means of intimidation and to get rid of certain employees.

. Job applicants, as well as current employees, are forced to take the test.

. Polygraph is not accurate, therefore, people are being unjustly denied jobs or losing jobs.

. The questions asked during a polygraph test are intrusive, an invasion of privacy, and create a humiliating, de-humanizing experience.

. Often felt, but rate stated, is the inherent dislike and mistrust of any instrumental attempt to assess one's integrity - there seems to be a presumption of guilt (with innocence to be proven).

American Polygraph Association Response

The American Polygraph Association's position on these issues is essentially the following:

. No one should be denied a job or lose a job simply and solely on the basis of an examiner's diagnosis of truth or deception. Polygraph should be used as a screening and investigative aid, not as the sole arbiter of the truth.

. Contrary to the misconception that many, many job applicants fail the test and are rejected for employment, the majority of applicants do fine on the test; 60-70% meet the client's standards as applied to recent, job related activity. Those who do not meet the standards are primarily disqualified because of their acknowledgement that they have engaged in behaviors which exceed the employer's standards. Pre-employment polygraph testing is not merely intended to help the employer identify whether or not the applicant falsified any information on the job application, but also to help identify the risk potential of the candidate. The acknowledgements of wrongdoing that job applicants make often come only after a polygraph test has indicated that the subject was withholding information.

. To quality for any given position, a job applicant will be required to fulfill and successfully complete certain screening procedures - truthfully fill out the application, submit to an interview, take a medical exam, perhaps complete a paper and pencil psychological test (re: honesty, aptitude, personality characteristics, etc.), as well as, in some cases, a polygraph test. The applicant can refuse to take the test, as well as refuse to do anything else the employer may require, e.g., take the physical, provide proof of educational background, etc. A balance must be maintained between the two principles that 1) while everyone has a right to a job, they do not have a right to a specific job; and 2) an employer must demonstrate that he exercised a reasonable standard of care in the screening of applicants.

. In the last decade, 7 surveys of people who have taken polygraph tests have been conducted and published. The composite of these 7, involving thousands of subjects, indicate that 85-95% said the exams were not offensive, objectionable, or an invasion of privacy. Contrary to background investigations where other people provide information about the applicant, in a pre-employment test the subject has total control over what information is revealed about himself, how it is revealed and the accuracy of the information.

Credibility in Opposition's Viewpoint

Some employers do make decisions based solely on polygraph results, without corroborating statements, admissions, or evidence. Some examiners do not follow proper procedures and do ask inappropriate and improper questions. As a result of improve use by some employers and improper application by some examiners, innocent people can suffer, and some examiners are poorly trained and are incompetent.

Compromise Legislation

In an effort to maintain the continued value of polygraph, while at the same time minimizing the potential for abuse, compromise legislation should be enacted. This compromise legislation should:

. Prevent an employer from making hire/fire decisions based solely on an examiner's opinion of truth or deception, without corroborating evidence.

. Prevent examiners from using improper procedures and from asking improper inquiries.

. Allow proper remedies for the "innocent" who are erroneously labeled deceptive, and suffer negative consequences from the same.

. Allow all employers to use polygraph in accordance with the above.

. Establish minimum examiner qualifications and testing procedures.

Polygraph can be a very helpful screening and investigative aid for the employer if used under proper circumstances, administered by a well-qualified examiner using an established technique, and considered in conjunction with other relevant information. On the other hand, of course, it can be abused by unscrupulous employers and unethical examiners. Therefore, in an effort to balance competing rights that exist in the workplace, regulation, not prohibition should be encouraged.

APPENDIX

The Office of Technology Assessment Report

The authors of the report, <u>Scientific Validity of Polygraph Testing: A</u> <u>Research Review and Evaluation - A Technical Memorandum</u> (1983), indicate that polygraph does in fact seem to achieve a significant degree of accuracy when the 10 field and 14 analog studies are averaged out. Specifically, on page 97 of the report, the authors indicate that between the 10 field studies they reviewed, the average accuracy rate for correctly identifying innocent subjects (true positives) was 81%, and the average accuracy rate for correctly identifying guilty subjects (true negatives) was 90%.

When the 14 analog studies were averaged out, the report indicates an accuracy rate of 86% for correctly identifying innocent subjects, and 90% accuracy for the correct identification of the guilty subjects.

Furthermore, these figures include inconclusive results as "errors". The OTA report acknowledges that "exclusion of inconclusives would raise the overall accuracy rates calculated". It has been estimated that the elimination of inconclusive test results would increase the average accuracy rates to 90%.

It is also interesting to note that in their "base rate" projections, OTA, in this report as well as their March 1987 report (Review of the Defense Department's Polygraph Test and Research Programs), suggest that if 4,000 people are tested, about 600 innocent people should fail the test. Specifically, the OTA says that if 4,000 people are tested for spying, and there are only 4 spies in the group, then 599 innocent people would fail because the polygraph is so inaccurate.

[Similar "predictive" arguments have been made by Michael Phillips, Allan Bett and John Beary in their paper, "Predictive Power of the Polygraph: Can the 'Lie Detector' Really Detect Lies" (<u>The Lancet</u>, March 8, 1986). The American Medical Association has also adopted this posture in their report, "Polygraph", <u>JAMA</u>, 1986: 256; 1172-1175.]

The erroneous nature of all of these predictions is exposed, however, when compared to a real life testing situation.

In their report to the U.S. Congress for 1986, the Department of Defense showed that they had tested nearly 4,000 people in a screening (espionage) context. According to OTA predictions (and the others as well) almost 600 people should have failed the test, the overwhelming majority of whom were innocent. In reality, however, only 13 were reported as deceptive, 8 of whom acknowledged their wrongdoing.

The Reliability of Polygraph Versus Medical Tests*

Reliability
Up to 7% False Positives
Cannot reach conclusive conclusion from one test
Varies widely with the skill and experience of the doctor
10 to 20% False Positives 10 to 30% False Negatives
Wide deviations in accuracy
Generally highly accurate
Any negative results should be followed up with additional tests
10 to 20% False Negatives
10 to 15% False Negatives
50% False Positives
95% accuracy
15 to 40% False Negatives
20 to 30% False Negatives

* Source: <u>Hippocrates</u>, May/June 1987, pg. 86. "Just Testing: 13 Common Medical Tests Yield Mixed Results" by Mary Spletter.

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* These publications may be purchased from the American Polygraph Association Publications and Reference Office, P.O. Box 1061, Severna Park, Maryland 21146.

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PRETESTING PANELIST EXPERTISE FOR VALIDITY STUDIES COMPARING PANEL AND POLYGRAPH JUDGMENTS

By

Dean D. Given

ABSTRACT

An experienced investigator reviewed all of the evidence in 20 criminal investigations, except that the polygraph materials, polygraph reports, interrogation notes, and confessions were removed. The investigator made decisions on the quilt or innocence of the person from the remaining evidence in the file. The decision of the investigator was compared with the decision of the polygraph examiner in each case. The cases selected for the study were all verified by subsequent confession and investigations, so that there was no doubt as to guilt or innocence. Nine of the persons were confirmed as innocent and eleven persons were confirmed as quilty, a mix unknown to the investigator. The independent judgment of the investigator was in agreement with the polygraph examiner's decision in 19 of 20 cases.

This pilot study suggests a method for selecting members of panels used to compare their judgment of case facts (less polygraph information) with polygraph results. If the panelists are selected for their proven accuracy in adjudicating case facts for innocence or guilt, then more weight can be given to the results obtained by comparing the panel decisions with polygraph outcome.

One of the approaches to determining polygraph validity in the field has been to have a panel of attorneys review all of the evidence in a criminal investigation except for the polygraph test results, decide on the suspect's guilt or innocence, and compare the panel's determination with the polygraph results. In the first such study (Bersh, 1969) the experimenters controlled the mix of polygraph techniques, GQT (a relevant-irrelevant test) 50% and zone (a control question test) 50%. They also controlled the mix of calls, deceptive and non-deceptive, eliminating all inconclusive results. They also allowed the military attorneys to eject files that did not have enough evidence for a decision. There was a high degree of correlation between the polygraph results and the panel's decision. Employing the same principle, Barland had a panel evaluate the evidence in criminal cases and compared their decisions with his polygraph results (Barland and Raskin, 1976). Unfortunately, Barland's files didn't contain the extensive evidence typical

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of military files, and the panel was asked to make decisions on all of the Not surprisingly, the attorneys tended to find people innocent when cases. there was insufficient admissible evidence to convict, rather than decide on a preponderance of the available evidence. While the panel approach eliminates some of the problems encountered in comparing polygraph results with judicial outcome (Edwards, 1981; Elaad & Schahar, 1976; Lyon, 1936; Peters, 1982), there has been no attempt to evaluate the accuracy of the panel. It would have been interesting to have put some cases before the panel in which the truth was known, and withheld only the conclusive evidence (i.e., someone else confesses). That might have been a way of evaluating the accuracy of a panel which was being used to evaluate the accuracy of polygraph results. The same problem exists when one person adjudicates the evidence in the files and compares his judgment to polygraph outcome. A psychology student did that in Israel, and his judgment of the evidence matched the polygraph results in 94 percent of the cases (Ben-Ishai, 1962).

In these studies we don't know who has erred when the panel and polygraph examiner results don't coincide. Nor do we know how many errors occur when the panel and polygraph outcomes are alike and they are both wrong. Then there is the problem of skill in making judgment on the evidence. It may be that lawyers (and psychology students) are not the best persons to judge the evidence. Why not try investigators? Throughout an investigation, the agents are constantly evaluating the information and taking positive action on those decisions. One might suppose that investigators would have a tendency to assume every suspect is quilty while the investigation progresses and that bias might carry over. If investigators are accurate judges of investigative results, perhaps future panels should be made up of investigators rather than lawyers. Better yet, there might be a variety of professions from which proposed panelists are drawn, with only the highly accurate being selected. As a means of evaluating an investigator's skill, a pilot project was conducted in which an investigator judged the contents of investigative files as to guilt or innocence. The files were typical of what a panel would see. The investigations, arrest records, and other data was there, but all the polygraph information was removed, and so was conclusive proof, such as a post-test confession. Some would argue that confessions should be left in the file, and there is merit in that view, but in this study we decided not to do that.

Method

A supervisor of polygraph examiners in a U.S. Treasury agency randomly selected the first 20 case files in which a polygraph examination was given and the test results were confirmed by investigation, confessions of the subjects (guilty), or investigation and confessions of other parties (subject innocent). The supervisor removed from consideration files lacking in evidence, and cases in which the polygraph results were inconclusive. In all the cases, the polygraph results were correct in terms of agreeing with conclusive evidence of guilt or innocence. Like the Bersh study, the supervisor then removed from the 20 files all evidence of the polygraph examination, including examiner notes, charts and confessions.

Cases included computer fraud, a breaking and entering compromise case, drug smuggling, theft, bribery, and arson. The breaking and entering

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compromise case included seven polygraph tests conducted on seven suspects. The theft case included four polygraph tests conducted on four suspects. (See Table 2)

There were seven examiners who were federal Special Agents with an average of three years polygraph experience.

Each case was then reviewed by the investigator who made an independent guilty/not guilty judgment. This decision was then taken by the quality control person and compared to the polygraph examination and case results.

The investigator did not know the mix of guilty or innocent cases. The mix was 11 guilty and 9 innocent.

The polygraph examiners used two techniques for their examinations: Modified General Question Technique (MGQT) and Zone Comparison (ZQT).

TABLE 1

TECHNIQUES AND OUTCOME

Modified General Question Technique Zone Comparison

Dec Ind	eption licated	No Deception Indicated	Deception Indicated	No Deception Indicated
	4	2	7	. 7
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Results

The investigator's judgment on the evidence remaining in the file agreed with the polygraph examiner's conclusion in 19 of 20 cases (95%).

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TABLE 2

File	≥ #	Polygraph Technique	Type of Criminal Case	Reviewer Decision	Polygraph Decision
	1	MGQT	Computer Fraud	Guilty	DI
	2	Zone	Breaking/Entering Com-	-	
			promise	Not Guilty	NDI
	3	Zone	Breaking/Entering Com-		
	14		promise	Guilty	DI
	4	MGQT	Breaking/Entering Com-		
			promise	Not Guilty	NDI
	5	Zone	Breaking/Entering Com-		
			promise	Not Guilty	NDI
	6	Zone	Breaking/Entering Com-		
			promise	Not Guilty	NDI
	7	Zone	Breaking/Entering Com-		
			promise	Not Guilty	NDI
	8	Zone	Breaking/Entering Com-		
			promise	Not Guilty	NDI
	9	MGQT	Drug Smuggling	Guilty	DI
	10	Zone	Drug Smuggling	Not Guilty	DI
	11	MGQT	Theft	Guilty	DI
	12	MGQT	Theft	Not Guilty	NDI
	13	Zone	Theft	Not Guilty	NDI
	14	Zone	Theft	Not Guilty	NDI
	15	Zone	Informant	Guilty	DI
	16	Zone	Bribery	Guilty	DI
•	17 .	MGQT	Smuggling	Guilty	n n DI na na si
	18	Zone	Smuggling	Guilty	DI
	19	Zone	Arson	Guilty	DI
	20	Zone	Smuggling	Guilty	DI

TABLE 3

Comparison of Reviewer and Polygraph Examiner Decisions

·	Investigator	<u>Polygraph Examiner</u>
Guilty/DI	10	11
Not Guilty/NDI	10	9
Total	20	20

Discussion

In this study, the investigator's judgment of the evidence in the files was highly accurate. He did so without benefit of the polygraph results. Because the pilot project involved one person, no general statements may be made about the judgment of investigators. What this study does is suggest

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that there is a way to test the accuracy of the judgments of proposed panel members before they take part in a study that compares polygraph results and panel judgments. A replication of Bersh or Barland might be useful if it were established beforehand that the panelists were highly accurate in their judgment of evidence in case files, by pretesting them on case files like those they will see in the study, but case files in which the guilt or innocence is known. If the panel is composed of highly accurate people, then the comparison of polygraph and panel results will be more useful.

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