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### A CASE FOR FORENSIC PSYCHOPHYSIOLOGY

# AND OTHER CHANGES IN TERMINOLOGY

#### By

### William J. Yankee, Ph.D.

#### Abstract

The purpose of this paper is to identify and examine a variety of misnomers used in the detection of deception lexicon and to define and advocate a new discipline: Forensic Psychophysiology.

Over the years a variety of words and terms have been used in naming what are essentially the processes and procedures used in the psychophysiological detection of deception. Most, if not all, of these words and terms are unquestionably misnomers. It is the purpose of this paper to identify the nature of these misnomers and to suggest appropriately descriptive words and terms to replace them.

To begin, it is necessary to establish the bases for the new terminology. The bases will be determined by defining two disciplines: Psychophysiology and Forensic Psychophysiology. Psychophysiology is a science involving the presentation of stimuli to one or more of the human senses to determine the affects of that stimuli, when psychologically processed, on selected physiological activities (Coles, Donchin & Porges, 1986). Forensic psychophysiology, on the other hand, is a science that deals with the relationship and application of psychophysiological detection of deception examinations to the legal system (DoDPI Annual Report, 1991).

The use of the modifier *forensic* in Forensic Psychophysiology, delineates and delimits the scope of the science of psychophysiology, as it applies to the legal system, to those systems, processes and applications that are an integral and functional part of the psychophysiological detection of deception. Similarly, the modifier *forensic* delineates and delimits the discipline Forensic Psychology from the broader discipline of Psychology; the discipline Forensic Psychiatry from the broader discipline of Psychiatry; the discipline Forensic Odontology from the broader discipline of Dentistry; and the discipline Cardiovascular Psychophysiology from the broader

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disciplines of Cardiology and Psychophysiology. Forensic Psychophysiology is the discipline that provides the student, the practitioner and the researcher, with the theoretical and applied psychological, physiological and psychophysiological fundamentals for understanding and conducting PDD examinations and to pursue research.

For years the word *psychophysiology* and the term *psychophysiological detection of deception* (PDD) have been associated with detection of deception by scientists and others. In 1935, there was a proposed plan to expand the first National Crime Laboratory at Northwestern University School of Law. The pan called for "... two psycho-physiological laboratories for lie detection..." (Northwestern University Crime Laboratory, 1935). Many other studies (Elaad & Ben-Shakar, 1991; Furedy, 1986; Furedy & Ben-Shakar, 1991; Heselgrave, 1981; Hunter & Ash, 1973; Kugelmass, Lieblich & Bergman, 1967; Orne, Thackray & Paskewitz, 1972; Podlesny & Raskin, 1977; Podlesny, 1978; Slowik & Buckley, 1975; and Thackray & Orne, 1968), to identify a few, have also used the word, *psychophysiology* or the term *psychophysiological detection of deception* or *PDD* to refer to the process of determining if a person is attempting to deceive or being truthful to an issue under investigation. Today, as cited above, the word, *psychophysiological* or the term, *PDD* are regularly used in detection of deception literature.

Many tests used to detect deception are psychophysiological detection of deception (PDD) tests. This conclusion is arrived at by considering the following: (a) stimuli (questions) are presented and are psychologically evaluated by the examinee; (b) the subjective interpretation of the stimuli, when psychologically evaluated, will affect the activity levels of the selected physiological functions that are recorded; (c) the stimuli elicits psychological evaluations of the stimuli, and this process is reflected in the prefix "psycho" used in the word psychophysiology; (d) the resulting change in physiological activities brought about by the stimuli represent the root *physiological* portion of the word psychophysiology; and (e) the questioning format--what and how the questions are presented--represents the "test" portion of the term *psychophysiological detection of deception tests*.

It should be clear then that PDD tests are not "polygraph tests." The polygraph is simply a recording device used to collect selected physiological activities, or in the case of electroencephalograph, neurological activities. Polygraphs, as recording devices, are used in many different laboratories, for many different purposes, other than the detection of deception.

Over the years the following generic psychophysiological detection of deception tests have emerged: Relevant-Irrelevant Tests; Knowledge Based Tests; and Control Question Tests. Each category has spawned numerous other tests. For example, some of the Control Question Tests have been: Zone Comparison Test; Modified General Question Test; Counterintelligence-Scope Polygraph Test; Reid Control Question Test; Utah Test; Positive Control Question Test; Counter Narcotics Polygraph Test. The Relevant-Irrelevant Tests have been: Preemployment Tests; Periodic Screening Tests and Relevant-Irrelevant Criminal Tests. The Knowledge Based Tests have been: Peak of Tension Tests; Searching Peak of Tension Tests; Guilty Knowledge Tests;

and a variety of Stimulation Tests. Each of these tests has its own format; its own test question sequence; its own scoring and interpretation guidelines; and its own technical quality.

Since these PDD tests have been appropriately called "tests" it is a misnomer to call them, as has been the practice, "charts." The word "chart" when used as a noun is defined by Webster as "a sheet of paper ruled and graduated for use in a recording instrument." When used as a transitive verb, a chart is defined "to make a map or to lay out a plan." The real function of chart paper is to serve as a vehicle upon which to record the selected physiological data generated by the examinee and mechanically and electrically processed by the polygraph instrument. This strongly suggests that a "chart" is not a "test" and that "chart" should not be used as a synonym for "test."

All examinations have common procedures. These common procedures include a pretest interview; a sequential presentation of test questions (stimuli) and the simultaneous recording of selected physiological activities; the analysis of the physiological data for the purpose of arriving at an opinion or diagnosis; and the last procedure following these tests (post-test) is dependent upon the diagnosis made and agency policies regarding post test interviews. Although each examination will have common procedures, there are also additional processes which will differ depending on the type of test or tests to be used. The pretest when a Control Question test is to be used is quite different from that when a Peak of Tension or Relevant-Irrelevant test is to be used.

An examination is defined by Webster as "the act or process of examining." Thus, an examination is not a "test;" it is a complete process as defined here: A psychophysiological detection of deception examination encompasses all activities that take place between an examiner and an examinee during a specific series of interactions. It includes: (a) the pretest interview; (b) the use of the polygraph to collect physiological data from the examinee while presenting a series of tests; (c) the diagnostic phase, which includes the analysis of physiological data in correlation with the questions asked during each test to support a diagnostic decision; and (d) the post-test phase which may or may not include interrogation of the examinee depending on the diagnostic outcome.

The pretest procedure is considered to be vital to accurate outcomes and has a two-fold purpose: (a) for the examiner to determine, through questioning and observation, if the examinee is suitable psychologically and physically to take the PDD tests to be administered and (b) prepare the examinee psychologically for the tests. This psychological preparation, along with the stimuli presented during the PDD tests, add to the significance of the prefix *psycho* in the word *psychophysiological*.

During an examination, the test selected to be used will have the appropriate number of questions for that particular test format. Since each question in a test must be asked at least three times, it is necessary to administer the same test three times; thus, the common practice of

stating, "three tests were conducted" or "three charts were collected" is incorrect since only one test (e.g., Control Question) was administered three times.

The analysis of the physiological data collected during an examination enables the examiner to make a decision or diagnosis. The analysis of the data involves evaluating the relative changes in the physiological data in correlation with the stimuli (questions) presented. In turn, the nature of this analysis is dependent on the type of test(s) used. These are some of the reasons why the term, *psychophysiological detection of deception* is used to describe detection of deception processes. Thus, we do not, as the popular misnomer has it, "analyze charts." Rather, we analyze the physiological data recorded on a chart as these data relate to the type of test or tests administered during an examination.

Most<sup>1</sup> PDD tests are conducted during examinations in which the objective is to determine if the examinee was involved in the commission of a crime such as murder or espionage. Crimes are defined in criminal law statutes and as such fall within the criminal justice or forensic system. As specified earlier in this paper, psychophysiological principles, procedures and systems applied to the detection of deception process in the criminal justice system can logically and descriptively be called *forensic psychophysiology*. It follows then that a person who has studied, understands and applies forensic psychophysiological principles, processes, procedures and systems; uses psychophysiological detection of deception tests during examinations to detect deception; or, as a matter of professional responsibility, engages in experimental or field psychophysiological detection of deception research activities, is a forensic psychophysiologist. Therefore, the practitioner is not a "polygraph examiner," since one does not examine polygraphs, except perhaps to calibrate the polygraph instrument. One is not a polygrapher, since that is defined by Webster as "one who operates a polygraph." What PDD examiners, or forensic psychophysiologists, do is far more comprehensive and complex than merely operating a polygraph. The same is true for the misnomer "polygraphist," which Webster defines as a polygrapher.

To use the name *forensic psychophysiologist* is not an attempt to be erudite or pretentious, but rather to more aptly describe which PDD examiners and researchers do in practice. As mentioned earlier, Forensic Psychophysiologists have studied forensic psychology as a discipline and have trained to apply psychophysiological principles, processes and procedures while conducting PDD examinations or to conduct research. The name forensic psychophysiologist or applied forensic psychophysiologist seems very appropriate.

The name forensic psychophysiology has been used for some time. It was first proposed as the name for a master's degree program that was developed and implemented at Jacksonville State University in collaboration with the Department of Defense Polygraph Institute in 1987.

<sup>&</sup>lt;sup>1</sup> "Most" is used to recognize that some PDD tests, such as preemployment screening, may or may not fall within the criminal justice system.

For a variety of reasons, it was not adopted. The name, however, was used in a video developed in 1990 by the Institute entitled, *Computerizing the Polygraph*. It was used in the DoD Polygraph Institute Annual Report for 1991 and also on June 10, 1991, when Mr. Maynard Anderson, Assistant Deputy Under Secretary for Security Policy, presented a paper entitled, "The Role of the Forensic Psychophysiologist in our Future Concept of Security." This was presented as a keynote speech to the examiners attending the 1991 Federal Interagency Polygraph Seminar at the FBI Academy in Quantico, Virginia. It was later published in *Polygraph*, Volume 20, Number 3, 1991. In that article, Mr. Anderson specifically used the words "forensic psychophysiologist" in place of the word "polygrapher."

A few years ago, a book entitled, *Psychophysiology: Systems, Processes and Applications* (Coles, Donchin & Porges, 1986) was published. This large book contains 761 pages and is divided into three parts and 26 chapters. It is purported by the editors to " ... provide a tutorial review of the field." A substantial amount of the information contained in this book has been incorporated into the five chapters that the DoDPI students now take. The information in fifteen of the chapters have direct relationship and are: the central nervous system; electrodermal activity; physiological bases of respiratory psychophysiology; physiological bases of cardiovascular psychophysiology; adrenal system; signal acquisition and analysis; attention; cognitive psychophysiology and information processing; bodily changes during attending; memory; thought and bodily response; operant reinforcement; stress; emotion; psychophysiological organizations; individual differences and psychosomatics.

Part three of the book is devoted to applications. There are two applications listed: (a) Lie Detection as Psychophysiological Differentiation and (b) Applications of Brain Event-Related Potentials (ERP) to Problems in Engineering Psychology. In recent years "event related potentials" have also been applied to the psychophysiological detection of deception. It seems then that most applications of psychophysiology are embedded in the discipline Forensic Psychophysiology.

Thus, what PDD examiners do when conducting PDD examinations is a significant and major part of all applications of psychophysiological systems and processes. As Furedy (1986) put it, after reviewing various other approaches to detecting deception, "Hence by elimination, psychophysiology appears to offer the only sound way to differentiate deception from honesty." It seems that it is time for PDD examiners to identify, in name and in practice, with the science of forensic psychophysiology; and, through research and scholarly development enhance its evolution.

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### VALIDITY OF AN EXPANDED-ISSUE (MODIFIED GENERAL QUESTION)

### POLYGRAPH TECHNIQUE IN A SIMULATED

### DISTRIBUTED-CRIME-ROLES CONTEXT

#### by

### John A. Podlesny and Connie M. Truslow

The validity of an expanded-issue control question technique that is commonly used in investigations as tested with simulations of thief, accomplice, confidant, and innocent crime roles. Field numerical scores and objective measures discriminated between the guilty and innocent groups. Excluding inconclusives (guilty = 18.1%, innocent = 20.8%), decisions based on total numerical scores were 84.7% correct for the guilty group and 94.7% correct for the innocent group. There was relatively weaker, but significant, discrimination between the thief group and the other guilty groups and no significant discrimination between the accomplice group and confidant group. Skin conductance, respiration, heart rate and cardiograph measures contributed most strongly to discrimination.

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Psychophysiological detection of Deception (polygraph) examinations are often used in criminal investigations when there is uncertainty, not only regarding guilt or innocence, but also about the roles of guilty suspects, which may be distributed among perpetration, complicity, or knowledge. Some field polygraph techniques recognize this by including crime-relevant questions that address issues other than perpetration. Among these expanded-issue techniques are the Utah version of the Zone Comparison Technique, which includes a question regarding general involvement; the Backster SKY technique, which includes questions regarding suspicion and knowledge; and various versions of Modified General Question Techniques (MGQTs), which may include questions regarding general truthfulness, perpetration, participation, and knowledge. MGQTs are commonly used by U.S. federal examiners; however, these examiners usually do not attempt to resolve different guilty subgroups with MGQTs.

Previous research has focused on discrimination and classification of perpetration versus innocence (e.g., Barland & Raskin, 1975; Dawson, 1980; Honts, 1986; Horowitz, 1989; Horvath, 1977, 1988; Kircher & Raskin, 1988; Patrick & Iacono, 1989; Podlesny & Raskin, 1978; Raskin & Hare, 1978; Rovner, 1986) and has not adequately addressed uncertainty about crime roles. In a field study (Raskin, Kircher, Honts, & Horowitz, 1988; Raskin, Kircher, Horowitz, & Honts, 1989), examinations in 30 of 62 cases included four different relevant questions about the same incident (C.R. Honts personal communication, February 28, 1992), and 14 of 119 examinees lied when asked one or more relevant questions and told the truth when asked one or more other relevant questions ("mixed" group). Presumably, this sample represented various crime roles. Relative to examinations in which the examinees were either innocent or guilty with respect to all questions for which there were sufficient truth criteria, the mixed group had more false positives (17% vs. 9%), more false negatives (9% vs. 4%), and more inconclusives (48% vs. 35%). Others (Bradley & Rettinger, 1992; Bradley & Warfield, 1984) have reported that subjects who had information about a simulated crime produced detection scores similar to those of innocent subjects, or between those of innocent and guilty subjects, on guilty knowledge tests. These findings suggest that the validity of examinations may be weaker in distributed-crime-roles contexts.

Kubis (1973) attempted to classify subjects who had participated as either thieves or lookouts in a simulated theft. He reported 94% correct for thieves versus lookouts and 79% correct for lookouts versus innocent subjects. Each group--consisting of thief, lookout, and innocent--was examined and classified as a unit, and accuracy was reported in terms of correct discriminations between pairs of subjects. Those results may not generalize to situations in which decisions must be based on information from individual subjects. Also, the methods were not representative of techniques that are used in field examinations.

Thus, there is insufficient information to estimate the validity of expanded-issue examinations in distributed-crime-roles contexts. Therefore, one goal of our research was to evaluate the validity of a commonly used expanded-issue technique, an MGQT, for discriminating

and classifying guilty versus innocence in a simulated distributed-crime-roles context. Because techniques for classifying suspects with greater resolution would be useful to criminal investigators, a further goal was to evaluate the feasibility of discriminating different guilty subgroups.

In addition to the four relevant questions about different aspects of a crime, MGQTs include control questions that are designed to elicit relatively large physiological responses from innocent subjects, allowing inferences of no deception (Raskin, 1989). Reports of laboratory analog research have indicated that, on average, guilty subjects respond most strongly to relevant questions and innocent subjects respond most strongly to control questions (Barland & Raskin, 1975; Dawson, 1980; Honts, 1986; Horowitz, 1989; Horvath, 1988; Kircher & Raskin, 1988; Podlesny & Raskin, 1978; Raskin & Hare, 1978; Rovner, 1986).

On the basis of those previous results, we hypothesized that innocent subjects would respond more strongly to control questions than to relevant questions and that guilty subjects would respond more strongly to those relevant questions to which they attempt deception than to the control questions. If the latter hypothesis is correct, questions about general truth and knowledge should produce larger responses from all guilty subjects, a question about perpetration should produce larger responses from perpetrators, and a question about participation should produce larger responses from both perpetrators and accomplices.

Guilty and innocent subjects may react differently to relevant and control questions because their strongest emotional and cognitive activity is directed by attention to those test items that they evaluate as representing the greatest personal threat or threat of goal disruption (e.g., Abrams, 1977, pp. 41-51; Raskin, 1979; Steller, 1987, pp. 104-147). By the same rationale, guilty subjects in different roles might evaluate relevant questions to which they attempt deception as representing a greater threat than those to which they tell the truth. We hypothesized that, relative to their control-question responses, guilty subjects who attempt deception to a particular relevant question might produce larger responses to that question than would guilty subjects in other roles who tell the truth to that question. If this is correct, perpetrators should produce larger relative responses to a question about perpetration than should accomplices or subjects only knowledge of the crime, and both perpetrators and accomplices should produce larger relative responses to a question about participation than should subjects having only knowledge of the crime.

We conducted laboratory simulations of a criminal investigative context with thief, accomplice, confidant, and innocent roles. Realistic procedures were used to improve the generality to applied contexts (Podlesny & Raskin, 1977; also see Procedure section, this article). The recordings were analyzed using both blind semiobjective evaluations by experienced examiners and objective measurement methods. We selected physiological measurements for the objective analyses on the basis of previous findings in control-question research (Barland & Raskin, 1975; Honts, 1986; Kircher & Raskin, 1988; Podlesny & Raskin, 1978; Raskin & Hare,

#### Expanded-Issue Polygraph Technique

1978; Rovner, 1986). Skin conductance amplitude clearly discriminated between guilty and innocent subjects in those studies. Skin conductance recovery time, cardiograph amplitude, finger pulse amplitude, and respiration showed significant but smaller and less consistent contributions to between-groups variability. Heart rate decreased most strongly in response to relevant questions in guilty groups (Podlesny & Raskin, 1978; Raskin & Hare, 1978; Rovner, 1986). We used a stepwise discriminant analysis (Klecka, 1980) to eliminate weak and redundant variables and to identify a subset of the selected variables with optimal ability to discriminate the groups.

#### METHOD

### **SUBJECTS**

One hundred thirty-three subjects were recruited from the local community and were paid for their participation in a polygraph study. Thirty-seven subjects were eliminated; 9 did not attend both sessions; 8 had information from previous subjects or staff; 6 refused to perform the theft simulations, 2 did not follow instructions, 1 was a trained examiner, 1 had a serious medical condition, 1 confessed before the test, and there were three errors and two outside interferences in conducting simulations as well as four equipment failures. Of the 96 subjects who were retained,50% were male and 50% were female (by selection). A small proportion of the subjects were Black (10%) or Hispanic (2%); the rest were White (88%). Their ages ranged from 21 years to 55 years (Mdn = 35), their education ranged from 10 years to 23 years (Mdn = 14), and they had various occupations. None reported lack of sleep or current serious illness, with the exception of 15% who reported hypertension. Some (27%) reported previous examinations (distribution among groups did not differ from chance).

### APPARATUS

The examinations were conducted in a quiet, well-lit 10 ft. x 12 ft. (3.05 m x 3.66 m) room in which the temperature was about 70 degrees F. Each subject was seated in an armchair. The instrument was behind the subject in the same room. Physiological activity was recorded using a Beckman Dynograph (Model R611). Except for vasomotor activity, the bandpass was 0 Hz to 30 Hz. Respiration was recorded from a mercury strain gauge using a 9875B mercury strain gauge coupler. The gauge was fastened around the torso at the level of the diaphragm. Skin conductance was recorded with a 9844 skin conductance coupler from thenar and hypothenar eminences of the left hand, using Sensor Medics 9 mm Ag/AgCl electrodes and a .05 molar NaCl Unibase electrolyte. Cardiograms were recorded with a Lafayette Model 76442-G cardiograph and a 9806A coupler from a cuff placed on the upper right arm. The cuff pressure was released after each chart. The mean cuff pressure was 82 mm Hg. and there were no significant group differences in mean cuff pressures. Finger pulse was recorded with a 9853 A

Polygraph, <u>23(3)(1994)</u>.

voltage/pulse/pressure coupler (0.53 Hz to 30 Hz) from a reflection-type transducer (Weinman, 1967) with an infrared LED light source. Electrocardiograms (from electrodes on the right arm and left leg) and the subject's vocalizations were also recorded, but those data are not reported here. The digitization rates were 10 Hz for the respiration and skin conductance channels and 100 Hz for the cardiovascular channels.

# PROCEDURE

A temporary employer recruited the subjects and scheduled appointments. Subjects performed their roles by following written and tape-recorded instructions without personal coaching. Each subject participated in two sessions about 1 to 2 weeks apart. The crime-role simulations were conducted during Session 1, and the polygraph examinations were conducted during Session 2. All subjects were instructed that if they could pass the examination they would receive a \$100 bonus in addition to their regular pay.

# SESSION 1

On arrival for the first session, each subject received an envelope from a receptionist who did not provide further assistance. Instructions in the envelope directed the subject to go to a lounge area and listen to tape-recorded instructions. Each subject performed a role that was fully described and generally scripted by the tape-recorded instructions. The simulations were monitored by television to assure conformance to the required roles.

Using a randomized list, an assistant assigned the subjects to crime roles in order of their arrival. Sufficient crime simulations and examinations were conducted to fill all cells in the experiment. There were four role groups--thief, accomplice, confidant, and innocent--with 24 subjects in each. Twelve men and 12 women were recruited for and assigned to each role.

THIEF GROUP. After listening to the tape, each subject in the thief group went downstairs to another lounge and found a purse. The subject took two \$5 bills from the purse and concealed them on his or her person. The thieves were instructed to do this in a way that would not arouse suspicion, to avoid leaving fingerprints, and to prepare an alibi in case they were caught. They were instructed to keep and spend the \$10. Each subject then returned to the upstairs lounge area.

ACCOMPLICE GROUP. Each subject in the accomplice group was instructed to wait for a man named "Don" to enter the lounge. Don was an assistant of the experimenter, but the subjects were not told this. Don asked the subject to help steal some money. He explained that someone had left a purse in the busy downstairs lounge, so he needed a lookout while he stole the money. He offered the subject half of the money. As instructed, the subject agreed to be

#### Expanded-Issue Polygraph Technique

the lookout, and they planned a method for the accomplice to signal when someone was coming. The subject went with Don to the lower lounge and stood where he or she could watch the hallway. The lounge was open to the hallway on one side. Don gave the appearance of having difficulty finding the money and did not "find" it until the accomplice used the signal that they had agreed on. Thereafter, Don found two \$5 bills, and they returned to the upstairs lounge. Don gave one \$5 bill to the subject and said "Here is your cut, keep quiet about this." After Don left, the accomplice concealed the \$5 bill on his or her person. The subject's instructions were to keep and spend the \$5.

CONFIDANT GROUP. Subjects in the confidant group were instructed to wait in the lounge until a man named "Don" arrived. Following instructions, the subject, pretending to know Don, asked "How have you been doing?" Don responded, "Not so good, I think I'm in trouble. This FBI agent has been asking me questions about some stolen money." After further conversation, Don showed the subject two \$5 bills and confessed. Then he appeared nervous and asked the subject not to tell anyone. The subject promised not to tell, and Don left.

INNOCENT GROUP. Subjects in the innocent group were instructed that there had been a theft of money and they were innocent suspects. They were told to remain in the lounge.

About 10 minutes after each role simulation, a Federal Bureau of Investigation (FBI) special agent entered. The agent questioned the subject regarding the theft. The subject stated that he or she had come for a polygraph study, followed directed to the lounge, and listened to the tape that said he or she was innocent. The subject denied any part in the theft and signed a statement to that effect. The agent obtained the subject's agreement to take a polygraph examination.

# **SESSION 2**

On returning for Session 2, each subject was given an envelope containing instructions. The subjects in the thief, accomplice, and confidant roles were reminded to lie about the theft, and those in the innocent role were reminded to tell the truth. Subjects in all roles were given the same story: that they had come for a polygraph study and listened to taped instructions, that the tape said they were innocent, and that they knew nothing about the theft. They were reminded that they could receive a bonus of \$100 by convincing the examiner of their innocence and that the bonus would be paid before the end of the session.

The examiner was John A. Podlesny, a psychophysiologist who had completed the polygraph courses at the Backster School of Lie Detection and the U.S. Army Military Police School. The examiner knew the number of subjects in each role, but did not know the roles of individual subjects. In addition, to reduce the information available to the examiner, he did not receive role information after each examination. After the 13th examination, the examiner was

Polygraph, <u>23(3)(1994)</u>.

given information on the correct roles of the first 13 subjects. Thereafter, he received no role information until all the examinations had been completed. There was no change of procedures at any point during data collection.

After obtaining consent and background information, the examiner asked each subject to describe his or her family and rearing. The examiner asked the subject if he or she had been taught that lying and stealing are wrong and if it was correct that the subject was "not the kind of person who would lie or steal." The subjects all responded affirmatively. This procedure committed each subject to presenting himself or herself as a person who did not lie or steal and was intended to predispose subjects to answer no to the control questions. The examiner asked each subject to explain what had happened regarding the theft. Each subject responded with the story outlined above. The examiner stated that the purpose of the examination was to find out if the subject was telling the truth or lying. He described examples of lying about perpetration, complicity, and knowledge. The examiner stated that there would be different questions about the different kinds of lying and presented the relevant questions to the subject:

- 3. Have you told me the truth about that missing money? (general truth)
- 5. Did you remove that money from the purse? (perpetration)
- 8. Did you participate or take part in the theft of that money? (participation)
- 9. Are you withholding any information or knowledge about the theft of that money? (knowledge)

The subjects answered yes to Question 3 and no to Questions 5, 8, and 9 throughout the examination.

The examiner stated that he needed to find out if the subject was the "type of person who would steal and lie about it." He stated that the subject had already told him that he or she was "not that kind of person" and that there would be some questions to verify this. He introduced the control questions and solicited the subject's answers to them. The control questions excluded the time period of the subject's first session and conformed to the individual subject's background, for example:

6. Before 1986, did you ever steal anything?

#### Expanded-Issue Polygraph Technique

# 10. While you were at Duke, did you ever lie to get out of trouble?

When the subjects answered yes to control questions, the examiner appeared surprised, asked about the circumstances, made some notes, and then said, "You haven't done anything else, have you?" This procedure was repeated until the subject stated that he or she had not done anything else. Typically, subjects initially answered no or made one or two minor admissions. The examiner reworded the control questions to exclude the admissions (e.g., "Besides what you told me about ..."). All of the subjects answered no to either the original or reworded versions of the control questions. Finally, the examiner introduced the irrelevant questions, for example:

- 1. Are you now in the state of Virginia?
- 2. Were you born in North Carolina?
- 4. Do you now live in Triangle?
- 7. Are you married?

The examiner placed the sensors on the subject and conducted a practice test, during which the subject truthfully answered a series of questions about his or her choice of a number. After the practice test, he told the subject that the instruments were working properly. Some data obtained from university students indicate that "stimulation tests" presenting accuracy demonstrations to subjects may improve the accuracy of examinations (Bradley & Janisse, 1981). However, those procedures have been criticized because it is often necessary for the examiner to mislead subjects about the results and because subjects may have learned about misleading stimulation tests (Ben-Shakhar & Furedy, 1990, p. 22; Lykken, 1981, pp. 93-95). Our procedure differed from those in general use (e.g., Raskin, 1989, p. 256). The practice test was presented accurately to the subject as an opportunity for the subject to practice taking a polygraph test and for the examiner to assure the quality of the recordings. This circumvented the necessity to mislead subjects regarding the outcome. It is possible that this procedure could have affected the results in this study; however, the present data are not sufficient to compare the practice test with the usual method. The examiner reviewed the questions with the subject and then presented four series of questions (charts) while recording the subject's physiological activity. The interchart interval was about 5 min. According to the FBI's usual MGQT practice, the questions were presented in order from 1 through 10 during Charts 1, 2, and 4 and were presented in mixed order on Chart 3. The mixed order was 4, 1, 9, 6, 2, 3, 10, 5, 6, 8, and 10. The minimum time between question onsets was 36 s.; longer times were used when necessary to allow physiological recovery and to avoid artifacts. After Chart 1, the examiner asked, "Did any of the questions bother you?" After Chart 2, the examiner asked, "Did any of the questions bother you that time? Are you still convinced that you are telling me the truth?" This was intended to enhance the subject's concern about the examination outcome without directing their attention to particular questions. Some subjects made admissions to the control questions, and the examiner handled

them as described above. After the examination, an assistant debriefed the subject while the examiner evaluated the charts. When the examiner's decision was "no deception indicated," the assistant gave the subject \$100.

### DATA REDUCTION AND ANALYSIS

Numerical Chart Evaluations. The polygraph recordings were evaluated independently by 10 instructors of the Department of Defense Polygraph Institute (DODPI), Fort McClellan, Alabama. These examiners had received basic examiner training from DODPI, had 4-16 years (Mdn = 8.5 years) of experience in polygraph positions, and were experienced in the scoring of MGQT examinations. The evaluators had no contact with any of the subjects and no knowledge of the study design, the wording of the questions, or the role assignments. Each examiner evaluated a randomly selected portion of the 96 examination recordings (9-10 each). The examiners were cautioned not to make any assumptions about the base rate of guilt, because it could vary depending on the particular set of records assigned. They scored the response to each relevant question by comparing it with the response to a nearby control question separately for the respiration, skin conductance, and cardiograph recordings, using a 7-point integer scale (from -3 to +3). On Charts 1, 2, and 4, they compared the responses to Question 3 and 5 with the responses to Question 6 and the responses to Question 8 and 9 with responses to Question 10. On Chart 3, they compared the Question 9 responses with those to the adjacent Question 10, and the responses to Questions 5 and 8 with the larger of those responses to the adjacent Question 6 or 10. Larger responses to the relevant questions were scored as negative, and larger responses to the controls were scored as positive. Response criteria were respiration suppression or apnea, slowing, and baseline increases; skin conductance amplitude and duration of increases; and cardiograph amplitude and duration of increases in diastolic level.

Objective Physiological Measures. Physiological features were measured by computer algorithms using methods similar to those used by Kircher and Raskin (1988). Skin conductance onsets were defined as the beginning of segments having positive slope and initiated by positive acceleration, and skin conductance peaks were defined as the highest points between onsets. Skin conductance amplitude was the positive difference in digitizer units between the first onset following 0.3 s after the beginning of the question and the highest subsequent peak on or before 15 s after the beginning of the question. Skin conductance recovery time was the time in seconds between the highest peak and the point at which the skin conductance returned to one half the measured amplitude. This point was limited by the end of the digitized data 24.5-s postquestion onset; where half recovery did not occur, the measurement was made to this point. Respiration excursion was the sum of absolute point-to-point changes in digitizer units during the interval between question onset and 10 s later divided by 10. Respiration length (Kircher & Raskin, 1988) is not fully proportional to changes in girth because changes in length are computed from the sums of squared changes in girth and squared fixed time intervals using the Pythagorean theorem. The proportional contribution of the fixed time value to length depends on the size of

the change in girth. Respiration excursion is simply the summation of absolute changes in girth over a given time period. Cardiograph diastolic points were located within 0.01 s. Cardiograph amplitude was measured during the 20-s postquestion onset, using the method of Kircher & Raskin (1988). Plethysmograph diastolic and systolic points were located within 0.01 s, and pulse amplitudes were the differences between each pair of systolic and diastolic levels. Finger *pulse amplitude* was the difference between the mean amplitude of the two smallest consecutive pulses from 3 s to 15 s after question onset and the average of all pulse amplitudes during the 3 s before guestion onset. Rates in beats per minute were computed for successive pairs of diastolic points in the cardiograph data. Heart rate deviation was the difference between the mean of the lowest two consecutive rates from 4 s to 15 s after question onset and the mean rate during the 4 s before question onset. Skin conductance recovery times were not measurable for one innocent subject and two accomplices because of very small skin conductance amplitudes in these subjects; cardiograph amplitudes and finger pulse amplitudes were not measurable for one thief because of excessive extrasystoles. Those missing data were replaced with cell means. The respiration, finger pulse, and heart rate measurements were multiplied by -1.0, so that larger responses were indicated by more positive or less negative values for all of the measures. To establish a common scale among the measures and subjects, we standardized each measurement relative to the data for each subject. We obtained difference scores by subtracting the mean score for each of the relevant questions from the mean score for the control questions.

#### RESULTS

### DECISIONS BASED ON NUMERICAL EVALUATIONS

To test the accuracy of a typical field decision method, the guilty thief, accomplice, and confidant groups were combined, and decisions were made with field rules using the evaluators' total scores for each of the four relevant questions. A decision of "no deception indicated" was made when each and every question total was >/- +2. A decision of "deception indicated" was made when one or more of the totals was </- -3. Examinations were inconclusive when no score was </- -3 and not all scores were >/- +2. Table 1 shows that this produced a large proportion of inconclusives for the innocent group. Excluding inconclusives, decisions were 93.8% correct for guilty groups and 64.3% correct for the innocent group. Decisions were also made with a method similar to zone-comparison control-question techniques, using overall total scores with an inconclusive region from -5 to +5 (Barland & Raskin, 1975; Dawson, 1980; Patrick & Iacono, 1989; Podlesny & Raskin, 1978; Raskin & Hare, 1978). Table 1 also shows that this produced a moderate rate of inconclusives and that the decisions were significantly correct for both guilty groups (84.7%) and the innocent group (94.7%). The false negatives and inconclusives were distributed among the guilty roles as follows: thief, 2 and 3; accomplice, 2 and 6; and confidant, 5 and 4.

# Decisions Based on Blind Semiobjective Numerical Evaluations of the Respiration, Skin Conductance, and Cardiograph Recordings

	Decision											
Deception Indicated Role Freq. %	Deception Indicated		No deception indicated		Inco	nclusive	Tc	Total				
	Freq.	%	Freq	<u>l</u> . %	Freq.	%						
			Decis	ions using in	dividual qu	estion scores						
Combined guilty <sup>*</sup>	61	84.7	4	5.6	7	9.7	72	100.0				
Innocent <sup>b</sup>	5	20.8	9	37.5	10	41.7	24	100.0				
				Decisions u	sing total s	scores						
Combined guilty <sup>°</sup>	50	69.4	9	12.5	13	18.1	72	100.0				
Innocent <sup>d</sup>	1	4.2	18	75.0	5	20.8	24	100.0				

*Note*: The statistics exclude inconclusives. Combined guilty includes the thief, accomplice, and confidant groups. Freq. = frequency of decisions; % = percentage of role group for which the decisions were made.

 $x^{2}(1, n = 65) = 49.98, p < 01.$ 

<sup>b</sup>  $x^{2}(1, n = 14) = 1.14$ , ns.

 $x^{2}(1, n = 59) = 28.49, p < .01.$ 

 $^{d} x^{2}(1, n = 10) = 15.21, p < .01.$ 

# ANALYSES OF NUMERICAL SCORES

# TABLE 2

# Mean Numerical Scores Based on Blind Semiobjective Evaluations of the Respiration, Skin Conductance, and Cardiograph Recordings

	Numerical Score (by Role)									
Question	Thief (n = 24	Thief (n = 24)		plice -)	Confidant $(n = 24)$		Innocent $(n = 24)$			
	M	SD	M	SD	M	SD	M	SD		
General truth	-4.5*	5.0	-3.9*	4.9	-2.2	5.5	+3.3*	3.8		
Perpetration	-4.9*	5.1	-3.0*	4.0	-0.1	4.3	+3.3*	3.6		
Participation	-1.0	4.2	-1.3	4.6	+2.0	5.8	+6.3*	4.4		
Knowledge	-3.6*	4.6	-3.6*	4.3	-3.4*	4.8	+1.5	4.5		
Total Score	-14.0*	14.9	-11.8*	13.5	-3.8	16.6	+14.5*	14.2		

Note. A value of 0.0 would represent no scored difference between the relevant- and the control-question responses. Negative values indicate that the evaluators considered the relevant-question responses to be larger than the control-question responses; positive values indicate the reverse. For the hypothesis tests involving means for the three guilty roles, the critical values for t were obtained from Dunnett's t distribution (Winer, 1971, pp. 201-204) to control the overall significance level for each set of comparisons.

\* Significant results for two-tailed paired comparisons with 0.0 according to t tests ( $_{\sigma}$  = .05).

The mean numerical scores are shown in Table 2. A multivariate analysis of variance of the question-by-question scores produced significant effects for role, F(3,92) = 18.16, p < .01, and for the Role x Relevant question, A = .827, F(9,219) = 1.97, p < .05. The mean total scores for the guilty subgroups did not differ significantly, but each was significantly different from that of the innocent group (Tukey honestly significant difference {HSD} procedure (Winer, 1971, p. 198); all Tukey HSD tests used a = .05). Paired comparisons with 0.0 (Table 2) were used to test the hypotheses that innocent subjects would respond more strongly to control questions than to relevant questions and that guilty subjects would respond more strongly to those relevant questions to which they attempt deception than to the control questions. The former hypothesis was supported for the innocent group by significantly positive mean scores on all of the relevant questions except the knowledge question and, also, by a significantly positive mean total score. The latter hypothesis was supported by significantly negative mean scores for the thief group on the general truth, perpetration, and knowledge questions; for the accomplice group on the general truth and knowledge questions; and for the confidant group on the knowledge question. However, both the thief group and the accomplice group failed to produce significantly negative mean scores for the participation question, the confidant group failed to produce a significantly negative mean score for the general truth question, and the accomplice group produced a significantly negative mean score for the perpetration question to which subjects in that group were answering truthfully. The thief and accomplice groups produced mean total scores that were significantly negative. The confidant group did not produce a significantly negative mean total score.

We tested the differences in mean perpetration and participation question scores between the thief, accomplice, and confidant groups (Tukey HSD) to evaluate the hypothesis that, relative to their control responses, guilty subjects who attempt deception when asked a particular relevant question might produce larger responses to it than would guilty subjects in other roles who tell the truth when asked the question. This hypothesis was supported only by a significantly larger perpetration-question mean in the thief group than in the confidant group. There was no significant difference in the perpetration-question means of the thief and accomplice groups or in the participation-question means between any of the groups. To determine if the guilty subjects tended to receive their largest negative scores for the relevant questions matching their subgroups, we tallied the frequencies of largest negative scores </- -3. Respectively, the frequencies for the perpetration, participation, and knowledge questions were (a) thief, 12, 2, and 5; (b) accomplice, 8, 4, and 6; (c) confidant, 3, 3, and 11; and (d) innocent, 0, 0, and 5. The perpetration question produced the largest negative score more frequently than did the other questions in the thief group,  $x^2(1, N-19) = 7.62$ , p <.01, and the knowledge question produced the largest negative score more frequently than did the other questions in the confidant group,  $x^{2}(1, N = 17 = 7.52, p < .01$ . There was no significant difference between the frequencies for the participation question and the other questions in the accomplice group.

### ANALYSES OF OBJECTIVE MEASURES

A stepwise linear discriminant analysis of the objective measures eliminated weak and redundant variables, identified an optimal set of discriminating variables, and provided efficient orthogonal discriminant functions combining subsets of the variables (Klecka, 1980). Intercorrelations among the variables in this analysis are shown in Table 3; descriptive statistics are shown in Tables 3 and 4. The analysis selected only variables that contributed uniquely and significantly (p < .05) to the reduction of the within-groups variance to total variance ratio for the discriminant functions (A). The selected variables are indicated in Table 4. The analysis produced two functions for which the mean discriminant scores differed significantly among the roles. The mean Function 1 scores were as follows: thief, 0.01; accomplice, -0./93; confidant, -0.91; and innocent, 1.83. The accomplice and confidant means differed from the thief and innocent means, and the thief mean differed from the innocent mean; but the accomplice and confidant means did not differ significantly (Tukey HSD). Inspection of the discriminant and structural coefficients in Table 4 shows that the general-truth-question variables of respiration excursion and heart rate deviation and the knowledge-question variables of skin conductance amplitude, skin conductance recovery time, and cardiograph amplitude contributed positively and most strongly to the determination of discriminant scores on Function 1. The mean Function 2 scores were as follows: thief, -1.23; accomplice, 0.27; confidant, 0.54; and innocent, 0.42. The thief mean differed from each of the other group means, but there were no significant differences between the accomplice, confidant, and innocent means (Tukey HSD). Inspection of the discriminant and structural coefficients shows that the perpetration question variables of skin conductance amplitude, respiration excursion, and heart rate deviation contributed positively and most strongly to the determination of discriminant scores on Function 2. The proportions of between-groups variance to total variance in the discriminant scores were .57 for Function 1 and .35 for Function 2.

# Means, Standard Deviations, and Intercorrelations, for the Physiological Difference-Score Variables

Variable	М	SD	1	2	3	4	5	6	7
1. Skin conductance amplitude (G)	-0.38	0.70	•	.67	.60	.60	.44	.37	.42
2. Skin conductance amplitude (PE)	-0.14	0.66	.57	-	.71	.65	.24	.47	.42
3. Skin conductance amplitude (PA)	-0.09	0.76	.46	.61	-	.71	.33	.42	.55
4. Skin conductance amplitude (K)	-0.23	0.72	.46	.56	.59	-	.39	.38	.53
5. Skin conductance recovery time (G)	-0.10	0.74	.41	.17	.26	.34	-	.47	.44
5. Skin conductance recovery time (PE)	0.07	0.66	.26	.38	.31	.28	.44	-	.58
7. Skin conductance recovery time (PA)	0.01	0.67	.30	.32	.45	.42	.41	.54	-
8. Skin conductance recovery time (K)	-0.28	0.72	.15	.16	.13	.33	.45	.28	.42
9. Cardiograph amplitude (G)	-0.33	0.70	.20	.13	.07	.10	.11	.24	.12
10. Cardiograph amplitude (PE)	-0.13	0.71	.25	.17	.19	.20	.27	.30	.21
11. Cardiograph amplitude (PA)	-0.12	0.76	.12	.14	.18	.16	.05	.14	.12
12. Cardiograph amplitude (K)	-0.27	0.64	.17	.16	.09	.03	.07	.02	00
13. Finger pulse amplitude (G)	-0.16	0.68	.14	.02	.14	01	.14	.08	.19
14. Finger pulse amplitude (PE)	-0.11	0.67	.12	.23	.10	.07	.16	.15	.16
15. Finger pulse amplitude (PA)	0.00	0.74	.14	.03	.10	01	.09	.02	.23
<ol> <li>Finger pulse amplitude (K)</li> </ol>	-0.25	0.66	11	05	.09	.19	.07	.01	.02
17. Respiration excursion (G)	-0.32	0.74	.07	.03	.16	.04	.05	13	19
18. Respiration excursion (PE)	-0.03	0.69	.12	.21	.29	.23	.19	03	.05
19. Respiration excursion (PA)	-0.14	0.69	.23	.22	.20	.10	.17	.03	.15
20. Respiration excursion (K)	-0.14	0.62	.16	.20	.28	.16	.09	.00	.07
21. Heart rate deviation (G)	-0.17	0.76	.03	.22	.17	.23	06	13	.02
22. Heart rate deviation (PE)	-0.00	0.69	.03	.10	.20	.24	.01	04	.10
23. Heart rate deviation (PA)	-0.09	0.69	.06	.07	.12	.09	.13	08	.01
24. Heart rate deviation (K)	-0.04	0.65	.02	00	.07	.05	.04	09	11

Note: Total correlations are above the diagonal; pooled within-groups correlations are below the diagonal. G = General truth question; PE = perpetration question; PA = participation question; K = knowledge question.

# Part 2

Variable	8	9	10	11	12	13	14	15	16
1. Skin conductance amplitude (G)	.28	.33	.37	.25	.28	.27	.21	.27	.00
2. Skin conductance amplitude (PE)	.27	.28	.31	.27	.25	.16	.28	.17	.02
3. Skin conductance amplitude (PA)	.28	.23	.33	.30	.23	.28	.20	.25	.17
4. Skin conductance amplitude (K)	.46	.25	.32	.26	.19	.17	.18	.16	.27
5. Skin conductance recovery time (G)	.47	.17	.31	.09	.11	.19	.19	.14	.09
6. Skin conductance recovery time (PE)	.34	.33	.38	.24	.11	.17	.21	.12	.06
7. Skin conductance recovery time (PA)	.50	.21	.30	.21	.11	.28	.22	.32	.09
8. Skin conductance recovery time (K)-	-	.12	.25	.06	.03	.12	.22	.14	.32
9. Cardiograph amplitude (G)	.03	-	.61	.55	.38	.30	.05	.21	01
10. Cardiograph amplitude (PE)	.18	.56	-	.54	.50	.25	.04	.12	03
11. Cardiograph amplitude (PA)	03	.51	.48	-	.37	.30	.11	.25	.09
12. Cardiograph amplitude (K)	10	.33	.46	.31	-	.27	.20	.22	.09
13. Finger pulse amplitude (G)	.00	.23	.16	.23	.18	-	.66	.55	.47
14. Finger pulse amplitude (PE)	.15	02	04	.03	.13	.63	-	.53	.54
15. Finger pulse amplitude (PA)	.03	.12	.01	.15	.13	.50	.48	•	.39
16. Finger pulse amplitude (K)	.26	06	09	.04	.00	.43	.51	.35	-
17. Respiration excursion (G)	10	04	02	07	17	.07	10	10	01
18. Respiration excursion (PE)	.17	01	.08	09	04	.02	03	14	.05
19. Respiration excursion (PA)	.02	06	05	00	15	.07	.01	.03	04
20. Respiration excursion (K)	06	.01	07	02	15	08	<b>-</b> .09	11	14
21. Heart rate deviation (G)	.11	09	21	.06	13	13	03	14	05
22. Heart rate deviation (PE)	.11	.13	.13	.20	01	08	04	02	.01
23. Heart rate deviation (PA)	.12	07	.03	00	.00	02	04	08	03
24. Heart rate deviation (K)	.03	04	.03	.00	.00	.03	02	.03	06

# Part 3

Variable	17	18	19	20	21	22	23	24
. Skin conductance amplitude (G)	.28	.22	.37	.26	.15	.19	.17	.13
2. Skin conductance amplitude (PE)	.25	.33	.35	.28	.27	.27	.18	.11
B. Skin conductance amplitude (PA)	.37	.36	.35	.37	.26	.33	.23	.18
I. Skin conductance amplitude (K)	.29	.29	.28	.28	.33	.34	.21	.18
5. Skin conductance recovery time (G)	.14	.24	.23	.14	01	.08	.17	.09
5. Skin conductance recovery time (PE)	.03	.06	.14	.07	04	.08	00	02
7. Skin conductance recovery time (PA)	.01	.11	.27	.16	.12	.19	.10	01
8. Skin conductance recovery time (K)	.07	.18	.15	.04	.21	.16	.19	.10
Cardiograph amplitude (G)	.12	.10	.06	.09	02	.24	.01	.03
0. Cardiograph amplitude (PE)	.12	.16	.08	.02	12	.24	.10	.10
1. Cardiograph amplitude (PA)	.06	02	.11	.04	.12	.28	.06	.05
2. Cardiograph amplitude(K)	02	01	02	06	02	.06	.07	.06
3. Finger pulse amplitude (G)	.19	.06	.18	.01	03	.02	.06	.09
4. Finger pulse amplitude (PE)	00	02	.10	03	.05	.01	.01	.02
5. Finger pulse amplitude (PA)	.05	08	.15	03	03	.07	00	.08
6. Finger pulse amplitude (K)	.07	.02	.04	08	.04	.03	.02	03
7. Respiration excursion (G)	-	.65	.51	.51	.14	.21	.24	.22
8. Respiration excursion (PE)	.64	-	.49	.48	.23	.31	.40	.31
9. Respiration excursion (PA)	.42	.50	-	.66	.24	.17	.22	.19
0. Respiration excursion (K)	.45	.48	.63	-	.16	.09	.14	.14
1. Heart rate deviation (G)	.05	.27	.16	.10	-	.42	.41	.37
2. Heart rate deviation (PE)	.07	.21	.07	.02	.43	-	.45	.25
3. Heart rate deviation (PA)	.15	.38	.14	.08	.38	.42	-	.44
4. Heart rate deviation (K)	.11	.26	.12	.08	.35	.19	.41	-

We limited hypothesis testing to those variables selected by the discriminant analysis (see Table 4). Because no participation question variables were selected, no hypothesis tests were conducted on those variables. We used paired comparisons with 0.0 to test the hypotheses that innocent subjects would respond more strongly to control questions than to relevant questions and that guilty subjects would respond more strongly to those relevant questions to which they attempt deception than to the control questions. The former hypothesis was supported by significantly positive mean difference scores for the innocent group on half of the selected variables: general truth question/respiration excursion; perpetration question/skin conductance amplitude and heart rate deviation; and knowledge question/skin conductance amplitude. The other innocent means were not significantly positive. The latter hypothesis was supported by significantly negative means for the accomplice and confidant groups on all the general truthquestion and knowledge question variables and for the thief group on all the perpetration question The thief group also produced significantly negative means for general truth variables. question/respiration excursion and knowledge question/skin conductance amplitude, as predicted, but did not produce significantly negative means for the remaining general-truth-question and knowledge-question variables. The differences in mean perpetration-question scores between the thief, accomplice, and confidant groups were tested (Tukey HSD) to evaluate the hypothesis that, relative to their control responses, guilty subjects who attempt deception when asked a particular relevant question might produce larger responses to it than would guilty subjects in other roles who do not attempt deception when asked the question. As predicted, the thief mean for respiration excursion was significantly more negative than the accomplice and confidant means for respiration excursion, and the thief mean for heart rate deviation was significantly more negative than the confidant mean for heart rate deviation. However, there was no significant difference between the heart rate deviation means for the thief and accomplice groups or between any of the guilty subgroup means for skin conductance amplitude.

# Descriptive Statistics, Standardized Discriminant Function Coefficients, and Structural Coefficients for the Objective Standardized Physiological Difference Scores

			Differen	ce Score (by	( role)	Coefficient					
Measure	Thief Ad (n=24)		(n=24)	Confidant (n=24)	Innocent (n=24)	Function 1		Function 2			
	М	SD	M SD	M SD	M SD	Discrin	inant Stru	ctural	Discriminant	Structura	
General truth question	on			· <u> </u>							
Skin conductance amplitude	64	.53	63 .66	47 .69	.22 .58	-	-	-	-		
Skin conductance recovery time	26	.66	12 .51	18 .93	.15 .77	-	-	-	-		
Cardiograph amplitude	60	.70	48 .67	28 .52	.04 .77	-	-	-	-		
Finger pulse amplitude	22	.80	38 .59	25 .66	.21 .51	-	•	-	-		
Respiration excursion <sup>*</sup>	65	* .63	41* .70	49* .75	.26* .58	.99	.52*	08	.43*		
Heart rate deviation <sup>*</sup>	07	.82	41* .69	36* .66	.17 .76	.36	.40*	63	12		
Perpetration question	n										
Skin conductance amplitude	53*	• .56	31 .67	13 .52	.38* .54	.02	.49*	.65	.59*		
Skin conductance recovery time	11	.63	14 .66	.13 .60	.41 .64	-	-	-	-		
Cardiograph amplitude	34	.64	37 .59	06 .59	.25 .83	-		-	-		
Finger pulse amplitude	08	.71	35 .73	15 .51	.14 .66	-		-	-		
Respiration excursion <sup>*</sup>	51*	* .54	.12 .53	.05 .63	.23 .81	81	.12	.61	.68*		
Heart rate deviation	37*	* .51	09 .62	.11 .77	.34* .67	04	.26	.61	.54*		
Participation questio	n										
Skin conductance amplitude	39	.67	35 .65	23 .69	.61 .60	-	-	•	•		
Skinconductance recovery time	09	.49	15 .71	14 .70	.44 .59	-	•	-	-		
Cardiograph amplitude	27	.68	50 .80	.06 .62	.23 .76	-	-	-	-		
Finger pulse amplitude	05	.67	32 .78	<b>-</b> .01 .70	.39 .65	-	-	•	-		
Respiration excursion	27	.72	34 .44	23 .73	.30 .67	-	•	-	-		
Heart rate deviation	22	.62	15 .61	21 .53	.20 .90	•	-	-	-		
Knowledge question											
Skin conductance amplitude*	44*	* .56	44* .65	52* .59	.48* .58	.49	.73*	16	.29*		
Skin conduct. recovery time*	29	.68	49* .74	50* .59	.15 .72	.43	.49*	16	.01		
Cardiograph amplitude <sup>®</sup>	25	.80	51* .54	37* .52	.06 .57	.51	.43*	18	00		
Finger pulse amplitude	14	.59	46 .60	•.39 .69	02 .68	-	-	-	-		
Respiration excursion	22	.55	19 .58	29 .69	.15 .61	-	-	-	-		
Heart rate deviation	21	.67	01 .71	17 .60	.22 .53	•	-	-	-		

*Note:* The structural coefficients are total Pearson product-moment correlations between the variables and the discriminant scores ( $\sigma$ =.01). The difference-score means were compared with 0.0 using two-tailed t tests ( $\sigma$ =.05). A value of 0.0 represents no difference between the mean relevant-question and control-question responses. Significant negative means indicate that the relevant-question responses were larger than the control-question responses; significant positive means indicate the reverse. For the hypothesis tests involving means for the three guilty roles, the critical values for t were obtained from Dunnett's t distribution (Winer, 1971, pp. 201-204) to control the overall significance level for each set of comparisons. Dashes indicate measures not selected by discriminant analyses: Discriminant coefficients were not obtained and structural coefficients were not evaluated for those variable that were not selected. \* This variable was selected by the stepwise discriminant analysis. \*p < .05.

### DISCUSSION

### Validity in the Discrimination and Classification of Guilty Versus Innocent

The present MGQT clearly displaced its ability to discrminate and classify subjects in guilty versus innocent roles in this laboratory study. Each of the guilty groups differed significantly from the innocent group in their total numerical scores and in their scores on one discriminant function based on combined objective measures. A second function further discriminated the thief group from the innocent group. The objective measures that contributed to discrimination; skin conductance amplitude, skin conductance recovery time, respiration excursion, heart rate deviation, and cardiograph amplitude were similar to those that discriminated guilty from innocent in previous studies (Barland & Raskin, 1975; Honts, 1986; Kircher & Raskin, 1988; Podlesny & Raskin, 1978; Raskin & Hare, 1978; Rovner, 1986). In agreement with Kircher and Raskin (1988), we found that finger pulse amplitude did not contribute uniquely to the discrimination of the groups. The prediction that innocent subjects would respond more strongly to control questions than to relevant questions was generally supported. However, the innocent group failed to produce a significantly positive mean numerical score of the knowledge question and also did not produce significant positive mean difference scores for four of the eight selected objective variables. Also generally correct, with some exceptions, was the prediction that the guilty subjects would respond more strongly to those relevant questions to which they attempt deception than they would to the control questions. Particularly noteworthy are the failure of the thief and accomplice groups to produce significantly negative mean numerical scores for the participation question and the failure of all the participation-question measures to contribute uniquely to the discriminant functions. Decisions based on total numerical scores produced a moderate rate of inconclusive results, accurate decisions for the innocent group, and moderately accurate decisions for the combined guilty groups. Thus, this study provides positive, but qualified, support for the laboratory validity of the present MGQT and provides estimates of its classification performance with field evaluation and decision methods.

# Feasibility of Discriminating Guilty Subgroups

The technique also displayed limited ability to discriminate among the guilty subgroups. The thief group produced a larger negative mean discriminate score on Function 2 (the weaker of the two functions) than did the accomplice and confidant groups, and the thief and confidant groups produced their peak frequencies of largest negative numerical scores to the perpetration and knowledge questions, respectively. Also partially correct was our prediction that, relative to their control question responses, guilty subjects who attempt deception when asked a particular relevant question would produce larger responses to that question than would guilty subjects who tell the truth when asked the same question. The mean numerical, respiration excursion, and heart rate deviation scores for the perpetration question were more negative for the thief group than for the confidant group. Also, the thief group produced a more negative mean respiration excursion score than did the accomplice group. There was no indication of any discrimination

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between the accomplice and confidant groups, and this is apparently traceable to the weakness of the accomplice-group responses to the participation question. The results suggest that it might be feasible to achieve some discrimination of guilty perpetrators from guilty nonperpetrators using the present technique.

### Implications for Field Practice

Inferences from the accuracy rates and other findings of this study to field practice should be made with caution because, as noted below, generalization to field contexts has not been established. Users of results obtained with the present technique should be cautioned that errors in classifying guilty and innocent subjects are not unlikely. The results further suggest that attempts to subcategorize deception using present MGQTs are not advisable. Where MGQT examinations are used to detect deception versus no deception in distributed crime roles contexts, decision methods based on overall question totals might reduce inconclusives and improve accuracy with innocent subjects in comparison with methods based on individual question scores. The results suggest that the individual-scores methods may be biased toward deception results. With that method, any one question total </- (-3) is sufficient for a deceptive decision, whereas the requirement for a nondeceptive decision, that all four totals must be >/- (+2), is more stringent. There were more false negatives with the totals method, but they occurred most frequently in the confidant group, which was not included in previous studies; the rates for more serious errors with thieves or accomplices were relatively low. The following results indicate that attempts to discriminate subjects with knowledge only from innocent subjects may be relatively weak: the relatively high rate of false negatives in the confidant group, the relatively large number of innocent subjects (five) who produced large negative scores for the knowledge question, the failure of innocent subjects to produce a significantly positive mean numerical score for the knowledge question, and the failure of the confidant group to produce a significantly negative mean total score. Because decisions based on individual questions totals produced more false positives than did decisions based on overall totals, investigative examiners might choose to interview examinees further when one or more individual question total (or totals) is less than or equal to -3 but to base their decision on the overall totals.

#### Limitations of This Research

Because field contexts differ from the present simulation, particularly with regard to our substitution of the possible failure to obtain a \$100 bonus for the threat of punishment, the results of this research may not generalize to actual examinations. Patrick and Iacono (1991) presented results and analysis suggesting that field control question tests may have higher false-positive rates, possibly caused by the presence of the threat of punishment. After consideration of the relative advantages and disadvantages of laboratory research, Podlesny and Raskin (1977) suggested criteria for conducting laboratory research that could be generalized for field use and concluded that laboratory and field research should be considered complementary (Raskin & Podlesny, 1979). This study adhered to those criteria, but our results should be considered with

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an awareness of the need for field validation. Patrick and Iacono and Raskin *et al.* (1988) addressed considerations related to the conduct and interpretation of field studies.

### Suggestions for Further Research

Our results suggest that the inclusion of perpetration, participation, and knowledge relevant questions may make over-ambitious demands on subjects' ability to divide their attention among them and react appropriately, especially in the case of the participation question. Nevertheless, further research might built on the present positive results to produce methods with a stronger ability to discriminate perpetrators form guilty non-perpetrators. Alternative expanded-issue techniques could restrict the relevant questions to perpetration and knowledge, which should be readily distinguishable to subjects. This would also allow examiners to use more repetitions of each question for more reliable estimates of differences. Alternatively, the limitation may be on the present method rather than on the subjects' ability to divide their attention among the relevant questions. For example, it is possible that the inclusion of a participation question with more focused wording, such as "Did you help someone else remove that money?" could improve discriminative ability. Systematic research to further develop the ability to resolve different guilty subgroups might yield valid techniques that would be useful in criminal investigations.

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# THE AMERICANS WITH DISABILITIES ACT

# AND CRIMINAL JUSTICE, AN OVERVIEW

By

### Paula N. Rubin

When the Americans With Disabilities Act (ADA) was enacted on July 26, 1990, a new era began in the quest to integrate persons with disabilities into the mainstream of society. The ADA is perhaps the most sweeping civil rights legislation passed since the enactment of the Civil Rights Act of 1964 nearly 30 years before.

This law is predicated on the belief that persons with disabilities have traditionally been isolated and segregated and that this discrimination took many forms, including architectural, transportation, and communication barriers; overprotective rules; exclusionary standards; lesser services, programs, activities, benefits, jobs, or other opportunities; and outright exclusion from certain places and privileges.<sup>1</sup>

One purpose of the ADA is simple: "to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities."<sup>2</sup> The goal is to provide the estimated 43 million persons with disabilities<sup>3</sup> access to employment, to governmental programs, services and activities, and to public accommodations such as restaurants, hotels, theaters, and shopping centers. To achieve this goal, the ADA contains five sections designed to eliminate barriers in employment, public services, transportation, public accommodations, and telecommunication.

The ADA was intended to pick up where the Rehabilitation Act of 1973 left off by expanding coverage to include employers neither receiving Federal funds nor working pursuant to a Federal contract. The ADA also covers access to government facilities and the delivery of services and programs by government agencies.

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#### The Americans with Disabilities Act and Criminal Justice: An Overview

While the ADA has significant implications for the criminal justice system, law enforcement is mentioned only once in the legislative history of the ADA, and even that is only in reference to persons with a history of illegal drug use.<sup>4</sup> Yet experts believe the impact on criminal justice is major:

The ADA may very well be the most significant piece of legislation affecting law enforcement since the Civil Rights Act. It will cause police agencies throughout the United States, as well as other employers, to adjust and, in some cases, completely overhaul their recruitment and selection procedures. Furthermore, if departments do not immediately develop changes in their personnel policies by the time the Act becomes applicable, they will expose themselves to substantial liability.<sup>5</sup>

Attempts to create an exemption for law enforcement were unsuccessful. Thus, the way the criminal justice community selects and treats its employees and delivers services to the public must be brought into compliance with the ADA. This includes limitations on blanket exclusions and requires a selection process that deals with individuals on a case-by-case basis.

The requirements of the ADA present unique challenges for the criminal justice system. Director, Office of National Drug Control Policy, Lee Brown, in his role as former president of the International Association of Chiefs of Police, pointed this out in a letter to the Equal Employment Opportunity Commission (EEOC), "[W]e do ... think that the extremely 'physical' nature of law enforcement work, coupled with the 'security/integrity' needs inherent to the job, impart a special perspective to our analysis of the Act."<sup>6</sup>

The need to have a working understanding of the law itself is critical to beginning to develop strategies for the recruitment, screening, selection, and treatment of police and corrections officers as well as for the delivery of services by criminal justice agencies. This Research in Action report provides a framework to begin to assess ADA's impact on the criminal justice system. Future issues will focus on the delivery by criminal justice agencies of their services to the public as well as on their hiring, promotion, and firing practices.

# UNDERSTANDING THE BASICS

A person has a disability under the law if she or he has a mental or physical impairment that substantially limits a major life activity, such as walking, talking, breathing, sitting, standing, or learning. A person will also be considered to have a disability for purposes of this law if he or she has a record of such an impairment or is perceived or regarded as having an impairment. Those associated with the disabled person are also entitled to certain protections. Family members who need special consideration in caring for someone with a disability may be entitled

to some protections under the law. However, the ADA does not require employers to provide reasonable accommodation in these cases.

Equal employment opportunities. Title I of the ADA addresses employment aspects of the law. The law makes it illegal to discriminate against persons with disabilities. These individuals are entitled to equal access to employment, including recruitment, hiring, promotion, and any other benefits and privileges of employment. To be "protected" (that is, covered by Title I of the ADA), the individual must have a disability and be qualified for the job.

To be qualified, the individual must satisfy the job requirements such as education, experience, and skills, and must be able to perform the essential functions of the job, with or without a reasonable accommodation.

*Provision of reasonable accommodation.* A reasonable accommodation can include modifying existing facilities to make them accessible, job restructuring, part-time or modified work schedules, acquiring or modifying equipment, and changing policies. However, reasonable accommodations will not be required when providing them causes an undue hardship for the agency.

Undue hardship means significant expense or difficulty. More than just money may be involved; it can also mean disruption or fundamental alternation of the nature or operation of the business or agency. Direct threat of serious harm is defined by the law as "a significant risk of substantial harm to the health and safety of others that cannot be eliminated by reasonable accommodation." Direct threat is not a defense to an employer's obligation to provide a reasonable accommodation. A reasonable accommodation is required if it will eliminate the direct threat.

If a police officer were recovering from a communicable disease but was fit for duty apart from the fact that he or she would remain contagious for 2 weeks, a reasonable accommodation would be to award him or her 2 weeks of leave. After that, there would be no significant risk in returning to duty.<sup>7</sup> Speculative or remote threats will not satisfy this requirement. Such a determination must be predicated on objective evidence.

Accessibility to facilities and in delivery of government services. In addition, Title II of the ADA requires government entities to achieve accessibility to their facilities as well as in the delivery of services and programs. Accessibility encompasses new construction and the alteration of existing facilities. It can mean anything from adding curb ramps to creating parking spaces reserved for persons with disabilities.

### DEFINING DISABILITY

A person with a disability is someone who: Has a physical or mental impairment that substantially limits one or more major life activities; Has a record of such an impairment; Is regarded as having an impairment.<sup>8</sup>

There are several key phrases in this definition: "impairment," "substantially limits," "major life activity," "record," and "regarded as." Understanding these concepts is essential to making an evaluation of whether someone is disabled for purposes of the ADA.

"Impairment." A threshold criterion that must be met under this definition is that there be an impairment--"some sort of physiological disorder or mental disorder."<sup>9</sup> This definition applies regardless of whether an individual can compensate for the impairment by use of an auxiliary aid or medication. For instance, someone who uses a hearing aid nevertheless has a disability under the ADA even if the device restores the person's hearing to normal levels. Likewise, an insulin-dependent diabetic whose diabetes is fully controlled by the insulin has a disability under the law.

On the other hand, physical characteristics such as hair or eye color or left-handedness do not constitute impairments. Certain personality characteristics such as poor judgment, a bad temper, or lack of dependability are not considered disabilities.

Not all cases are clear cut:

A person who cannot read due to dyslexia is an individual with a disability because dyslexia, which is a learning disability, is an impairment. But a person who cannot read because he or she dropped out of school is not an individual with a disability, because lack of education is not a disability.<sup>10</sup>

"Substantially limits." Having a disability, in and of itself, is not enough; it must be a disability that substantially limits a major life activity. These types of activities include: walking, speaking, breathing, performing manual tasks, seeing, hearing, learning, caring for oneself, and working.<sup>11</sup> Also considered major life activities are the ability to have intimate sexual relations and procreation. For this reason, those with AIDS or HIV infection will fall within the definition.

There are three criteria to consider when determining whether a major life activity is substantially limited by any given condition: Its nature and severity. How long it will last or is expected to last. Its permanent or long-term impact, or expected impact.<sup>12</sup>
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A good rule of thumb is to look at the effect of the condition and not its name.<sup>13</sup> So, for example, "an individual with mild cerebral palsy that only slightly interferes with his or her ability to speak and has no significant impact on other major life activities is not an individual with a disability under this part of the definition."<sup>14</sup>

"Record of impairment." Even if an individual does not currently have a physiological or mental disorder, she or he may still be considered disabled under the three-part definition, inasmuch as those who have a record of an impairment are also protected from discrimination. The law also covers persons who have been erroneously classified as having an impairment. Remember, however, that the impairment must have substantially limited a major life activity. Having a record of an impairment, alone, will not satisfy the definition.

"Regarded as having an impairment." A more subtle aspect of the definition of disability is that part that protects those who are perceived to have a disability. How does this occur? Here are some examples:<sup>15</sup>

(1) A person has high blood pressure controlled by medication. Nevertheless, his employer places him on permanent light duty for fear of a possibility of a future heart attack. In this case, the person has a disability that does not substantially limit a major life activity, but his employer treats him as though it does.

(2) Refusal to hire someone who has severe scars from burns. Here there is no disability nor a limitation of a major life activity. Instead, the fears, stereotypes, and attitudes of others toward these scars are disabling.

(3) Firing someone rumored to have HIV infection, who in fact does not, may violate the law. Even though the individual does not have a disability, she or he is regarded as having a substantially limiting impairment.

There are very subtle differences between these examples. Indeed, they have been described as "all different sides of the same coin."<sup>16</sup> The bottom line is that the ADA prohibits discriminating against people who are being treated as if they have a disability.<sup>17</sup>

## **DEFINING ADA EXCLUSIONS**

What conditions are not covered by the ADA? The law explicitly states that certain conditions, including homosexuality, transvestism, bisexuality, transsexualism, voyeurism, exhibitionism, pedophilia, sexual behavior disorders, compulsive gambling, kleptomania, pyromania, and gender-identify disorders are not caused by a physical impairment. Therefore, they are not disabilities.

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Persons with temporary conditions are also not usually found to have a disability under the definition. The question is whether the impairment substantially limits one or more major life activities. An example offered by the Equal Employment Opportunities Commission (EEOC) is that of a broken leg. If it heals normally within a few months, there would be no disability. But if the leg heals improperly, causing a permanent limp, or if the leg takes an abnormally long time to heal, during which time the person cannot walk, she or he might be considered to have a disability.<sup>18</sup> Pregnancy, for purposes of the ADA, is not an impairment. Moreover pregnancy is addressed in the Pregnancy Discrimination Act, which requires employers to treat pregnancy no less favorably than any other temporary disability.

Also specifically excluded from protection under the ADA are those who currently use illegal drugs. Prior drug addicts, including those who are in the process of, or who have successfully completed, a rehabilitation program, are protected by the law. The protection applies to those with an addiction to drugs or alcohol. It does not apply to the casual or recreational user of drugs or alcohol.

The issue of current drug use or prior drug history has significant implications for criminal justice agencies. Issues as to what constitutes current drug use and whether and under what conditions individuals with a history of drug use may lawfully be denied sworn criminal justice positions will form the basis of a future Research in Action.

# OTHERWISE QUALIFIED INDIVIDUALS WITH DISABILITIES

Having a disability does not automatically entitle someone to protection under the ADA. The ADA is not a guaranteed-jobs law requiring criminal justice agencies to hire persons with disabilities. Nor is it an affirmative action law requiring that preference be given to persons with disabilities over those who are not disabled. Under the ADA, employers are still entitled to hire the most qualified candidate for the job.

The ADA does not safeguard a person with a disability unless the person is also otherwise qualified for the position. In evaluating whether a person with a disability is qualified for a job, two questions should be answered:

(1) Does that person meet the initial job requirements, such as work experience, education, skills, certificates, or licenses?

(2) If so, can the person perform the essential functions of the job, with or without reasonable accommodation?

Defining initial job requirements. In answering the first question, care must be taken to make sure that the specifications for the position are job-related and consistent with business

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necessity. For example, law enforcement agencies would most likely be permitted to require applicants and employees to have a driver's license, inasmuch as operating a patrol car is an essential part of police work in most jurisdictions. On the other hand, driving a car may not be an essential part of the job of a corrections officer or administrative or clerical employees, and therefore might not be appropriately included as a requirement for these positions.<sup>19</sup>

Note that the purpose of the law is to integrate persons with disabilities into the work force. It is impermissible to attempt to subvert the intent of the ADA by imposing qualifications and job requirements that are not job-related or only relate to marginal functions of the job.

Persons with disabilities who meet the specified job requirements are not considered qualified unless they can also perform the essential functions of the job with or without a reasonable accommodation. Making this determination also requires answering two questions:

(1) Are the functions truly essential or are they marginal?

(2) Can these essential functions be performed with or without a reasonable accommodation?

Identifying essential job functions. This involves determining whether employees in the position actually are required to perform the function and, if so, whether or not removing the function would fundamentally alter the job.

If the employer rarely requires a specific task, then it may not be appropriate to list the task as an essential job function. In that case, the employer would need to demonstrate that, although the function is rarely performed, to eliminate it would be to fundamentally alter the nature of the job. For example, even if 99 percent of police officers rarely make forcible arrests, departments may establish this as an essential function of the job by showing that the consequences would be significant if a police officer were not able to do so.

Answers will vary not only from job to job, but from department to department as well. The size and location of the agency may play a role in this assessment. Here are reasons offered by the EEOC as to why a job function may be essential: The position exists to perform the function. There are a limited number of other employees available to perform the function, or among whom the function can be distributed. A function is highly specialized, and the person in the position is hired for special expertise or abilities to perform it.<sup>20</sup> What factors may be used in determining essential functions of a particular job?<sup>21</sup> The employer's judgment (while the employer may not be second guessed, other factors will also be regarded). A written job description prepared before advertising or interviewing for a job (this is not required under the ADA, but it is a good idea to have one that accurately reflects the true nature of the job and is created in advance of the screening and selection process). The amount of time spent performing the function (the example of the forcible arrest, used above, might apply to this factor). The

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consequence of not requiring the person to perform this function (the above example of the police officer might apply here). The terms of a collective bargaining agreement. The work experience of people who have performed the job in the past and work experience of people who currently perform similar jobs. (It is a good idea to talk with employees who have performed the job in the past as well as those who are doing the job now. Do not presume to know what a job involves; ask the people who are doing it.) Other relevant factors (this can include the kind of services provided by the employer or the organizational structure of the agency).

The principle is that job requirements should not have the practical effects of imposing a blanket exclusion of a particular disability or class of persons.

#### REASONABLE ACCOMMODATION, UNDUE HARDSHIP, AND DIRECT THREAT

If an otherwise qualified individual with a disability cannot perform the essential functions of the job, the employer may be obligated to provide a reasonable accommodation. However, an "employer has no duty to accommodate an employee with a disability unless the accommodation will enable the employee to perform the essential functions of the position."<sup>22</sup> Reasonable accommodation is any modification or adjustment to a job, an employment practice, or the work environment that makes it possible for an individual with a disability to enjoy an equal employment opportunity."<sup>23</sup>

Defining reasonable accommodation. An employer's duty to reasonably accommodate individuals with disabilities applies to all aspects of employment. This includes the application and selection process, an employee's ability to perform the essential functions of the position currently held as well as those desired and the benefits and privileges other employees without disabilities enjoy.

This duty, however, only applies to known physical or mental disabilities. It is usually the responsibility of the person needing an accommodation to request one. An employer's applications, test announcements, or advertisements may request persons with disabilities requiring an accommodation to participate in the application process to inform the employer within a reasonable time prior to applying or interviewing for a position or taking an examination.<sup>24</sup>

Here are five additional explanations of reasonable accommodation:<sup>25</sup> A reasonable accommodation must be an effective accommodation. The reasonable accommodation obligation applies only to accommodations that reduce barriers to employment related to a person's disability; it does not apply to accommodations that a disabled person may request for some other reason. A reasonable accommodation need not be the best accommodation, as long as it is effective for that purpose. An employer is not required to provide an accommodation that is primarily for the employee's/applicant's personal use. An individual is not required to accept an

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accommodation if the individual has not requested an accommodation and does not believe that one is needed.

An employer, for example, might offer to raise a worktable so that a disabled employee's wheelchair would fit under it. The employee would be entitled to decline accepting the higher table as an accommodation; the individual might prefer the lower table to permit easier use of a computer keyboard in her or his lap.

When is an accommodation effective? When it enables the person to perform the essential functions of the job. The accommodation should avoid limiting, segregating, or classifying the individual.

What happens if an applicant or employee refuses an accommodation? Remember, employers are not required to provide the accommodation the person requests, although where possible it is advisable to do so. The employer does not even have to provide the best accommodation. The accommodation must be effective in helping the individual perform the essential functions of the job. If the individual chooses not to accept this accommodation, there is a risk that doing so will render her or him unable to carry out the essential functions of the job. When that happens, the individual is no longer "otherwise qualified" for the position.

*Examples of reasonable accommodations.* Because the same disability can manifest itself very differently in two different people, accommodations require a case-by-case determination, as noted above. The following list of possibilities is not meant to be exhaustive.<sup>26</sup>

Making facilities accessible and usable. For instance, provided designated parking spaces for those with disabilities if parking is provided to others.

Job restructuring. This does not include reassigning essential functions of the job. It can include exchanging or reassigning marginal functions, or changing how and when essential functions are performed.

Modified work schedules. This might include part-time work.

Flexible leave policies. Accommodations do not include paid leave, but could include leave without pay.

Reassignment to a vacant position. This is new to the ADA and applies to incumbents only and not to applicants.

Acquisition or modification of equipment and devices. Examples include TDD's (telecommunications for the deaf) and apply to job-related equipment only.

Polygraph, <u>23(3)(1994)</u>.

Employers are not required to provide devices for the personal use of the individual.

Adjusting and modifying examinations, training manuals, and policies. This includes using training sites that are accessible.

Providing qualified readers. This does not mean two people must be hired to do one person's job.<sup>27</sup>

Providing qualified interpreters. This can be done on an as-needed basis.

There may be times when providing an accommodation will not be required. Obviously, no accommodation is required when it would not enable the individual to perform the essential functions of the job.

Likewise, no reasonable accommodation will be required if it would impose an undue hardship on the employer or a direct threat to the health and safety of the employee or others is created, which cannot be eliminated by a reasonable accommodation.

Defining undue hardship. The ADA defines this term as "significant difficulty or expense." What may be an undue hardship for one criminal justice agency may not be a hardship for a different agency in different circumstances. Accommodations may constitute undue hardship if they are unduly costly, extensive, substantial, disruptive, or would fundamentally alter the nature or operation of the agency.<sup>28</sup>

"An undue hardship may be something less than a cost that would drive the employer to the verge of going out of business, but at the same time it must impose more than a negligible cost."<sup>29</sup>

Defining direct threat. This involves a significant risk of substantial harm based on objective evidence and not mere remote possibility in the future but must be a present risk. Employers are required to reduce or eliminate the risk with an accommodation. When this is not possible, then a refusal to hire due to direct threat may be appropriate.

Deciding what accommodation to provide. The best place to start is with the person requiring the accommodation. Often she or he will know what accommodation will work and how to obtain that accommodation as cost-efficiently as possible. It may also be a good idea to consult with other employers and local vocational rehabilitation agencies. The Job Accommodations Network (JAN), offered by the President's Committee on Disabilities, is an information and reference service that suggests accommodations. JAN may be reached at 1-800-ADA-WORK.

### ACCESSIBILITY TO PROGRAMS AND SERVICES

The ADA not only addresses how criminal justice agencies are to treat their own employees under Title II but also governs how they are to treat members of the general public who may have a disability. Although Title II went into effect on January 26, 1992, many of its requirements have been in effect for federally assisted programs for nearly 20 years under the Rehabilitation Act of 1973. The ADA merely expands coverage to all government programs, services, or activities. However, a significant consequence of the ADA was to bring to the attention of the public at large the rights of those with disabilities to enjoy both equal employment opportunity and equal access to programs and services.

Title II applies to any governmental agency regardless of its size and requires the agency to make sure that its programs, services, and activities are accessible to persons with disabilities. This affects two areas: (1) the services and programs delivered by the agency; and (2) physical access to the facilities where these programs, services, and activities are offered.

Determining accessibility of programs and services. To ascertain if the agency is meeting the requirements of the ADA, the offered programs, services, and activities in their entirety need to be examined and the following questions asked: Are any modifications to the agency's policies, practices, or procedures necessary to ensure accessibility? Do any eligibility criteria eliminate or tend to screen out a qualified individual with a disability from enjoying the benefits of these programs, services, or activities? Do any policies or practices segregate persons with disabilities from others participating in these programs, services, or activities? Are any of these programs, services, or activities delivered at a location or facility that has the effect of denying persons with disabilities the right to enjoy the benefits of these programs, services, or activities? If alternative services are offered to persons with disabilities, are these benefits unequal to those offered to the public at large?

If the answer to any of these questions is "yes," the agency may need to revise the way it offers its programs, services, and activities. Modification will not be necessary, however, if doing so fundamentally alters the nature of the program, service, or activity or causes an undue burden. Undue burden under Title II is analogous to undue hardship under Title I, and means "significant difficult or expense ... taking into account such factors as the nature and cost of the action, the financial resources of the site or a parent organization, the relationship of the site to the parent organization, and the type of the parent organization."<sup>30</sup>

Is it always illegal to have discriminatory practices or policies? Obviously not. An agency is allowed to take into account the safety of the public. So, for example, prohibiting persons with heart disease from riding on a roller coaster at a county fair might be a permissible rule with a discriminatory effect.

Polygraph, <u>23(3)(1994)</u>.

Determining physical access to facilities. Are criminal justice agencies expected to rebuild or renovate their facilities? The answer is a qualified "no." Criminal justice agencies are not expected to "retrofit" their existing buildings. Nor are they expected to alter historical landmarks. A rule of thumb is to look at the program, not the building. Is it possible to change the way the program is delivered rather than the building? Examples include moving the program or service to an accessible part of the building, such as the first floor, providing home deliver of the service, or telephoning the person with a mobility impairment. If so, then remodeling the delivery of the service rather than the building in which it is delivered may suffice. A little creativity can go a long way in complying with this part of the ADA.

New construction or alterations to existing buildings, however, must comply with the ADA. The Architectural and Transportation Compliance Board (the "Access Board") has issued proposed accessibility guidelines for State and local governments. These guidelines are expected to have special considerations not originally contemplated for courthouses and correctional facilities. Until the final guidelines are issued, however, agencies may choose between two different sets of architectural standards: the Uniform Federal Accessibility Standard (UFAS) or the ADA Accessibility Guidelines (ADAAG).

What must be done at the administrative level to comply with Title II of the ADA? Several things. Some of these administrative requirements will only apply to entities with 50 or more employees. A word of caution on calculating the number of employees. The size of a particular entity will be computed based on the number of employees not only in the department, but also on the number of employees in the city or county in which the specific department operates. Therefore, only the smallest of jurisdictions will be exempt from most administrative requirements.

What are these requirements?

Self-evaluations of programs, services, and activities delivered should be conducted and a study made of whether the policies and practice prevent persons with disabilities from enjoying the benefits and privileges of them. For entities with 50 or more employees, the self-evaluation must have been completed by January 26, 1993, and be made available to the public for 3 years.

Transition plans for entities with 50 or more employees are required if structural changes are necessary in order to make programs accessible.

Public notice must be given to all interested parties of their rights and protections under the ADA. This notice can include signs, posters, and pamphlets and should be made in accessible formats.

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ADA compliance officers must be designated for entities with 50 or more employees to provide a contact point for individuals who need information on the ADA and to assist in the employees' education in the law.

A grievance procedure must be created and implemented for entities with 50 or more employees to handle the receipt and processing of complaints as well as their resolution.

# MORE QUESTIONS REMAINING

Since enactment of the ADA, criminal justice agencies have begun to apply the ADA requirements. But at this juncture, there often seem to be more questions than answers about how to implement the ADA.

The law affects virtually every facet of the application, screening, and selection process for corrections and law enforcement personnel. Careful consideration of actions is required as there are, as yet, no certainties about how the courts will interpret the ADA. As apply put in the October 1991 issue of *Fire & Police Personnel Reporter*, "Professionals can act only as weathervanes, and not forecasters."

# GLOSSARY

The ADA uses numerous terms to describe its requirements and the obligations of those covered by the law. Here is a brief index and short explanation of some of the key words and phrases commonly used in the ADA.

*Disability*: (1) A mental or physical impairment that substantially limits a major life activity; (2) a record of having such an impairment; (3) being regarded as having such an impairment.

Impairment: A physiological or mental disorder.

Substantial limitation: When compared to the average person: (1) an inability to perform a major life activity; (2) a significant restriction on how or how long the activity can be performed; or (3) a significant restriction on the ability to perform a class or broad range of jobs.

*Major life activity*: Basic functions that the average person in the general population can do with little or no difficulty such as walking, seeing, hearing, breathing, speaking, procreating, learning, sitting, standing, performing manual tasks, working, or having intimate sexual relations.

# The Americans with Disabilities Act and Criminal Justice: An Overview

Otherwise qualified: A person with a disability who satisfies all of the requirements of the job such as education, experience, or skill and who can perform the essential functions of the job with or without reasonable accommodation.

Essential functions: The fundamental, not marginal, duties of a job.

*Reasonable accommodation*: A change in the application process, work environment, or job descriptions involving marginal functions of the job, or the use of modified or anxiliary devices that enable a person with a disability to perform the essential functions of the job without causing an undue hardship or direct threat to the health and safety of herself or himself or of others.

Undue hardship: Significant difficulty or expense relative to the size and overall financial resources of the employer.

*Direct threat*: A significant risk of substantial harm based on valid, objective evidence and not mere speculation.

# TERMINOLOGY

In 1973 when the Rehabilitation Act was signed into law, it used the term "handicapped" to describe persons with disabilities. Since that time, individuals with disabilities have indicated their preference for the term "disability."

Many terms used to describe certain disabilities invoke stereotypes and can be dehumanizing. Here are some terms to avoid with suggested substitutes:

Avoid	Instead of		
Handicapped, invalid, disabled	Person(s) with disabilities		
Victim of epilepsy, arthritis	Officer Smith has epilepsy, Lt. Jones has arthritis		
Deaf-mute, deaf and dumb	Deaf, hearing impaired, speech impaired		
Confined to wheelchair, bound	Wheelchair user, users of wheelchairs, mobility impaired		

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Cripple, crippled	Physically disabled, mobility, impaired, Use name of the disability (e.g., polio)
Deformed	Physically disabled
Retarded, show, stupid	People with mental disabilities
Slow, stupid, illiterate	People with learning disabilities, Officer Day has dyslexia
Spastic, fits	Seizures, Captain Collins has epilepsy

Notes:

1. Americans With Disabilities Act (ADA), 42 USC, Section 12101(a)(5).

2. ADA, Section 12101(b)(1).

3. ADA Section 12101(a)(1).

4. Appro Exchange, "Get Ready for the Disabilities Act," July 1991, p. 7, reprinted from *Law Enforcement News*, a publication of John Jay College of Criminal Justice, New York.

5. T. Schneid and L. Gaines, "The Americans With Disabilities Act: Implications for Police Administrators," *Police Liability Review*, Winter 1991: 4.

6. Lee Brown, "Model Response to EEOC's Regulations Governing the Americans With Disabilities Act (ADA)," unpublished memorandum by the International Association of Chiefs of Police to its membership, April 3, 1991.

7. Equal Employment Opportunity Commission, Technical Assistance Manual (TAM), Section 4.5.

8. TAM, Section 2.2(a)(1).

9. C. Feldblum, "The Americans With Disabilities Act: The Definition of Disability," *The Labor Lawyer*, 7, 11 (1991).

10. TAM, Section 2.2(a)(i).

Polygraph, <u>23(</u>3)(1994).

11. TAM, Section 2.2(a)(ii).

12. TAM, Section 2.2(a)(iii).

13. TAM, Section 2.2 (a)(iii).

14. TAM, Section 2.2 (a)(ii).

15. Examples from TAM, Section 2.2(c).

16. Feldblum, p. 16.

17. Ibid.

18. TAM, Section 2.2(a).

19. D. Snyder, The Americans With Disabilities Act, Labor Relations Information System, 1991: 82.

20. TAM, Section 2.3(a).

21. Suggestions from TAM, Section 2.3(a).

22. TAM, Section 3.1.

23. R. Fitzpatrick, "Reasonable Accommodation and Undue Hardship Under the ADA," Federal Bar News & Journal, January 1992.

24. Snyder, p. 177.

25. Suggestions from TAM, Section 3.4.

26. From TAM, Section 3.5.

27. See also Snyder, p. 167.

28. TAM, Section 3.9.

29. Fitzpatrick, p. 73.

30. Bureau of National Affairs, Americans With Disabilities Manual (ADAM), Washington, D.C., monthly, Section 40:0006.

Polygraph, <u>23(</u>3)(1994).

# **INTERROGATING CHILD MOLESTERS**

By

#### Blaine D. McIlwaine, M.S.

Despite an evolving public awareness during the past decade, the sexual molestation of children remains a vastly under-reported crime--one that represents a significant threat to America's children. When allegations of abuse do surface, cases are often difficult to investigate and prosecute because of a lack of physical evidence. Therefore, most investigations focus on resolving discrepancies between the victim's statement and that of the accused.

One of the best ways to overcome the problems inherent in this approach is to obtain a confession from the offender. Such a confession produces many positive results, perhaps most notably averting the need for the young victim's testimony in court.

This article provides descriptions of the various typologies of child molesters. It then introduces interrogation techniques designed to assist investigators in interviewing these offenders successfully.

# MOLESTER TYPOLOGIES

Research conducted by the FBI Academy's Behavioral Science Services Unit in Quantico, Virginia, divides child molesters into two groups based on descriptive typology. All child molesters fall into one of these two broad categories--the situational child molester and the preferential child molester.

# Situational Child Molesters

Situational child molesters do not have a true sexual preference for children, but instead, engage in sex with the young for varied and sometimes complex reasons. For such molesters, sexual contact with children may range from a "once-in-a-lifetime" act to a long-term pattern of behavior. However, situational child molesters generally have a very limited number of victims.<sup>1</sup>

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Perhaps the most common manifestation of situational child molestation is represented by the parent or relative who molests a child because of stress or while intoxicated. Because the

#### Interrogating Child Molesters

Perhaps the most common manifestation of situational child molestation is represented by the parent or relative who molests a child because of stress or while intoxicated. Because the majority of child sexual abuse cases encountered by investigators may indeed by situational, it is important to remember that this type of molester abuses children for reasons other than genuine sexual attraction.

### Preferential Child Molesters

Preferential child molesters have a definite sexual preference for children. Their sexual fantasies and erotic imagery focus on children. They engage in sexual acts with the young not because of some situational stress or insecurity, but because they are sexually attracted to, and prefer, children. They can possess a variety of character traits, but all engage in highly predictable sexual behavior. Although preferential child molesters are fewer in number than their situational counterparts, they have the potential to molest a much large number of victims.<sup>2</sup>

# Comparison of Typologies

As a general rule, less physical and documentary evidence exists in investigations involving situational child molesters. This is true primarily because of a low victim-offender ratio and because of the less-predictable sexual behavior exhibited by this type of offender.

By contrast, preferential child molesters engage in highly predictable, and often, high-risk activities in order to identify and seduce their victims. In fact, because of their often-blatant behavior, preferential molesters are more commonly identified today as pedophiles.

# SUCCESSFUL INTERROGATION

The key to conducting a proper interrogation of either type of molester is to document patterns of behavior thoroughly. The interrogator must gather as much information as possible on both the offender and the victim(s).

Further, the offender's interpersonal style and methods of approach and seduction of children should be established in the interrogator's mind. A skillful interrogator should also be aware of the victim's background and be very familiar with the details of the case.

# INTERVIEW AND INTERROGATION

Skillful interviewing and interrogation are essential elements in resolving child sexual abuse cases. As taught at the FBI Academy, an interview is a "conversation with a purpose." During child sexual abuse cases, investigators may conduct numerous interviews with victims,

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witnesses, and professionals in the field. However, the ultimate success of an investigation often rests with the interrogation of the suspected offender.

Interrogation is an art that uses proposals and observations to elicit the truth from a subject. Investigators should base their interrogations on sound reasoning and understanding, without the use of threats or promises.

Because interrogations assume such importance in child abuse cases, they must be thoroughly planned in advance. Location and timing are critical. Great care should also be exercised when selecting the interrogator. Interrogators who prove successful in other kinds of cases may not always be the best choice to interrogate suspected child molesters.

A successful interrogator must display self-confidence, as well as a positive attitude, and must refrain from expressing demeaning or insensitive remarks that may preclude a successful interrogation. Interrogators should generally avoid the use of legal or emotional terms, such as "allegation," "molest," "charge," and "count."

# PRIMARY DIFFERENCES BETWEEN AN

# INTERVIEW AND AN INTERROGATION

Interview	vs.	Interrogation
Non-accusatory		Accusatory
Less structured		More structured (Both setting and presentation)
Goal: To gather factual information		Goal: To obtain admissions and confession

#### Interrogating Child Molesters

### Use of Themes

Developing themes is the cornerstone to obtaining confessions in child sexual abuse cases. Proper theme development provides offenders with moral excuses that serve to minimize their crime. In this way, offenders can maintain their self-respect and still confess. Therefore, successful interrogators use themes and proposals or simply provide possible reasons why the offender committed the crime.

Throughout the interrogation, the purpose of the themes is to use the defense mechanisms of rationalization and projection. Themes allow offenders to rationalize or excuse their behavior to themselves or others and to project their actions onto something or someone else.

A properly formatted interrogation with the use of themes makes a big difference in an interrogator's success rate. Interrogators should ensure that the themes appear plausible to offenders, as well as to investigators. Therefore, the proposed excuses for offenders' actions should be carefully selected before the interrogation. While they may feel uncomfortable offering "excuses" to suspected offenders, interrogators must understand that providing such themes is a proven method to break down suspects' reluctance to confess their crimes. However, the investigator must have confidence in the themes used to appear credible to the offender.

If a theme approach proves unsuccessful, interrogators should not terminate the meeting. Often, an offender who is on the verge of confessing will hold back to observe the interrogator's next move.

In these cases, interrogators should consider using a new approach. They should advise the suspect that the absence of a confession will require the victim to appear and testify in court. An offender with any emotional attachment to the child may well want to avoid putting the victim through additional turmoil.

## Confronting the Offender

The offender should also be confronted with all physical and documented proof of the violation. Any medical histories, child drawings, and witness observations should be discussed and exhibited.

The offender should then be informed that, given the evidence in the case, a denial would seem implausible to an average juror. This can be accomplished by simply asking an offender, "If you were a juror in this case, what would you believe?"

## Nonverbal Behavior

Persistence in the interrogation process, coupled with self-confidence, is another key ingredient to obtaining a confession. In this regard, nonverbal behavior often makes a difference. Good interrogators should be aware of the "body language" they display. Their gestures should exhibit self-confidence and sincerity.

Likewise, an accurate reading of the offender's body language is also essential when themes are established in an interrogation. An upward glance, with eyes cast to the right, or the placing of a hand on the chin may indicate that the offender is seriously considering a particular theme.

## LOCATION AND TIMING

Aside from the interrogation itself, the site chosen for it may be the most important determinant of a successful outcome. Offenders may feel less inhibited during an interrogation conducted in a neutral setting, away from the police station. In fact, offenders reluctant to appear at the station due to status, employment, or personality style may prove more forthcoming in a different atmosphere, such as a motel. However, "hardcore" offenders, those unfamiliar with police techniques, and those with extensive records are generally best interrogated in a police setting.

Often, investigators can interrogate "on scene" in the offender's home or in the location where the offense allegedly occurred. When possible, this approach should be conducted in a surprise manner, without warning to the offender.

The timing of the interrogation is also important. Every effort should be made to interrogate the suspected offender as quickly as possible. The timing of the interrogation should be commensurate with the collection of other facts related to the investigation. The longer the delay in scheduling an interrogation, the greater the risk of the offender gaining confidence and/or deciding against the meeting.

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# **Themes For Successful Interrogations**

An interrogator may suggest that the offender:

- \* Seduced the child in a moment of weakness
- \* Blamed spouse for neglecting sexual role in the relationship
- \* Was teaching the child about life, love, and affection
- \* Believed such encounters occurred regularly in families
- \* Acted out of love
- \* Was under a great deal of stress (divorce, unemployment, loneliness), which caused the act
- \* Was not in a "real" state of mind at the time of offense because of the influence of drugs, alcohol, or a combination of factors
- \* Read and collected pornography, which caused the offender to lose control and to commit the crime
- \* Was predisposed to commit the crime because the offender was victimized as a child. (In reality, evidence suggests that the majority of individuals who were sexually molested as children lead productive lives and do not become child molesters.)

(Based on guidelines issued by the U.S. Department of Defense Polygraph Institute.)

## USE OF POLYGRAPH

The polygraph is a potentially valuable forensic tool, especially in cases where individuals make allegations in direct contradiction to each other. For this reason, and because child sexual abuse investigations are private in nature and rarely produce eye witness corroboration, the use of polygraph procedures should not be overlooked.

Polygraph examinations often lead to confessions in the post-test interrogation. In fact, when administered by a well-trained examiner/interrogator, the polygraph often means the difference between a successful and a case that ultimately remains unresolved.

## CONCLUSION

Several factors make the sexual molestation and abuse of children a difficult crime to investigate and prosecute. Effective interrogation of suspected offenders is a key element to building successful cases. Therefore, investigators should prepare thoroughly for interrogations. This includes a review of all pertinent documentation, selection of appropriate time and interrogation site, and development of plausible themes to induce offenders to confess.

A thoroughly planned interrogation that results in a confession benefits not only law enforcement agencies but also the entire criminal justice system by reducing caseloads. Perhaps most important, however, is the benefit to young victims who will not be required to recount a painful violation in court.

\* \* \* \* \*

1. Kenneth V. Lanning, *Child Molesters: A Behavioral Analysis.* National Center for Missing and Exploited Children, Office of Juvenile Justice and Delinquency Prevention, Office of Justice, Research, and Statistics, U.S.Department of Justice, Washington, D.C., 5.

2. *Ibid*.

# THE DETECTION OF INFORMATION WITH ITEMS OF HIGH OR LOW PERSONAL SIGNIFICANCE USING A POLYGRAPH: THE EFFECTS OF MOTIVATION

#### By

# **Donald Krapohl**

## Abstract

In this research, twenty subjects were administered polygraph tests to detect either items of high personal relevance, or items of low personal relevance. The subjects were tested with motivational instructions to attempt to beat the test, and also tested a different time with no motivation. The results indicated an interaction between item-significance and motivation. The findings were discussed in light of earlier results, and a three-dimensional model was offered to explain disparate conclusions reached by previous researchers.

# Introduction

The issue of motivational influences on the accuracy of instrumental deception tests has been given a moderate amount of attention by researchers in the past. Since the motivation to avoid detection is expected in guilty subjects who stand to lose liberty or livelihoods if their deceptions are identified, interested researchers have induced motivation artificially and cautiously attempted to generalize their data to the real world. Unfortunately these methods yielded little consistency in results across studies and produced more questions than answers. Depending upon the study cited, the motivation to defeat the tests will increase, decrease, or have no effect on detection rates. A close examination of the methodologies of these studies suggest that motivation may interplay with specific ingredients within the experimental designs.

As points in common, virtually all experiments looking into motivation and detection rates have used rewards or incentives to generate the desired drive and employed electrodermal recordings to detect the concealed information. A main point of separation, however, is the type of information experimenters are attempting the detect. While some have used numbers arbitrarily assigned to the subject to remember and conceal (Gustafson and Orne, 1963; Horvath, 1978; Horvath, 1979), others used personally-significant items (Lykken, 1960; Lieblich, Naftali, Shmueli, and Kugelmass, 1974) and skill others used information about a mock crime (Davidson, 1968; Bradley and Janisse, 1981; Lykken, 1959). The influence of motivation has also been investigated as part of a validity study (Correa and Adams, 1981).

The author performed this research while in St. Louis in private practice in 1984. Due to the small sample size, it is difficult to generalize from this study although its results give useful insight into motivation theories. (Ed.).

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It has been suggested by Lieblich *et al.* that motivation may effect detection rates differently when the critical items are of high personal relevance to the subject. Taking the literature as a while, there is, in fact, a tendency to find that motivation has no impact on detection rates when the detected information is of high personal significance; that is, detection efficiency is consistently high at all levels of motivation when high-significance items are utilized. This is also true in mock crime paradigms where assigned details of the crime were made important to the subject by means of elaborate and involving procedures.

Those studies using information of low significance have been less successful in identifying the effects of motivation. Horvath saw average hit rates of objectively scored GSRs fall from 65.6% to 40.6% when motivation was increased. Conversely, Gustafson *et al.* found increased motivation to improve detection rates to 63.9% while lower motivation did not produce rates significantly above the chance level of 20%.

Horvath postulated that naive subjects had little difficulty in reducing the contrast between the responses to critical and non-critical items, and his data supported that contention. Gustafson's results were in support of the "fear of detection" model; that is, that by increasing the consequences of detection, physiological responses would be greater, leading to easier detections. The source of this paradox may be methodological, but the issue is currently unresolved.

The present study was designed to test the effects on detection rates of item-significance across two motivational levels. In an attempt to test these manipulations upon field measures of deception detection, a standard field polygraph was used to record the physiological data, and experienced polygraph examiners were employed to interpret the polygraph charts. It was anticipated the interaction of motivation and item significance would be manifested in the form of differences in detection rates.

### Method

## Subjects

Twenty subjects, all male security officers of Wells Fargo Guard Services in St. Louis, Missouri, were recruited through letters and signs announcing the need for volunteers in a lie detection study. They were offered \$5.00 for each of two polygraph tests completed. None of these subjects had ever been administered an instrumental deception test. Subjects reporting the recent use of vigilance-altering or mood-effecting drugs were excluded from the selection process. The subjects' ages ranged from 18 to 64, with a mean age of 29.8 years. In formal education, the mean for this sample was 11.9 years, with a range of 7 to  $\cdot 16$  years.

#### **Apparatus**

A standard field polygraph, a four-pen Stoelting Polyscribe #227700 was used for this experiment. The cardiovascular activity was monitored by means of occlusion plethysmography. The cardiovascular activity recording unit contained an electronic signal amplifier which was activated to set a pen deflection between systole and diastole at about 5/8 inches (1.6 cm). Cuff pressure was between 40 and 44 mm Hg. The placement of the cuff was directly against the skin of the subject's upper left arm, with the bladder over the brachial artery.

Two galvanic skin response (GSR) fingerplates were placed on the right hand, one on the index finger, and other on the ring finger. The contact points were on the palmer surfaces, over the fingerprint area. These plates were held in place with Velcro fasteners. The sensitivity was set at 30, and the automatic centering mechanism was activated to reduce the recording examiner's interference with the GSR recordings.

Two respiration components were utilized. One of the convoluted breathing tubes was placed around the subject's thoracic area and the second around the abdominal area immediately below the bottom of the ribcage. These components were also electronically enhanced. The settings were dependent upon the subject being tested, but pen deflection between peaks of inhalation and exhalation averaged one inch (2.5 cm). The placement of all sensors follows that outlined by Reid and Inbau (1977).

Two decks of cards were designed for this study. The first deck contained five cards, each having one of the following letters printed on it: W, R, J, H, or L. The second deck of cards contained one of the letters X, E, Q, K, or P on each of them. These cards were shuffled and placed face-down so that the subject would be forced to make his selection blind to the letter on the card.

## Procedure

Two groups of 10 subjects were created by random assignment. One group was to be given polygraph tests using items of high personal significance (HS), while the other was tested on items of low personal significance (LS). Each subject in both groups was given two polygraph examinations with at least a one-week interval between examinations.

Each subject served both in the high motivation (HM) condition and low motivation (LM) condition. In the HM condition each subject was offered an additional \$5.00 for successfully beating the test, while in the LM condition he was told there was nothing extra to be earned, regardless of the outcome. The order of the HM and LM conditions were balanced across all subjects.

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When the subject reported for his first of two scheduled polygraph examinations, he was given an ambiguous explanation of the purpose of the study, but reminded it was a study of lie detection; and told he could withdraw from the experiment at any time. In order to receive any payment, however, he was told he must complete both of the examinations. If he agreed to the conditions, a consent form was provided for his signature.

Background information was received from all subjects which included names of parents. If the subject was in the HS group, the first name of his mother was placed on a list of four other female names selected at random. For those subjects in the LS group, each blindly drew a lettered card from the deck of lettered cards and was told to remember the selected letter. The placement of both the name and letter within the lists was by chance.

In the testing laboratory each subject was given a very brief explanation of the polygraph instrument. He was instructed to answer with the word "no" to all of the items presented, even though he would be lying to one item on the list. He was told he should not reveal to the recording examiner the true letter or name until the completion of all phases of the experiment.

During the testing, the recording examiner asked each of the items in the relative lists three times, in a different sequence each time, with a buffer item placed in the first sequence in the first position. The items were read at 10-second intervals. The test procedure was patterned after what is commonly known as the Guilty Knowledge Technique (GKT).

Upon completion of the testing, the subject was released and was scheduled for the second of his two examinations. The recording examiner evaluated the polygraph charts, recorded his decision, and filed away all of the materials. He did not discuss his decision with the subject until the completion of the experiment.

On the return of the subject for his second test, the same procedures were followed, with minor exceptions. Subjects in the LS group drew lettered cards from the second deck, none of these letters having been used on the first examination. HS subjects were tested with the same name list. Subjects in the HM condition were placed in the LM condition, and vice versa.

The recording examiner was blind to the critical items and the motivation conditions for all subjects. All testing was performed in the same testing room with the same equipment and examiner. Annotation on the individual physiological recordings was limited to the subject number, date, and the point of presentation of the test items. Numerals were used to indicate which questions were asked.

The 40 polygraph records were later evaluated by five practicing polygraph examiners, each of whom was a member of the American Polygraph Association. They were asked to identify the critical items, list the specific sensor recordings which supported their decisions, and express the confidence they felt for each decision (0-4, none to certainty). The correct detections

were used in a  $2 \times 2$  ANOVA with repeated measures. The rejection region for all statistics was at the .05 level.

# Results

The detection rates for all six polygraph examiners for each condition is shown in Figure 1. The maximum number of correct decisions was 6 examiners times 10 subjects, or 60 possible correct decisions for each of the 4 categories. Chance probability was 20%, or 12 correct decisions.



#### Donald Krapohl

A 2 x 2 ANOVA found no overall effect for motivation, F(1,18) = 0.58, or for item significance, F(1,18) = 3.04, but an interaction was found to be highly significant, F(1,18) = 22.71, p < .001. Employing a binomial test, only the LS/LM condition did not have a detection rate greater than chance. Standardized *t* tests performed on combinations of motivation and significance levels found only one significant difference; LS/HM was greater than LS/LM.

The examiners used the physiological features to base their decisions in the following proportions: pneumograph, 46.3%; GSR, 31.6%; and cardiograph, 22.1%. No significant correlation between examiners' use of any of the three features and the rate of correct decisions was found. Likewise, no relationship between the correctness of the raters' choices and their respective confidences in the decisions was seen. A mile correlation (r = .50) was found between the correctness of each examiners' choice and the number of parameters used to make the decision, but it was not significant.

### Discussion

Most of the literature on polygraphic detection of deception cites as a basis for the occurrence of physiological arousal the "fear of detection" theory, a longstanding hypothesis that these arousals result from the anticipated consequences of detection rather than lying per se (Marston, 1917). As the fear of detection increases, and the concomitant motivation to avoid detection with it, increases in detection would be expected. The trend in the literature, also demonstrated in this study, is that motivation interacts with information type, yielding differences in detection rates. The body of data restricts the number of possible theoretical models which can be generated. Given that motivation appears to have no impact on the detection of HS items, but the lack of motivation diminishes detection of LS items only, a three-dimensional model can be produced which should reflect and predict detection rates at varying levels of motivation and item-significance.

Figure 2 is a hypothetical model which integrates the empirical findings of motivationdeception studies. It is not inconsistent with the "fear of deception" theory. It does not account for the effects of countermeasures, habituation, or learning. The vertical dimension (X) represents the continuum of detection probabilities, and  $x_1$  marks the level of chance expectancy. Levels of motivation, from none to high, is presented as the horizontal dimension (Y). The last variable, item significance, is shown as Z.



The lower plane is formed by chance-level probabilities across the other two variables. The upper place is the motivation-significance interaction (MSI) surface. Following this model, it would be expected that increases in motivation and/or item significance would tend to increase the probability of detection of the critical item. HS or HM elements alone would bring a high level of detection rates. At no point does the MSI surface pass below the chance probability plane.

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The MSI model does not predict the findings of Horvath. That difference may have been in the motivational instructions Horvath gave to his subjects. In his study, subjects in the HM condition were told to "concentrate on something else other than their chosen card." The resultant data may have reflected the influence of this specific countermeasure as much as motivation. Since LS paradigms are convenient vehicles to isolate factors affecting detection rates, the examination of instructions to subject, and attention, may be a fruitful avenue of future research.

There were factors in the present design which prevent it from being considered an assessment of the accuracy of field examiners and field techniques. First, while pretest conditioning is a standard part of all field polygraph examinations, the lack of this conditioning in this study could have limited successful detections compared to actual field tests. Secondly, the spacing between presentations of the test items on the tests was held at 10 seconds. These intervals were probably adequate to allow for GSR recovery, but respiration responses call for 15- to 20 second spacings in field techniques currently used. Since the largest proportion of decisions used pneumographic data, detection rates may have been generally suppressed for all conditions in this study. Finally, as Gustafson and Orne (1964) have observed, detection rates are expected to be generally lower in "guilty information" studies than "guilty person" paradigms.

The lack of a significant correlation between the examiner's confidence in his selection of an item, and the correctness of his choice is a curious phenomenon. It may spring from the tendency of these raters to base decisions on pneumographic data which, as explained, did not match the field standards normally set by these examiners. Another possible answer is that GKT formats are seldom used in field testing, and response criteria may differ, leading raters to false assumptions on the magnitude or clarity of the response. It may also be an artifact of the present method.

In conclusion, evidence in the literature and the present experiment indicate the motivation to avoid detection will act differentially on critical items of different types. Most studies show this motivation not to be a factor in the detection of items of high personal significance. Questions of motivational influences on the detection of low-significance items are only partially answered.

It may be that attention is a hidden factor, being both a byproduct of the fear of detection and also a capacity over which a subject may exert some control. Only further investigation can determine if attention has been an undercontrolled variable in motivation and deception detection studies.

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## **POLYGRAPH IN AUSTRALIA**

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# THEORIES AND APPLICATIONS

## IN THE DETECTION OF DECEPTION

By G. Ben-Shakhar and J. Furedy. (New York: NY: Springer-Verlag, 1990. Pp. 169)

## **Book Review**

### By

## Frank Horvath and Norman Ansley

These authors maintain that one purpose in preparing this volume was to meet the need of judges, lawyers, psychologists, and other professionals to learn about polygraph testing. Lay persons who may be confronted with a decision to undergo a polygraph examination are also part of the intended audience. The book begins with a very general history and description of detection of deception procedures, followed by a number of chapters addressing various related issues, including a separate chapter on each of the following: a critical comparison of major procedures, reliability and validity concerns, laboratory studies, theoretical issues, international and cultural considerations, legal issues, and comments on the future of the field. In general, this volume contains some useful insight and provides some welcome critical commentary about issues that are or ought to be of concern to the relevant communities the authors hope to address. Nevertheless, in our view there are many points to find fault with here, some serious and some less so, and we caution readers to be careful in judging the field based upon what is presented in this volume.

The authors correctly point out that the most commonly employed method of polygraph testing in the United States is Control Question Testing (CQT). The CQT is not, as the authors suggest, a single, invariant method but is actually, like other approaches, such as "relevant-irrelevant" and "guilty knowledge" tests, actually a family of related procedures. The authors go to some lengths to show that a CQT is not a "test" in the sense that an IQ test is a test. This point is emphasized by the authors to buttress their claim that a CQT is unscientific and represents merely an "unstandardized interview" in which the examiner's sole intent is to obtain admissions against interest.

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We are certainly in agreement that CQTs--as well as all other instrumental "lie detector" tests, in our opinion--are not tests in the sense that psychometric tests are tests. The difference between these procedures does not lie in the presence or absence of examiner effects but, rather, in the degree to which there is dependence on the skills of the examiner. Regardless of the procedure, examiner qualifications are a critical concern. The polygraph examiner community explicitly recognizes the importance of this and a casual acquaintance with the field would clearly show a concerted effort to elevate, standardize, and professionalize the nature and type of training and continuing education the examiners receive. What has been done in these arenas may be less than what some are willing to accept, but to suggest, as these authors do, that there is an applied instrumental method of deception detection that is truly independent of examiner qualifications is to make a point on which no informed observer we know of would agree.

The authors attempt to discredit CQTs in favor of their preferred procedure, which has come to be called a Guilty Knowledge Test (GKT). It is necessary to point out, again, that both of these terms refer not to specific, unique testing formats but rather to a family of variations. The authors state that the GKT was developed by a psychologist in the late 1950s, but in fact the procedure was described by Wertheimer and Klein in 1904 and by Munsterberg in 1907 and was used by police examiners in the 1930s and 1940s. This erroneous assumption that the GKT was first used in the 1950s probably limited the authors' historical research, but we do not know why they failed to consult the extant literature that would have revealed the use of a GKT that is and has long been known to--and, where possible, used by--trained field examiners across the world.

The authors present their case so as to make it seem that field examiners do not make use of GKT testing because of disdain for the approach. They refer to the GKT as the "rival" approach to CQT. But there is no rivalry. Field examiners make use of both formats, usually in a complementary way. The real problem is that in the U.S., where the public media have access to detailed information about criminal events, a GKT is not usable in many situations. Also, CQTs are presented as if they are related to an ideology of members of the American Polygraph Association (APA), the nation's leading professional organization in the field. But the APA has no investment in any specific approach to polygraph testing; rather, it concerns itself with general support of the field, ethical standards, school accreditation, and so forth, all of which are unrelated to any particular testing methodology. Moreover, the authors express the view that the CQT rests on an assumption of a "specific lie response," which is a point that is not supported in a reading of either early or contemporary field literature, which they apparently have not consulted, or in scientific studies, or in the views of those who use a CQT in practice. We can only conclude that the authors raise this point either out of ignorance or in an attempt to mislead those who might be uninformed on this important issue.

The authors assert that field examiners use a CQT because their intent is not to determine the truth through instrumental means but rather to seek admissions of criminal wrongdoing. It is well accepted that persons who undergo polygraph testing (and, importantly, who are found to be deceptive) frequently do admit to their acts of wrongdoing. Whether this actually occurs

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more often than it would in other circumstances has not been scientifically documented. However, the authors fail to note that the same inducement would very probably accompany testing using a GKT as well as a CQT. In short, the authors' views on this point, as well as those of many others who attempt to discredit the use of the CQT, are, if not wrong, at least debatable.

Readers ought to realize that, the authors' comments notwithstanding, much of what is presented in this volume about testing procedures is uninformed, oversimplified, and, in some instances, wrong. We would also point out that, in spite of the authors' attempts to discredit polygraph testing in the U.S. by showing alternatives in use in other countries, there is considerable literature in the criminal justice field that is not accounted for. An acquaintance with this cross-cultural literature would show that the authors' position on the relationship between polygraph testing and police work is erroneous. Finally, we found a rather irritating repetition of main points and commentary throughout the book, showing perhaps that the two authors did not do as good a job at integrating their material as they could have. There are some useful and insightful points made by the authors, but one has to read this volume with a very discerning eye and be quite skeptical of the conclusions that are drawn.

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# THE POLYGRAPH TEST: LIES, TRUTH, AND SCIENCE

By Anthony Gale (Ed.). (Newbury, Park, CA: Sage Publications, 1988, Pp. viii, 223).

## Review

#### by

#### Frank Horvath and Norm Ansley

This compilation of papers represents the deliberations of a Working Group established by the British Psychological Society to respond to the government's announced intention, following the Geoffrey Prime spy case, to carry out pilot studies on the use of polygraph testing for security vetting purposes. Since polygraph testing had never been used in Britain, most of the group had little firsthand knowledge of the topic; their writings were apparently based on a casual acquaintance with some of the available U.S. materials.

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Those who are familiar with but wish to learn more about the fascinating and controversial field of "lie detection" should read this book with a great deal of caution. The subtitle, "Lies, Truth, and Science," is apropos; the reader can find some of each here. Of the 14 chapters in this volume, many show little understanding of "lie detection" and frequently misrepresent actual practice and current knowledge. In this book just about every argument can be bound that has been advanced against "lie detection" -- more properly, polygraph testing -- and especially the use of what is referred to as the "control question test." The attempt at balance by inclusion of two chapters authored by proponents of polygraph testing is disingenuous, since they apparently were written in isolation; thus, issues pro and con are not addressed head-on.

Because the topics covered in this volume are very broad-ranging, without central focus, we have decided to provide a glimpse of the chapters along with an evaluative comment or two. In chapter 1, Bull sets out to tell us what a "lie detector" test is by describing a variety of techniques which, as best we can tell, represent the author's creative rewriting of some available literature. His description is neither accurate nor detailed enough to be of value. In addition, it is hard at times to determine what is "technique" and what is the author's view of what a technique ought to be.

In chapter 2, Carroll sets out to describe the evidence on how accurate polygraph tests are. His use of the research studies is highly selective and his criteria for inclusion are inconsistent. This, however, is not unusual in such reviews; the interested reader, therefore, should consider Carroll's paper in light of other, similar reviews in which different conclusions have been reached.

In chapter 3, Blinkhorn considers a polygraph test as a standard psychometric device and proceeds to show quite forcefully that it does not meet the standards imposed on such devices by psychometricians. If one accepts his basic premise, that polygraph testing is best understood solely in the context of psychometric devices, there is not much to take issue with here. If, on the other hand, one considers polygraph testing as it is actually practiced and as it is presented in the open literature, this chapter is indicative only of the deep misunderstanding of it by some of these authors.

Chapter 4, by Cunningham, presents a rather straightforward description of British practices in selecting, interviewing, and investigating persons who are to have access to classified materials. Cunningham shows that it is fallacious to assume that a person who is dishonest in a polygraph test will behave in other undesirable ways and concludes that preemployment screening is therefore without merit. Of course, the author misses the point of screening exams: Future behavior is predicted from an assessment of an examiner's past behavior, not from the discovery of a "lie" during a test.

In chapters 5 and 6, the concepts of truthfulness and honesty and the limits to our knowledge about emotional expression are discussed. In spite of these authors' attempts, there
#### Reviews

is little direct relationship between what they discuss and the practice of polygraph testing, although some of the points raised here are quite provocative.

In chapters 7 and 8, by Barland and Raskin respectively, we find the two most favorable assessments. In chapter 9, Lykken, an American psychologist, expressed his now familiar objectives to most forms of polygraph testing. We will have more to say about these chapters in our concluding paragraphs.

In chapter 10, Gudjonsson discusses possible countermeasures to detection during a polygraph examination. All in all, the author is so tentative about his methods--probably because so little empirical data are available on the topic--that there is little comfort here for the guilty person who would like a certain and practical way of avoiding detection.

In the next chapter, by Grime, we find what is in our view the best and most carefully argued of the British papers in the book. It is informative and useful, particularly in the discussion of the mechanisms in the legal system that are designed to test the veracity of evidence. The author notes that the insertion of the polygraph into this complexity would be possible and no less scientifically based then other mechanisms; it is the political, not the legal or the scientific obstacles, that need to be addressed. Thornton, in chapter 12, discusses the relationships between civil liberties and certain aspects of polygraph testing.

In the penultimate chapter, an American law professor who is unalterably opposed to polygraph testing outlines various arguments with which one might bring legal challenges; there seems to be no case law to support these views, however. In the final chapter, the views of a trade union representative are offered; these merely restate what others have said in earlier pages.

In our view this book carries the weight of some authority. After all, many of the authors are well known members of the scientific and legal communities. Consequently, the fact that there is so little attempt at balance here is disturbing. The inclusion of only two chapters written by proponents of polygraph testing, only one of which discusses the central issue of the British government's attention--polygraph testing as a preemployment screening technique--is hardly sufficient to counteract much of the misleading and one-sided presentation of the other authors.

In addition, it is important to point out another serious shortcoming of this volume: There is almost no distinction made among the different uses to which polygraph testing is put. Preemployment screening, for example, as opposed to the testing of persons suspected of involvement in criminal activities, is not only different in form and purpose but also raises a number of different and distinctive legal, ethical, moral, and social issues. The lack of attention to these issues and the failure to make the distinctions necessary to responsibly discuss them heightens our concern that these authors simply were not familiar enough with either the literature or the practice to consider them seriously.

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### Reviews

Now let us return to the three chapters by Lykken, Barland, and Raskin. Lykken's views are widely disseminated and there is little question but that many of the points he has raised at one time or another are reiterated by others who hold similar, and often preconceived, ideas about what polygraph testing is and how it ought to be regarded. In our view this is, in the main, what has occurred here. Most of these authors have merely adopted objections raised by others without critical appraisal. There is no attempt to address head-on, pro and con, the important questions about polygraph testing. In fact, the one issue on which alternative perspectives are offered here is the accuracy of testing. Lykken's (and Carroll's) view of the evidence is directly challenged by both Barland and Raskin, both of whom have not only scientific but also some practical experience in the field. Our point is not that any of these authors presents the correct view; rather, we think that their different perspectives reveal that the debate about polygraph testing will not be settled soon, no matter how well intentioned, well credentialed, or well respected those who offer their views may be.

Almost all of the questions raised in this collection, from accuracy to civil rights to utility, deserve open and honest discussion. We are disappointed that this volume does not provide that. With some exceptions, it is an unfocused and generally uncritical presentation of anti-polygraph dogma. Nevertheless, some of the material here is worthwhile and some of the views expressed cannot be dismissed easily; they reveal the extent to which those interested in the field need to go to dispel the (apparent) prevailing ignorance about it.

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### ABSTRACT

Putnam, Richard L. Field Accuracy of Polygraph in the Law Enforcement Environment.

## PROCEDURE

All of the polygraph cases conducted by the author for the Washoe County Sheriff's Office, Nevada, during the period 1 January 1979 to 1 September 1982 were reviewed to determine which cases could be verified as to an accurate or erroneous outcome. The only ground for verification was confession of the subject or another person. There were 552 cases conducted during the period. The examiner was a trained and experienced examiner.

All of the test formats were control question techniques with time-bar controls. 433 were Backster Zone Comparison tests and 119 were Modified General Question tests. There was a minimum of two charts in every case. Scoring cutoffs were +/- 5. The field polygraph instrument recorded cardiovascular, electrodermal, and respiratory activity.

# RESULTS

It was possible to verify the results of these cases in 284 of the 552 cases (52%). Of those 285 cases, four were errors and 281 were correct.

# TABLE 1

Category	Correct	Error
Suspects	253 (98.8%)	3 (1.2%)
Victims	13 (100%)	0
Witnesses	15 (93.7%)	1 (6.3%)

## TABLE 2

Outcome	Correct	Error
Truthful Decentive	62 (85.4%) 219 (99 5%)	3 (4.6%) 1 (0.5%)
Total	281 (98.6%)	4 (1.4%)

\* \* \* \* \* \*

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