Polygraph

VOLUME 15

SEPTEMBER 1986

NUMBER 3

Contents	
Standards for the Admissibility of Polygraph Results as Evidence	
Gordon H. Barland, Ph.D.	157
Polygraph Surveillance of Probationers	174
Stanley Abrams, Ph.D. & Ernest Ogard, L.LU.	174
Innocence, Information, and the Guilty Knowledge Test in the Detection of Decention	
M.T. Bradley & J.F. Warfield	183
Effects of Preemployment Polygraph Testing on	
Peggie L. Lopez	195
Detection of Deception By Conventional Qualitative Method and Its Confirmation By Quantitative Method; An Experimental Study in Polygraphy	
A.K. Ganguly, Ph.D.; S.K. Lahri, Ph.D.; & Vinod Bhaseen, M.S.	203
Special Care Questioning	
Bryan, Tully, Ph.D.	211
Interviewing Victims and Witnesses of Crime	
R. Edward Geiselman & Ronald P. Fisher	221
A Bibliography of Recent Scientific Studies on the Polygraph Norman Ansley	228
Abstracts	230

PUBLISHED QUARTERLY [©]American Polygraph Association, 1986 Polygraph 1986, 15(3)¹⁰⁶¹, Severna Park, Maryland 21146

STANDARDS FOR THE ADMISSIBILITY OF POLYGRAPH RESULTS AS EVIDENCE

Βy

Gordon H. Barland, Ph.D.

INTRODUCTION

A number of jurisdictions have long admitted results of stipulated polygraph examinations, and a few federal and state courts have allowed admissibility of even nonstipulated polygraph results.[1] Several states which experimented with admissibility of polygraph results have expressed concerns over establishing reasonable standards and safeguards to minimize the admissibility of erroneous polygraph results and/or to minimize a battle of experts.[2] The purpose of this article is to propose criteria for courts to consider when determining whether the results of a given polygraph examination should be admissible. This articles does not advocate whether polygraph results should or should not be generally admissible. Rather, it is assumed that the court has decided in a given instance that the polygraph examiner's decision will be admissible if the examination was properly conducted according to high standards. The guidelines suggested here should assist the court in its evaluation of the adequacy of a specific polygraph examination, and should minimize the likelihood of a battle of experts.

Several of the standards suggested in this article are higher than are generally applied to most polygraph examinations currently being

The author graduated with honors from the federal polygraph school in 1970, then at Ft. Gordon, Ga. He obtained his M.A. in 1972 and Ph.D. in experimental psychology (psychophysiology) in 1975 at the University of Both his Master's and doctoral research was on the problems and lltah. issues of the detection of deception, and he has published numerous articles. In addition to his private practice as a polygraph consultant, he is an adjunct faculty member of the University of Virginia and teaches regularly at polygraph courses conducted by the U.S. and Canadian govern-He has testified as an expert on the detection of deception in ments. state, federal, and military courts, and before congressional committees in the U.S., and a governmental committee in Israel. Requests for reprints should be addressed to the author at the Department of Defense Polygraph Institute, Ft. McClellan, Alabama 36201.

The author is deeply indebted to the following people for their thoughtful criticisms of an earlier draft of this article: Cleve Backster, Rex J. Beaber, James Bullard, Ed Gelb, Frank Horvath, Paul K. Minor, Martin T. Orne, Charles M. Sevilla, and William J. Yankee. This should not be taken to imply that they all agree with everything in this article; not all of their suggestions could be accepted. Nonetheless, their insights and comments were greatly appreciated.

Reprinted from: 16 <u>University</u> of <u>West Los Angeles</u> <u>Law</u> <u>Review</u> 37-54 (1984), with permission of the publication and the author.

Polygraph Admissibility

administered to criminal suspects. This is intentional, and is done for two reasons. First, it is felt that higher standards should be required for those polygraph results which are to be used as evidence in a court of law than should be required for routine investigative use of the polygraph. Erroneous results are likely to have a more severe impact upon the individual or upon society when used as evidence, than would generally be the case with investigative use. Secondly, it would seem wiser to start off with rather restrictive standards which can be relaxed if experience suggests that they are excessive, than to have unduly low standards which permit problems to develop. The objective is to set the highest possible standards consistent with what can reasonably be demanded in the context of real life. These criteria are therefore considered to represent a cautious yet reasonable approach to the problems inherent in the evidentiary use of the polygraph.

HOW POLYGRAPH EXAMINERS REACH THEIR CONCLUSIONS

Two fundamentally different approaches to decision-making exist among polygraph examiners. Historically, the clinical approach was the predominant method. The proponants of this approach believe that the examiner's decision regarding the truthfulness of an individual has such important consequences for both the individual and society, that it is morally incumbent upon the conscientious examiner to incorporate all bits of evidence which are available to him at the time he makes his decision. For example, he must look at the polygraph charts, the suspect's demeanor and behavior, the case facts, and whatever other indicators there may be. Using his clinical skills, he assesses these various data, calling upon his years of experience to weight them according to the situation. This approach was probably at its height during the 1940's, when the relevantirrelevant test was the primary test in criminal investigations, and the polygraph was viewed as an adjunct to interrogation. This view was modified by the development of the control question test by John Reid.[3] Control questions are designed both to reduce false positive errors by diverting the attention of the innocent-but-nervous person from the relevant questions, and to simplify chart interpretation by serving as a measure of the emotionality of the subject for use in determining the significance of any reactions to the relevant questions. By making chart interpretation more objective, the control question technique reduced the examiner's need to rely on investigative information for making decisions. Consequently, the clinical approach today as espoused by the Reid and Arther polygraph schools, advocates that during the pretest interview the examiner should carefully observe and make written notes about the subject's demeanor. The examiner should not only observe the subject's spontaneous behavior, but should also seek to elicit behavioral cues which are believed to help distinguish between truthful and deceptive subjects.[4] When making his decision, the clinical examiner today relies upon a careful inspection of the polygraph charts, after which he reviews the subject's behavioral cues as a reality check upon his decision. This approach differs from the earlier one in that the examiner views his primary role as being to make a decision regarding the subject's truthfulness, not necessarily to obtain a confession. Furthermore, the case facts do not contribute much, if anything, to the decision; the primary extrapolygraphic source of information contributing to the decision is the behavior of the subject during the The clinical approach minimizes inconclusive results, for examination.

Polygraph 1986, 15(3)

such examiners tend to rely upon their analysis of the subject's behavior when the charts are marginal.

The second approach, which can be called the numerical approach, started about 1960. Over the last two decades it has largely displaced the clinical approach. This method of decisionmaking was originated by Backster, [5] who argued that it is up to the jury to weigh all available evidence when making its decision; the examiner is being retained to obtain physiological information. Thus, it is morally incumbent upon the examiner to rigorously exclude all nonpolygraphic sources of information at the time he makes his decision. Backster developed the concept of numerically evaluating the physiological information on the polygraph charts. Numbers are assigned to the reactions or lack thereof, using prescribed guidelines. The numbers are then summed to form scores for the individual questions and, when appropriate, for the overall test. The examiner's decision is based solely upon the numerical scores. The epitome of the numerical approach is when the polygraph charts are scored by Because all nonpolygraphic sources of information are exa computer. cluded from the decisionmaking process, the inconclusive rate with this approach is higher, typically about 10 to 20 percent.

The clinical and numerical approach are not necessarily mutually exclusive, and many examiners probably combine aspects of both. The examiner must know the case facts in order to conduct a valid examination. Moreover, it is human nature to note the subject's behavior and demeanor during the examination. The advantage of numerical scoring of the polygraph charts is that it helps to ensure a rigorous, semi-objective evaluation of the physiological information contained in the charts. It also serves as a safequard against examiner bias. After making a tentative conclusion based upon the numerical evaluation of the charts, many examiners then look at the consistency of the individual numbers contributing to that score, along three dimensions: across relevant questions, across charts, and across physiological measures. The examiner may also look for evidence of countermeasures which may have affected the numerical score. He may also look at portions of the polygraph charts which were not included in the numerical evaluation. Finally, he may use the subject's demeanor and behavior throughout the test as a reality check upon the numerical score. If they are consistent, he would feel very confident in the test outcome. If there are strong inconsistencies, he may wish to continue the examination in an effort to resolve the inconsistencies. If they cannot be resolved, he may elect to report the results as inconclusive.

There is some anecdotal evidence to suggest that the clinical examiner who does not score the charts numerically may make more false negative errors than false positives.[6] In my experience, most polygraph examiners, including police examiners, are so afraid of making a false positive error that they lean over backward to avoid it, thereby increasing the possibility of a false negative error. There is some experimental evidence suggesting that when the polygraph charts are numerically scored by an independant, blind[7] polygraph examiner, false negative errors are minimal, and there tends to be more false positive errors than false negatives.[8]

159

While it is not yet known which approach, the clinical or numerical, is the more accurate overall, the two used in combination may minimize errors at the expense of an increase in the number of inconclusives. Since the clinical approach minimizes false positive errors and the blind numerical scoring of polygraph charts minimizes false negative errors, if the polygraph charts are numerically evaluated by an independent examiner and the decisions agree, the possibility of an error should be minimized. Laboratory research involving mock crimes has demonstrated that the concept of numerical scoring by a blind examiner is both highly valid and reliable.[9,10] Moreover, numerical chart analysis would seem to be more compatible with the evidentiary use of the polygraph, as it is both more objective and more limited in scope. Because it does not look at nonpolygraphic evidence, it does not usurp the function of the jury. Therefore, all control question tests being proffered as evidence should be numerically evaluated to ensure that the physiological information contained in the charts is sufficiently strong and unambiguous to support the examiner's decision. This analysis should best be done by an independent, disinterested polygraph examiner who was not a party to the examination, as outlined later in this article.

QUALIFICATIONS OF THE POLYGRAPH EXAMINER CONDUCTING THE TEST

The accuracy of the polygraph technique depends in part upon the training, skill, and experience of the examiner. Although the polygraph technique is firmly based upon established psychological and psychophysiological principles, the application of those principles is a clinical art. Even when the charts are numerically scored, the interaction between the examiner and the subject during the pretest interview may affect how the subject reacts on the charts. For example, if the subject is unusually nervous, there may be a lot of spontaneous reactivity observed in the charts, making them harder to interpret. Moreover, the skill of the examiner in developing the precise wording and emphasis of the test questions is very important.

The examiner's qualifications pose relatively little problem in stipulated examinations, since both sides have a voice in the selection of the examiner. This helps ensure that the examiner is experienced and has a reputation for being unbiased. Most state court rulings admitting stipulated examinations provide that the trial court may refuse to accept the testimony of the examiner despite the stipulation if the court is not convinced of the examiner's expertise or if the test was substandard.[11]

The following minimum standards are suggested for qualifying an examiner as an expert in a non-stipulated situation:

1. Graduation from a polygraph school accredited by the American Polygraph Association (APA) is a basic prerequisite.[12] A certificate of completion is not sufficient. All APA-accredited polygraph schools require the review and approval of a number of the student's polygraph examinations after completion of the course, prior to issuing a graduation certificate. Preceptor or tutorial training in lieu of a formal course is not sufficient. 2. In those 30 states which license or certify polygraph examiners,[13] the proposed expert must be licensed as a full examiner unless exempted by law. Intern status is not sufficient. Most state licensing regulations require an examiner to have graduated from an APA-accredited school, have served an internship period of usually six months, be at least 21 years old, be a college graduate (or have a high school diploma plus five years of investigative experience), have no criminal record, and have a good reputation.

3. The examiner must have had at least three years' fulltime experience as a polygraph examiner after graduation from polygraph school and must have conducted at least 250 forensic polygraph examinations of criminal suspects, victims, witnesses, or persons involved in civil litigation. Many private examiners have conducted thousands of examinations, but often the bulk of them have been on job applicants or on employees who are examined periodically. The commercial applications of the polygraph are only superficially related to the examination of criminal suspects. Therefore, it is necessary to enquire into the number of criminal suspects that the proposed expert has examined.

4. The proposed expert should subscribe to journals such as <u>Poly-graph</u> to remain abreast of current developments and trends. In addition, in the year immediately preceding the polygraph examination in question, he must have attended a minimum of 20 hours of advanced training courses and seminars dealing specifically with lie detection.

STANDARDS FOR THE EXAMINATION FORMAT

There are a wide variety of test formats, each with its attendant strengths and weaknesses, capabilities and limitations. No one test structure can be the test of preference in all criminal investigative situations. One of the tasks of the polygraph examiner is to evaluate the testing situation to decide which format is best. Depending upon the situation, all standard, recognized tests are acceptable: the guilty knowledge test (GKT), the peak of tension (POT) test, the control question test (CQT), and the relevant-irrelevant (RI) test.[14] Within each of these four categories are a number of variations.

The guilty knowledge test is ideal for evidentiary use, for when it is properly conducted, the possibility of a false positive error can be made to be vanishingly remote, and the probability of such an error can be precisely calculated. A method for estimating the false negative error rate for the GKT has recently been proposed.[15] The peak of tension test also minimizes the possibility of false positive errors, but the FP error rate can not be precisely calculated. Unfortunately, these two types of tests can only be used in situations where the subject denies knowing various details of the crime which the perpetrator could be presumed to know, and which the investigators also know. For example, if the matter involves a stolen car, such details might include the make and color of the car, the location where it was stolen from and where it was recovered, the time it was stolen, etc. The later in the investigation that the polygraph is utilized, the more likely it would be that such details would have been revealed to the innocent suspect through the media, questioning by the investigators, the preliminary hearing, etc. Furthermore, when the

suspect admits being present at the scene of the crime, and the issue to be resolved is his precise role or his intent, the GKT and POT tests are not generally considered useable.

The most frequently administered type of polygraph test in a criminal investigation is the control question test. It can be used in a wide variety of situations, including those in which the subject admits knowing all pertinent details of the crime or where he admits peripheral involvement. There are several major varieties of the CQT, including the Reid test, the Arther test, and several versions of the Backster Zone Comparison test, plus several less widely used procedures. All of them contain control questions which serve as a safeguard against false positive errors, although the available evidence suggests that there is a realistic possibility of errors, both false positive and false negative. The inclusion of control questions also permits the numerical scoring of the charts, which increases the objectivity of chart interpretation, safeguarding against any biases the examiner may have. It is the only format which is commonly evaluated numerically.

The relevant-irrelevant (RI) test is the oldest test format and does not include several of the safeguards developed over the last forty years. Consequently, it is not widely used in criminal investigations today. Nonetheless, the available evidence suggests that it is accurate at levels far above chance, and there is no evidence yet available which indicates that it is less accurate than the control question test. It is considered by many examiners to be the test of preference in several situations, such as when the subject refuses to have control questions included, when the subject has "an emotional complex" about the matter under investigation, when another polygraph examiner is being examined, or when the use of certain types of countermeasures is suspected. Because the RI test is far more complex and sophisticated than is generally recognized, it should be administered only by examiners who have been formally trained in its use and who are experienced in its nuances.

Except for the guilty knowledge test, at least three separate charts containing the relevant questions must have been obtained. This ensures that there must be sufficient consistency in the pattern of physiological responsivity to allow a valid inference to be drawn regarding the subject's truthfulness. With the guilty knowledge test, at least three separate critical items must be used, although only one scorable chart need be obtained using each critical item.

The entire examination procedure, including the pretest interview, must have been videotaped, in order to permit an adequate review of the procedures as described below. This safeguard is especially important in those cases where the issue to be resolved is complex, ambiguous, or subject to rationalization, for the pretest discussion of the issue and the discussion of the precise wording of the relevant questions has a major bearing upon the accuracy of the examination. Such issues include situations where the subject admits having killed the victim, but claims that it was self defense, or that he only intended to scare the victim by shooting in his direction. The discussion of the control questions and the nature of the conversation between charts is also critically important to the outcome of the test. The primary advantage of a video tape over an audio tape is that it serves as a check against the possibility that some of the reactions in the charts may have been caused by movements which may not have been observed or recorded by the examiner at the time of the test.

A blood or urine specimen should have been obtained from the subject as a check against the use of drugs, especially the benzodiazapines, as a countermeasure. This is especially important with the peak of tension and relevant-irrelevant tests, but should be done routinely in all forensic polygraph tests. The specimen should be obtained immediately following the final polygraph chart, although it would be acceptable for it to have been obtained during the pretest interview if the subject had not known that a urine or blood specimen was to be obtained.

CONSIDERATIONS REGARDING THE PERSON EXAMINED ON THE POLYGRAPH

One of the arguments against the admissibility of the polygraph is the friendly polygrapher hypothesis,[16] which is derived from the fear of detection theory of the polygraph.[17] This hypothesis states that, since the physiological reactions to deception recorded by the polygraph may be caused by the fear of detection or the fear of punishment experienced by the guilty person, the size of the reactions to the relevant qeustions would be expected to be smaller if the subject is not greatly concerned about whether his lie is detected or not. Consequently, if the subject is being examined in confidence at the request of his defense attorney, and he has been told that if the polygraph results are adverse they will be discarded and never revealed to the prosecution, then the possibility of a false negative error should increase. At present, the only research bearing upon this hypothesis does not support it,[18] but additional research is required to definitively prove or disprove the issue.

A related concern is that if a guilty defendant undergoes a polygraph examination by a polygraph examiner retained by the defense and flunks it, the results need not be revealed to the prosecution, and the defendant is free to shop around by taking additional polygraph examinations until he eventually passes one (<u>i.e.</u>, a false negative error occurs, perhaps because of habituation of his responses). The temptation is for the defense to reveal only the favorable result to the prosecution and to conceal any damaging results under the cloak of attorney/investigator confidentiality. There must be adequate procedures to guard against the introduction of polygraph results which were carefully selected by the requesting party.[19]

When a defendant seeks to have privately-obtained polygraph results introduced as evidence, he should be deemed to waive all portions of the client-attorney privilege pertaining to the polygraph and relevant to the matter before the court. Specifically, the defendant and his lawyer must reveal to the prosecution and/or the court all polygraph examinations directly or indirectly dealing with the case at bar, under penalty of perjury. Moreover, the polygraph examiner is free to reveal everything relating to the polygraph which is relevant to the issue being examined, such as any constraints put upon his examination by the requestor or by the subject being tested. For example, if the defendant were suspected of being involved in a murder, possibly as being the driver of a getaway car

Polygraph Admissibility

in which the killer rode, and the defense requested that the only issue to be covered by the polygraph exam were whether the defendant drove the getaway car, the examiner should indicate that the scope of the examination was limited by the requestor. Similarly, if the requesting attorney did not limit the scope of the exam, but during the pretest interview as the examiner was reviewing the questions with the suspect, the suspect said, "Don't ask the question 'Are you in any way involved in that shooting?' I'm not sure I could pass that question. Just ask if I drove the getaway car", that exchange would no longer be protected by the confidentiality rule. Of course, if the person being examined about the 1983 murder of John Doe confesses to a totally unrelated crime, such as a robbery in 1975, such information would remain protected by the attorney/investigator relationship.

REVIEW OF POLYGRAPH BY INDEPENDENT EXPERT

By far the most important single safeguard that should be required prior to the admissibility of polygraph evidence is the review of the polygraph examination by an objective, disinterested expert polygraph examiner. Few attorneys and judges are competent to assess the quality of a polygraph examination. If a substandard test were to be proffered, the possibility of an erroneous result is increased, and the likelihood of a time-consuming battle of experts is also increased. Some of the criteria previously suggested, such as the qualifications of the original examiner or the videotaping of the examination, may be relaxed on occasion provided that the safeguard of an independent review is enforced. However inexperienced the original examiner may have been, if he followed standard procedures and his decision is supported by a close review of those procedures and a blind analysis of the polygraph charts, the chances of both an erroneous decision and a battle of experts are reduced. Because the review process is not limited to a blind analysis of the polygraph charts, computer analysis of the charts does not satisfy the requirement for an independent review.[20]

In federal and military cases, the government attorney would undoubtedly wish to have the polygraph results reviewed by the polygraph quality control office of the organization having investigative jurisdiction, such as the FBI or the U.S. Army Criminal Investigation Division.[21] Although they are not completely disinterested, the various federal and military quality control offices have reputations for conducting fair and impartial reviews of polygraph examinations. If upon review they find that a privately conducted polygraph examination of the defendant was properly conducted and interpreted, the requirement for review would have been met.

In those cases where there is no organized quality control office having jurisdiction, as would be the case in most non-federal and non-military criminal investigations, a highly qualified, disinterested reviewer should be appointed. The reviewing examiner may in some instances be appointed directly by the court. More commonly the following selection procedure may be followed: A polygraph examiner selected by the defense attorney would confer with a polygraph examiner selected by the prosecuting attorney. The two examiners would agree on a third examiner to conduct the review, whose fee would be paid by both sides equally. The following criteria should be met by the reviewing examiner:

1. The reviewer must have a reputation for both competence and impartiality.

2. The reviewer must have a high level of expertise. He should have at least five years of fulltime experience in the detection of deception, and should have conducted at least 350 polygraph examinations on criminal suspects.

3. The reviewer must have received formal training in the test format used by the original examiner, $\underline{e} \cdot \underline{q} \cdot \underline{q} \cdot \underline{q}$, the control question test, the relevant-irrelevant test, the guilty knowledge test, or the peak of tension test.

4. The reviewer should be familiar with the scientific research literature bearing upon the accuracy of the various test methodologies and what factors can cause errors.

5. The reviewer must be given full access to all polygraph examinations and all pertinent case materials, such as the original examiner's interview notes, the videotape of the examination, the questions asked during the examination, the polygraph charts, the score sheet (if one was made by the original examiner), and the examiner's written report. The reviewer should be able to discuss the case with the original examiner in order to clarify points not adequately covered by the documentation. The location for the review would be agreed upon by the examiners, as the review may taken several hours. The materials should be transmitted directly to the reviewing examiner by the original examiner, rather than through the attorneys or court. The reviewer should have the original polygraph charts and materials to work with, rather than xerographic copies, wherever possible.

6. The reviewer must make a formal, independent analysis of the polygraph charts and must score them numerically where applicable.

7. The reviewer should submit a written report directly to the court (if court appointed) or simultaneously to the prosecuting and defense attorneys. The report should summarize his review of the following areas:

a. A list of the material reviewed.

b. The suitability of the issue for forensic polygraph.[22]

c. A critique of the selected test formats, including the wording of the relevant and control questions.

d. A critique of the technical adequacy of the physiological tracings. For example, were they of adequate amplitude and clarity for interpretation? Was there any evidence of countermeasures, <u>e.g.</u>, excessive movement artifacts, unusually slow heartrate, unusual levels of lability or reactivity, or unusual respiration patterns? e. His decision regarding the subject's truthfulness, based upon his independent analysis of the charts.

f. His assessment of what the weak aspects of the reviewed examination are, and his estimate of the extent to which they may affect the accuracy of the conclusions reached by the examiner. This would allow the recipient(s) of the report to make an informed judgment as to how much weight should be attached to the polygraph results, whether they should permit their introduction as evidence, and what the likelihood is of a battle of experts.

If the reviewer approves of the test procedures and concurs with the original examiner's decision, then the results may be admissible as evidence at the discretion of the court if permitted by law within the jurisdiction. However, there are other possible outcomes of the review process. The independent expert may conclude that there were serious flaws in the examination procedure or that the examiner reached the wrong conclusion. In either event, the polygraph results should not be admitted as evidence, for they would be open to serious challenge in a time-wasting battle of experts. Should the proffering party still wish to have polygraph results admitted, the subject could be re-examined and the resulting test submitted to the same review process described above.

Another possible outcome of the review process is that the independent expert may decide that the examination is inconclusive, either because of flaws in the examination, or because his analysis of the polygraph charts indicates that they are not consistent enough to support the examiner's conclusion. The results may have had value in the investigation, for the original examiner was also able to observe the subject's demeanor and behavior; but if the results are to be used as evidence, the physiological evidence on the charts must be strong and consistent enough, standing alone, to support the examiner's decision. When the reviewer believes that the test is inconclusive, the polygraph examination should be subjected to a second review by another independent expert. If both independent experts agree that the test is inconclusive, it should not become evidence. If the second independent expert concurs with the original examiner, then the results are probably worthy of becoming evidence, although the fact that the first reviewer felt the charts were inconclusive suggests that there could be a battle of experts.

If the polygraph results have been supported by the review process, the original polygraph examiner would be the logical person to testify, with the reviewing examiner's written report being submitted as an exhibit. In some cases, however, it may be desirable for the reviewing examiner to also testify in order to clarify any points in his report.

CONCLUSION

Before polygraph results should be admitted as evidence, certain standards must be met. These standards should be higher for judicial use than when the results are limited to an investigative role. The examiner should be properly trained and experienced, should use a testing technique which is appropriate for the issue to be resolved, and should record the entire examination on videotape. If the examination was conducted

confidentially for the defense, the subject must waive his confidentiality privileges, and all aspects of the examination and related polygraph examinations must be disclosed. By far the most important safeguard to ensure that the standards were met is a formal review of all aspects of the examination(s) by a disinterested polygraph expert. If the review does not support the original examiner's decision, the polygraph results should not be admissible as evidence, although the proffering party may be re-examined on the polygraph and the results then admitted if the review supports the results of the re-examination.

Footnotes

[1] New Mexico admits nonstipulated polygraph tests when the examiner is properly qualified and there is testimony to establish the reliability of the test procedure as approved by the authorities in the field. See, State v. Dorsey, 87 N.M. 323, 532 P.2d 912, remanded 88 N.M. 184, 539 P.2d 204 (1975), 17 Crim.L. 2495. The New Mexico Supreme Court has recently promulgated Rule 707, effective October 1, 1983, to establish the minimum qualifications of the polygraph examiner to be qualified as an expert witness and refining the requirements for admissibility. Massachusetts permits the introduction of unstipulated polygraph examinations if the defendant agrees to its admissibility prior to the administration of the examination. It may not be admitted during the Commonwealth's casein-chief for the independent purpose of proving guilt or, in the defendant's case, to prove his innocence. It is admissible, however, to impeach or corroborate a defendant's testimony. <u>See, Commonwealth v. A</u> Juvenile (No. 1), 365 Mass. 421, 313 N.E.2d 120 (1974) and Commonwealth v. Vitello, 376 Mass. 426, 381 N.E.2d 582 (1978).

[2] At least two states have recently moved to make stipulated polygraph examinations inadmissible. These include North Carolina [State v. Grier, 300 S.E.2d 351 (N.C. 1983)], and Wisconsin [State v. Dean, 307 N.W.2d 628, 103 Wis.2d 228 (1981)]. In a memorandum dated April 21, 1983, the New Mexico Supreme Court stated that it decided to adopt Rule 707 "...in response to complaints and serious problems that we presently have in relation to polygraph testimony in New Mexico."

[3] John E. Reid, <u>A Revised Questioning Technique in Lie Detection</u> <u>Tests</u>, 34 J.Crim.L. and Criminology, 542-47 (1947).

[4] A growing number of studies in psychology have found behaviors that tend to occur when a person is deceptive. Within the specific context of "lie detection" as meant in this article, some of the behaviors that are believed to differentiate between truthful and deceptive subjects are described in articles by John E. Reid & Richard O. Arther, <u>Behavior</u> <u>Symptoms of Lie Detector Subjects</u>, 44 J.Crim.L. and Criminology, 104-08 (1953), and Frank S. Horvath, <u>Verbal and Nonverbal Clues to Iruth and Deception during Polygraph Examinations</u>, 1 J. Police Sci. and Admin., 138-52 (1973). For a concise exposition of the clinical approach <u>see</u>, John E. Reid, <u>The Diagnostic Examiner</u>: <u>The Life and Breath of the Polygraph</u>, 9 Polygraph 69-73 (1980) and Stanley M. Slowik, <u>Global Evaluation</u>: <u>An Inductive Approach to Case Resolution</u>, 11 Polygraph 215-24 (1982).

[5] Backster is the director of the Backster School of Lie Detection

in San Diego. In addition to developing numerical scoring of polygraph charts, he devised the zone comparison control question test, which was the first test format to be based on a rational analysis of psychological principles.

[6] As is the case with most diagnostic tests, including trials, there are two possible types of error. In a polygraph examination, a false negative error is when an examiner mistakenly concludes that a deceptive person was being truthful. A false positive error is when an examiner concludes that a truthful person was being deceptive. Within the judicial context, the analogous errors are when the guilty defendant is acquitted (false negative) or when the innocent defendant is convicted (false positive).

[7] In this context, blind implies that the reviewing examiner evaluated the polygraph charts without knowing how the original examiner scored them, without knowing the case facts and without having observed the subject. There are varying degrees of blindness. In the truly blind condition, the reviewing examiner has access only to the polygraph charts and knows only which questions are the relevant questions and which, if any, are the control questions. In a more common form of blind evaluation, the reviewing examiner knows the precise wording of each of the test questions, but is blind to the case facts and the subject's appearance and demeanor. A review of the polygraph charts by an examiner who actually witnessed the examination or who had witnessed videotapes of the examination would more properly be called an independent evaluation rather than a blind evaluation.

[8] The issue of the accuracy of the polygraph is extremely complex. Among the factors affecting the accuracy of the polygraph are the competance of the examiner, the issue to be resolved, the adequacy of the case information, the test format used, and the base rate for deception. Most scientists who have conducted research on this issue generally agree that, excluding inconclusive results, the accuracy of the polygraph technique with criminal suspects is about 90 percent, and almost certainly is between 80 and 95 percent. The issue is somewhat controversial at present, for several scientists now claim that the polygraph is only 50 percent accurate in detecting the truthfulness of the innocent suspect. While they concede the polygraph may be about 90 percent accurate at detecting the deception of the guilty suspects, they believe that when the numbers of guilty and innocent suspects are equal the overall accuracy of the polygraph technique is about 70 percent. For a detailed presentation of the revisionist viewpoint, see, D.T. Lykken, <u>A Tremor in the Blood</u> (1981). For a short reply to that position, see, G.H. Barland, On the Accuracy of the Polygraph: An Evaluative Review of Lykken's Tremor in the Blood, 11 Polygraph, 258-72 (1982).

[9] There are several different types of reliability and several different types of validity. Reliable is used here in its meaning of being consistent or repeatable, which is quite distinct from the concept of validity, which refers to accuracy. Imagine, if you will, a thermometer. Since most people will agree as to what temperature it registers, it is considered to be highly reliable. If we note, however, that the glass stem is cracked and some of the mercury has leaked out, the temperature reading may not be at all valid. There is a relationship between validity and reliability. This relationship may be summarized as follows: (a). If a test is highly valid (accurate), it implies that it must also be highly reliable (consistently evaluated). (b). If a test is highly reliable, no prediction can be made about its validity, as in the example of the broken thermometer. (c). If a test has low reliability, that is, nobody can agree as to how it is interpreted, it implies that it must also have low validity. (d). If a test has low validity, no prediction can be made about its reliability. Thus, the proponents of the polygraph technique need to establish that it is both highly valid and that the charts can be interpreted with a high degree of reliability, whereas the opponants merely need to establish that it is either invalid or unreliable.

[10] The great majority of laboratory studies involving mock crimes conducted throughout the past thirty years has demonstrated that the examiner's decisions (setting aside inconclusive results) are accurate about 90 percent of the time (plus or minus a bit, depending upon the precise conditions). For summaries of the research literature, the reader is referred to the following reviews: (a). M.T. Orne, R.I. Thackray, & D.A. Paskewitz, On the Detection of Deception, In Handbook of Psychophysiology (1972); (b). G.H. Barland & D.C. Raskin, <u>Detection of Deception</u>, in Electrodermal Activity in Psychology Research (1973). (c). J.A. Podlesny & D.C. Raskin, Physiological Measures and the Detection of Deception, 84 Psychological Bulletin, 282-99, (1977). (d). Scientific Validity of Polygraph Testing: A Research Review and Evaluation (Washington, D.C.: U.S. Congress, Office of Technology Assessment, November 1983). (e) The Accuracy and Utility of Polygraph Testing (Washington, D.C.: Department of Defense, 1984).

[11] The guiding decision, referred to by many other states, seems to have been Arizona's <u>State v. Valdez</u>, 91 Ariz. 274, 371 P.2d 894 (1962).

[12] The American Polygraph Association (APA) inspects polygraph schools periodically and certifies those that meet their standards. The inspection standards have been published by the American Polygraph Association Committee on Standards and Ethics, Polygraph School Accreditation Manual for Polygraph School Inspections, 12 Polygraph, 91-143 Program: (1983). As of January, 1984 some 29 schools were accredited by the APA. Most are privately operated. Some of these are affiliated with colleges which offer college credit for the school. Of the nonprivate schools, two are operated by federal governments and five are operated by colleges or The schools accredited in 1983 are: (a). Academy for universities. Scientific Investigative Training, Philadelphia, PA. (b). Academy for Forensic Polygraph, Atlanta, GA. (c). Academy of Polygraph Science and (d). American Institute of Polygraph, Methodology, Charlotte, NC. Dearborn, MI. (e). Backster School of Lie Detection, San Diego, CA. (f). Canadian Police College, Ottawa, Ontario, Canada. (g). Carroll Institute of Polygraphy, Baton Rouge, LA. (h). Gormac Polygraph School, Arcadia, (i) Harrisburg Area Community College Polygraph Training School, CA. Harrisburg, PA. (j). International Academy of Polygraph, Fort Lauderdale, (k). Keeler Polygraph Institute, Chicago, IL. (1). The Las Vegas FŁ. Academy of Polygraph, Las Vegas, NV. (m). Los Angeles Institute of Polygraph, Sherman Daks, CA. (n) Maryland Institute of Criminal Justice, Severna Park, MD. (o). National Academy of Lie Detection, Santa Ana, CA.

Polygraph 1986, 15(3)

169

(p). National Polygraph Institute, Miami, FL. (q). New York Institute of Security & Polygraph Sciences, New York, NY. (r). New York School of Lie Detection, New York, NY. (s). Reid College of Detection of Deception, Chicago, IL. (t). Rocky Mountain Security Institute (Wheatridge, Colo.).
(u). State University of New York Agricultural & Technical College, Farmingdale, NY. (v). Southern School of Polygraph, Augusta, GA. (w). Spokane Community College, Polygraph Examiner's School, Spokane, WA. (x).
U.S. Army Military Police School, Ft. McClellan, AL. (y). Universal Polygraph Institute, Columbia, SC. (z). University of Houston Downtown Polygraph Program, Houston, TX. (aa). Utah Academy of Forensic Polygraph (Orem, UT.). (bb). Virginia School of Polygraph, Norfolk, VA. (cc). Zonn Institute of Polygraph, Inc., Miami, FL and Atlanta, GA.

[13] Those states which license polygraph examiners as of January, 1984 include: Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Iowa, Kentucky, Maine, Massachusetts, Michigan, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, and West Virginia. Louisiana certifies polygraph examiners on a voluntary basis, while Indiana requires all private polygraph examiners be certified. A number of states exempt police examiners from licensing or certification requirements.

[14] The guilty knowledge and peak of tension tests are related. They are essentially multiple answer tests in which each question (Regarding the item that was stolen from Mrs. Jones' house last Friday, do you know if it was ...") is followed by a series of possible answers ("... a diamond ring?" "... a set of silverware?" "...a gold coin?" etc.) The unwitting, innocent suspect could truthfully answer "no" to all alternatives, whereas the guilty suspect would recognize the relevant item and thus react more to it than to the noncritical alternatives. These tests thus guard against false positive errors, for no matter how fearful the innocent suspect might be of appearing deceptive on the test, he cannot consistently react more to the critical item than to the noncritical alternatives if the critical item has no special relevance for him. Thus most errors on such tests would be expected to be false negative errors. The relevant-irrelevant test consists of essentially two types of questions: those relevant to the matter under investigation, and those which are totally unrelated to it. It is susceptible to both false positive and false negative errors. Although there is no research to support such a position, it is generally believed that false positives would occur more frequently than false negatives. Control question tests incorporate relevant, irrelevant, and control questions. The wording of the control questions varies as a function of the type of matter under investigation and the personality and background of the person being examined. In an assault case a control question might be phrased, "Except for what you told me about, between the ages of 15 and 21, did you ever think about seriously hurting even one other person?" For a more thorough discussion of control questions, see, Stanley Abrams, <u>A Polygraph Handbook for Attorneys</u> (1977). The inclusion of control questions is designed to guard against false positive errors by diverting the attention of the truthful-but-nervous person from the relevant questions. The control question test is susceptible to both false positive and false negative errors, and there is some evidence suggesting that false positives may occur more frequently than false negatives.

[15] D.T. Lykken, A Tremor in the Blood (1981).

[16] This hypothesis was proposed by M.T. Orne in 1972, and is detailed in his paper, <u>Implications of Laboratory Research for the Detection</u> <u>of Deception</u>, published in Legal Admissibility of the Polygraph (1975). It should be noted that the hypothesis applies only to those polygraph examinations conducted privately by the defense, and then only to the relevant-irrelevant test and peak of tension test. It does not apply to control question tests for reasons outlined in note (18) below. It does not apply to stipulated polygraph examinations or those conducted by a courtappointed examiner.

[17] All told, there are some thirteen theories which have been proposed to explain the causes of the reactions observed to deception. Thus, far, no one theory can explain all of the known facts. The most commonly accepted theory within the polygraph community is the fear of detection theory. That theory has a great deal of evidence to support it, but it is unable to explain the high accuracy of the polygraph in low-emotion situations, such as a laboratory experiment in which a volunteer is instructed to select one of five numbers, then lie about which number he picked. In such a situation, chance accuracy within the polygraph is 20 percent. With the polygraph, however, the detection accuracy is typically 70 to 80 percent. The fact that the body is so reactive to even such an unimportant lie argues against the friendly polygrapher hypothesis.

[18] Several laboratory studies have shown that increasing the subject's motivation to beat the test increases the accuracy of the test. This supports the fear of detection theory and thus the friendly polygrapher hypothesis. However, other studies have found high detectability for both high and low motivation groups, and no clear picture has yet emerged regarding the effect of motivation on accuracy. Furthermore, for theoretical reasons the control question test should be resistent to any friendly polygrapher effect. The control question test is scored by looking at the relative size of reactions on the control versus relevant questions, not the absolute size of the reaction. It is thus believed to be a particularly robust type of test largely impervious to many potentially confounding factors such as how high a given subject's blood pressure is, how fast his heart is beating, how nervous he is about taking the test, how quilty he feels about the crime that was committed, and even how fearful he is that his lie might be detected. If any reduction in the fear of detection were to reduce the size of the reactions on the relevant guestions, the reactions on the control questions should likewise be reduced, leaving the ratio largely the same. The worst that would be expected to happen in such a situation would be an increase in the inconclusive rate, not the false negative rate. Since inconclusive results have no probative value in court, such a result would affect primarily the investigative use of the polygraph, not the evidential use. Moreover, the fact that the polygraph can be quite accurate even in many low motivation situations (see, footnote 17, supra), together with the presumption that a guilty criminal suspect "shopping around" for a favorable polgyraph outcome has a higher level of eqo-involvement in the test outcome than most laboratory volunteers, do not support the friendly polygrapher hypothesis. The hypothesis makes certain predictions, one of which is that when the police or prosecutors are aware that a given suspect is being examined, his

polygraphic reactions to the relevant questions should be larger than when he is being examined privately with only his defense attorney aware of the test, but a study conducted by Raskin compared the numerical scores of control question tests given to criminal suspects when the prosecution was aware that the test was being administered, against the scores from a group of criminal suspects being examined privately for the defense attorney. There was no difference in the average scores for the two groups. He also found no difference in the percentages found truthful, deceptive, and inconclusive for the two groups. These results are somewhat ambiguous, however, for it was not known if the base rate for guilt was the same in all groups. <u>See</u>, D.C. Raskin, G.H. Barland, & J.A. Podlesny, <u>Validity and Reliability of Detection of Deception</u>, a report published by the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice in June, 1978.

[19] Stipulating to the admissibility of the polygraph result and specifying the examiner to conduct the test is one way to ensure that adverse results will not be discarded. Another, related, solution would be to require the use of examiners on a fixed court panel (as is done for some psychiatric testimony), and that such examiners would be required to submit all results to the court and prosecutor, all of which would be admissible regardless of outcome.

[20] Research on the computer analysis of polygraph charts being conducted at the University of Utah by Drs. Kircher and Raskin holds promise for improving the objectivity of chart interpretation. At present it seems to be about as accurate as field numerical evaluation by humans, but a number of questions about it remain unanswered. Until the details have been published and subjected to scientific scrutiny, and the results have been replicated in other laboratories, such analyses should be treated with caution.

[21] Quality control procedures have long existed within the federal government's polygraph programs. All polygraph examinations conducted by the Army, Navy, Air Force, FBI, Secret Service, Drug Enforcement Administration, U.S. Post Office, National Security Agency, and other governmental offices, must be reviewed by their respective quality control office. If the reviewing examiners disagree on the interpretation of the charts, or if they feel the test was substandard, the examiner may be directed to reexamine the subject. There is some evidence to suggest that errors are more apt to occur when the charts are somewhat ambiguous and reviewing experts disagree on their interpretation, than when the charts are sufficiently clear that reviewing examiners completely agree on their analysis. See, G.H. Barland & D.C. Raskin, <u>An Evaluation of Field Polygraph</u> Techniques in Detection of Deception, 12 Psychophysiology, 321-30 (1975).

[22] The polygraph technique is believed to be most accurate when a criminal suspect denies having committed a physical act, such as robbing a store. It is believed to be less accurate when the issue is more nebulous, ambiguous, or where rationalization can occur, such as when the suspect admits shooting the victim, and the issue to be resolved is whether the shooting was intentional or not. The extent to which the polygraph's accuracy may be reduced in such situations would depend upon a number of

factors peculiar to each individual case. These factors would include the precise issue to be resolved, the subject's background and personality, the examiner's skill in formulating and defining questions, etc. Although the accuracy may well be lower in some such instances, there often is little or no physical evidence available to the judiciary concerning the defendant's intentions or state of mind, in which case the polygraph may yield physiological evidence which would have some probative value.

* * * * * *

Reprints of the following articles are also available by writing to: Gordon H. Barland, Ph.D., Director, Research Division, Defense Polygraph Institute, Ft. McClellan, Alabama 36201.

- 1. The reliability of polygraph evaluation. <u>Polygraph</u>, 1972, <u>1</u>, 192-206.
- Detection of deception. In W.F. Prokasy & D.C. Raskin (Eds.), <u>Electrodermal activity in psychological research</u>. New York: Academic Press, 1973. Pp. 417-477. With D.C. Raskin.
- Implications of drug-induced memory loss for interrogation and lie detection. <u>Polygraph</u>. 1973, <u>2</u>, 287-294.
- 4. An evaluation of field techniques in detection of deception. <u>Psycho-physiology</u>, 1975, <u>12</u>, 321-330. With D.C. Raskin.
- Validity and reliability of detection of deception. National Institute of Law Enforcement and Criminal Justice. Washington, D.C.: Government Printing Office, June, 1978. With D.C. Raskin and J.A. Podlesny.
- 6. A survey of the effect of the polygraph in screening Utah job applicants: Preliminary results. <u>Polygraph</u>, 1977, <u>6</u>, 318-324. Also published in <u>Polygraph Control and Civil Liberties</u> <u>Protection Act</u>. Hearings before the Subcommittee on the Constitution of the Committee on the Judiciary, 95th Congress. Washington, D.C.: Government Printing Office, 1978. Pp. 63-69.
- Use of voice changes in the detection of deception. <u>Polygraph</u>, 1978, <u>7</u>, 129-140.
- 8. A fail-proof blind number test. Polygraph, 1978, 7, 203-208.
- On the accuracy of the polygraph: A critical review of Lykken's "Tremor in the blood". Polygraph, 1982, 11, 258-272.
- 10. A dual-issue test format. Polygraph, 1983, 12, 1-6.
- 11. Criminal investigations. Society, 1985, 22, 46-51.
- 12. The case for the polygraph in employment screening. <u>Personnel Admin-</u> istrator, 1985, 30(9), 58, 61-62, 64-65.

POLYGRAPH SURVEILLANCE OF PROBATIONERS

Bу

Stanley Abrams, Ph.D. Ernest Ogard, E.Ed.

Abstract

Rates of recidivism are extremely high demonstrating that neither prison nor probation have been successful in rehabilitating offenders. Prisons are overcrowded and there has been a search for procedures that would reduce the prison population, rehabilitate, and protect the public as well. The concept of polygraph surveillance was developed in the 1960's as a means of accomplishing these three goals. Select groups of individuals who had been convicted of a crime were given the option of prison or probation with periodic polygraph testing as one of the conditions of their probation. While positive results were reported, none of the studies were sufficiently well controlled to determine what degree of actual success was obtained.

The present study compared groups of offenders found guilty of sex offenses, substance abuse, and burglary who were placed on polygraph and probation supervision with comparable groups in which only probation supervision was utilized. The results demonstrated that the former groups had a statistically significant lower rate of revocation than the control groups. Polygraph surveillance was shown to serve as a deterrent to reoffending among the probationers studied. Moreover, the polygraph procedure appeared to be a valid means of measuring whether probationers were reoffending. Verification was obtained on every deceptive chart so that no false positive findings resulted. While there were no reported false negative results, there was no way of determining that all of those who were found to be truthful were, in fact, responding honestly on the test. However, there was no external evidence that indicated that the test findings were in error.

Although this investigation is weakened by the small number of subjects in the experimental group, it is felt that there is sufficient evidence for the effectiveness of this approach to recommend an extension of its use in the area of probation. [author abstract]

Dr. Abrams is in private practice at 2222 N.W. Lovejoy, Portland, Oregon, and is a member of the APA. Reprints are available from Dr. Abrams. Dr. Ogard heads the Department of Criminal Justice at Western Oregon State College in Monmouth, Oregon.

Abrams & Ogard

In two different parts of the United States, very close in time, a very similar idea was being conceived. Born out of the frustration of high rates of recidivism, re-offending probationers, and insufficient resources for supervising these individuals, a plan for polygraph surveillance was devised. In 1966, Judge Clarence E. Partee[1] of Illinois utilized polygraphy as an aid in making decisions on probation applications. During the probation hearing, after the defendant was informed that he had the right to refuse to respond to avoid self-incrimination, he was gueried as to whether he had committed any offenses other than the one for which he had been convicted. While the majority of the defendants elected to respond, they denied the commission of any prior criminal acts. After again being given their rights, they were informed that they were required to take a polygraph test. Those who refused were denied probation. A11 of those individuals who were tested were found to have committed from one to thirteen offenses for which they had not been apprehended. It was Judge Partee's belief that being unable to outsmart the law and being exposed to their friends, relations, the police, and the court for what they were made them better prospects for probation. Four years after he introduced this program, he began to require that the probationers waive their rights against self-incrimination and agree to take annual polygraph examinations as a condition of their probation.

While this program was being implemented in Illinois, Judge John C. Tuttle[2] developed a similar plan in Walla Walla, Washington in about 1969. Probationers were periodically polygraphed to determine if they were violating the terms of their probation. The procedure was found to be particularly effective because most of the examinees admitted to any violations prior to the actual testing. Knowlton[3], in describing this program, characterized it as "... an inexpensive twenty-four hour tail", which served as a deterrent to further anti-social behavior. In addition to this, it allowed probation officers to employ their time more effectively knowing who required more and who needed less supervision. He assumed that there was another benefit in that other offenders tended to avoid the probationers out of fear their criminal activities might be exposed during the polygraph examinations.

In 1970 Skousen[4] reported the use of a similar approach with probationers who had been convicted of offenses associated with sexually deviant behavior. A hundred were placed on a polygraph program in which they were tested bi-weekly for the length of their probation. The author reported only four failures. The deterrent effect of the examination was exemplified by a statement made by one of the population who said, "Everytime I get the inclination, I think of that damned box and right away it turns me off." Arther[5], commenting on this study, recommended that a polygraph examination be conducted prior to entering the program to be assured of the suitability of the subject for testing.

Employing the polygraph procedures in a different manner, Judge John Cooney[6] of Spokane, Washington offered convicted shoplifters the option of jail or reporting all of their shoplifting episodes in the last five years prior to their arrest. They were warned that a polygraph test might be administered to determine their truthfulness and a finding of deception would result in their having to serve their sentence. The sixty defendants studied confessed to over 1400 shopliftings, and restitution or POlygraph 1986, 15(3) arrangements for restitution were made in every case. Polygraph testing, however, was never administered, only threatened.

The polygraph surveillance program in Oregon had its onset in 1973. Riegel[7] reported that probationers were selected who ordinarily would have been sent to prison for the protection of society. They were felons who had demonstrated an inability to refrain from unlawful activity. Πf the eighteen chosen, two were successful, two were failures, eight had been revoked for other reasons, and six were still in the program. It was, however, too early in the program to determine its effectiveness. This investigation was continued by Teuscher[8] who reported on the results four years later after 117 probationers had been placed in the program. He emphasized that none of them ordinarily would have been granted probation because of the nature of their criminal record. Therefore, any success of any kind with these individuals was considered to be a gain. Of the 117 cases, 60 were reviewed as being successful, 54 as failures, and of the remaining three, two died and one was transferred. A great many admissions were made during the examinations resulting in thousands of dollars of stolen goods and drugs being recovered in addition to being able to save the cost of imprisonment.

Throughout all of these programs certain common elements exist. There is an awareness of the cost of imprisonment and a recognition that a successful probation program could reduce these expenditures. Moreover. prisons are overcrowded so that in some states lessor criminals have to be released to provide space for more serious offenders. Quite naturally, this is not in the best interest of society. Even worse, however, prisons are not serving their function in rehabilitating the offenders and probation and parole officers are too overwhelmed with heavy caseloads to adequately supervise their charges, let alone assist them in their rehabilitation. This has led to a cycle of growing crime rate, insufficient prison space, lack of rehabilitation, and increasing recidivism. The concept of polygraph supervision was developed by Judges Tuttle and Partee to break this cycle. If it were successful, it would, in fact, improve all of the four problems listed above. Rehabilitation, in particular, is prominent in the thinking of all those who have developed these programs. Since the polygraph is capable of providing an electronic surveillance that should be superior to any human supervision, it could effectively serve its major role, that of a deterrent to further acting out behavior. If the probationer is forced to reject any criminal involvement for a long-enough period of time, he conceivably might develop a non-criminal orientation. He may marry, obtain a satisfactory job, and develop new relationships. In line with this thinking, Schmidt et al.[9] have labeled this approach the "artificial conscience."

A final issue has been discussed in some of the articles that is of considerable concern--the right of the probationer. Knowlton has indicated that probation is a privilege and not a right, therefore, the trial court's discretion is broad in establishing the conditions of probation. He does, however, have the right to a hearing prior to a revocation and right to counsel at that hearing. Moreover, conditions placed upon the probationer must be reasonable and these, according to Knowlton, must satisfy the right of privacy and privileges against self-incrimination.

Polygraph 1986, 15(3)

ī.

Abrams & Ogard

Invasion of the probationer's privacy can be adequately minimized through the use of qualified examiners who will restrict their questions to the conditions that have been established. In regard to self-incrimination, Knowlton stated that it was sufficiently broad to include the protection of persons in all settings. The case precedents indicated that the Fifth Amendment safeguards apply to the probationer and to the revocation hearings. He concluded that adverse results can not be used against a probationer but there are no constitutional barriers to requiring polygraph testing as a condition of probation.

In the Riegel paper, he presented a case that went before the Court of Appeals. The defendant argued that the probation condition that required her to take the polygraph test was an unconstitutional infringement upon her rights against self-incrimination. She further argued that her choice to agree to polygraph testing was not voluntary since the choice between the testing and a long incarceration was no choice at all. It was found by the Court of Appeals that the defendant had voluntarily executed the polygraph stipulation, in spite of what she perceived as coercion. The conditions set forth were that the results of the examination could be used as evidence in further proceedings in this case and in determining the defendant's probationary status, but the results could not be used in any other case without the defendant's consent. The Appeals Court found that since the defendant had agreed to that stipulation, they did not feel it could be challenged at that time. It would appear that the Oregon decision was that the Fifth Amendment privileges could be waived in regard to the probationer's conditions if it were stipulated in that manner. Riegel's article includes a copy of the probation stipulation form and the polygraph rights and waiver form.

The various programs have reported success and it is likely that gains have been obtained from the savings in costs of imprisonment, recovery of stolen goods, financial retribution, reduction of crime, protection of society, and finally, and most important, rehabilitation. The statistics, however, are not clear, and even when data is presented, it is not as meaningful as it might be without a control group. While Teuscher's statistics of a 52% success rate among a group of high-risk probationers is most impressive, a comparable group of non-polygraph probationers should be studied as well to determine if a significant difference would occur between the two groups. The purpose of this investigation was to ascertain this.

The over-crowding conditions in the Oregon prison system and the resulting need to find alternatives for prison sentence were also primary motives for this investigation. In 1983 the Polk County Circuit Court in Oregon and the Community Corrections Staff agreed to initiate a pilot study to determine if periodic polygraph testing of probationers could serve as an effective means of ascertaining if these individuals were abiding by the conditions of their probation. If the polygraph approach were successful in accomplishing this, an attempt would be made to determine if it would function as a deterrent to reoffending. The following two hypotheses were made:

l. The polygraph technique is a valid means of determining if probationers are reoffending.

Polygraph Surveillance of Probationers

2. A combination of probation and polygraph supervision serve as a greater deterrent to reoffending than probation supervision alone.

Procedure:

Three groups of convicted offenders--burglars, substance abusers, and sex offenders were selected from two neighboring counties in Oregon. The Control Group was drawn from Marion County where every individual who had been convicted of one of the crime categories selected and placed on probation was followed for a two-year period from July 1, 1983 to July 1, 1985. The probationer would be considered successful if probation had not been revoked, he had not absconded, and had not committed another crime during that period.

The Experimental Group was chosen from Polk County and consisted of any convicted offender from among the aforementioned categories who had stipulated to periodic polygraph testing as a condition of his probation. While an attempt was made to have comparable subjects in the Control and Experimental Groups, it should be recognized that the control subjects were considered to be a low-risk group, who would not be a danger to society and who might profit from probation. In contrast to this, as in the Teuscher and Riegel Programs, the probationers who were placed on polygraph supervision tended to be a high-risk group made up of individuals who would ordinarily not have been placed on probation. In this instance, they were given the option of being sentenced to prison or entering a probation program which included periodic polygraph testing as one of the conditions of their probation. Each individual was informed that if he were to fail the examination, he would be able to take a second test administered by a different examiner prior to a revocation hearing. If he were to fail both examinations, a revocation hearing would be held and at that time a decision would be made by the courts as to whether he would complete the remaining time of his sentence in prison. Prior to the onset of this program, each subject was administered a polygraph test to determine if he were a suitable candidate for polygraph testing. It was planned that each individual would be tested at 90-day intervals.

Control Subjects:

The Control Group consisted of 243 subjects. Of this population 81 had been convicted of burglary, 7 of sex offenses, and 155 of substance abuse. Unfortunately, at the end of the study it was learned that everyone of the substance abusers had been charged with an offense associated with the use of alcohol. Therefore, this particular group was not comparable to the substance abusers in the Experimental Group who had been charged with such offenses as manufacturing, possession, or delivery of drugs, and because of that, the groups could not be compared statistically.

Experimental Subjects 1:

Although the courts agreed to this proposal during the two-year period, they only referred 17 individuals to this program. Of this group, four were burglars, five were six offenders, and eight were substance abusers. With the exception of those revoked all but one subject was on Polygraph 1986, 15(3)

Abrams & Ogard

the program for a year or more. The one individual who was on the program for less than a year was a participant for eleven months. These subjects were compared to probationers from the Control Group when they had only been on the program for a year.

Experimental Subjects 2:

Because of the disproportionately low number of subjects in the Experimental Group, an equivalent group was selected from the Portland area that had been part of the Riegel and Teuscher Program. This population consisted of all those individuals from the three crime categories who had been placed on probation and stipulated to polygraph examinations during a two-year period. This group was composed of 18 subjects, 11 of these were burglars, two sex offenders, and five substance abusers. Since these individuals had been on the program for two years, they were compared to Control Group subjects when they had been on probation for two years.

Results:

The two Experimental Groups were compared to the Control Group subjects individually by crime categories and then as a total group. The results are shown in Table 1. A Chi Square Test was utilized to determine if statistical significance was obtained. When the total of Experimental Group 1 was compared to the total Control Group, statistical significance at the .01 level was found. While large differences existed between the sex offenders and burglars in these two groups, statistical significance was not reached. This was probably due to the small number of subjects in the Experimental Group. When the two Experimental Groups were combined and compared to the Control Group employing the Bayesian Technique, statistical significance was obtained at the .01 level for the burglar category and at the .001 level for the total experimental Group when it was compared to the total Control Group. These findings are indicative of a high-level of statistical significance and clearly indicate the combination of polygraph and probation supervision was significantly more effective as a deterrent to reoffending than probation supervision alone. Hypothesis two was verified by this investigation.

A second aspect of this study was to determine if the polygraph approach were a valid means of ascertaining whether probationers were reoffending. In every instance in which polygraph findings were indicative of deception, admissions were obtained. This consisted of eight subjects, another three failures had absconded so that no polygraph examination The findings indicated that there were no false could be administered. positive results demonstrating that this was a very valid approach when dealing with those individuals who were found to have been deceptive on the test. In every instance, deceptive findings were verified through admissions. While there were no false positive findings, it was not possible to determine if false negative results had occurred. However, in no case was a subject who had been found to be truthful ever been demonstrated to have been deceptive based on evidence other than the polygraph. Despite this, complete accuracy cannot be assumed.

These results are consistent with the findings reported by other examiners who have employed this approach in other areas of the country. Polygraph 1986, 15(3)

A COMPARISON OF THE SUCCESS RATE OF THE TWO EXPERIMENTAL GROUPS WITH THE CONTROL GROUP

	Experimental Group 1				Experimental Group 2#				Experimental Group 1 & 2				Control Group			
	Total Subjects	Successful	Unsuccessful	Percent Successful	Total Subjects	Successful	Unsuccessful	Percent Successful	Total Subjects	Successful	Unsuccessful	Percent Successful	Subjects	Total	Unsuccessful	Percent Successful
Substance Abuse	8	4	4	50%	5	3	2	60%	13	7	6	54%				
Alcohol Abuse	<u></u>			·····									155	37	/ 118	24%
Sex Offenders	5	4	1	80%	2	1	1	50%	7	5	2	71%	7	3	4	43%
Burglary	4	2	2	50%	11	10	1	91%	15	12	3	80%**	81	23	58	28%
TOTAL	17	10	7	59%**	18	14	4	78%	35	24	11	69*	243	63	;80	26\$

- * Statistically Support the .001 Level
- ** Statistically Support the .01 Level
- # No statistical comparisons were made between Experimental Group 2 and the Control Samples

Polygraph 1986, 15(3)

180

Abrams & Ogard

Personal communication with polygraphists in Washington[10] and Colorado[11] have demonstrated that this is an effective aid to probation supervision. Similar programs are now being developed in Virginia[12] and Florida[13], but there are no clear indications of the success of their particular approaches at the present time.

Although statistical significance was not reached with the sexual offender group, the probation officer was particularly impressed with the results with these offenders. All five of the child molesters that he supervised were considered to be of high risk and four of them were viewed as unqualified successes. Statistics alone do not describe success, and Van Dusen[14] has pointed out that "when we consider the long-term pain, anguish, and outright devastation that sex offenders cause to their victims and their families, any deterrent takes on real meaning and value". This is particularly important in view of the epidemic nature of child molesting today. There is, however, another aspect to be considered. The aversion treatment utilized in the therapy of sexual deviants requires that normal sexual activity be positively conditioned while deviant sex be nagatively reinforced. If a pedophile continues to obtain sexual gratification through deviant sexual behavior, the treatment will not be effective. Therefore, it is all the more important that this behavior be discontinued and it would seem that polygraph surveillance could accomplish this. This same approach should act in a similar manner with other kinds of anti-social behavior with the assumption being that the longer the probationer is not offending, the greater likelihood there is that he will continue functioning in this manner.

The U.S. Department of Justice released the results of a study on recidivism based on over 11,000 inmates who were admitted into prison in 1979[15]. Of these individuals, 61% were recidivists and an estimated 42% of those entering prison were on probation or parole for prior offenses. It is obvious from these findings that neither prison nor probation are effective rehabilitative methods. In view of the success attained in reducing reoffending through the combination of probation and polygraph supervision, this approach would appear to be a highly valuable addition to the probation and parole armamentarium.

References Cited:

 Partee, C.E. "Probation and the Polygraph," in N. Ansley (Ed.) Legal <u>Admissibility of the Polygraph</u>. Springfield, Illinois: Charles C. Thomas, 1975, pp. 31-39.

2. Tuttle, John C. Personal Communication, 9316 Howard, Walla Walla, Washington 99362.

3. Knowlton, J. "The Polygraph and Probation." <u>Idaho Law Review</u> 9(1972): 74-84.

4. Skousen, W.C. "The Homosexual--Can He Be Cured?" Law and Order 19(1971): 12-20.

5. Arther, R.O. "Comments on Skoussen Article." <u>The Journal of</u> Polygraph Studies 6(March-April 1973): 4. Polygraph 1986, 15(3)

Polygraph Surveillance of Probationers

6. Cooney, John C. "Polygraph Used by Judges to Get Shoplifters to Repay All Thefts." <u>American Polygraph Association Newsletter</u>, (March-April 1976): 9-10.

7. Riegel, L. "Court Use of Polygraph in Probation Programs." <u>Poly</u>graph 3(1974): 256-268.

Teuscher, T. "The Polygraph and Probation." <u>Polygraph</u> 7(1978):
 1-4.

9. Schmidt, M.K., Soloman, G.F., and Johnson, H. "The Artificial Conscience." <u>Corrective and Social Psychiatry</u> 23(1973): 93-100.

10. McCormick, James. Personal Communication, Route 1, Box 368, Wapato, Washington 98951.

11. Murray, Ken. Personal Communication, 281 N. College, Ft. Collins, Colorado 80524.

12. Genebach, Larry. Personal Communication, 54 East Lee Street, Warrenton, Virginia 22186.

13. Saylor, Joe. Personal Communication, 3228 Gun Club, West Palm Beach, Florida 33406.

14. Van Dusen, Larry. Personal Communication, Supervisor, Polk County Community Corrections, P.O. Box 417, Dallas, Oregon 97338.

15. <u>Examining Recidivism</u>. U.S. Department of Justice, Bureau of Justice Statistics, Special Report, Washington, D.C., 20531, February, 1985.

* * * * * *

INNOCENCE, INFORMATION, AND THE GUILTY KNOWLEDGE TEST IN THE DETECTION OF DECEPTION

Bу

M.T. Bradley and J.F. Warfield

Abstract

The purpose of this detection of deception experiment was to study the assumption of the Guilty Knowledge Test that subjects with guilty knowledge will be classed as guilty by the test regardless of their actual guilt or innocence. Prior to a polygraph examination, three groups of innocent subjects were given the same crime-relevant information as members of a group quilty of a mock crime. These innocent subjects either witnessed the crime, were told the crime details, or carried out innocent activities involving crime-relevant information. An additional group of innocent subjects had no crime-relevant information. Analysis of the Guilty Knowledge Test results showed that the detection scores of guilty subjects were higher than those in any of the innocent groups. In fact, with the exception of the innocent activities group, the innocent informed subjects did not differ from those in the uninformed group. The major conclusion is that subjects may have crimerelevant information and not be classed, based on the detection scores, as guilty.

The purpose of this study was to determine the effect of guilty knowledge upon responsiveness to critical items on a Guilty Knowledge detection of deception test. The Guilty Knowledge Test (GKT) (Lykken, 1981) includes the assumption that suspects aware of crime-relevant information will be physiologically more reactive to questions about items of that information than to similar but crime-irrelevant items. If only guilty subjects are aware of information and innocent subjects are not, then the test should be effective in discriminating among these different groups. By the same token, if innocent suspects do have crime-relevant information, and if that is the necessary and sufficient condition to cause differential rectivity, then innocent suspects would be incorrectly judged as guilty. If other factors in the detection of deception context such as intent to deceive (Gustafson & Orne, 1963) influence differential reactivity to critical items, then it may be possible for innocent suspects to have information and not be found guilty.

This article was previously published in <u>Psychophysiology</u> 21(6) (1984): 683-689 and is reprinted here with permission of that journal, the Society for Psychophysiological Research, and the authors.

Requests for reprints should be sent to M.T. Bradley, Chairman of the Division of Social Science, University of New Brunswick, P.O. Box 5050, Saint John, N.B., Canada E2L 4L5.

Portions of this study were supported by Grant A7B66 from the National Sciences and Engineering Research Council of Canada.

Two studies have exposed innocent subjects to crime-relevant information prior to a polygraph examination with the Guilty Knowledge Test. Giesen and Rollison (1980) had one group of subjects read a scenario and act out a mock crime. Another gorup read a different scenario wherein they were exposed to the same critical details of information as the guilty subjects but these items were given in an innocent or non-crime context. On the GKT examination 19 or 20 guilty subjects were classed as guilty and 20 of 20 innocent subjects were classed as innocent. Thus, the possession of crime-relevant information alone may not result in large responses to items of that information if the information was obtained in a non-crime, innocent context. In a similar type of study, Stern, Breen, Watanabe, and Perry (1981) correctly classified 23 of 26 subjects with crime-relevant information from an innocent context as innocent. If these results hold across a wide variety of innocent contexts, they have important implications for the application of detection of deception tests and for the theory of the GKT.

That is, for applied detection, innocent suspects could be aware of crime-relevant information yet still be judged as innocent. The implication for theory is that simple exposure to crime-relevant items does not lead to increased responsivity on the GKT. The inference would be that mere knowledge of the information is not enough. Other factors, such as guilty or emotional associations with the items, may play a role in increasing responsivity.

There are many more ways in which an innocent subject may be exposed to critical information than the way the exposure was done by Gieson and Rollison (1980) and by Stern <u>et al</u>. (1981). For example, an innocent suspect may have witnessed a crime and thus be familiar with all the relevant information. Also, from the time of the arrest until a polygraph examination, an innocent suspect may be informed of many details of the crime by arresting officers. In these situations not only have innocent suspects been exposed to critical details of crime-relevant information, but these subjects are explicitly aware of the relevance of those items to the crime.

In the studies by Giesen and Rollilson (1980) and Stern <u>et al</u>. (1981), no attempt was made to indicate to innocent subjects that, by coincidence, the information they had was relevant to the crime of which they were accused. It may even be questioned whether subjects remembered critical items obtained in the innocent context. For innocent subjects, the GKT examination represents a change of context whereas for the guilty subjects the questions and the crime are within the same context.

The present study examined the context in which crime-relevant information was received and its effect on both responsivity to critical items on the GKT and memory. There were five groups of subjects. Members of one group were guilty because they committed a mock crime murder. Members of the remaining four groups were innocent. Members of one of the four innocent groups witnessed the murder. Members of another innocent group were arrested and briefed in detail about the crime they were accused of. In another innocent group, members carried out a set of innocent actions involving crime-relevant details without being made aware of the crime relevance of the details. The members of the remaining group were not exposed to any crime-relevant information and they served as a control group.

To create a testing situation in which the innocent informed subjects could respond "No" to crime-relevant items on the GKT without lying, a modification in the test format had to be made. Typically, the test requires subjects to deny awareness of crime-relevant knowledge under the assumption that those who have such knowledge are guilty. In this experiment wording of the questions was changed so that subjects denied doing certain activities involving that knowledge. Thus innocent suspects would respond "No" to these questions without attempting deception because they did not do the activity.

If recognition of crime-relevant information is the major factor resulting in responsivity to these items on the GKT, then it was expected that subjects with the information would score as guilty. The clearer the relevance of the information is to the crime, the greater should be the tendency to score as guilty. Thus guilty subjects, witnesses, and the informed accused should score as guilty from this perspective. The group receiving information in the innocent activities situation should score as innocent. Memory for crime-relevant items should follow the same pattern and be best in conditions clearly related to the crime. If factors beyond simple knowledge, such as attempting deception, are important, then only the guilty subjects may score as guilty.

METHOD

Subjects

Subjects were 40 male and female introductory psychology students who received one point of course credit for volunteering for the experiment.

Apparatus

A Grass polygraph with a 7P1 DC preamplifier was used to measure skin resistance responses (SRRs) by passing a $50_{\mu}A$ current through Beckman cupshaped silver-silver chloride electrodes. These electrodes were 1 cm in diameter and attached to the medial phalanges of the first and second fingers after being filled with 0.05 molar NaCl Unibase electrode paste. Recording sensitivity levels were adjusted and set individually for subjects.

GKT examination questions were presented on a Sony portable tape recorder. The onset of each question was marked on the polygraph chart by a hand-operated signal marker.

A medical demonstration mannequin dressed as a man in a trenchcoat and hat was used as the murder victim. The murder weapon was a metal model of a revolver. Also included in the experiment was a styrofoam head, of the type normally used for the display of wigs, a cloth, a wastebasket, and blue envelopes.

Procedure

Forty folders containing 8 copies of 5 types of instructions had been 185 Polygraph 1986, 15(3) randomly ordered and stacked by a laboratory assistant. As each subject reported for the experiment he or she received the folder from the top of the pile. The laboratory assistant indicated to subjects when the folder should be opened and read.

The instructions were five different types ranging from those which told the suspect to commit a mock crime, through those that gave innocent subjects crime-relevant information, to a completely innocent no-information condition. Extracts from these instructions are as follows:

Guilty Subjects:

Please read these instructions over carefully twice and then do the actions they describe. Ignore the witness except to tell that person after you commit the crime that you will murder him (her) too if anything is said about the crime. The room you are in is a small office in a hotel. A person (the mannequin), whom you know as Frank, is seated in this room. He has money and information you will obtain by murdering him. Look in the top drawer of the desk and find a gun. Take the gun and murder Frank by firing three shots into his head. In his left coat pocket you find a blue envelope. Open it. Steal the one dollar in it and memorize, by speaking out loud several times, the safe combination (10-20-35) written on the inside flap of the envelope. Put the empty envelope back in the left coat pocket. Wipe your fingerprints off the gun with the cloth on the desk and throw the gun in the wastebasket.

Now that you have read and carried out your instructions, return to the waiting room. You are guilty but you are only one of several suspects including the witness. You and they are all going to be examined on a polygraph lie detector. The interrogator has no idea who is innocent or guilty. So just like everyone else claim you are innocent. Cooperate with the interrogator so that he will not be suspicious and if you can lie effectively to the machine about the crime, you may get away with it. Do not admit your guilt. If you are successful and judged innocent by the interrogator, you will receive apologies and five dollars as compensation for your troubles.

Witnesses:

Please read these instructions over twice.

Are you ever in trouble! You are just an innocent witness to the brutal murder of Frank (the mannequin) but you are now a suspect in the murder case. The following is the crime you are now going to witness. Read the following material over, and watch and remain silent while the person in the room with you commits the following crime.

You are in an office in a hotel. In front of your eyes this person will pull a gun out of the top drawer of the desk, aim the gun at Frank's head, and fire three shots. Frank will have been murdered. The person will then reach into Frank's coat pocket, take out a blue envelope, remove a one dollar bill, and memorize the safe combination 10-20-35 written inside by speaking it out loud several times. The murderer will then wipe fingerprints off the gun with a cloth, throw it in the wastebasket, and

leave. Stunned and scared, because just before he left the murderer threatened you with death if you say anything, you decided not to inform the police when you leave the room.

After the crime is over, and you have left the room and reported to the experimental assistant, you will find that the real murderer has been picked up as a suspect. Unfortunately, the real murderer is lying, and has accused you of the crime. The police don't know which of you to believe. There is hope before this thing goes much further. That is, you will be given a polygraph lie detection test. Since you are innocent and truthful, and the other person is guilty and lying, there should be no difficulty in establishing your innocence. If you are successfully found innocent, you will receive apologies and \$5 as compensation for your troubles and inconvenience.

Innocent Suspects:

Please read these instructions twice.

You are a suspect in a brutal murder. You did not do it. You are not even capable of doing it. However, you have no witnesses to account for what you were doing on the day of the crime, and the interrogations with the police have not been going well. From these interrogations and the newspaper you have learned quite a bit about the crime.

A fairly big time crook known as Frank was murdered in a hotel room. He was shot three times through the head. The gun was his own and had been taken from the top drawer of his desk and then after it had been used was thrown in the wastebasket. To the police this indicated the work of an amateur because a professional would have his own weapon. Frank was not murdered for money since he had only one dollar in his coat pocket. It seems he was murdered for information he carried in a blue envelope. A couple of things really upset you during the interrogation. When you asked if there were fingerprints on the gun the police officer did not give a direct answer but asked if you owned a pair of leather gloves. You said yes and then he changed the topic. Later he surprised you by pulling out a blue envelope and asking you if the numbers 10-20-35 meant anything to you. Again you said yes but before you could explain the officer became angry and started in on some thorough questioning about what you did on the day of the murder, how could you have no witnesses as to what you did, and why did you murder Frank. It wasn't until much later, when you found out that the numbers referred to a combination for a safe filled with drugs, that you had the opportunity to explain that by coincidence the numbers were the same as your old bicycle lock. If you had not just lost that lock a few days ago, you could show them. Unfortunately the interrogator found that explanation pretty weak. There is, however, one positive event coming up before this whole thing goes any further. You are going to be given a polygraph lie detection test. With the test you will at least have a fair and unbiased chance to prove that you are not a liar. In fact you can be pretty optimistic that because you are only one of several suspects, one of whom is guilty and really lying, you have a very good chance of being proven truthful and innocent. If you are successfully judged innocent, you will be given \$5 and apologies as compensation for your troubles.

Polygraph 1986, 15(3)

187

Innocent Associations Group:

Please read these instructions twice.

Your task, as strange as it may seem, is to read over and then carry out the actions in the following instructions.

You are to imagine that you are in your Uncle Frank's office. He runs a hotel but is away for a few days and said you could use it for studying if you liked. You have taken him up on his offer but the office is a mess as usual and you decide to clean up a little. First take the styrofoam head (it's for Uncle Frank's wig!) off the desk and put it on the table. You don't want to stare at that while you work. Under the head is a one dollar bill. Uncle Frank owes it to you so take it because he never remembers to pay his debts. In fact what you may as well do is take a piece of paper and write "Remember you owe me \$10-\$20-\$35 for work on Monday, Wednesday and Thursday of this week." Put the message in his right coat pocket. He has hung it on the dummy leaning against the wall. Open the top drawer of the desk. There are three crumbled blue envelopes in there. What a mess. Throw the envelopes in the wastebasket. How can anyone run a business that way? You realize if you stay here any longer you will not study but will end up cleaning the whole office, so you decide to leave.

After you have done the above tasks, report back to the experimental assistant.

Innocent Uninformed Group:

You are a suspect in a murder case. You are innocent but your account of what you did at the time of the murder sounded odd to the police investigator. There are no witnesses to back up your story and you know the investigator does not believe you. For these reasons you are relieved to find that you will have the opportunity to take a lie detector test and clear the whole thing up. You are quite willing to take the test because you are only one of several suspects, one of whom is really guilty and is attempting to lie, and you will have a very good chance of being found truthful and innocent. If you are found innocent as you truthfully are, you will be given \$5 as compensation for your troubles.

All groups were instructed to read the material at least twice so that they thoroughly understood what they must do. The guilty subjects, witnesses, and innocent associations groups were led to an office down the hall from the laboratory and were instructed to do their reading after they entered the office. The innocent informed and innocent uninformed subjects read their material in a laboratory waiting room.

Once this preparation was over, all subjects were told that they were accused of murder and that they would have an opportunity to demonstrate their innocence in a polygraph test examination. All subjects were told that the polygraph is very effective and if they were innocent they would have a very good chance of being found innocent. If they were guilty, then they probably would be found guilty. Guilty subjects were, however, to attempt to beat the polygraph. As an inducement to appear innocent, all subjects were promised \$5. Subjects were also cautioned that because the polygraph examiner was completely blind to their guilt or innocence, they must be cooperative and maintain their innocence, from the moment of meeting the examiner to the end of the examination. They were told that the examiner would be alert to any clues that might indicate guilt.

Once subjects were introduced to the examiner they sat in a comfortable chair and were hooked up for SRR measurement. During that time the examiner explained a little bit about the instrumentation and reinforced the idea of the effectiveness of the apparatus by saying "If you are innocent, as you claim to be, you will have no difficulty in demonstrating innocence on the polygraph. If you are guilty, however, you have very little chance of beating the polygraph."

The examination consisted of a GKT with 10 sets of items. The critical items involved those underlined in the various instruction sets outlined earlier in the procedure. Subjects were instructed to answer "No" to all items. These included the critical items and thus guilty subjects would be lying whereas innocent subjects would be telling the truth.

Two examples of GKT items follow:

You murdered the man in a: house? bank? store? hotel? service station?

You pulled the gun out from: your holster? inside a filing cabinet? the top drawer of a desk? a wall safe? your jacket?

The questions were worded such that a guilty subject denying, for example, he murdered the man in a "hotel" would be lying, whereas innocent subjects by also saying "no" to the question would be telling the truth even though they knew the man was murdered in the "hotel."

All 10 sets of questions were delivered by tape recorder so that the examiners' vocal inflections would be standard across subjects. The questions were spaced 20 seconds apart and it took 17 minutes to give the test.

At the end of the examination subjects were told that the results and money (which was paid if they were judged innocent) would be available at a later date. Subjects were sent back to the laboratory assistant. The assistant gave them two memory tests with the strict assurance that the results of the memory tests would not be available to the polygraph examiner before he judged their charts. The first memory test was on recall of crime-relevant items. Subjects attempted to answer questions such as the following: "In what part of the body was the man shot?", "What was the name of the man who was murdered?" The second test was a recognition memory test. In this test subjects were to circle the correct crime-relevant item on a copy of the GKT that had been used in their polygraph examination. If they were guilty, witnesses, or innocent informed accused subjects, they were instructed to recall or recognize the crime-relevant items. The members of the innocent association group were told that the details of their innocent room cleaning activities were the same as the details involved in the crime. Thus they were to remember those details in attempting to respond in the memory tests. Innocent uninformed subjects were asked to make their best guess as to the items involved in the crime. Money, 10¢ per correct item on each test, was used as an inducement to respond correctly. Thus subjects could gain \$2.00 with correct recall and recognition of the 10 items on both tests.

DATA QUANTIFICATION AND ANALYSIS

SR responses were measured for each of the final four questions of the 10 sets on the GKT. This was done by measuring the maximum decrease in resistance in millimeters which occurred within 10 seconds following the beginning of the questions. It was expected that large amplitudes would be associated with deception. The response to the first item was excluded from measurement since it served as a buffer item to habituate the orienting responses expected upon the introduction of different question sets. The response to the critical items was assigned a 2, 1 or 0 depending on its magnitude in comparison to other responses in the set. If the response to the critical item was largest it received a 2, if second largest 1, and finally 0 for any other response magnitude. In this test with ten 4-item sequences plus a buffer item, the scoring range was from 0 to 20. Once these scores were obtained, they were analyzed in a five-level one-way ANOVA. Memory scores were tallied and analyzed in the same ANOVA design. Significance was declared at the .05 level.

RESULTS

Detection scores (F(4/35) = 20.29), recognition memory scores (F(4/35) = 47.86), and recall memory scores (F(4/35) = 28.73) differed among groups (see Table 1). Tukey's HSD test was used to identify the specific group differences.

Table l

Mean detection, recognition memory, and recall memory scores for guilty and innocent subjects

	Mean			
Subjects	Detection	Recognition Memory	Recall Memory	
	••			
Guilty	15.5	10.0	10.0	
Innocent Witness	7.5	9.0	8.6	
Innocent Informed	8.3	8.9	8.0	
Innocent Assoc.	10.4	8.1	5.8	
Innocent Uninformed	5.0	3.4	2.6	
	190			

Examination of detection scores showed that guilty subjects scored as more guilty than members of every other group. Those who had innocent associations scored as more guilty than innocent uninformed subjects. Examination of recognition memory scores showed that innocent uninformed subjects had lower memory scores than all other groups. Also, the innocent associations group scored lower on recognition memory than those in the guilty group. With recall memory, innocent uninformed subjects had the lowest memory scores of all the groups. The innocent associations group had lower memory scores than the guilty, witness, and innocent accused groups.

Since subjects must remember guilty knowledge to respond consistently to critical items on the detection tests, memory scores may serve as covariates. Over all, subjects' detection scores correlated significantly with recognition memory r = .56 and recall memory r = .49. (If, however, the scores of the innocent uninformed group were not included, the correlations between detection scores and the types of memory were not significant.) With memory as a covariate over all five groups, the relationship remained the same for the omnibus F tests, recognition memory covariate F(4/34) = 10.39, recall memory covariate F(4/34) = 13.16, and in general for the comparisons tested by Tukey's HSD. The one change was with recognition scores as a covariate. Subjects who had innocent associations no longer scored as more guilty than innocent uninformed subjects.

In field work a cutoff value on detection scores, to decide who was guilty or innocent, would be imposed. With a cutoff of 10 (a sufficiently high score to avoid false classifications of innocent subjects as guilty by chance alone), all 8 guilty subjects would be classed as guilty and none of the innocent uninformed subjects would be classed as guilty. Two witnesses, 2 innocent informed, and 6 innocent association subjects would be incorrectly classed as guilty.

DISCUSSION

Subjects may be exposed to guilty knowledge, remember that knowledge, and understand its relevance to the crime they are being examined for, and yet not be judged as guilty with a Guilty Knowledge Test. Although guilty knowledge is necessary for detection, as illustrated by the fact that none of the innocent uninformed subjects were detected, it is not a sufficient condition for detection. Witnesses and innocent informed subjects did not differ in memory from guilty subjects but differed in detectability from guilty subjects. In fact, witnesses and innocent informed subjects scored like innocent uninformed subjects even though they had and retained the crime-relevant information.

These findings were robust even when memory was used as a covariate. It should be pointed out that the relationships to memory were actually inflated by including the uninformed innocent group in those analyses. Because these innocent uninformed subjects had no information, and information is a necessary prerequisite to reacting to critical items on the test, their low memory scores corresponded with their low detection scores. When this group was excluded, the correlations of both types of memory, recognition and recall, with detection were not significant. These inflated relationships between the covariates and detection scores
resulted in very conservative tests for differences among the groups. In spite of this, the findings held.

The innocent associations group is somewhat of an exception to the above results. Although they scored as less guilty than guilty subjects, they were the only group to score as more guilty than the uninformed group. This relationship did not hold when memory was used as a covariate but because 6 of the 8 subjects in the group were classed as guilt it seems worthwhile to comment on the group's results. The only explanation the present authors can offer is that subjects in this group did not expect that some items on the GKT would be the same as those involved in their innocent activities. Thus they may have become suspicious and very attentive to the crime-relevant items because of this unexpected coincidence. Our explanation is highly speculative because the experiment was not designed to obtain information on this surprising (to the authors) It should be pointed out that it is doubtful that this group result. would ever have a counterpart in applied detection since it would be highly improbable that an innocent suspect would have all crime-relevant information from another unrelated context.

The relationship between memory and detection scores for informed subjects was low. The reason is that very little forgetting took place, at least with recognition memory. The guilty, witness, and innocent informed groups remembered all 10 or nearly all 10 items. The irrelevant task group differed, but even they remembered 81% of the items. As expected, recall memory was less. It is, however, questionable how appropriate recall memory is for this study, since the Guilty Knowledge Test closely resembles a recognition memory test, because the actual items to be remembered are given in the test. These results replicate and extend those reported by Giesen and Rollison (1980), and Stern et al. (1981). The extension is important because it includes groups who not only had critical information, but also understood its relevance to the crime for which they were being examined. In addition, the memory test used in the present study ensured that decreases in detection were not due to simple forgetting.

As mentioned in the introduction there is a format difference between the GKT as presented in this study and the GKT originally designed by Lykken (1959). The questions in our version were constructed in such a way ("Did you shoot the victim X times?") that innocent subjects who know the correct information are still telling the truth when they reply "No" to the critical question. Guilty subjects who shot the victim that number of times are, of course, attempting deception if they say "No." Lykken (1981, pp. 286-287) designed his test to concentrate on knowledge such that the equivalent question would be worded "Do you know if the victim was shot X times?" In Lykken's format the test provides almost perfect protection for an innocent person without knowledge because he does not know the item and therefore could not be expected to respond beyond chance levels to that crime-relevant item. The guilty subject, whether attempting deception or just repeating the item, does know and responds physiologically, presumably, prior to our results, simply because of his knowledge. The test, as altered in the present study, still provides almost perfect protection for uninformed innocent subjects but of course may not for informed innocent subjects. The present authors could not recommend

the applied use of this altered test since other factors such as the seriousness of consequences in actual crimes may interact with knowledge to make innocent informed suspects appear guilty. Until we understand these relationships, this form of the test should remain a useful laboratory tool for the developent of an adequate theory to explain responsivity in detection paradigms.

In reference to theory and hypothesis testing, this study addresses a problem with the study of the GKT. In most GKT studies innocent subjects differ from guilty subjects in two ways. That is, not only do innocent subjects not attempt deception but they lack crucial information, which is the necessary condition before any detection, accurate or inaccurate, can take place. In some studies this leads to inefficiencies. Half of the subjects tested with the GKT by Bradley and Janisse (1981), for example, were innocent and uninformed and could not, therefore, be expected to be affected by the manipulation of some of the variables of interest $(\underline{i},\underline{e},$, threat of shock or apparent effectiveness of detection.) Under these circumstances, the factors which could promote reactivity with innocent subjects remain masked. The results of the current study, however, show that possession of information does not necessarily lead to detection. Only those who were attempting to deceive were detected at high rates of accuracy. Thus follow-up studies to these results could be set up so that innocent groups do have information and differ on only the one variable (attempt at deception) from guilty groups. From this perspective the question becomes what variables influence groups that have information but are attempting or not attempting to deceive. For example, would severe consequences, apparent ineffectivenss of the polygraph, or GKT questions on particularly gruesome details of a witnessed crime promote responsiveness differentially in innocent subjects such that they might be falsely detected?

In summary, this study has examined the basic assumption of the GKT and the results challenge that assumption. Innocent subjects, in a laboratory setting may have guilty information, be examined by the GKT, and be judged as innocent. Whether this finding would generalize to field situations remains questionable. The findings seem particularly important for theories in the detection of deception since factors affecting reactivity to critical items on the GKT can now be studied with innocent subjects by giving them critical information.

References

- Bradley, M.T., & Janisse, M.P. (1981). Accuracy demonstrations, threat, and the detection of deception: Cardiovascular, electrodermal, and pupillary measures. <u>Psychophysiology</u>, <u>18</u>, 307-315.
- Giesen, M., & Rollison, M.A. (1980). Guilty knowledge versus innocent associations: Effects of trait anxiety and stimulus context on skin conductance. Journal of <u>Research in Personality</u>, <u>14</u>, 1-11.
- Gustafson, L.A., & Orne, M.T. (1963). Effects of heightened motivation on the detection of deception. <u>Journal of Applied Psychology</u>, <u>47</u>, 408-411.

- Lykken, D.T. (1959). The GSR in the detection of guilt. <u>Journal of Applied Psychology</u>, <u>43</u>, 385-388.
- Lykken, D.T. (1981). A tremor in the blood: Uses and abuse of the lie detector. New York: McGraw-Hill.
- Stern, R.M., Breen, J.P., Watanabe, T., & Perry, B.S. (1981). Effect of feedback of physiological information on responses to innocent associations and guilty knowledge. <u>Journal</u> of <u>Applied</u> <u>Psychology</u>, <u>66</u>, 677-681.

* * * * * *

EFFECTS OF PREEMPLOYMENT POLYGRAPH TESTING ON EMPLOYEE ATTITUDES

Вy

Peggie L. Lopez

Abstract

There has been little research on the effect of preemployment polygraph testing on employee theft. One past study (White, Lopez, Haney, 1982) suggested that there may be a negative effect on employee theft by asking an applicant to take a polygraph examination. In the present study 24 actual job applicants who had already agreed to take a polygraph were given a questionnaire designed to measure their attitudes toward the employer, particularly on factors identified as relating to employee theft (Saxe, 1983). The experimenters were three examiners from a commercial polygraph company. Half of the subjects were chosen randomly to be given the questionnaire just prior to the polygraph interview and the other half were given it afterward. There were no statistically reliable differences between the two groups. [Author abstract]

Polygraph examinations have been used to screen prospective employees for honesty for at least 50 years. The controversy over such use has continued unabated during that time. Opposition has focused mainly on either questions of ethics or of questions of validity. The ethical issues, the right of privacy of the employee <u>vs</u>. the right of the employer to screen out persons likely to steal, are addressed in other forums, and will probably never be completely resolved.

The validity of polygraph examinations in specific criminal cases has been studied in many contexts. In contrast, only two studies were found on polygraph validity in the preemployment setting. Correa and Adams (1981) used a laboratory design in which half the subjects were instructed by one experimenter to lie about nine facts listed on their background form. The second experimenter conducted the polygraph screening examinations, and classified each subject overall as either truthful or deceptive, and then tried to pinpoint specific areas of deception in those found to be lying. They found a 100% accuracy rate ($\underline{p} \leq .01$) in overall classification as truthful or deceptive.

The author wishes to express her thanks to Matthew O'Connor and William Warner for their help in collecting data for this paper. Polygraph 1986, 15(3)

The author is a member of the APA and the California Association of Polygraph Examiners. Reprints of this article may be obtained by writing to her at Central Coast Polygraph, 10420 DeAnza, C-4, Cupartino, California 95014.

Employee Attitudes

Barland (1981) also used a laboratory paradigm to screen subjects on background information. The background information was verified by investigators, and some subjects were instructed to lie to one question asked in a background screening examination. Three methods (zone method, greatest control method, and relevant-irrelevant method) were used to evaluate each set of polygrams. He found 50% to 80% accuracy, depending upon which method was used. Neither of these studies used methods that approach standard field use of preemployment polygraph.

In their 1983 report, the Office of Technology Assessment (Saxe, 1983) pointed out that an overall measure of preemployment polygraph validity is probably not possible since the test is a complex process with elements that differ substantially from one situation to the next. These elements include characteristics of the examiner, the setting, the subject, and the occasional use of various types of countermeasures by subjects. Even given the fact that Belt and Holden (1978) reported that half of the retailers and commercial banks surveyed used polygraph examinations either in specific loss incidents or as a preemployment tool to screen out likely thieves, the question still remains: What effect does a preemployment polygraph have on employee theft?

In 1981 Clarke and Hollinger completed a study for the U.S. Department of Justice to isolate factors which are related to employee theft. They surveyed 9175 employees in 47 companies, personally interviewed 256 of these employees, and also interviewed 247 executives from the companies. They found that the following characteristics correlate strongly with employee theft:

- Employees who are younger, have never been married, and are male.
- (2) Employees who are dissatisfied with their job. The primary sources of dissatisfaction were the employer and the supervisor. Specifically, where the integrity, fairness, and ethical quality of the organization were questioned, and when supervisory personnel were viewed as unhelpful, incompetent, and unconcerned, higher theft levels were detected.
- (3) Whether or not the company has a clearly defined anti-theft policy.
- (4) In-depth preemployment checks on such factors as job history and references of applicants.
- (5) The employee's perceived chance of being detected in theft activity. This was the best single predictor of involvement in theft.

In 1982 White, Lopez and Haney addressed the effect of the preemployment polygraph examination on simulated employee attitudes. They concluded that there was a negative effect on items such as perceived truth levels and anticipated quality of working relationships. They found no gender differences. These two factors relate to those identified by the Clarke study, and might lead to the conclusion that polygraph testing,

Peggie L. Lopez

in and of itself, could lead to increased employee theft. That study involved college students reading scenarios about a hiring procedure. In contrast, Silverberg (1980) found that actual job applicants and employees were overwhelmingly favorable in their attitudes toward the polygraph procedure whether or not they "passed" the test.

The purpose of this study is to measure attitudes towards the employer of actual job applicants either just before or just after going through a polygraph interview and examination and to compare the attitudes between these two groups. It is the hypothesis of this study that in the real world polygraph testing does not have a negative effect on employee attitudes.

METHOD

Subjects

Subjects were 24 job applicants for retail sales or restaurant positions who had already volunteered to take a preemployment polygraph examination. There were 14 males and 10 females in the study and the mean age was 25.5 years. All had previously worked in a position similar to that for which they were applying, and 13 had previously taken a polygraph examination.

Material

A questionnaire was prepared which aimed at measuring anticipated employee satisfaction, applicant awareness of anti-theft policy, and anticipated chance of apprehension if engaged in theft activity. (See Appendix). The questions asked for answers on a 10 point Likert scale. The direction of the scale was varied so that a "10" sometimes indicated a strongly positive response and sometimes indicated a strongly negative response. This was done to minimize the effect of a positive or negative bias on the part of a subject. In addition, biographical data was collected so that the sample could be compared with those in the previous study and to see if there were any differences based on gender, age or marital status.

Procedure

Three examiners asked the first eight subjects they tested for the above positions to participate in the study. No one declined. Each examiner gave the questionnaire to four subjects prior to the interview and examination and to four subjects after the examination. The order for this assignment was made randomly. The result was a 2×3 (Condition x Examiner) factorial study with four subjects in each condition.

Subjects were told that the questionnaire was for a survey being performed by the polygraph firm and that neither their willingness to participate nor their answers to the questions would have any effect on whether or not they would be hired for the position. They were also informed that none of the questionnaires would be read until all had been completed, thus there would be no way to identify which questionnaire had been completed by any particular applicant. Each was asked if he or she was

Employee Attitudes

willing to fill out a form, and was then allowed to complete the questionnaire in private and instructed to place the forms in a sealed envelope and put the envelope into a sealed container when finished.

After completing the questionnaire, subjects were thanked for their participation, and were told the purpose of the study. Comments by the subjects during debriefing revealed no suspicions about the experimental manipulation.

RESULTS

Analyzing the data using a 2 x 3 analysis of variance yielded no statistically reliable results for a condition effect, an examiner effect, or for an interaction effect. When the variables were pooled for condition the result on question four (company integrity) approached significance for an examiner effect, F(2, 21) = 3.99, p < .052.

When the results were analyzed for gender differences, it was found that females expected to be more satisfied than males in their new job $[\underline{F}(1, 22) = 5.72, \underline{p} < .024]$, and that males felt their new manager would be more concerned about them than females [F(1,22) = 8.42, p < .008].

Examination of mean scores in Table 1 reveals that applicants anticipated fairly high job satisfaction, rated the companies high in fairness and ethical standards, felt very strongly that employee theft was not tolerated, and believed that there was a high chance of employee theft being detected.

	Score "1"	_	Score "10"
	Equals:	Mean Score:	Equals:
Question:			
1	Very satisfied	2.88	Very unsatisfied
2	Very unconcerned	7.38	Very concerned
3	Very incompetent	8.42	Very competent
4	Much integrity	2.54	Little integrity
5	Not fair at all	9.04	Very fair
6	Very low	9.48	Very high
7	Very much	9.96	Not at all
8	Very likely	8.58	Not likely at all
9	Not likely at all	2.21	Very likely
10	Very likely	1,92	Not likely at all

Table 1 Mean Scores

The Questions appear in the Appendix.

Table 2 shows the magnitude of effect sizes in the form of eta^2 . There are eight values over 15%.

Table 2

Eta² Values

	Condition	Examiner	Interaction
Question:			
1	.000	.152	.072
2	.020	.132	.230
3	.045	.113	.025
4	.048	.262	.048
5	.176	.207	.207
6	.111	.177	.127
7	.053	.100	.100
8	.063	.081	.095
9	.024	.016	.085
10	.091	.193	.123

DISCUSSION

The analysis shows that there were no reliable difference in attitude toward the employer between subjects who were about to take the polygraph and those who had already done so. It may be that the sample size was too small to detect an effect. It should also be noted that the sample consists only of those who had already agreed to take a polygraph. This population may differ systematically from persons who have declined the opportunity, and from those who have never been asked. Further studies might focus on measuring attitudes among applicants at various stages in the employment process to determine whether there might be differences that were not addressed here.

In the debriefing sessions it was noted that there was confusion regarding the word "concern" in question 2. Some subjects saw it in a positive sense (<u>i.e.</u>, as in "caring"), and some interpreted it negatively. This question should be reworded to avoid this ambiguity if the questions are used in another study.

It was also noted in debriefing that some applicants were confused by the change in direction of the Likert scales. Several subjects said that they had not read the questions carefully but had answered anyway. They apparently wanted to comply with the request to fill out the questionnaire, but did not want to spend much time doing so. They belived the experimenter when told that their answers would have no effect on whether **POlyGraph 1986**, 15(3)

Employee Attitudes

or not they were hired, and seem to feel that they were helping just by circling numbers, even though they had not really read the questions. This confusion and inattention could certainly contribute to the lack of reliable differences between the groups, particularly given the small sample size.

In examining the instances where there was an effect size for examiner over 15%, most of the differences seems to be associated with an examiner with less than four months experience. This study does not reveal whether it is the examiner's newness which is related to the difference, but again suggests an area for further research.

The possibility must also be considered that there really is no effect between the two groups. It would thus be the case that experiencing a polygraph interview and examination does not have a negative effect on employee attitudes.

It is interesting to note the mean scores themselves. The applicants as a whole tend to give high ratings on questions designed to measure the factors identified by the Clarke, <u>et al</u>. study. It may be that by just asking the prospective employee to take a preemployment polygraph the employer is suggesting an anti-theft policy and increasing the perceived chance of apprehension of employees who steal.

APPENDIX

Although you are not yet working for this company, you have probably formed some impressions about the company and the people who work for it. Please answer the following questions based on your impressions at this time. Most of the questions require that you circle a number from 1 to 10. Please circle the number that best describes your answer.

When you have answered all the questions, fold the sheets and seal them in the envelope you have been provided. Then place the envelope in the sealed container. None of the questionnaires will be read until the end of the study so there will be no way to connect you to the questionnaire you have completed. Thank you.

1. How satisfied do you think you will be in this job?

Very satisfied 1 2 3 4 5 6 7 8 9 10 Very unsatisfied

2. How concerned about you do you think your new manager will be?

Very unconcerned 1 2 3 4 5 6 7 8 9 10 Very concerned

How competent do you think your new manager will be?

Very incompetent 1 2 3 4 5 6 7 8 9 10 Very competent

4. How much integrity do you think this company has?

Much integrity 1 2 3 4 5 6 7 8 9 10 Little integrity Polygraph 1986, 15(3)

Peqgie L. Lopez

5. How fair do you think this company will be?

Not fair at all 1 2 3 4 5 6 7 8 9 10 Very fair

- Do you think that this company has high ethical standards?
 Very low 1 2 3 4 5 6 7 8 9 10 Very high
- 7. Do you think that employee theft is tolerated by this company? Very much 1 2 3 4 5 6 7 8 9 10 Not at all
- 8. How likely is it that a person who is in the habit of stealing from employers would apply for a job with this company?

Very likely 1 2 3 4 5 6 7 8 9 10 Not likely at all

9. How likely is it that a person who is in the habit of stealing from employers would be hired by this company?

Not likely at all 1 2 3 4 5 6 7 8 9 10 Very likely

10. If an employee were to steal from this company, how likely is it that the employee would be caught?

Very likely 1 2 3 4 5 6 7 8 9 10 Not likely at all

11. Your age: _____ 12. Sex: M F

13. Are you now or have you ever been married? Yes No

14. Previous employment (check one):

I have never worked. I have worked in a retail store or restaurant. I have worked but never in a retail store or restaurant.

15. Have you ever had a polygraph examination? Yes No.

16. Briefly describe any polygraph experience you have had:

17. Have you ever had any type of honesty screening for a job?

If yes, what type?

18. Would you prefer to work at a place where all employees had been screened for honesty via a polygraph examination or other similar test? Yes No

Employee Attitudes

- 19. Under what circumstances would you be willing to take a polygraph examination in relation to a job?
 - Under any circumstances
 - _____ Under no circumstances
 - If I needed a job in a hurry and did not want to wait for a reference check
 - ____ If I had to be bonded or insured
 - ____ If I were handling large amounts of cash or dealing with valuable merchandise

References Cited

- Barland, G.H. (1981). A validation and reliability study of the counterintelligence screening test. Unpublished manuscript, Security Support Battalion, Military Intelligence Group, United States Army, Fort George Meade, MD.
- Belt, J.A. & Holden, P.B. (1978). Polygraph usage among major U.S. Corporations. Personnel Journal 52, 80-86.
- Clark, J.P. & Hollinger, R.C. (1981). Theft by employees in work organizations (Grant No. 79-NI-AX-0090). Minneapolis: University of Minnesota, Department of Psychology.
- Correa, E.I. & Adams, H.E. (1981). The validity of the pre-employment polygraph examination and the effects of motivation. <u>Polygraph 10</u>, 143-156.
- Saxe, L. (1983). Scientific validity of polygraph testing: A review and evaluation--A technical memorandum. Office of Technology Assessment, Congress of the United States. Reprinted in Polygraph 12, 198-319.
- Silverberg, B.A. (1980). Attitudes of job applicants and employees toward the polygraph. <u>Polygraph 9</u>, 162-169.
- White, L.T., Lopez, P.L., & Haney, C. (1982). To polygraph or not: The effects of pre-employment polygraphing on work-related attitudes. <u>Polygraph 11, 185-199</u>.

* * * * * *

DETECTION OF DECEPTION BY CONVENTIONAL QUALITATIVE METHOD AND ITS CONFIRMATION BY QUANTITATIVE METHOD AN EXPERIMENTAL STUDY IN POLYGRAPHY

Bу

A.K. Ganguly, Ph.D., S.K. Lahri, Ph.D. and Vinod Bhaseen, M.S.

Polygraph and its application in criminal investigation have caused mixed reactions both in the general public and legal experts. According to the opponents' view polygraph is offensive and lacks reliability. However, those in favor feel that the technique based on scientific principles, is reasonably accurate and renders useful help to verify the credibility of testimony given by a person (Arther, 1974; Abrams, 1973; Matte, 1980; Raskin, 1981; Smith, 1974; Block, 1977; and in India Lahri & Ganguly, 1978, 1981). As a result of diverse opinion particularly in the occident various researches have been undertaken in two distinct directions. On one hand to develop further either the accuracy of the instrument or new devices to record physiological changes during attempted deception, and on the other to develop new methods and procedures for conducting and interpreting the deception tests (Bami and Ganguly, 1974).

The main reason which has created maximum hinderance towards its acceptance is perhaps the qualitative nature of chart evaluation. Although there are studies which reported the application of some statistical methods to interpret the physiological responses (Cook, 1968; Matte, 1980; Backster, 1963; and Raskin, 1981), by and large, the approach has remained to be qualitative in nature.

In India, where application of polygraph in criminal investigation is gradually gaining momentum (Ganguly <u>et al.</u>, 1977 & Ganguly, 1983) it was felt that in this country as well, in due course the question of its accuracy would be raised to consider its admissibility in a Court of law. Incidentally, it may be mentioned here that drawing from a foreign source a news item in one of the leading newspapers in the country, <u>The Times of</u> <u>India</u> on 13th May 1984 categorically remarked that a Lie-Detector is only <u>a 20th Century witchcraft</u>. Thus it could be presumed that in India,

The authors are in the Central Forensic Science Laboratory, Central Bureau of Investigation, New Delhi. A.K. Ganguly holds a doctoral degree in Experimental Psychology. He is the Principal Scientific Officer, Central Forensic Science Laboratory, C.B.I., New Delhi. He has published and lectured widely on criminalistics. S.K. Lahri holds a doctoral degree in Psychology. He is associated with the Polygraph Division, Central Forensic Science Laboratory, C.B.I., New Delhi, India. He has been association with the C.B.I. since 1973 and is presently working as Senior Scientific Officer-II. He has published widely in Indian and foreign journals. Vinod Bhaseen holds a Masters degree in Criminology and Forensic Science from Sagar University. He is a Scientific Assistant in the Polygraph Division, C.B.I. and has been associated with the Division since August 1982.

Polygraph 1986, 15(3) ite to Dr. A.K. Ganguly.

Qualitative and Quantitative Analysis

sooner or later, legal experts would take up the issue to prove that the technique, particularly the chart interpretation, is unreliable and subjective in nature, therefore, opinion based on polygraph (Lie-Detector) examination should not be given credibility in a court of law. Studies so far conducted at the Central Forensic Science Laboratory, New Delhi based on conventional qualitative technique (Ganguly, 1982; Lahri and Ganguly, 1978, 1981; Lahri <u>et al.</u>, 1984), indicate accuracy of approximately 80-98%. Since quantitative analysis of polygraph charts can enhance the credibility of test results, it was felt that a study in that direction should be undertaken to counter negative criticism towards its admissibility. Accordingly, the present study was designed to probe whether application of a quantitative method could confirm the results obtained by conventional qualitative method.

METHODOLOGY

A sample of seventeen male volunteer subjects was chosen to be included in the study. Lafayette Polygraphs (Models 76058 & 761-69 G*C) were used. To obtain the data, instead of conventional method of card test developed by Reid and Inbau (1966; also see Lahri & Ganguly, 1978), a slightly modified form of card test was adopted, as detailed below.

The subject was given one blank piece of paper and instructed to keep that in his pocket after writing any number between 1 and 10 of his choice on it without divulging the same to the experimenter. Thereafter, he was given five more similar blank pieces of paper with instructions to write the chosen number on one and different numbers on the remaining four. Subject was instructed to shuffle these before returning them to the experimenter. It was explained that the experimenter will ask him one by one, "Have you written the number (___) on the piece of paper which is in your pocket?" He was instructed to reply in the negative in respect of all the numbers thus giving a wrong reply intentionally in one case only. For convenience of recording on the running chart the numbers written by each subject were serialized from 1 to 5.

To evaluate the charts only pneumo and blood pressure tracings were considered. Keeing in view the aim of the study for qualitative analysis the charts were evaluated by following the conventional deception criterion (Table I). For quantitative analysis, the amplitude of pneumo and cardio tracings from one point of stimulation to the next were measured. In pneumo the exhilation tracings, and in cardio the diastolic tracings were measured for computing the mean value (Tables II & III).

RESULT

From Table I it may be seen that following the conventional qualitative method of diagnosis the accuracy is 76.00% (N=17). This is close to the figure of 80% reported earlier (Lahri & Ganguly, 1978) on volunteer subjects by following the similar qualitative method, although in respect of field cases accuracy has been reported to the tune of 90-98% (Ganguly, 1982; Lahri and Ganguly, 1981; and Lahri <u>et al</u>., 1984). In pneumo (Table II) it may be seen that in respect to S. Nos. 2, 3, 4, 5, 6, 10, 12, 13, & 15 either the lowest or the highest mean value coincide with the actual number where deception was attempted by the subject. Whereas in respect **Polygraph 1986**, 15(3)

Ganguly, Lahri and Bhaseen

of S. Nos. 1, 7, 8, 9, 11, 14, 16, & 17 either highest or lowest mean value does not coincide with the deceptive number or there are more than one highest or lowest mean value in respect of the same subject on the basis of which definite inference can not be drawn. Thus adopting the criterion of lowest or highest mean value which is a quantitative method confirmation of result by following qualitative method is possible to the extent of only 52% (N=17). Following the same procedure in cardio (Table III) confirmation is possible to the extent of only 40\% (N=15).

CONCLUSIONS

Results indicate that while the quantitative confirmatory test in respect of penumo tracings is little more than 50%, with regard to cardio it is only 40%. On the basis of above return it is difficult to conclude that the quantitative confirmatory test would be able to ascertain beyond doubt the deception diagnosed by conventional qualitative method. However, the results are indicative of the possibility that along with conventional method, if quantitative confirmatory test is also applied, at least in respect of pneumo tracings, an examiner can have a second criterion to authenticate his findings. In fact, due to small sample consisting of volunteer subjects the accuracy rate in the present study is perhaps low. In case the method is applied in a field case the response to a relevant question may show more distinct variations when compared with the irrelevant and controls of the same test run. Accordingly, to arrive at a better and more acceptable conclusion it is imperative that a similar study on a larger sample be undertaken and compared with the same number of field cases where follow-up results are available.

Following the above, therefore, a programme in this direction is being contemplated. Present authors are convinced that the results of the forthcoming study should be interesting both from academic as well as applied angle.

TABLE I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
3	4	4	3	4	3	4	4	4	5	3	1	3	1	5	4	3
				• •		-										
3	4	4	3	4	3	3	1	2	5	3	1	3	5	5	4	3
	1 3 3	1 2 3 4 3 4	1 2 3 3 4 4 3 4 4	1 2 3 4 3 4 4 3 3 4 4 3	1 2 3 4 5 3 4 4 3 4 3 4 4 3 4	1 2 3 4 5 6 3 4 4 3 4 3 3 4 4 3 4 3	1 2 3 4 5 6 7 3 4 4 3 4 3 4 3 4 4 3 4 3 4	1 2 3 4 5 6 7 8 3 4 4 3 4 3 4 4 3 4 4 3 4 3 4 4	1 2 3 4 5 6 7 8 9 3 4 4 3 4 3 4 4 4 3 4 4 3 4 3 4 4 4 3 4 4 3 4 3 3 1 2	1 2 3 4 5 6 7 8 9 10 3 4 4 3 4 3 4 4 4 5 3 4 4 3 4 3 4 4 4 5 3 4 4 3 4 3 3 1 2 5	1 2 3 4 5 6 7 8 9 10 11 3 4 4 3 4 3 4 4 4 5 3 3 4 4 3 4 3 4 4 4 5 3 3 4 4 3 4 3 3 1 2 5 3	1 2 3 4 5 6 7 8 9 10 11 12 3 4 4 3 4 3 4 4 4 5 3 1 3 4 4 3 4 3 1 2 5 3 1	1 2 3 4 5 6 7 8 9 10 11 12 13 3 4 4 3 4 3 4 4 4 5 3 1 3 3 4 4 3 4 3 4 4 4 5 3 1 3 3 4 4 3 4 3 3 1 2 5 3 1 3	1 2 3 4 5 6 7 8 9 10 11 12 13 14 3 4 4 3 4 3 4 4 4 5 3 1 3 1 3 4 4 3 4 3 4 4 4 5 3 1 3 1 3 4 4 3 4 3 3 1 2 5 3 1 3 5	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 3 4 4 3 4 3 4 4 4 5 3 1 3 14 15 3 4 4 3 4 3 4 4 4 5 3 1 3 1 5 3 4 4 3 4 3 1 2 5 3 1 3 5 5	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 3 4 4 3 4 4 4 4 5 3 1 3 14 15 16 3 4 4 3 4 4 4 4 5 3 1 3 1 5 4 3 4 4 3 4 3 1 2 5 3 1 3 5 5 4

Detection of Deception by Following Conventional Qualitative Method

	Distribution of Judgement	
1.	Correct diagnosis of attempted deception	13(76%)
2.	Wrong diagnosis of attempted deception	4(24%)

Qualitative and Quantitative Analysis

						TAE	BLE B	[]					
Mean	Value	of	Pneumo	Ĩra	cings	and	Its	Applicati	ion	for	Confi	irmation	of
	Results	a Ot	otained	Вy	Follow	ring	Conv	ventional	Qua	lit	ative	Method	

1		2				3	4
S. No. of subject	<u>Mean v</u> 1	<u>alue in</u> 2	regard 3	of car 4	<u>d Nos.</u> 5	No chosen by the subj.	Diagnosis by conventional qualitative method
1	0,766	0.791	0.725	0.725	0.800	3	3
2	1.783	1.772	1.700	1.533	2.818	4	4
3	0.720	0.880	0.780	0.710	0.840	4	4
4	0.833	0.980	0.985	0.940	0.900	3	3
5	1.033	1.175	0.940	0.700	0.866	4	4
6	1.170	1.200	1.111	1.237	1.266	3	3
7	0.958	0.863	0.841	0.816	0.883	4	3
8	1.581	1.566	1.441	1.625	1.575	4	1
9	0.600	0.600	0.570	0.660	0,566	4	2
10	1.162	1.114	1.185	1.200	1.257	5	5
11	0.670	0.730	0.670	0.730	0.730	3	3
12	0.762	0.885	0.862	0.800	0,800	1	1
13	0.788	0.870	0.937	0.860	0.860	3	3
14	0.950	0.116	0.117	0.900	1.160	1	5
15	1.120	1.163	1.170	1.600	1.100	5	5
16	0.575	0,580	0.540	0.540	0.607	4	4
17	0.627	0.642	0.640	0.650	0.625	3	3

Distribution of judgement:

i) Confirmation of result by quantitative method - 9 - 52%
 ii) No confirmation of result by quantitative method - 8 - 48%
 Polygraph 1986, 15(3)

Ganguly, Lahri and Bhaseen

TABLE II Mean Value of Pneumo Tracings and Its Application for Confirmation of Results Obtained By Following Conventional Qualitative Method

1	5		6
S. No. of subject	Obtained highest o mean value (Figure sis indicating the card No.)	r lowest in parenthe- respective	Confirmation of detection of deception by qualitative method (Col. No. 4 on the basis of Highest/Lowest mean value (Col. 5)
	Highest	Lowest	
1	0.800 (5)	0.725(3) 0.725(4)	No confirmation
2	2.818 (5)	1.533 (4)	Confirmed
3	0.880 (2)	0.710 (4)	Confirmed
4	0.985 (3)	0.833 (1)	Confirmed
5	1.175 (2)	0.700 (4)	Confirmed
6	1.266 (5)	1.111 (3)	Confirmed
7	0.958 (1)	0.816 (4)	No confirmation
8	1.625 (4)	1.441 (3)	No confirmation
9	0.660 (4)	0.566 (5)	No confirmation
10	1.257 (5)	1.114 (2)	Confirmed
11	0.730 (2,4,5)	0.670 (1,3)	No confirmation
12	0.885 (2)	0.762 (1)	Confirmed
13	0.937 (3)	0.788 (1)	Confirmed
14	1.160 (5)	0.116 (2)	No confirmation
15	1.600 (4)	1.100 (5)	Confirmed
16	0.607 (5)	0.540 (3,4)	No confirmation
17	0.650 (4)	0.625 (5)	No confirmation

Qualitative and Quantitative Analysis

T.	A	8	L	E	I	I	I
----	---	---	---	---	---	---	---

Mean Value of Cardio Tracings and Its Application for Confirmation of Results Obtained By Following Conventional Qualitative Method

1		2				3	4
S. No. of	Mean v	alue in	regard	of car	d Nos.	No chosen	Diagnosis by
subject	1	2	3	4	5	by the subj.	conventional qualitative method
1	1.010	0.840	0.820	0,930	0.890	3	3
2	1.100	1.780	0.990	0.830	1.110	4	4
3	-	-	-	-	-	-	-
4	0.410	0.290	0.360	0.190	0.370	3	3
5	1.000	0.970	1.100	1.300	1.200	4	4
6	0.830	0.920	0.930	1.000	0.810	3	3
7	1.100	0.930	1.000	1.000	1,100	4	3
8	0.910	0.950	0.940	1.130	1.200	4	1
9	0.910	0.860	0.760	0.870	0.830	4	2
10	-	-	-	-	-	-	-
11	1.100	1.200	1.500	1.100	1.400	3	3
12	0.500	0.530	0.510	0.480	0.500	1	1
13	1.100	1.100	1.200	1.100	1.100	3	3
14	0.710	0.690	0.690	0.780	0,700	1	5
15	0.760	0.740	0.730	0.680	0.700	5	5
16	0.750	0.750	0.800	0.840	0.830	4	4
17	0.960	1.000	0.950	1.000	0.940	3	3

Distribution of judgement:

i) Confirmation of result by quantitative method - 6 - 40%
 ii) No confirmation of result by quantitative method - 9 - 60%

Ganguly, Lahri and Bhaseen

TABLE III

Mean Value of Cardio Tracings and Its Application for Confirmation of Results Obtained By Following Conventional Qualitative Method

1	5		6
S. No. of subject	Obtained highest mean value (Figure sis indicating the card No.)	or lowest e in parenthe- e respective	Confirmation of detection of deception by qualitative method (Col. No. 4 on the basis of Highest/Lowest mean value (Col. 5)
	Highest	Lowest	
1	1.010 (1)	0.820 (3)	Confirmed
2	1.780 (2)	0.830 (4)	Confirmed
3	-	-	-
4	0.410 (1)	0.190 (4)	No confirmation
5	1.300 (4)	0.970 (2)	Confirmed
6	1.000 (4)	0.810 (5)	No confirmation
7	1.100 (1)	0.930 (2)	No confirmation
8	1.100 (5)		
9	0.910 (1)	0.910(1) 0.760(3)	No confirmation No confirmation
10	-	-	-
11	1.500 (3)	1.100 (1) 1.100 (4)	Confirmed
12	0.530 (2)	0.480 (4)	No confirmation
13	1.200 (3)	1.100(1,4)	Confirmed
14	0.780 (4)	0.690 (2)	No confirmation
15	0.760 (1)	0.680 (4)	No confirmation
16	0.840 (4)	0.750(1)	Confirmed
17	1.000 (2) 1.000 (4)	0.940 (5)	No confirmation

Polygraph 1986, 15(3)

Qualitative and Quantitative Analysis

References <u>Cited</u>:

- Abrams, S. Polygraph Validity & Reliability. <u>Journal of Forensic Science</u> 18(1973): 313-326.
- Arther, R.C. Testimony before the Subcommittee of the Committee on Government Operations of the House of Representatives, U.S.A. (1974).
- Backster, C. Zone Comparison Technique. <u>Standardized Polygraph Notebook</u> & <u>Technique Guide</u>, 1963.
- Bami, H.L. & Ganguly, A.K. Polygraph (Lie Detector) Its Applications and Legal Status. CBI Bulletin 8(5)(1974): 1-8.
- Block, E.B. Lig-Detectors; Their History and Use, 1977, pp. 187-193.
- Cook, R.E. Truth, Statistics and the Polygraph. Police 12(1968): 36-41.
- Ganguly, A.K., Lahri, S.K. & Bami, H.L. Polygraph (Lie-Detector) Its Application in the Investigation of Crime in India. <u>CBI</u> <u>Bulletin</u> 9(1977): 1-6.
- Ganguly, A.K. Application of Polygraph in India. <u>Indian Journal of Crime</u> and <u>Criminalistics</u> II(1)(March 1981).
- Ganguly, A.K. Polygraph (Lie-Detector) and its Legal Admissibility. <u>Indian Journal of Crime and Criminalistics</u> III(3 & 4)(July-October 1983).
- Lahri, S.K. & Ganguly, A.K. An Experimental Study of the Accuracy of Polygraph Technique in Diagnosis of Deception With Volunteer and Criminal Subjects. Polygraph 7(2)(1978): 89-94.
- Lahri, S.K. & Ganguly, A.K. Polygraph (Lie-Detector) Its Application and Success in Crminal Investigation Connected With Homicide. <u>Police</u> <u>Research and Development</u> (Jan-Mar 1981).
- Lahri, S.K., Ganguly, A.K., Bhaseen, V. & Sehgal, V.N. Accuracy of Polygraph Technique on Female Indian Population. <u>Indian Police Journal</u> XXXI(1)(Jan-March 1984).
- Matte, J.A. <u>The Art and Science of Polygraph Technique</u>. Illinois: Charles C. Thomas, 1980.
- Raskin, D.C. The Scientific Basis of Polygraph Techniques and Their Use in the Judicial Process. <u>Proceedings of the Stockholm Symposium on</u> <u>Witness Psychology</u>, 1981.
- Reid, J.E. & Inbau, F.E. <u>Truth and Deception</u>. Baltimore, Maryland: Williams & Wilkins, 1966.

Smith, R.E. Testified Before the Sub-Committee of the Committee on Government Operations of the House of Representatives, U.S.A., 1974.

Bу

Bryan Tully, Ph.D.

This article details the foundation of "special care questioning" techniques which are being developed by the Psychology Unit of the Royal Hong Kong Police Force. Although a good deal of the referenced work has been conducted in European countries, it may be familiar to American readers.

The testimony to which we refer is that of witnesses, including that of victims, and in special cases, cooperative suspects. The latter have been identified as examples of "memory distrust syndrome", <u>i.e.</u>, where an individual cannot remember clearly whether he committed a crime, considers there is a good chance he did so, and makes a false confession on that basis.[1] Such individuals can be considered witnesses to their own behavior.

In general, however, precariously accesible testimonial memories may pose problems in cases involving children, the mentally impaired, emotionally traumatized victims, and normal adults whose original memories of a particular incident are just not clear. This latter group may be candidates for examination with forensic hypnosis. The term "precarious," used in this context, refers to the fact that the way the individual is managed, and the manner in which his or her memory is examined by questioning, has a significant effect on the hazard of testimonial error and fabrication.

Suggestibility

At one time, the above-mentioned categories of individuals had been considered defective or untrustworthy as witnesses because they were more "suggestible" than other people. This concept of "suggestibility" as an unreliable attribute of certain persons is worth examining. Henry Abraham found there was some association between people's suggestibility on tests of sensory changes and their willingness to change their opinion by persuasion, but this association was very low.[2] Frederick Evans conducted a more thorough and extensive review and concluded there were at least three components to the general phenomenon of suggestibility--an ideometer component (responsiveness to suggestions as to how parts of the body will move), inability to overcome challenge ($\underline{i} \cdot \underline{e} \cdot$, to be unable to move a part of the body), and an imagery sensory component (responsiveness to suggestions of feelings through the senses).[3] Individuals who scored high on one component did not necessarily do so on another.

The author is the Senior Force Clinical Psychologist with the Royal Hong Kong Police Headquarters, Arsenal Street, Hong Kong. The article was previously published in the November 1985 <u>FBI Law Enforcement Bulletin</u> and is reprinted with permission of the author, and Thomas J. Deakin, Editor of the <u>Bulletin</u>.

Recently, however, a scale has been developed in order to assess specifically the suggestible effects of questions on a person's uncertain recollections. This has been produced by Dr. Gisli Gudjonsson, a clinical psychologist at the Institute of Psychiatry in London who has worked with the Icelandic police.[4] The scale involves a subject attempting to remember a spoken passage concerning a crime. The subject is then questioned and the degree to which he or she is influenced by the suggestible nature of the questions provides a "yield" score. The subject is then put under mild pressure to do better, and the questions are repeated. The extent to which a subject changes responses provides a "shift" score. In his studies, Gudjonsson found that higher scores of "interrogative suggestibility" were related to lower intelligence, worse memory, lower selfesteem in relation to the questioner, and to a lesser extent, neuroticism.[5] A British psychologist, Noel Sheehy, has discussed motivational sources of error in reports of accidents given by adults and children.[6] "Good" witnesses believe they have provided accounts in a concise, wellstructured fashion. Where their competence or integrity seems under test, there is a tendency to avoid appearing foolish or unobservant. In these circumstnaces, the accounts they give under questioning may "bear only a superficial resemblance to the multiplicity of spontaneous events which contributed to the accident."

Testimony of Children

Since the turn of the century, commentators in the United States and Europe have assumed that children were more suggestible than adults. However, a recent major review by Elizabeth Loftus and Graham Davies indicates the truth is not so straightforward.[7] First of all, younger children's memories are not as detailed as older persons with the same learning opportunity, and therefore, contain less inaccuracies. However, insofar as a memory is poorer, it becomes more precarious to the manner of questioning if children are involved in crimes, they may be questioned repeatedly by authoritative adults, some of whom may be none too careful about strong prejudicial forms of inquisition. Where a young child's original memory is very adequate because of the nature and extent of experience, this age-related power of recall and precariousness can be overcome.

Another contrary effect has been identified by Loftus and Davies and that is memory is strongly affected by what is already known. With age and intellectual development, memory "encoding" becomes more sophisticated, as does rehearsal and the organization of memory. At the same time, this increased integrative power can result in generating inferences that go beyond what has explicitly been observed. In the case of accidents, Sheehy has pointed out that children can sometimes be more accurate when questioned, because they don't fill in "what must have happened," owing to their naiveness in this respect. In assessing how good a child's memory is, factors other than age and involvement in the original incident are important, including the extent of the child's interest and understanding of what was going on and how relevant it all was to the child.

Two English psychologists, Helen Dent and Geoffrey Stevenson, have found there are demonstrable differences in the skills of good police interviewers, as compared with those who tend to elicit erroneous

Bryan Tully, Ph.D.

recollections.[8] Allowing children to give "free recall," \underline{i} .e., an account of the incident in their own words, without questions, provided the However, such accounts could lack completeness. fewest inaccuracies. Interviewers who formed strong impressions of how an incident probably happened and asked for detailed descriptions (of people or things) in answer to specific questions, tended to elicit many inaccuracies. These same "minimally prompting questions" could, however, enhance narrative reports about what happened. In the case of younger and more mentally deficient children, there is an exception. They may lack organization in memory and may have to be upheld by organizing questions. For example, if a person is reading a list of creatures, he or she will place them in groups of birds, fish, mammals, and so on, regardless of the original order on the list. A young, mentally deficient child lacking the active organizational principle of "associative clustering" could be helped by questions such as "Can you remember any other birds?"

Although children's use of language to give an account may be less sophisticated than adults, for any given extent of recollection, there is no consistent evidence that children are hypersuggestible compared with adults. Marin and his co-workers found in a study of photo lineups that children performed as well as adults.[9] Concluding a review of mainly American studies in this area, Goodman and Michelli stated: "... children can be excellent witnesses--if conditions in the courtroom are as supportive as those in the laboratory, if parents do not impose their own views on their children's statements, and if lawyers do not ask them leading questions on the stand."[10]

Sex Crimes Against Children

Conviction rates for sex crimes against children are notoriously low worldwide. Frequently, cases are not even brought to trial because the court, prosecutor, or law enforcement officer does not consider the child's testimony to be credible, a conclusion that is often unjustified.

Many of the conditions already discussed will be present, which make for robust testimony. A child will have been involved over a period of time with the offender. Since the stages of luring, the use of threats or inducements, the assaults themselves, and the steps taken afterwards to minimize disclosure will have taken time, the child is likely to have paid the fullest attention. And in cases of sexual abuse, there may have been repeated incidents.

There are, nevertheless, some special hazards to questioning in these circumstances. The tendency to provide "socially desirable" responses has an added importance here. Many young persons believe that they were to some extent the blame for allowing themselves to be lured by a predator. They may have been in a forbidden place, or should have been elsewhere and were disobeying instructions. They may have agreed to initial suggestions and are now afraid to say so. Or, they may employ a fabrication just to avoid disclosure. Two cases which have come to my attention in Hong Kong illustrate this. In one case, the police arrested some young men for abducting and raping a 14-year-old girl. Her mother proclaimed there was no way her daughter would get involved in this sort of thing willingly, and so she must have been raped. In the presence of her mother, the girl duly provided a detailed statement of abduction and rape, being "helped" by the interviewing officer. In truth, because of her mother's strictness, the girl had run away, sought refuge, and engaged in sexual intercourse with full consent, as she had done 6 months previously. In another case, a little girl was lured away from her playmates and raped. Her 12-year-old sister, questioned with her mother present, stated that she had turned around and saw her sister getting into a bus with a stranger. She said this to avoid censure from mother that she should have kept better watch of her little sister. The older girl's story wasted a great deal of detectives' time, as they sought the bus and passengers. Some police departments exclude parents as a matter of course from these kind of interviews.[11] Whatever the policy of individual police agencies, examining officers should recognize these hazards and control them accordingly.

The most substantial work which has been done to develop methods of interviewing and evaluating the testimony of victims of sexual abuse has come from Professor Udo Undeutsch of the University of Cologne, Federal Republic of Germany, and Professor Arne Trankell, head of the Laboratory of Witness Psychology at the University of Stockholm, Sweden. For several decades they have studied and testified on thousands of cases, and their systems are similar.[12]

Undeutsch's approach is to solicit testimony in a particularly careful manner, being aware of the issues considered so far in this article. The account has to fit the "cognitive" abilities of the informant with respect to perception, understanding, and powers of recollection. Undeutsch tests the veracity of the text of the testimony, rather than judging the overall truthfulness of the informant. Individuals with reputations for telling the truth may have the most to gain from careful lying!

The most important criteria applied by Undeutsch concern how the testimony develops over several interviews. Language and manner of delivery are noted, and the content of the statement is examined for particular detail. Tests for personal originality in expression and coherence are also applied. Some specific and unusual aspects of criminal-victim relationship are sought. Spontaneous accounts of the context and impact of the crime on the individual's life are examined for veracity. How complications in the execution of the crime, emotional reactions, and spontaneous corrections of getting the order of events mixed up (indicating truth-telling rather than fabrication) are recounted, constituting the chief basis of this kind of assessment.

Undeutsch has been involved in over 1,500 cases over 30 years. Where his findings indicate veracity, the West German courts convict 9 times out of 10. There has not been a single case where such a finding has been overturned when it concurs with his assessment.

These assessment techniques have been developed in some countries because their judicial systems have been more supportive of having experts advise the courts. Some European courts are inquisitional rather than completely adversarial, as in the Anglo-American system. The judiciary and jurors may share a bench and conduct their own factfinding. Legal codes reflecting the proper use of this expertise exist in the Federal Republic of Germany, Austria, Switzerland, the German Democratic Republic, and Sweden.

The Mildly Mentally Handicapped

In the United Kingdom over the past decade, there have been a number of highly publicized cases where individuals of limited mental ability have been convicted of very serious crimes, primarily on the basis of their confessions. Subsequently, these convictions have been overturned and the confessions shown to be "unreliable." Two researchers, Brandon and Davies, reviewing overturned convictions state simply: "One striking fact which has emerged from cases of people whose convictions have been quashed, or who have [been] pardoned after having been convicted largely on the basis of their own confessions or statements, is how many of them are inadequate."[13] This cause of concern about possible miscarriages of justice was considered by a royal commission on criminal procedure, which reported in 1982. It was noted that the British Home Office advises police to exercise "special care" when questioning mentally handicapped people. What "special care" meant has never been elaborated.

A mentally handicapped person can be a victim-witness. In 1981, Dr. Gisli Gudjonsson and Dr. John Gunn of the Institute of Psychiatry in London established a precedent by presenting a kind of experimental evidence for the first time to the Central Criminal Court (Old Bailey), London.[14] A young woman, legally defined as "mentally subnormal," had allegedly been sexually assaulted by a group of six young men and women at a party. The questions to be considered were whether the victim remembered what occurred and was she competent to distinguish genuine recollection from suggested creations. Like children, the mentally handicapped were believed to be highly suggestible, and hence, unreliable. Gisli Gudjonsson conducted a variety of clinical tests and arranged for various people to bring items to his room. On a later occasion, he suggested to this woman that various events had happened, and when she acquiesed (as indeed she did even to false suggestions), he was able to persuade her that she was mistaken. At the same time, when she had a recollection grounded in real experience, she was unmovable. This differential suggestibility effect was described to the jury, who were thus assisted to assess her performance under gentle but thorough cross-examination.

Once again, suggestibility turned out not to be such a simple "trait" as one might have thought. In fact, the interactional nature of influential questions and other task demands have been clarified by the work of Zigler and his associates over many years.[15] First of all, those handicapped subjects who have suffered relatively greater social deprivation tend to prolong interaction with supportive adults by overpersistence in highly learned or stereotypically rigid behavior. This may be elaborated arbitrarily. Other subjects who experience negative and anxiety reactions with authority figures may seek to provide quickly what the authority figures seems to want, and therefore, bring the encounter to a close. If a handicapped person lives in a social world where his or her shortcomings are continuously manifest and personal solutions are experienced as poor, then that individual is more likely to rely on cues from others as to the "appropriate" way to make a response.

In order to clarify further the effects of police questioning style on the accuracy of mentally handicapped people's testimony, the newly established U.K. Police Foundation funded an experimental study in 1981, conducted by the author and an associate research worker.[16] We were interested in the mildly mentally handicapped, an "at risk" group for the problems we are discussing. These people live in the community, do simple work, and their "handicap" is neither blatant nor obvious. Basically, we are referring to people in the I.Q. range of 70 to 85. They represent about 12 percent of the population.

Our research subjects and average I.Q. "controls" observed an incident and were later questioned by police at London's Metropolitan Police Training Establishment. Gisli Gudjonsson's suggestibility scale was administered and susceptibility to suggestion was primarily related to the individuals' ability to remember and their general intelligence. The willingness of subjects to revalue their confidence after being told they had to try again showed no special pattern at all. Indeed, the confidence proclaimed for any memory was no guide whatsoever to its likelihood of being correct. Average I.Q. subjects remembered better, but the number of inaccuracies was only partly predictable from this and "suggestibility" Errors were mostly generated through an interaction of memory scores. weakness and the kinds of questioning certain police interviewers adopted. Fluency and confidence in demeanor frequently seduced interviewers into overestimating the reliability of the information they received. This, in turn, undermined the various cautions and inhibitions they knew they should apply to known vulnerable witnesses. An active search for a plausible version of events through detailed cross-examination resulted in "flows" of error. Various forms of interview "driving" were noted.

We found 16 categories of error-producing question sequences. Included among these were overriding or upgrading inarticulate or ambiguous responses, erroneous compromise descriptions offered by the interviewers, offers of alternative answers by the interviewer (a particularly damaging form of question for precarious memories), eliciting a string of "don't knows" until the witness finally offers an erroneous guess, and ignoring an inconvenient or belated fragment qualification to an already-given coherent statement. Notwithstanding all this, there was good examinable memory available. Our less bright subjects remembered about three-quarters as much as our average control subjects.

Eye Witness Testimony

The fact that normal eye witnesses can make serious errors in perception, judgment, and recollection is now well-documented.[17] Elizabeth Loftus is noted for her classic studies of how false information embedded in questions to an eye witness can be incorporated into the subject's memory, and in subsequent questioning, may be produced as if it were part of the original recall,[18] depending on the information and circumstances. Determining the parameters of the "Loftus effect" is the subject of recent research,[19] although it is not certain if this "updating" is irrevocable or whether it is still possible to return to the original memory after the Loftus effect has occurred.[20] The point to be considered here is that precariously accessible memories may vary estensively in anyone, depending on the circumstance. The hazards of their examination are not restricted to immature or mentally impaired persons.

Forensic Hypnosis

Normal witnesses whose memory of a particular incident is weak, but from whom the need for recollection is very important, may be candidates for forensic hypnosis. The hazards to these precariously accessible memories from the hypnotic procedures are controversial. Proponents of forensic hypnosis insist they regularly obtain useful and verifiable information which was not previously produced.[21] At the same time, the more strictly and carefully experimental psychologists control their studies, the more difficult it is to show that hypnotic induction per se enhances recall.[22] How can these apparently contradictory findings be explained?

A possible answer lies in what forensic hypnotists actually do apart from inducing hypnosis. Martin Reiser teaches that the setting for the interview should be free from noise and distractions. The subject's comfort and relaxation is attended to meticulously, and the interviewer consciously adopts an appropriate social distance, posture, and nonjudgmental stance. There is a good deal of preparation. The purpose and nature of the interview is explained, allaying fears and building rapport.

During the hypnotic interview, Reiser recommends gathering an uninterrupted narrative before asking specific questions. Extreme care is taken not to use suggestion or hints of coercion. The subject has time to respond, and the interview is conducted as much as possible in the vernacular of the subject. Certain ploys may be used, such as reinstating the scene of the crime in imagery, and the witness may be guided through the course of re-imagined events.

Almost all these factors might be expected to assist in recovering precariously accessible memories without invoking hypnotic effects. Simply preparing a subject for recall accuracy can sharpen their discrimination between what is true and false in their recollections, and carefully guided imagery procedures can enhance recall.[23] One group of researchers based at UCLA has devised a "cognitive interview" for normal eyewitnesses.[24] They developed a set of maneuvers for searching memory based on certain principles of contemporary memory theory, which included reinstating the original context and guided imagery through time, various perspectives, and looking at the sequence of events in different orders. They reported enhanced recall without undue error increase, at least for relatively well-remembered material. It is possible to develop special care questioning practices whihe make use of these effective variables and to dispense with the one component which is not only unproven experimentally but is dubious judicially.

Special Care Questioning

The development of principles of special care questioning at the Psychology Unit of Royal Hong Kong Police Force can be viewed as deriving from a synthesis of the experimental psychology of human memory, the developmental psychology of childhood or mental immaturity, and the social psychology of the interview. In concept and application, special care questioning respects and takes account of the vagaries of human memory and the effects of various styles of questioning. Thus, in comparison with

Special Care Questioning

forensic hypnosis for example, it constitutes the best safeguards against damaging the veracity of testimony. Instead of being left as a last resort because of judicial doubts, it can be used as a first option of choice; taking "special care" is judicially commendable. Obtaining valid testimony is optimized when the techniques are used as soon as possible, while unwitting error production is minimized. This is just the opposite to "last resort" forensic hypnosis.

The essence of special care questioning lies in the assessment and preparation of the subject. Comfort, relaxation, establishing rapport, setting appropriate attitudes for accuracy, and dealing with fears, doubts, and misleading expectations on the part of the interviewer and subject are all part of this initial preparation. In the case of emotionally traumatized victims, the investigator must know how to deal with the victim's doubts about being questioned and about issues of shame, insensitivity, and defensiveness. If the emotional needs of the victim-witness are met, then the interview is likely to produce better quality information and a higher degree of subsequent cooperation between the victim and the criminal justice system.

The initial preparation sessions allow the investigator to assess the style and idiosyncrasies of the subject. What is his or her typical demeanor? Is it necessary to calm an initial acute phase of nervousness? In talking about the subject's background, an interviewer can get an idea of how well the individual seems able to grasp and reproduce accounts of his life appropriate with age and status. The tendency to be indiscriminating in confidence about what the subject knows and doesn't really know should be noted. Where precariously accessible memories are being examined and confidence is expressed indiscriminately, the investigator should check his tendency to ask "Are you sure?" In these cases, acquiescent "yes" responses are likely to be elicited, so the question becomes redundant, and the next time the subject is examined he may "remember" how sure he was regarding this item.

There is overwhelming wisdom in collecting a free narrative account without probing questions. This may be the least inaccurate of all statements. Such an account on a later occasion or elicited by a different interviewer may well result in a few extra details. These accounts provide forensic investigators with the best clues as to the subject's linguistic competence and how the amount and detail of recall compares with other individuals of like age and status. Where a child provides consistently poor "free narrative" accounts, and then proceeds to give an answer to most every question, there is cause to be wary.

During the interview, the questioner needs to be aware of all the potential hazards there are in questioning subjects with precariously accessible memories. Some means of monitoring the interview should be established. The various memory enhancement techniques discussed, guided fantasy, reinstatement of context, etc., can be used by those with proven ability to do so.

Footnotes

[1] G. Gudjonsson and J.A. MacKeith. "False Confessions Psychological

Effects of Interrogation. A Discussion Paper." in <u>Reconstructing the</u> <u>Past: The Role of Psychologists in Criminal Trials</u>, ed. A. Trankell (Stockholm, Sweden: P.A. Norstedt & Soners Forlag, 1982).

[2] Henry Abraham. "The Suggestible Personality: A Psychological Investigation of Suspectibility to Persuasion." <u>Acta Psychologica</u>, vol. 20, 1962, pp. 167-184.

[3] F. Evans. "Suggestibility in the Normal Waking State." <u>Psycho-logical Review</u>, vol. 67, No. 2, 1967, pp. 114-129.

[4] G. Gudjonsson. "A New Scale of Interrogative Suggestibility." <u>Personality</u> and Individual Differences, vol. 5, 1984, pp. 303-314.

[5] G. Gudjonsson. "Suggestibility, Intelligence, Memory, Recall, and Personality, An Experimental Study." <u>British Journal of Psychiatry</u>, vol. 142, 1983, pp. 35-37; "Interrogative Suggestibility and its Relationship with Self-Esteem and Control." <u>Journal of the Forensic Science Society</u>, vol. 24, 1984, pp. 99-110.

[6] N. Sheehy. "The Child as Witness." Unpublished manuscript, 1983. University of Wales Institute of Science and Technology.

[7] E. Loftus and G. Davies. "Distortions in Children's Memory." Unpublished manuscript.

[8] H. Dent and G. Stevenson. "An Experimental Study of the Effectiveness and Different Techniques of Questioning Child Witnesses." <u>Bri-</u> <u>tish Journal of Social and Clinical Psychology</u>, vol. 18, 1979, pp. 41-51.

[9] B. Marin, <u>et al</u>. "The Potential of Children as Eyewitnesses." Law and Human Behavior, vol. 3, 1979, pp. 295-305.

[10] G. Goodman and J. Michelli. "Would You Believe a Child Witness?" Psychology Today, November 1981, pp. 82-95.

[11] N.H. White, Child Abuse Unit, Houston, Texas Police Department, personal communication.

[12] Udo Undeutsch. "Statement Reality Analysis," in <u>Reconstructing</u> <u>the Past: The Role of Psychologists in Criminal Trials</u>, ed. A. Trankell (Stockholm, Sweden: P.A. Norstedt and Soners, 1982); Arne Trankell. <u>Re-</u> <u>liability of Evidence</u>. (Stockholm, Sweden: Rotobeckman, 1972).

[13] R. Brandon and C. Davies. <u>Wrongful Imprisonment</u>. (London: Allen & Unwin, 1973).

[14] G. Gudjonsson and J. Gunn. "The Competence and Reliability of a Witness in a Criminal Court. A Case Report." <u>British Journal of Psychia-</u> try, vol. 141, 1982, pp. 624-627.

[15] E. Zigler and D. Balla. <u>Mental Retardation</u>: <u>The Development-Dif</u>ference Controversy. (New Jersey: Lawrence Erlbaum Associations, 1982). [16] B. Tully and D. Cahill. <u>Police Interviewing of the Mentally</u> <u>Handicapped</u>: <u>An Experimental Study</u>. (London: The Police Foundation, 1984).

[17] B. Cliford and R. Bull. <u>The Psychology of Person Identification</u>. (London: Routledge and Kegan Paul, 1978); J. Shepherd, H. Ellis, and G. Davies, <u>Identification Evidence</u>, (1982).

[18] E. Loftus. <u>Eyewitness Testimony</u>. (Cambridge, MA: Harvard University Press, 1979).

[19] A.P. Yarmely. <u>The Psychology of Eyewitness Testimony</u>. (New York: The Free Press, 1979); S. Lloyd-Bostock and Brian Clifford, eds. <u>Evaluating Witness Evidence</u>. (New York: Wiley & Sons, 1983).

[20] J. Bowers and D. Bekerian. "When Will Post-Event Information Distort Eyewitness Testimony?" <u>Journal of Applied Psychology</u>, 1983.

[21] M. Reiser. <u>Handbook of Investigative Hypnosis</u>. (Los Angeles, CA: LEHI Publishing Co., 1980); R. Ault. "Hypnosis: The FBI's Team Approach." <u>FBI Law Enforcement Bulletin</u>, vol. 49, No. 1, January 1980, pp. 5-8.

[22] G. Wagstaff and C. Maguire. "An Experimental Study of Hypnosis, Guided Memory, and Witness Memory." Journal of the Forensic Science Society, vol. 23, 1983, pp. 73-78; F. DePiano and H. Salzberg. "Hypnosis as an Aid to Recall of Meaningful Information Presented Under Three Types of Arousal." International Journal of Clinical and Experimental Hypnosis, vol. 29, 1981, pp. 383-400.

[23] S. Moeser. "The Effects of Accuracy Instructions Given on a Second Questioning Session." IRHA Report No. 82-015, St. John's Memorial University of Newfoundland; R. Malpass and P. Devine, "Guided Memory in Eyewitness Identification." Journal of Applied Psychology, vol. 66, 1981, pp. 343-350; Wagstaff and Maguire, <u>supra</u> note 22.

[24] R. Gieselman, <u>et al</u>. "Enhancement of Eyewitness Memory: An Empirical Evaluation of the Cognitive Interview." <u>Journal of Police Science</u> and Administration, vol. 12, 1984, pp. 74-80.

* * * * * *

Polygraph 1986, 15(3)

220

INTERVIEWING VICTIMS AND WITNESSES OF CRIME

Вy

R. Edward Geiselman and Ronald P. Fisher

The Problem

Research on the investigative process has emphasized that the completeness and accuracy of eyewitness accounts are important factors in whether or not the cases are solved. Eyewitness reports of crimes, however, are known to be incomplete, sometimes unreliable, and often at least partially incorrect.

Although the quality of a victim's or witness' report is important to effective investigation, police investigators often have minimal guidance in developing interview techniques that facilitate retrieving memories of a criminal event. The typical police investigator must rely on the limited interview techniques acquired during the initial recruitment training, on-the-job training, and intuition. The purpose of this research has been to identify and develop techniques police investigators can use to enhance the completeness and accuracy of eyewitness reports.

The volume of basic research studies on memory recall is immense. Most of this work, however, has little applicability to the victim or eyewitness situation because it was designed to help students learn from books and lectures. Most (but not all) victims and eyewitnesses, however, are so occupied with the event that they do not have time to try to learn or memorize details about a suspect at the time of the crime.

In the typical crime scenario, the events unfold rapidly under emotionally charged conditions. As a consequence, consciously controlled learning strategies are unlikely to be used. In practice, eyewitness memory can be enhanced only by developing techniques that improve the retrieval or search phase of memory.

The Cognitive Interview

The research summarized in this Research in Brief was designed to devise interview methods based on current memory theory to enhance the completeness and accuracy of eyewitness reports, and to test these methods under controlled, yet realistic, circumstances. Both general and specific

This article is reprinted from <u>Research in Brief</u>, December 1985, with the permission of the National Institute of Justice, U.S. Department of Justice.

Dr. Geiselman is a member of the Psychology Department at the University of California at Los Angeles. Dr. Fisher is a member of the Psychology Department at Florida International University, Miami. They are currently field testing interview techniques under a grant from the National Institute of Justice.

memory jogging and memory guidance techniques were identified and combined to form the cognitive interview.

The theoretical underpinnings of the research are based on two generally accepted principles of memory. First, a memory is composed of a collection of several elements. The more elements a memory retrieval aid has in common with the member of the event, the more effective the aid is. Second, a memory has several access routes, so information that is not accessible with one retrieval cue may be accessible with a different cue.

In standard police interviews, victims and witnesses are asked first to give a narrative report of what happened in their own words. The investigator then follows up on the narrative report with questions intended to enhance the completeness of the report.

Primary Techniques of the Cognitive Interview

The cognitive interview consists of four general methods for jogging memory plus several specific techniques. The four techniques outlined below are explained to the witness before the narrative report. The first two methods attempt to increase the overlap of elements between the stored memory and retrieval cues. The last two methods encourage using many retrieval paths.

1. <u>Reconstruct the circumstances</u>: In this method the investigator instructs the witness to reconstruct the incident in general: "Try to reconstruct in your mind the circumstances that surrounded the incident. Think about what the surrounding environment looked like at the scene, such as rooms, location of furniture, vehicles, the weather, lighting, any nearby people or objects. Also think about how you were feeling at the time and think about your reactions to the incident."

2. <u>Report everything</u>: The investigator explains that some people hold back information because they are not quite sure that the information is important. The witness is asked not to edit anything, even things that may not be important.

3. <u>Recall the events in different order</u>: The instruction may be: "It is natural to go through the incident from beginning to end. However, you also should try to go through the events in reverse order. Or, try starting with the thing that impressed you the most in the incident and then go from there, going both forward and backward in time."

4. <u>Change perspectives</u>: In this method witnesses try to recall the incident from different perspectives that they may have had at the time or adopt the perspectives of others who were present during the incident. Witnesses may be instructed to place themselves in the role of a prominent character in the incident and think about what he or she must have seen.

Mentally reconstructing the circumstances that surrounded a to-beremembered event has been shown to be a powerful memory aid in numerous laboratory experiments. This technique is certainly easier than physically returning to the scene of a crime, and it may be preferable given that the scene of a crime can change.

Asking the victim or witness to be complete has two positive effects. First, many people do not have a good idea of what information has investigative value. Second, the effort to be complete sometimes leads one to remember an important detail through association with something seemingly unimportant.

While the events should be recalled initially in the order in which they occurred, recalling the events in reverse order forces the victim or witness to examine the actual memory record looking for benchmarks. When events are recalled in chronological order, some people reconstruct in their minds what must have happened based on prior knowledge of similar crime scenarios. This sometimes leads to incomplete or even inaccurate reports.

Mentally changing perspectives while recalling an event also appears to enhance the completeness of reports. In many cases, the victim or witness had a variety of perspectives on the incident, but people tend to report what they remember from one, static perspective.

Additional Techniques

In addition to the four general methods, the cognitive interview also uses a series of specific techniques to help an investigator elicit specific items of information following the narrative phase of an interview. The investigator might suggest the following:

1. <u>Physical appearance</u>: Did the suspect remind you of anyone? If you were reminded of someone, try to think of why. Was there anything unusual about the suspect's physical appearance or clothing?

2. <u>Names</u>: If you think that a name was spoken but you cannot remember what it was, try to think of the first letter of the name by going through the alphabet. Then try to think of the number of syllables.

3. <u>Numbers</u>: Was a number involved? Was it high or low? How many digits were in the number? Were there any letters in the sequence?

4. <u>Speech characteristics</u>: Did the voice remind you of someone else's voice? If you were reminded of someone, try to think of why. Was there anything unusual about the voice?

5. <u>Conversation</u>: Think about your reactions to what was said and the reactions of others. Were there any unusual words or phrases used?

Some investigators may have been using some of these technques for years. However, as described below, three separate studies have found that, when all the techniques are used together, the cognitive interview is effective for enhancing eyewitness memory.

Experimental Tests

The cognitive interview was first evaluated positively in a preliminary experiment we conducted. In that research, actors disrupted a classroom, and student eyewitnesses were then asked to complete a questionnaire about the incident.

Students who were instructed in the four general memory retrieval methods at the time of the test recalled more correct information than did subjects who were told simply to keep trying to remember more information. Furthermore, the cognitive interview did not produce more incorrect information, nor did it lead to greater eyewitness confidence in the incorrect information.

To enhance the generalizability of the initial tests of the cognitive interview, further experiments were conducted. These experiments used emotionally arousing Los Angeles Police Department training films of simulated violent crimes. The eyewitness-recall protocols were collected using interactive interviews rather than fixed questionnaires. And the interviews were conducted by trained and experienced law enforcement investigators.

The first major study compared the cognitive interview to two interview procedures that have been used by police--the hypnosis interview and the standard polygraph interview. Eighty-nine UCLA students were interviewed 48 hours after viewing one of the films, generating a total of over 120 hours of recorded interviews for analysis.

As Table 1 shows, both the cognitive interview and the hypnosis interview elicited significantly more correct information from the student subjects than did the standard police interview. Table 2 shows that this result was obtained even for the 20 most critical facts with the greatest investigative value. Furthermore, there was no significant increase in incorrect or partially constructed (confabulated) information.

		Type of In	terview	
	Cognitive	Hypnosis	Standard	
Number correct	41.15	38.00	29.40	
Number incorrect	7.30	5.90	6.10	

Table 1Facts Recalled in Three Types of Interviews

Table 2Recall of the 20 Most Critical Facts

		Type of Interview		
·····	Cognitive	Hypnosis	Standard	
Number correct	12.0	12.3	9.2	
Number incorrect	1.1	1.7	1.4	

Neither differential questioning time, the number of questions asked, nor heightened subject or interviewer motivation could explain the results. We therefore concluded that the memory-enhancement effects lie in the

guided memory components of the cognitive and hypnosis interviews.

Although the cognitive and hypnosis procedures were equally effective, the cognitive interview can be learned and applied with relatively little training while training in hypnosis requires a minimum of 40 hours. In addition to the time saved in training, the results showed that much less time was required to instruct a witness in the general cognitive techniques than to perform a hypnosis induction. Thus, the cognitive interview is a workable memory-enhancement technique that is both effective and efficient.

It remains to be determined if hypnosis is preferable in cases where the victim or witness has sustained severe trauma. Such an experiment is ethically impossible to conduct in a controlled study. But there have been two undocumented, anecdotal cases reported from the field in which the cognitive interview was said to be successful in questioning eyewitnesses to violent crimes.

In the previous tests, the memory retrieval techniques were developed and evaluated primarily in student samples. To examine the effectiveness of the cognitive interview in a nonstudent population, 51 volunteers with an average age of 32 were paid to be subjects. The methodology was the same as in the first experiment, except that hypnosis was not studied.

The results, summarized in Table 3, provided a second replication of the memory-enhancement qualities of the cognitive interview. As in the previous experiment, the cognitive interview elicited significantly more correct information than the standard police interview without an increase in incorrect or confabulated information. Thus, the cognitive interview was effective when the subject population was more representative of those who are likely to be victims or eyewitnesses of crime.

	Type if Interview		
	Cognitive	Standard	
Number correct	41.67	35.58	
Number incorrect	8.57	8.61	

Table 3 Memory Recall of Nonstudent Witnesses

While it is important to demonstrate that the cognitive interview is an effective and reliable memory-enhancement device, it is also necessary, from a legal perspective, that the scientific community accept the cognitive interview as a reliable tool, free of technical problems potentially associated with memory retrieval.

The cognitive interview has been reviewed by trial lawyers, but it has not as yet been tested in appellate courts. However, it appears to avoid the legal problems surrounding the use of forensic hypnosis. Since 1979, appellate courts in many jurisdictions have refused to admit hypnotically elicited testimony at trials.

One criticism of forensic hypnosis has been that it may heighten the negative effect on eyewitness memory of asking leading questions. The fourth test of the cognitive interview was to determine whether these techniques affect a witness' responsiveness to leading questions.

The research found that law enforcement professionals ask very few leading questions, but in this particular test we intentionally asked leading questions. In the staged scenario, two men entered a classroom and stole a slide projector. One of the men carried a blue backpack. When the students were questioned 48 hours later, some were asked near the beginning of the interview, "Was the guy with the green backpack nervous?" Then, near the end of the interview they were asked, "What color was the backpack?"

The students who were questioned using the cognitive interview were less likely to change the color of the backpack from blue to green than were students who were questioned using the standard interview. Thus, the cognitive interview not only enhances memory recall, but it appears to reduce, in some cases, the negative effects of misleading questions should an investigator inadvertently ask them.

A fifth experiment was conducted to determine whether one or more of the methods used in the cognitive interview could be eliminated to shorten the procedure. Each subject in this study was shown a 4-minute film of a violent bank robbery and then was asked to give a narrative account of what they had seen.

Prior to the recall test, some subjects were instructed in one, and only one, of the four general retrieval techniques of the cognitive interview; some subjects were instructed in all four methods (the full cognitive interview); and others were instructed simply to try very hard to remember.

The pattern of results was clear. Witnesses who were instructed in any one of the four general retrieval techniques were able to recall more correct information than witnesses who were not instructed in any technique. But none of the four methods alone was as effective as the full cognitive interview.

Thus, each technique in the procedure is useful. Although one would want to make the interview as brief as possible, the technique as it presently exists is efficient. The number of incorrect bits of information generated did not differ across the conditions in this experiment. Therefore, this study provided the fourth replication of the success of the cognitive interview.

Conclusions

In five experiments, the cognitive interview was found to increase the amount of correct information elicited from eyewitnesses without increasing the proportion of incorrect information generated. The interview methods were successful with lesser educated witnesses, nonstudents, as well as with student witnesses, and for eliciting memories of real-life incidents as well as of films of violent crime scenarios. From our results, it appears that the cognitive interview techniques could be incorporated into the interviews of law enforcement investigators with a minimum of additional training. Eyewitnesses can learn the methods quickly, thus saving valuable time for investigators, who often have demanding caseloads. Police investigators who participated in the experiments, and others who have learned of the cognitive interview, already have begun to incorporate the memory jogging techniques into their own procedures. The logical and important conclusion of this work will be the implementation and evaluation of the cognitive interview in the field. Although the present results are encouraging, the skills of the interviewer may be a major variable in the success of the technique. Field research now in progress sponsored by the National Institute of Justice should provide important and necessary insights for effective training and use of the cognitive interview.

References

Loftus, E.F. 1979. <u>Eyewitness Testimony</u>. Cambridge: Harvard University Press.

Rand Corporation. 1975. <u>The Criminal Investigation Process</u>, v. 1-3. Rand Corporation Technical Report R-1776-DOJ, R-1777-DOJ, Santa Monica, CA

Bower, G. 1967. "A Multicomponent Theory of the Memory Trace." In <u>The Psychology of Learning and Motivation</u>, vol. 1. Eds. K.W. Spence and J.T. Spence. New York: Academic Press.

Flexser, A., and Tulving, E. 1978. "Retrieval Independence in Recognition and Recall." <u>Psychological Review 85</u>: 153-71.

Tulving, E. 1974. "Cue-Dependent Forgetting." <u>American Scientist</u> 62: 74-82.

Smith, S. 1979. "Remembering In and Out of Context." <u>Journal of Experimental Psychology: Human Learning and Memory 5</u>: 460-71.

Geiselman, R.E., <u>et al</u>. 1984. "Enhancement of Eyewitness Memory: An Empirical Evaluation of the Cognitive Interview." <u>Journal of Police</u> <u>Science and Administration 12</u>: 74-80.

Geiselman, R.E., <u>et al</u>. 1985. "Eyewitness Memory Enhancement in the Police Interview: Cognitive Retrieval Mnemonics Versus Hypnosis." <u>Journal</u> of <u>Applied Psychology</u> 70: 401-12.

Geiselman, R.E., <u>et al</u>. 1985. "Enhancement of Eyewitness Memory With the Cognitive Interview." <u>American Journal of Psychology</u>, in press.

Geiselman, R.E., Cohen, G. and Surtes, L. 1985. <u>Eyewitness Responses</u> to <u>Leading Questions</u> <u>Under the Cognitive Interview</u>. Manuscript submitted for publication.

Sanders, G.S., and Simmons, W.L. 1983. "Use of Hypnosis to Enhance Eyewitness Accuracy: Does it Work?" <u>Journal of Applied Psychology</u> <u>68</u>: 70-7.
A BIBLIOGRAPHY OF RECENT SCIENTIFIC STUDIES ON THE POLYGRAPH

Bу

Norman Ansley

Barland, Gordon H. "A Method of Estimating the Accuracy of Individual Control Question Polygraph Tests." Paper presented at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Beijk, J. "Experimental and Procedural Influences on Differential Electrodermal Activity." Psychophysiology 17(3)(1980): 274-278.

Ben-Shakhar, G. and Gati, I. "The Effect of Similarity on Psychophysiological Responsivity to Pictorial and Verbal Stimuli." Paper presented at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Ben-Shakhar, Gerson; Lieblich, Israel; and Bar-Hillel, Maya. "An Evaluation of Polygrapher's Judgments: A Review From a Decision Theoretic Perspective." Journal of Applied Psychology 67(6)(December 1982): 701-713.

Bradley, M.T. and Ainsworth, D. "Alcohol and the Psychophysiological Detection of Deception." <u>Psychophysiology</u> 21(1)(1984): 63-71, reprinted in Polygraph 13(2)(June 1984): 177-192.

Bradley, M.T. and Janisse, M.P. "Accuracy Demonstrations, Threat, and the Detection of Deception: Cardiovascular, Electrodermal, and Pupillary Measures." Psychophysiology 18(3)(May 1981): 307-315.

Bradley, M.T. and Janisse, M.P. "Extraversion and the Detection of Deception." <u>Personality and Individual Differences</u> 2(1981): 99-103.

Bradley, M.T. and Warfield, J.F. "Innocence, Information, and the Guilty Knowledge Test in the Detection of Deception." <u>Psychophysiology</u> 21(6)(1984): 683-689.

Desroches, Frederic J. and Thomas, Alfred S. "The Police Use of the Polygraph in Criminal Investigations." <u>Canadian Journal of Criminology</u> 27(1)(January 1985): 43-66.

Edel, Eugene and Moore, Lane A., Jr. "Analysis of Agreement in Polygraph Charts." <u>Polygraph</u> 13(2)(June 1984): 193-197.

Elaad, E. "Decision Rules in Polygraph Examinations." Paper presented at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Elaad, E.; Bonwitt, G.; Eisenberg, O.; and Meytes, I. "Effects of Beta Blocking Drugs on the Polygraph Detection Rate: A Pilot Study." <u>Polygraph</u> 11(3)(September 1982): 225-233.

Polygraph 1986, 15(3)

Elaad, Eitan and Schanar, Esther. "Polygraph Field Validity." <u>Poly</u>graph 14(3)(September 1985): 217-223.

Ginton, A. "A Built-in Validity in Polygraph Field Examinations." Paper delivered at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Gudjonsson, Gisli H. "Electrodermal Responsivity to Interrogation Questions and Its Relation to Self-Reported Emotional Disturbance." <u>Bio-</u> logical Psychology 14(1982): 213-218.

Gudjonsson, Gisli H. "Some Psychological Determinants of Electrodermal Responses to Deception." <u>Personality and Individual Differences</u> 3(1982): 381-391.

Gudjonsson, Gisli H. and Haward, Lionel R. "Detection of Deception: Consistency in Responding and Personality." <u>Perceptual and Motor Skills</u> 54(3 pt 2)(June 1982): 1189-1190.

Horneman, Christopher J. and O'Gorman, J.G. "Detectability in Card Test as a Function of the Subject's Verbal Response." <u>Psychophysiology</u> 22(3)(1985): 330-333.

Honts, C.R.; Raskin, D.C.; and Kircher, J.C. "Effects of Socialization on the Physiological Detection of Deception." <u>Journal of Research in</u> Personality 19(1985): 373.

Iacono, William G. "Guilty Knowledge." <u>Society</u> (October 1985): 52-54.

Iacono, William G.; Boisvenu, Guy A.; and Fleming, Jonathan A. "Effects of Diazepam and Methylpheniadate on the Electrodermal Detection of Guilty Knowledge." <u>Journal of Applied Psychology</u> 69(2)(1984): 289-299. Reprinted in <u>Polygraph</u> 13(4)(December 1984): 297-312.

Pennebaker, James W. and Chew, Carol H. "Behavioral Inhibition and Electrodermal Activity During Deception." <u>Journal of Personality and</u> <u>Social Psychology</u> 49(5)(1985): 1427-1433.

Raskin, David C.; Kircher, John C.; and Honts, Charles R. "Computerized Polygraph Interpretations and Detection of Physical Countermeasures." Paper presented at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Rovner, Louis I. "The Accuracy of Physiological Detection of Deception." <u>Polygraph</u> 15(1)(March 1986): 1-39.

Schterzer, G. and Elaad, E. "Validity of the Control Question Technique in Two Levels of Severity of Crimes." Paper presented at the International Conference on Techniques for Criminal Identification, 24-28 February 1985, Jerusalem, Israel.*

Widacki, Jan. "Analiza Przestanek Diagnozowania w Badaniach Poligraficznych." Uniwersytetu Slaskiego, Katowice, Poland, 1982. ("The Analysis

Polygraph 1986, 15(3)

A Bibliography of Recent Scientific Studies on the Polygraph

of Diagnosis Premises in Polygraph Examination.") Text in Polish, summary in English and Russian.

Yankee, William J.; Powell, James M.; and Newland, Ross. "An Investigation of the Accuracy and Consistency of Polygraph Chart Interpretation By Inexperienced and Experienced Examiners." <u>Polygraph</u> 14(2)(June 1985): 108-117.

*These papers have been printed as Proceedings of Identa-'85 in <u>Anti-</u> <u>Terrorism; Forensic Science; Psychology in Police Investigations</u> which is for sale by Heilger & Company, P.O. Box 2015, Jerusalem, Israel.

* * * * * *

ABSTRACTS

Voice Stress

Klaus R. Scherer. "Vocal Affect Expression: A Review and a Model for Future Research." <u>Psychology</u> <u>Bulletin</u> 99(2)(1986): 143-165.

In reviewing the literature on the vocal expression of emotion, a discrepancy between reported high accuracy in vocal expression is noted. The latter is explained by (a) a paucity of research on voice quality, (b) neglect of the social signaling functions of affect vocalization, and (c) insufficiently precise conceptualization of the underlying emotional states. A "component patterning" model of vocal affect expression is proposed that attempts to link the outcomes of antecedent event evaluation to biologically based response patterns. On the basis of a literature survey of acoustic-phonetic evidence, the likely phonatory and articulatory correlates of the physiological response characterizing different emotional states are described in the form of three major voice types (narrow-wide, lax-tense, full-thin). Specific predictions are made as to the changes in acoustic parameters resulting from changing voice types. These predictions are compared with the pattern of empirical findings yielded by a comprehensive survey of the literature on vocal cues in emotional expression. Although the comparison is largely limited to the tense-lax voice type (because acoustic parameters relevant to the other voice types have not yet been systematically studied) a high degree of convergence is revealed. It is suggested that the model may help to stimulate hypothesisguided research as well as provide a framework for the development of appropriate research paradigms.[author abstract]

Correspondence about the article and requests for reprints should be addressed to Klaus Scherer, Department of Psychology, University of Giessen, Ottobeighei-Strasse 10, 6300 Giessen, Federal Republic of Germany (West Germany). A Bibliography of Recent Scientific Studies on the Polygraph

of Diagnosis Premises in Polygraph Examination.") Text in Polish, summary in English and Russian.

Yankee, William J.; Powell, James M.; and Newland, Ross. "An Investigation of the Accuracy and Consistency of Polygraph Chart Interpretation By Inexperienced and Experienced Examiners." <u>Polygraph</u> 14(2)(June 1985): 108-117.

*These papers have been printed as Proceedings of Identa-'85 in <u>Anti-</u> <u>Terrorism; Forensic Science; Psychology in Police Investigations</u> which is for sale by Heilger & Company, P.O. Box 2015, Jerusalem, Israel.

* * * * * *

ABSTRACTS

Voice Stress

Klaus R. Scherer. "Vocal Affect Expression: A Review and a Model for Future Research." <u>Psychology</u> <u>Bulletin</u> 99(2)(1986): 143-165.

In reviewing the literature on the vocal expression of emotion, a discrepancy between reported high accuracy in vocal expression is noted. The latter is explained by (a) a paucity of research on voice quality, (b) neglect of the social signaling functions of affect vocalization, and (c) insufficiently precise conceptualization of the underlying emotional states. A "component patterning" model of vocal affect expression is proposed that attempts to link the outcomes of antecedent event evaluation to biologically based response patterns. On the basis of a literature survey of acoustic-phonetic evidence, the likely phonatory and articulatory correlates of the physiological response characterizing different emotional states are described in the form of three major voice types (narrow-wide, lax-tense, full-thin). Specific predictions are made as to the changes in acoustic parameters resulting from changing voice types. These predictions are compared with the pattern of empirical findings yielded by a comprehensive survey of the literature on vocal cues in emotional expression. Although the comparison is largely limited to the tense-lax voice type (because acoustic parameters relevant to the other voice types have not yet been systematically studied) a high degree of convergence is revealed. It is suggested that the model may help to stimulate hypothesisquided research as well as provide a framework for the development of appropriate research paradigms.[author abstract]

Correspondence about the article and requests for reprints should be addressed to Klaus Scherer, Department of Psychology, University of Giessen, Ottobeighei-Strasse 10, 6300 Giessen, Federal Republic of Germany (West Germany).

Abstracts

Nonverbal Detection of Deception

Charles F. Bond, Jr., Karen Nelson Kahler, and Lucia M. Paolicelli. "The Miscommunication of Deception: An Adaptive Perspective." <u>Journal of</u> Experimental Social Psychology 21(1985): 331-345.

Undergraduates were videotaped as they told lies and truths about their last job. Later, these undergraduates viewed the videotapes and tried to determine which of their fellow subjects were lying. They achieved some success, averaging correct determinations in 63.33% of their judgments. In a discussion of "The Deceptive Struggle" the authors consider a variety of possible explanations for the failure to detect lies at a high rate in society, including the "life-dinner" explanation, inadequate feedback, natural selection and fitness, and modeling by deceivers. There is also some discussion about those liars who failed to deceive.

Reprint requests should be sent to Charles F. Bond, Jr., Box 1402, Connecticut College, New London, CT 06320.

Nonverbal Detection of Deception

Mark A. deTurck and Gerald R. Miller. "Deception and Arousal: Isolating the Behavioral Correlates of Deception." <u>Human Communication Re-</u> <u>search</u> 12(2)(Winter 1985): 181-201.

This study tested a physiologically based arousal theory of deceptive communication. Three groups of communicators were monitored as to their sympathetic activation, measured by skin resistance. A noise stimulus was used to raise the arousal level of a group of truth tellers to that of those who were deceiving, while a third group of truth tellers were not so aroused.

Despite the arousal of a group of truth tellers, the deceivers displayed cues unique to the deception-induced arousal. As might be expected, the deceivers experienced significantly greater sympathetic activation than unaroused truth tellers. Behaviors which distinguished the deceivers from the aroused truth tellers are set forth in the article.

For copies of reprints write to Professor Mark A. deTurck in the Psychology Department at Cornell University.

* * * * * *