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HOW DOES A JURY VIEW POLYGRAPH EXAMINATION RESULTS?

By

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The Case of U.S. vs. Grasso, U.S. Federal Court, Boston, Massachusetts, June 1973, involved an individual (Bail Bondsman) who was charged with conspiracy to sell and the sale of a quantity of cocaine.

His defense was essentially that of an alibi since he was, at the time of the alleged sale, elsewhere.

A polygraph examination administered by Charles H. Zimmerman, Boston, disclosed that Mr. Grasso was being truthful when he denied participation in, or direct knowledge of, the alleged sale of cocaine on the date in question.

Subsequent investigative work on the part of the defense investigators brought in witnesses (an attorney, his client, an Ass't Clerk of Court, among others) who supported and corroborated Grasso's presence at a location different from that of the scene of the alleged crime. This information, along with the examination results, was brought to the attention of the Assistant U.S. Attorney, George V. Higgins,* who, although he would not stipulate to its admissibility, took the position that if the proper foundations were put before the jury regarding its admissibility, he would not object to such evidence being admissible.

Therefore, at trial, during the presentation of the defense case, a foundation regarding admissibility of polygraph testimony was held with testimony coming from Mr. Lynn Marcy, Detroit; Mr. Leonard H. Harrelson, Chicago; and Dr. David Raskin, University of Utah; regarding the background and scientific foundation of the polygraph technique and finally from Mr. Charles H. Zimmerman regarding the polygraph test and the test results itself.

Federal Judge Russell E. Smith from Montana, who was sitting by special designation, could not be said to have

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*George V. Higgins is better known as the author of the bestseller, The Friends of Eddie Coyle.

been persuaded by the foundation testimony but, in light of the Government's refusal to raise an objection to the admissibility, decided to let the testimony go to the Jury. After some few hours of deliberation the Jury returned the verdict of not guilty. To our knowledge, it was the first Federal Jury that had actually been confronted with Polygraph Test Results.

F. Lee Bailey and I were obviously very much interested in interviewing the jurors regarding their reaction to both the foundation testimony and their handling of the polygraph examination result testimony and to learn how they handled the polygraph testimony in their deliberations.

Accordingly, we wrote to Judge Smith and obtained permission from him to interview the jurors regarding their action and, subsequently, did manage to interview eight out of the twelve jurors. All eight Jurors came to our offices and met with F. Lee Bailey and myself for approximately an hour and a half to two hours individually. Initially we attempted to discover what part the test results played in the deliberation and return of the verdict of not guilty.

These eight jurors told us that they were impressed with the foundation testimony and were convinced that the polygraph did what it proported to do, i.e., to verify the truthfulness of a response to any given question. However, despite their belief in the efficacy of the polygraph as a truth verifier, they were somewhat at a loss regarding what to do with the impact of the testimony of Mr. Charles H. Zimmerman on the test result itself. Therefore, they resolved to put aside the test results and see if they could not arrive at a verdict by considering the other evidence that was present at the trial and, should they be unable to do so, they would then turn to the polygraph test results as an additional piece of evidence to consider. Well, the fact of the matter is that they never got to the polygraph test results in so far as taking any part in their deliberations because they were able to arrive at a verdict of not guilty based upon the other evidence in the case. However, each of the eight Jurors that we interviewed was fairly positive that had the case been closer, i.e., had the outcome been in doubt, the polygraph tests standing by themselves and the integrity of the testimony would have been sufficient to raise a reasonable doubt in their minds and, consequently, they would had to have voted not guilty.

The interviews that we had with the Jurors in the Grasso case would seem to refute the often heard comment that the polygraph will replace the Jury or usurp the Jury's functions, or somehow be so prejudicial in its weight and impact that the Jury will disregard all other evidence and go on the polygraph test results alone. Here we have direct proof that, at least in one case, not only did the polygraph test results not usurp the Jury's function but they were able to handle it in much the same manner they did all other evidence in the case.

They certainly were not overawed by it, they certainly did not feel that the polygraph test results by themselves were demonstrative of the guilt or innocence of Mr. Grasso and I think they handled the polygraph evidence in a very intelligent manner and certainly if they are at all representative of Jurors who have to deal with polygraph test results, then I think that we should be heartened to learn that they can consider such evidence and accord it whatever merit it deserves and treat it, perhaps in the same way as they do all other scientific evidence.

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LAW REPRINT AVAILABLE

Reprints of Howard S. Altarescu's article "Problems Remaining for the "Generally Accepted" Polygraph" are available from BHF Printing, P. O. Box 83, Auburndale, Mass. 02166 for $1.15 each, postpaid.

This scholarly article considers many of the problems to be faced in court. It first appeared in The Boston Law Review, Volume 53, Number 2, March 1973, pp. 375-405.

QUALITY CONTROL

By

Robert A. Brisentine, Jr.

Quality control! This expression brings forth feelings of mixed emotions from almost any audience. If we are the consumer of a product then we frequently feel that quality control standards should be raised so that we get a better, more trouble free product. If we are the employees, then possibly we feel that there is no need for quality control since we know that we will always do our best and we don't need some "Monday morning quarterback" from the "front office" looking over our shoulder trying to catch us making a mistake. Then there is the third viewpoint from our employer who knows that quality control costs money, but if the product is faulty enough, demand will fall and the company will go out of business. In almost any endeavor, there must be standards and someone must be in a position to insure that these standards are met. The American Polygraph Association recognizes this principle and has set up committees on membership standards and other activities of our association, to insure that the high standards of the association are maintained.

For those who are not familiar with the U.S. Army CID activities, the Army has an organization known as the U.S. Army Criminal Investigation Command, or CID for short. This activity is headquartered in Washington,D. C. My office, which is part of this headquarters, is physically located at Fort Holabird, Maryland. The primary mission of the Army CID is the investigation of felony offenses committed by Army personnel or against Army personnel or Army property. As part of our investigative program we have a polygraph capability. Within the CID, polygraph quality control starts with the selection of polygraph examiners.

Selection

To qualify for attendance at the Army school an applicant must:

a. Be a United States Citizen.

b. Be at least twenty-five years of age.

c. Be a graduate of an accredited college (Baccalaureate degree), plus two years as an investigator with a recognized government agency; or have satisfactorily completed two years training at an accredited college (a minimum of sixty semester hours, or an advanced standing as a junior), or two years of college plus five years of investigative experience.

d. Have successfully passed a complete background or character investigation which indicates that the applicant is of high moral character and sound emotional temperament.

Certification

After meeting the above requirements, the potential CID Examiner must then successfully complete the CID Polygraph Training Course. The training is considered by most knowledgeable persons as one of the most difficult and demanding courses of instruction given within the Army establishment. After successfully completing this course, the potential examiner must then serve an apprenticeship under a certified CID Examiner. The apprenticeship must be at least six months in length, and if after completing this apprenticeship the potential examiner has demonstrated that he is in fact proficient in the conduct of polygraph examinations, he will be certified as a fully qualified CID Polygraph Examiner. Refresher and additional specialized polygraph training is provided on a regularly scheduled basis. Even after certification, the CID insists that each examiner maintain proficiency based on the regular conduct of polygraph examinations. Norman Land, Joseph M. Keough and myself as reviewers, plus all of the polygraph examiner instructors at the Polygraph School, conduct live case polygraph examinations on a frequent basis to maintain our skills in the technique. In the event an examiner is assigned duties other than the conduct of polygraph examinations for a period in excess of 6 months, when he returns to polygraph duties he must then serve a refresher apprenticeship under the supervision of an active certified examiner for a period of at least two months.

Development of the Quality Control Program

The CID initiated a form of operational quality control for examiners who were assigned to what were known as Polygraph Centers in Europe in about 1951. These examiners, who were assigned to full time polygraph duties, were required to submit monthly statistical reports to a Polygraph Headquarters located in Frankfurt, Germany. The Headquarters would also send out Inspectors on an unscheduled basis to check the Polygraph Centers. If an examiner appeared to be having problems he would be called into the Frankfurt Headquarters where he would conduct examinations while being observed by Headquarters personnel and then given constructive criticism on how to improve his polygraph techniques.

In 1965, the Army established a concept where polygraph charts and documents would be reviewed prior to being placed on permanent file. Even at this stage, quality control of polygraph activities was spotty since there was no official requirement for the field CID units to forward polygraph documents for permanent file. Then in 1966, an Army Regulation required all documents relating to polygraph examinations conducted by or for CID units, be attached to the Completed CID Report which was forwarded to Fort Holabird, Maryland, for permanent file. For the first time, all CID polygraph examinations became available for review at Department of the Army level. But, this procedure, still fell short of what was needed. The problem with the system was the fact that by the time the CID case arrived for permanent file in the Crime Records Directorate, a time interval of two to six months had passed. This time lag was due to review procedures at different levels of command. By the time the polygraph charts were available for review, errors, if any, were difficult to correct because of the time lapse. By that I mean, if an examiner had been in error when he rendered an opinion regarding a subject's veracity, by the time the error was identified, the subject might have been transferred to a different location, been discharged from the service, been shot in combat, or changed status in countless other ways. To counteract this problem studies were initiated which led to our present CID Polygraph Quality Control System.

In the latter part of 1968, an Army Regulation was adopted which required that as of February 1969, polygraph charts along with appropriate other documents generated as a result of a CID polygraph examination conducted anywhere in the world would be forwarded directly to our quality control office at Fort Holabird, Maryland, for quality control review. These documents must be forwarded within three working days after the examination in concluded. After review of the polygraph documents at our office, they are returned to either the examiner who conducted the examination or the CID unit who requested the original examination, depending on the results of the quality control review. After return of the documents to the field, the polygraph charts and reports, with rare exception, are then attached to the permanent file copy of the completed CID report of investigation, which insures a second review prior to being placed on permanent file. This second review is to insure that all required documents such as the Polygraph Report, Polygraph Authorization Form, Subject Consent Form and of course the polygrams are present and ready for file. We also determine, when appropriate, if corrective action has been taken regarding the discrepancies previously cited during the original quality control review. This procedure, as you will note, allows quality control review at a point in time where discrepancies can be brought to the attention of the examiner when the examination is still fresh in his memory, and if reexamination is appropriate, the retesting can be conducted immediately when the results will still be pertinent to the investigation.

Quality Control Procedures

At the present time there are three qualified, certified polygraph examiners assigned to quality control. Mr. Norman Land, Mr. Joseph M. Keough and myself. Note that with rare exception, all CID polygraph examinations deal with specific criminal offenses in the felony area.

Within three working days after completing his polygraph examination, the examiner forwards polygraph documents to our office. These documents include, besides the charts, the questions asked during the test, a resume of the background of the subject, a short synopsis of the offense, and other comments relating to the examination which he desires to bring to the attention of the reviewer, including the date and exact times covered by the examination. When the examination

arrives at our office, usually by registered mail, a clerk opens the envelope and indicates on a slip of paper the type of test utilized by the examiner. The charts, first reviewed after noting the type of examination marked by the clerk, are being read completely in the blind. By that I mean the reviewer does not know the issue, the questions, or the identity of the examiner. The note by the clerk on the type of test utilized tells the location of the relevant, irrelevant, and control questions. After reviewing the charts, the examiner forms an opinion as to "Deception Indicated" (DI), "No Deception Indicated" (NDI), or "Inconclusive." If the charts are easy to interpret, fine. If not, and if the examination is a Zone Comparison test or a GQT, a complete numerical evaluation is made. Only at this point are the other documents read to determine the opinion of the original examiner. If the opinion of the examiner and the reviewer are the same, then we go on to other phases of review. If opinions differ, then we pass the charts to a third evaluator, tell him the type of test used, and he will then evaluate the charts, including a numerical evaluation when appropriate. After he completes his review we will then compare evaluations. If our evaluations concur, then we will have an official disagreement with the examiner arrived at by independent and objective evaluation of the polygrams by two reviewers.

When the original examiner's opinion is the same as the reviewers, the questions will be reviewed to determine if they were appropriate for the issue concerned, this particular subject, and the polygraph technique. We then recheck the charts to determine if the patterns or tracings are appropriate. During this review we cover: Pretest Interview; Test Construction; Question Construction; Spacing of Questions and Chart Markings; Overall Chart Interpretation; Post-test Interrogation (when appropriate); Length of Examination; and the Polygraph Report. You might wonder "How does a reviewer hundreds to thousands of miles away, determine whether an examiner's pretest interview is satisfactory or unsatisfactory?" When you see charts that are extremely erratic in nature and the subject seems to be reacting as much to the irrelevant questions as to the relevant or control questions, and, for example, on an incest or other highly emotional issue, the entire pretest phase of the examination only lasted for about twenty minutes, you receive the impression that the examiner

might not have been completely successful in gaining rapport with the subject in his pretest, and we so comment in the review letter. Another area you might wonder about is "Length of Examination." How long should an examination take? We feel that the examination should be long enough to resolve the issue under investigation. In other words a half-hour examination which produces charts that no one can interpret is obviously too short. On the other side of the coin, an examination which continues for several hours without a break, even though the charts indicate subject fatigue, could be considered too long. Our whole review is designed to remind our CID Examiners what is expected of a quality polygraph examination.

After completion of the review, the polygraph documents are forwarded along with a review letter to either the examiner concerned or the Commanding Officer of the requesting unit. In the event there are minor discrepancies which do not affect the validity of the examination, then the examination is returned to the submitting examiner with our findings and suggestions as to how he might improve future examinations. This way, only the examiner concerned is made aware of those minor technical problems which plague us all. He is not embarrassed by having technical problems brought to the attention of people who are not polygraph trained. When an examination is outstanding, or if there were no minor problems, we forward the review letter to the Commanding Officer of the requesting unit. The vast majority of our review letters fall in this category.

When there is a disagreement between the original examiner's opinion and that of the reviewers, we also return the review letter to the Commanding Officer of the unit which originally requested the examination. Why? Because when a reexamination is suggested, normally only the requesting official has the authority to initiate such action. So we must send the examination back to the original requester in those few cases where additional testing is appropriate. This procedure happens less than five percent of the time. In these cases, most of the time the reviewer is unable to see sufficient reactions in the polygrams to support the examiner's conclusion of DI or NDI, and retesting is requested to clear up what are really inconclusive polygrams. Most of these inconclusive examinations have been originally diagnosed as No Deception Indicated. This reinforces the conclusion

that errors, if any, are usually made in favor of the subject.

How can a reviewer evaluate charts better than the original examiner? We have found that sometimes an examiner will be subconsciously influenced by a subject to the point where he will, without realizing it, be forming opinions of the subject's veracity based on his impression of the subject rather than on the polygrams alone. Most experienced examiners are aware that their attitudes, prejudices and impressions of another person will, if not careful, contaminate diagnosis of the polygrams. And I do not think anyone who has been in police or personnel security work for any length of time will state that he cannot be influenced by an experienced, smooth-talking conman. For this reason, sometimes a reviewer is able to evaluate a subject's polygrams more objectively than the examiner who conducted the examination. The reviewer is not distracted or contaminated by a subject, has no outside pressure being brought to bear to influence his opinion, and only has the polygraph chart upon which to base an opinion. This does not mean, per se, that the reviewer is a better chart interpreter, but sometimes just in a better position to interpret those "close charts." We do not render an opinion as to the subject's veracity, but just whether the charts do, or do not, support the examiner's opinion. You might wonder what happens when there is a difference of opinion between the examiner and the reviewer, and the examiner insists his opinion is the accurate one, then refuses to conduct a reexamination. Since quality control was established in the Army, this has only happened five times. Almost without exception, when we do not agree with an examiner's original opinion and after he again reviews the polygrams without subject contamination, the original examiner will agree with the reviewer's evaluation. But, in the five cases I have mentioned, all of which were originally called NDI, the subjects were reexamined by other than the original examiner. In three of the cases I conducted the reexaminations, and in two cases the retesting was accomplished by an examiner assigned to a different unit than the original examiner. In all of the disputed cases the reviewers' opinions were substantiated by easily interpreted deceptive polygrams, and in three of the five disputed cases, these polygrams were confirmed by confessions.

Benefits in the Field

Quality control review requirement benefits the field examiner in several ways. For example, after graduation from polygraph school I was assigned to Fort Meade, Maryland, as a fulltime Polygraph Examiner. I was green and although I had conducted five or six live case examinations while attending school, plus about forty examinations on hypothetical cases, I did not consider myself a fully qualified examiner. I should also mention at this time I was a young warrant officer. Shortly after I arrived at Fort Meade, I was sent to Camp Pickett, Virginia, to conduct an examination of a murder suspect. There was no other examiner, military or civilian, in the area. The suspect's fingerprints had been found in the room where a girl had been killed and he denied ever being in the room. Additionally, it was common knowledge that this suspect had been dating the girl and that he was jealous because of her association with other men. My charts revealed the suspect to be truthful. I furnished the Agents and civilian police with a report to that effect. I will not go into detail, but certain of my superior officers and the civil police indicated that they had some doubts as to the accuracy of my conclusions regarding this suspect's veracity. At this stage I would have welcomed a high-level review of my charts to back up my opinion. But we had no such system in effect. I could only state that I had been trained and had a diploma indicating I had graduated from polygraph school and had rendered an opinion based on my charts and could do no more. For about two months I was under the gun and requests for examinations dropped off. Then, a CID Agent did me a favor when he picked up a suspect in another homicide case, who confessed to murdering the girl, and disclosed the location of the murder weapon. My opinion was confirmed and I was off the hook with my bosses, and in those days I had a lot of bosses. This has happened to many other examiners. If you were lucky, you had a fellow examiner to verify your conclusion. If you were the only examiner in town, or the case was such that you were not allowed to discuss it with anyone else, you lacked assistance when you needed it most. I feel certain that in cases like this you would have welcomed a chart review by an independent source who was in a position to uphold your opinion. Our examiners in the field have informed us of incidents of this type, and the vast majority of the CID Polygraph Examiners have indicated their

acceptance and agreement with the quality control procedures now in effect within the Army CID.

Another aspect of quality control which is a benefit is that when we know that someone else will be reviewing our work, we are encouraged, to produce the best polygrams possible under the circumstances. When we know that at the end of the examination we are not going to be able to toss those charts out and forget them, we take a little extra time and effort to produce a product that we won't be ashamed of. And when we are producing better charts, we are able to interpret our polygrams with less effort.

Standardization

In addition, the CID quality control program has been effective because of standardization of technique. Of course we do not conduct each examination "By the numbers" or by rote. Each pretest interview is tailored to the person being examined. But, the overall procedures are the same. On review we know that the subject has been advised of his legal rights in a certain way, that each question in the test has been reviewed with the subject prior to the actual test itself, and that the examiner has used proven examination techniques.

WE NEED YOUR NEW ADDRESS!

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IMPLICATIONS OF DRUG-INDUCED MEMORY LOSS FOR INTERROGATION AND LIE DETECTION

By

Gordon H. Barland

ABSTRACT

There is an increasing amount of evidence suggesting that if a person is under the influence of an addictive drug such as alcohol or heroin at the time that he commits a crime, it is possible for that person to have some degree of memory loss when the effect of the drug wears off. In order to optimize the recall of the memory, the internal chemical environment of that person which existed at the time of the crime should be duplicated during an interview, interrogation, or polygraph examination.

State Dependent Learning* refers to the fact that when something is done or learned under one set of internal chemical conditions, it may not be remembered when the chemical conditions within the body are different. In practical terms it refers to the occasional inability to remember what one had done when "the morning after the night before" makes its unpleasant but inevitable arrival and the state of drunkenness has been replaced by the state of sobriety. There are many fascinating stories about people waking up and finding themselves in a strange hotel room hundreds or thousands of miles away from the last place they can remember, which often had been a bar they had been sitting in . . . several days earlier! During their "lost weekend" they had engaged in complex, sophisticated behaviors: talking coherently with numerous people, buying tickets and accomodations with cash or credit cards, and generally conducting themselves in a manner which does not call undue attention to themselves. Observers may realize that such people have been drinking, but they appear in good control of themselves and the situation. The blackouts which occur on these binges may be complete for all

*Also called state dependent phenomenon, state dependent effect, dissociated learning and dissociation.

events which occur, or they may be partial and the person may be able to dimly recall some of the events which happened. It often happens that the next time the person becomes drunk he is able to remember everything that had happened during the blackout (4). Although this phenomenon has long been mentioned in the popular literature, it has only recently been studied by scientists.

There can be no doubt that the phenomenon exists. (2, 7, 8, 13). Overton (9) has written an excellent summary of these studies. State dependent behavior memory loss has most often been produced with alcohol. Goodwin et al. (4) describes two different types of memory loss associated with alcohol. One type, known as en bloc blackout, is a total amnesia for everything that happened beyond a specific point. It usually ends when the person wakes up, and is usually accompanied by a feeling of apprehension and dread. The person typically wonders whether he might have killed someone or committed some crime. He often avoids his drinking companions for this reason. Recovery of memory from this type of blackout seldom occurs, regardless of the amount of coaxing or drinking more alcohol. It thus does not appear to be State Dependent. The other type of blackout, known as palimpsest, is fragmentary. Most subjects report a total or partial recovery of memory after a period of time. This may occur spontaneously, but more usually it occurs when the person is told what occurred, or when he drinks again. Islands of recall gradually coalesce until the person feels he remembers all or most of what happened. This type of amnesia appears to be State Dependent. It is illustrated by the following example:(4)

> "A 47 year-old housewife often wrote letters when she was drinking. Sometimes she would jot down notes for a letter and start writing it, but not finish it. The next day, sober, she would be unable to decipher the notes. Then she would start drinking again, and after a few drinks the meaning of the notes would become clear and she would resome writing the letter. 'It was like picking up the pencil where I had left off.'" (p. 1035)

Goodwin, et.al. found that two-thirds of this sample of alcoholics and 61% of those reported that renewed drinking

seemed to jog their memories. Overton (12) suggests that these State Dependent effects increase with continued use of alcohol. Overton (10, 11, 12) indicated that barbiturates, anesthetics, hormones, tranquilizers and alcohol, all had significant State Dependent properties in animals. It is unclear whether these drugs would have similar influence on human behavior.

It is significant that perhaps all of the drugs to which one can be addicted show State Dependent effects. In fact, Overton suggests that perhaps one of the reasons they are addictive is because they produce state dependent effects (12).

Variables Affecting Drug-Induced Memory Loss

It is obvious that there are a number of variables which determine whether there will be a memory loss associated with the use of a drug which is capable of producing State Dependent effects. Not all persons experience it, not all who do experience it do so every time, and once it is experienced the degree of recovery under interrogation may range from zero to 100%. Because of the recency of the recognition of this phenomenon, very few of the variables are known. However, the following variables are probably involved.

1. Drug dosage. Generally speaking, the greater the dose, the greater the possibility for drug-induced memory loss to occur. It is obvious that the amnesia is not an all-or-nothing thing. Rather, it is a continuum between total recall on the one hand, and total loss on the other (12).

2. Experience with the drug. Overton (12) suggests that the longer a person abuses alcohol, the greater amount of drug-dependent behavioral patterns the person develops and the greater the amount of impairment (including memory loss) when the person is in the nondrug state. Information upon other drugs has not yet been obtained.

3. Type of activity. A recent study indicates that not all types of memory are equally effected by drugs(5). In an experiment involving the effect of alcohol upon human memory, it was found that recognition of pictures was not affected

by alcohol. A group of subjects which was shown a number of pictures while under the influence of alcohol was later, when sober, correctly able to identify those pictures which they had seen. However, memory of an avoidance task, the recall of memorized words and sentences, and the recall of word associations all showed significant impairment in the group that experienced them while drunk and was later tested while sober. Groups of subjects who were drunk on both trials or sober on both trials showed no such impairment. A group which was sober on the first trial and drunk on the second trial showed some memory loss, but less than the first group. Thus, as has often been reported by others, the State Dependent effect in the Goodwin et.al. study was asymmetrical: there was a greater memory loss among the subjects who were drunk when they did something and were sober when they were tested, than among the subjects who were sober when they did something and were drunk when they were tested. This works to the disadvantage of the interrogator or polygraph examiner, for normally the suspect is sober when interrogated or polygraphed.

Dissociated learning (amnesia) can and often does occur in the nondrug to the drug direction, the importance to interrogation comes from the amnesia that occurs from the drug to the nondrug change. Thus, a person who commits a crime while high on alcohol, heroin, LSD or a number of other drugs and who is interrogated when no longer high may be unable to remember having committed the crime.

Modifications of the Polygraph Technique to Counteract the Effect of Drug-Induced Memory Loss

There are a number of techniques available to the polygraph examiner to determine if drug-induced memory loss has actually occurred when the suspect claims that it has, and to reduce the seriousness of it when it has occurred.

1. Whenever drug-induced memory loss is suspected, the examiner should obtain a detailed history of drug use from the subject. This would include such items as the length of time the subject has been taking drugs; the type of drugs taken; the previous effects the drugs have had upon his behavior and memory; what drugs were taken within the day or two before the crime of which he is suspected; and what

drugs were taken in the day or two prior to the polygraph examination. Particular emphasis should be placed upon the length of time between the ingestion of drugs and the commission of the crime.

2. During the conduct of the examination a general question relating to drugs may be asked. This might be something like, "Have you told me the complete truth about the drugs you have taken?" During the pretest review of this question with the suspect, the examiner should point out that the suspect will be lying if he claims to have taken drugs shortly before the time of the crime (and thus may legitimately have a drug-induced memory loss) if in fact he had not.

3. Special attention must be given to the wording of the relevant questions in those cases where amnesia is claimed. Unless the questions are properly worded and reviewed with the subject, it is possible that an innocent person with a real memory loss may respond to the relevant questions merely because, not being able to remember not having committed the crime, he considers it possible that he might have. Questions which have been successfully used by the author in such case include, "Can you specifically remember . . . " and "Did you deliberately lie when you told me that you can't specifically remember . . . " The wording of these questions is intended to determine whether the memory loss is real or feigned. During the pretest review of the questions, it should be emphasized to the subject that the question excludes any fuzzy, vague "memory" that may have been brought about by suggestion or by merely thinking about it. It is for this reason that the word specifically is important.

4. If the results of the initial polygraph examination indicate that the person does indeed have a memory loss and that it may have been caused by drugs taken prior to the incident under investigation, another polygraph examination should be arranged for a later date. In order to optimize the conditions for recovery of the memory, it is important that the chemical environment within the subject be the same during the second polygraph examination as it was at the time

of the incident. Thus, if the subject is an alcoholic and at the time of the incident he had had several boilermakers, the subject should have the same number of boilermakers at the appropriate time interval prior to the reexamination. Likewise, if the first polygraph examination determined that the amnesia is genuine and the person was high on heroin at the time of the incident, he should again be high on heroin at the time of any further examination. Once a person is addicted to a drug, the presence of that drug state is actually that person's normal state and thus represents the optimal state for conducting a valid interrogation, interview, or polygraph examination. If the person is undergoing withdrawal symptoms at the time of the examination, the task of obtaining valid results is made much more difficult (1). By no means is it certain that the memory will return when the internal chemical environment is duplicated, for the social surroundings play a very important part in determining the effect any drug has; but it would certainly increase the possibility of recall.

The seriousness of the state dependent phenomenon during polygraph examinations is not known. The author has examined five persons who claimed to have alcohol-induced amnesia concerning their possible participation in a crime. The polygraph examination indicated that all of them could indeed remember having committed the crimes in question and that their claim of amnesia was merely feigned. It is thus possible that the issue raised in this article is of theoretical interest only. On the other hand, it is also possible that the implications of the state dependent phenomenon are very real for the polygraph profession. The author is extremely interested in hearing from other examiners concerning their experience with suspects who claim to have experienced drug-induced amnesia: were their claims real or feigned? Please address correspondence to:

Gordon H. Barland
Department of Psychology
University of Utah
Salt Lake City, Utah 84112

The information will then be published in the Journal or APA Newsletter, as appropriate.

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WANTED - DEAD OR ALIVE!

The Archives of the American Polygraph Association is now receiving material on research, law, instruments, cases, examiners' biographies, books, articles, polygraph organizations and polygraph history.

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POLYGRAPHY AT THE WATERSHED

By

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Until quite recently, debates over the legitimate scope of use of polygraph testing, if any, went on essentially outside the courts, simply because courts ruled polygraph evidence inadmissible for any purpose. The only other formal legal response was a flurry of legislative activity in about one-fourth of the states banning or limiting use of the polygraph in employment situations. Today, however, enough courts are showing a willingness to reconsider the matter of admissibility of polygraph evidence that those who function as polygraph examiners need to marshal their forces so that this class of evidence can be dealt with by courts and administrative agencies on a secure basis. There are three aspects of this: (1) developing the admissibility of polygraph evidence in the courts; (2) establishing the legitimate boundaries of use of the polygraph as an investigative tool in both public and private law enforcement and crime prevention; and (3) establishing institutional reliability in the field of polygraphy. These three aspects are important enough and interrelated that failure to treat any one of them adequately may well imperil the legal and social status of polygraph testing.

Developing Admissibility in the Courts

In a sense, polygraph evidence has been treated by the courts much more severely than other categories of scientific evidence. Generally speaking, when an appreciable number of specialists make use of a new test, device or procedure in their occupational or professional activities, and govern that activity according to the observations made or results reached, courts begin to permit them to testify on the basis of their tests or observations whenever their opinions are of help to court and jury in resolving one or more of the issues being litigated. The evidence at least is ruled admissible; it then is up to the opposing party to attack the

probabilities on which the expert opinion evidence rests. In other words, once the admissibility hurdle is passed, the fight turns on weight and credibility.

That the number of experts may be small is illustrated by so-called voiceprint evidence. As long as only one person, Dr. Lawrence Kersta, maintained the reliability of voiceprinting, it was difficult to persuade courts to admit the evidence. Today, however, the roster of experts, although quite small, embraces people like Dr. Tosi of M. S. U. and Lt. Nash of the Michigan State Police, and the body of test data has expanded rapidly. Consequently, several courts have admitted voiceprint evidence at least for purposes of corroboration.

Polygraphy continues to function under an inherited burden of adverse judicial rulings based on its claimed statistical unreliability. Therefore, from the standpoint of polygraph experts, a vital need is to bolster proof of the validity of the scientific bases on which polygraphy rests. There appears to me to be a great lack of empiric, basic research into the validity of the premise on which polygraph examination rests: lying produces physiological response to a state of psychic stress, a response which can be objectively measured and interpreted. Perhaps there are scientific studies not generally disseminated; if so, they should be widely circulated. If such studies have not been made, then they should be promptly commissioned. Please note that the increasing acceptance of voiceprinting flowed directly from large scale scientific testing by qualified experts, financed by federal LEAA grants. Rote reliance on the statements of totem figures like Inbau and Reid is not enough.

Moreover, greater attention must be given to the matter of statistical probabilities underlying polygraphy, since statistics appear to weigh heavily with courts. True, there are studies that claim a 95% or better reliability for polygraph testing [e.g., Horvath & Reid, The Reliability of Polygraph Examiner Diagnosis of Truth and Deception, 62 J. Cr. L., C. & P.S. 276 (1971)]. That high a percentage, if uncontradicted, will persuade most courts. A sophisticated opponent of polygraphy, however, will rely on the phenomenon of "conditional probability" [e.g., Skolnick; Scientific Theory and Scientific Evidence: An Analysis of Lie Detection, 70 Yale L. J. 694, 714-21 (1961); J. Shattuck, P. Brown & S.

Carlson, The Lie Detector as a Surveillance Device 24-26 (ACLU 1973; press mimeo ed.)]. This means that if a test has less than 100% accuracy, "the probability of its accuracy in any single case is dependent upon the prevalence of the condition in the population group to which the test is being given" [ACLU Report at 24].

Using an illustration in the ACLU Report, suppose there are 25 embezzlers among 1,000 bank employees. If a reliability factor of 95% is assumed, then 50 of the 1,000 employees will be incorrectly diagnosed. This means that 24 of the 25 embezzlers will be discovered, which sounds excellent. However, it also means that 49 people (5% of 975 innocent people) will also be incorrectly diagnosed, in this instance as guilty. Therefore, of the 73 people diagnosed as criminal (the 24 actually-guilty and 49 wrongly-accused innocent persons), only 24 are in fact guilty. Thus, the probability ratio is actually 24/73, or almost 33 percent. If there are only five embezzlers out of the 1,000, then the five will probably be discovered (95% of 5 = 5), but 50 innocent persons will also be classified by the polygraph examiners as guilty. The reliability factor is then based on 5/55, or 9%.

I claim no expertise in statistics or mathematics. As a lawyer, however, I foresee devastating attacks on polygraph evidence unless polygraph experts are equipped to counter persuasively the claim that conditional probability, correctly applied, leaves more than the 50% probability required by statisticians for scientific reliability.

A second caveat for proponents of polygraph evidence is that only admissibility for limited purposes should be sought. Judge Joiner's memorandum opinion in United States v. Ridling (unreported) is an excellent precedent. The issue of criminal intent was critical in that perjury case, and polygraph evidence would help indicate circumstantially the presence or absence of the intent to lie under oath. If intent appears to be well established through other circumstantial evidence, then probably it is unwise to offer polygraph evidence other than for purposes of impeachment or rehabilitation, as the case may be, after the person who underwent polygraph examination has testified under oath. In short, only in carefully controlled cases should polygraph evidence be offered.

A third factor to be stressed is that to the extent possible, selection of the polygraph examiner or examiners should be made under court order. There is probably inherent power in a court to enter such an order for cause shown [cf. United States v. Ridling, supra], and the Supreme Court appears to accept the constitutionality of such orders for the production of what is demonstrative evidence and not "testimonial utterances" [see United States v. Dionisio, 12 Cr. L. 3083 (1/22/1973); United States v. Mara, 12 Cr. L. 3089 (1/22/1973), involving grand jury subpoenas to provide voiceprint samples and handwriting exemplars]. A court predisposed to enter such an order should exercise care in the selection of polygraph examiners, control over the foundation laid for admission of the test results, and caution in preservation of the record, at the same time minimizing the likelihood of a "battle of experts" too frequently encountered when each side offers its own examiner.

A fourth element important in establishing judicial acceptance of polygraph evidence is use of carefully drafted stipulations enforced by the courts [cf. Note, "Lie Detector Tests: Possible Admissibility Upon Stipulation," 4 John Marshall J. of Practice & Proc. 244 (1971)]. Attention should be paid to developing a standard form with prescribed procedures to be followed in obtaining consent from parties and counsel and in offering the stipulation in court; perhaps an analogy worth considering is plea negotiation, including judicial procedures for accepting guilty pleas and pleas of nolo contendere. Once a valid stipulation is accepted and a polygraph examination conducted, then courts should require the parties to conform to it. In criminal cases, this means that evidence adverse to the defendant will be admissible within whatever limits are set by the court, as discussed above. But it should also mean dismissal of the charges if that is what the prosecution stipulates to [see Butler v. State, 228 So. 2d 421, 16 N.Y.L. Forum 646 (1969)]. Certainly the stipulation will continue to be critical to the admission of polygraph evidence in most cases, so that greater attention should be paid to it than has generally been done thus far.

Establishing Limits on the Polygraph as an Investigative Tool

A. Public Law Enforcement Use

Whatever the ultimate decision may be as to the in-court use of polygraph evidence, there is no appreciable legal problem if law enforcement agencies continue to use it to screen suspects out of the system. There is ample analogy for this conclusion in other areas of law enforcement. For example, even if Miranda requirements are not met in a particular case, no legal consequences flow if the suspect either gives inconclusive responses to questioning or reveals information that exculpates him. A stop-and-frisk situation, even if questionable under Adams v. Williams [407 U.S. 143 (1972)], brings no adverse legal consequences if the person stopped identifies himself adequately to the officer and is permitted to go his way, or if the frisk reveals no weapon or incriminating evidence (assuming no gross excess of force or abuse of authority that might support a civil rights act civil proceeding). Polygraph examinations that result in the non-arrest or release of suspects or arrested persons do not translate into legal disputes over evidence. Moreover, the concept of conditional probability, mentioned earlier, operates only to indicate that a few guilty suspects may be erroneously screened out of the criminal justice system as innocent, and this renders most unlikely any class actions or civil rights injunctive measures against police use of polygraph testing.

Dionisio and Mara, mentioned earlier, when coupled with the lineup decisions, seem to establish the premise that the polygraph does not fall with the concept of self-incrimination as long as the answers, as opposed to physiological responses, are not used in evidence against the person examined. The controlling constitutional doctrine seems to be Fourth Amendment search and seizure. The two grand jury cases, Dionisio and Mara do not directly govern orders for the conduct of polygraph examinations during preliminary proceedings. Dictim in Davis v. Mississippi suggests that practice rules for brief, limited detention of suspects for fingerprinting would not violate the Fourth Amendment if a probable cause basis were established for the order. A few courts appear to find inherent power to order voiceprinting and lineup identification at pretrial stages of prosecutions. Police may wish to keep this in mind; in the longer range, special procedures for the acquisition of evidence should be established in revised criminal procedure rules or statutes.

If the privilege against self-incrimination does not apply to polygraph evidence, then logically the Miranda doctrine, which rests squarely on self-incrimination, should have no application either. Nevertheless, officers administering polygraph tests may be well advised to use Miranda warnings whenever the suspect is in police custody, simply to forestall any attack on otherwise admissible polygraph evidence, which a magistrate or trial judge hostile to such evidence might seize upon as a legal basis for excluding it.

B. Private Law Enforcement Use

This is part of a developing problem area of the law, namely, the extent to which society can make use of private para-police agencies in law enforcement without having the evidence-acquiring actions of those agencies subjected to exactly the same rules that apply to regular law enforcement officers. Thus, for example, it is being asserted with increasing frequency, and sometimes successfully, that if plant security guards or private police agencies question suspected thieves (employees or customers) detained against their will, and obtain incriminating admissions in the absence of Miranda warnings, then the statements should be inadmissible. As another example, if school officials search student desks and lockers to obtain evidence to turn over to police, then the seizure should be invalidated under the Fourth Amendment. It may be a reasonable legal forecase that if private agencies use the polygraph to uncover crime, then their testing procedures will be subjected to whatever constitutional, statutory and evidence law controls are imposed on evidence derived from law enforcement polygraph testing. Accordingly, polygraph examiners affiliated with law enforcement agencies should be as concerned over the standards and techniques used by private polygraph firms and consultants as they are over their own, since prosecutions may well be sabotaged otherwise.

The use of the polygraph for purposes of employee discipline or discharge probably presents no constitutional problem under existing precedent. For example, even public school officials are allowed to question pupils and examine lockers if their good faith motivation is to enforce school regulations necessary to student safety and welfare during

school hours on school premises; private and parochial schools are entirely outside the Fourth Amendment-Fourteenth Amendment, whatever the motives of their staff in inquiring into student conduct.

In twelve states, however, statutes enacted at the behest of labor organizations prohibit or restrict use of the polygraph in connection with retention of employment. Although in these jurisdictions the statutes seem not to be invoked formally by prosecutors, they appear to restrict significantly the private use of the polygraph. Ironically, they seem to necessitate early summoning of the police to conduct polygraph examinations, since in most of these statutes, law enforcement use of the polygraph is not within the statutory prohibition.

In the rest of the states, use of the polygraph for plant protection and the like is dealt with through labor contracts. Most labor organizations oppose all polygraph examinations, usually on the basis that the polygraph invades personal privacy. Negotiators for employers in businesses and industries in which theft or embezzlement is a significant economic problem should probably seek a very limited type of authorization clause that limits use of the polygraph to instances of clearly apparent criminal acquisition of company property, and to those who have direct control over or unsupervised access to the property in question. Few responsible union representatives would seek to outlaw under a union contract a requirement that employee lunch boxes be inspected on departure, or perhaps that a metal detector be used; to the extent that such an assumption is valid, then clauses relating to polygraph examination should be as narrowly drawn.

A more sensitive area is use of the polygraph to screen employment applicants. Granted the indiscriminate nature of the examinations too frequently used in business, the professional body of polygraph examiners risk very substantial opposition from influential sectors of public opinion if indiscriminate use of the polygraph for profit is widely carried on. There is enough restiveness over fingerprinting of applicants, access to computer bank data, investigations into family and mental condition, and other probings of the soul,

that heedless use of the polygraph may accelerate the demand for highly restrictive legislation in every state. It may be highly prudent for polygraph examiners to insist on use of the device only on applicants for limited and highly sensitive positions, covering narrow categories of subject matter, under substantial safeguards for confidentiality, and subject to requirements of corroboration before action is taken by the employer; moreover only clearly qualified examiners should be used.

Establishing Institutional Reliability for Polygraphy

The last comment poses what is probably the most critical element to the establishment of the polygraph as acceptable scientific evidence: the qualifications and standards of those who conduct polygraph examinations. Even the strongest proponents of the polygraph recognize that perhaps a strong majority of those who hold themselves out as polygraph examiners are unqualified. Action is needed on three fronts.

A. Standardization of Training

It is essential that a sound accrediting agency be created to establish standards for the educational prerequisites and training of polygraph examiners. Only graduates of approved schools should be able to call themselves certified polygraph examiners. Moreover, only provisional certification should be offered initially. Final certification should be withheld until substantial experience has been gained under the direct supervision of senior examiners. Beyond this, a continuing education and recertification examination requirement should be imposed as a condition to biennial recertification. Without objectively defensible education and certification requirements, it is frivolous to speak of a breathalyzer "profession."

B. Discipline

A concomitant to standardization of training and certification is creation of a neutral, impartial disciplinary body which includes non-examiners (and non-law enforcement personnel) in its membership. Such a body must have the legal authority to enjoin unqualified practitioners and those whose certification has been revoked on adequate grounds. It must

also be empowered to maintain lists of qualified polygraph examiners, from among whom judicial appointments may be made in cases in which polygraph evidence is relevant. Mere membership in an organization which anyone can join on the unsubstantiated assertion that he is an examiner, and the payment of annual dues, is not any guarantee at all of professional qualifications. If courts are unwittingly led to admit testimony by unqualified or marginally qualified examiners, all examiners are thereby discredited. Self-preservation dictates adequate occupational standards rigorously enforced.

C. Constructive Law Revision

All this requires law change at the state level. Responsible polygraph examiners should urge licensing and regulatory legislation in every state, without grandfather clauses. There may be latent constitutional problems in legislation without such clauses, but one can find regulatory acts without such coverage that have been sustained as valid. There is probably no way absolutely to escape allegations of personal preference on the part of those who set the standards and form the initial accrediting body, but the process of establishing the formal machinery of a new profession or occupational group has occurred often enough in the past that it should be successful in this context as well.

As indicated earlier, a high order of priority should be given to empirical studies to establish the validity of the scientific premises underlying polygraph examination, and the statistical reliability of the technique, so that a valid foundation may be laid for this class of evidence in all jurisdictions in the country. So important a matter should not be left to haphazard development, particularly with a background of so many adverse rulings to admissibility of polygraph evidence based specifically on its unreliability.

The organized body of polygraph examiners should also be most careful in selecting suitable test cases and in providing qualified experts to make a record establishing the scientific validity of polygraph evidence. In Michigan, for example, evidence based on the Harger Drunkometer was rendered inadmissible because of a bungled presentation of evidence based on its use in the prosecution out of which the test case

arose. It took the adoption of a different device, the breathalyzer, and a carefully prepared test case, before law enforcement could rely on a generally accepted test for alcohol/blood ratio and the physical and mental impairment resulting. A failure to select suitable test cases may perpetuate the general inadmissibility of polygraph evidence.

Attention should be paid to realistic public education about the proper limits of polygraph examination. Popular mythology about the "lie detector" "black box" makes jurors mis-reliance on polygraph evidence all too possible, which in turn affects the willingness of courts to admit it. Moreover, to the extent that proponents of the polygraph indicate that belief in its infallibility is a prerequisite to its successful use, they invite judicial decisions that cite this as proof of the polygraph's scientific reliability. The polygraph has very real limits, which should be openly acknowledged to the public.

The polygraph has a role to play in both investigation and litigation. It suffers under a legacy of adverse, often hostile precedent which must be distinguished or overturned before polygraph evidence becomes generally admissible. Proponents of the polygraph must agree among themselves about how far courtroom use of the polygraph can properly extend, and the degree to which it can be a legitimate personnel management tool. Rigorous certification requirements must be created and enforced, and only clearly qualified examiners permitted to appear in court. If these strictures are followed, polygraph evidence may become generally accepted by courts and administrative agencies. If they are not, there is risk not only that the rule of evidence exclusion will continue, but that prohibiting legislation will become ever more widespread.

USE OF AN INTERPRETER DURING A POLYGRAPH EXAMINATION

By

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August - 1973

At first, it may seem to some that the use of an interpreter is too difficult a task, that it creates an awkward environment which is too cumbersome to control. Others may think that as long as the subject understands the questions and the examiner marks the charts properly, adequate results can be obtained. Still others might conclude that to utilize the services of an interpreter is too dangerous and the best policy is to examine only those subjects you can converse with directly, even if this means minimal communication. Obviously, these approaches have serious drawbacks. Fortunately, proper utilization of an interpreter is not a difficult process to master. However, it does require adherence to some basic guidelines and some planning.

Fundamentally, we must consider the polygraph procedure a rather unique and structured environment. This environment influences the subject and the resulting polygrams. Everything that transpires while the examiner and the subject are in contact is part of this process. Many unrecorded and sometimes apparently innocuous things can have a dramatic affect on the examination. Improper idle chatter, premature questions, facial expressions, all of these and more, can influence the subject's psychological attitude. The interpreter's very presence may create anxieties and stresses that are difficult to control. Therefore, it is of utmost importance that every outside influence be controlled by the examiner. Understandably, there are those outside influences we have no control over, but the interpreter is not one of them.

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Role of the Interpreter

The interpreter's role must be relegated to that of a machine, an inanimate object that merely parrots the words spoken. This, he must do without emotion or explanation. Only with this procedure can we reduce the adverse affect the interpreter may have on the examination. We must prohibit the interpreter from engaging in unmonitored conversation with the subject. Everything that is said between the subject and the interpreter must be repeated to the examiner. It is pure folly to allow the interpreter to conduct the pre-test while you do other tasks unaware of what is being said. At no time should the interpreter be allowed unrestricted license to converse with the subject. Nor should he make comments to you about the case (the subject may understand English better than you think, and often does). The interpreter must be a machine that receives your message, interprets it, repeats it in the foreign language, receives the reply, interprets it and feeds it back verbatim in English, without addition or deletion. Further, this robot or machine can do nothing on its own. It cannot pursue a confusing point, cannot clear up an uncoherent comment. It can only repeat what it is told. The interpreter's comments should never be prefaced with, "he says", "he wants to know", "it is his understanding that", etc. Obviously, if the interpreter is using this language, he is not repeating verbatim what the subject is saying and oftentimes the smallest word can influence the tack an examiner takes. Consider, for example: "I never saw the missing jewelry", versus "I never saw all the missing jewelry". What a profound difference that three-lettered word (all) would make in question construction or post-test interrogation!

Position of the Interpreter

The physical positioning of the interpreter is very important. The interpreter must be close enough to the examiner and his papers to be able to read directly from the question sheet and not positioned so as to be out of view of the hand signals that will be necessary. By and large, the best position for the interpreter is to the left of the examiner and in close proximity to him. This procedure dictates that the subject close his eyes during the examination (a procedure I have found beneficial and use in all examinations).

After writing your questions in English, ask the interpreter to study them. (Beforehand, determine if the interpreter can speak the foreign language while reading English. Most can.) Indicate that you will make a slight motion with your left hand when he is to begin the questioning and when each subsequent question is to begin. Conduct your lead-in just as you would in any other test; however, after you have said, "The test is about to begin", from then on the interpreter is the only one who speaks during that chart. When conversing with the subject, break each sentence up in some logical sequence so the interpreter can speak to the subject without having to remember a long question, and so that a more precise interpretation can be made. If you wish to select a question out of numerical order, point to the question and then give your hand signal when to begin the question. Be prepared for a longer than normal examination. If the examination would normally take 2 hours, it will probably be closer to 3 hours with an interpreter.

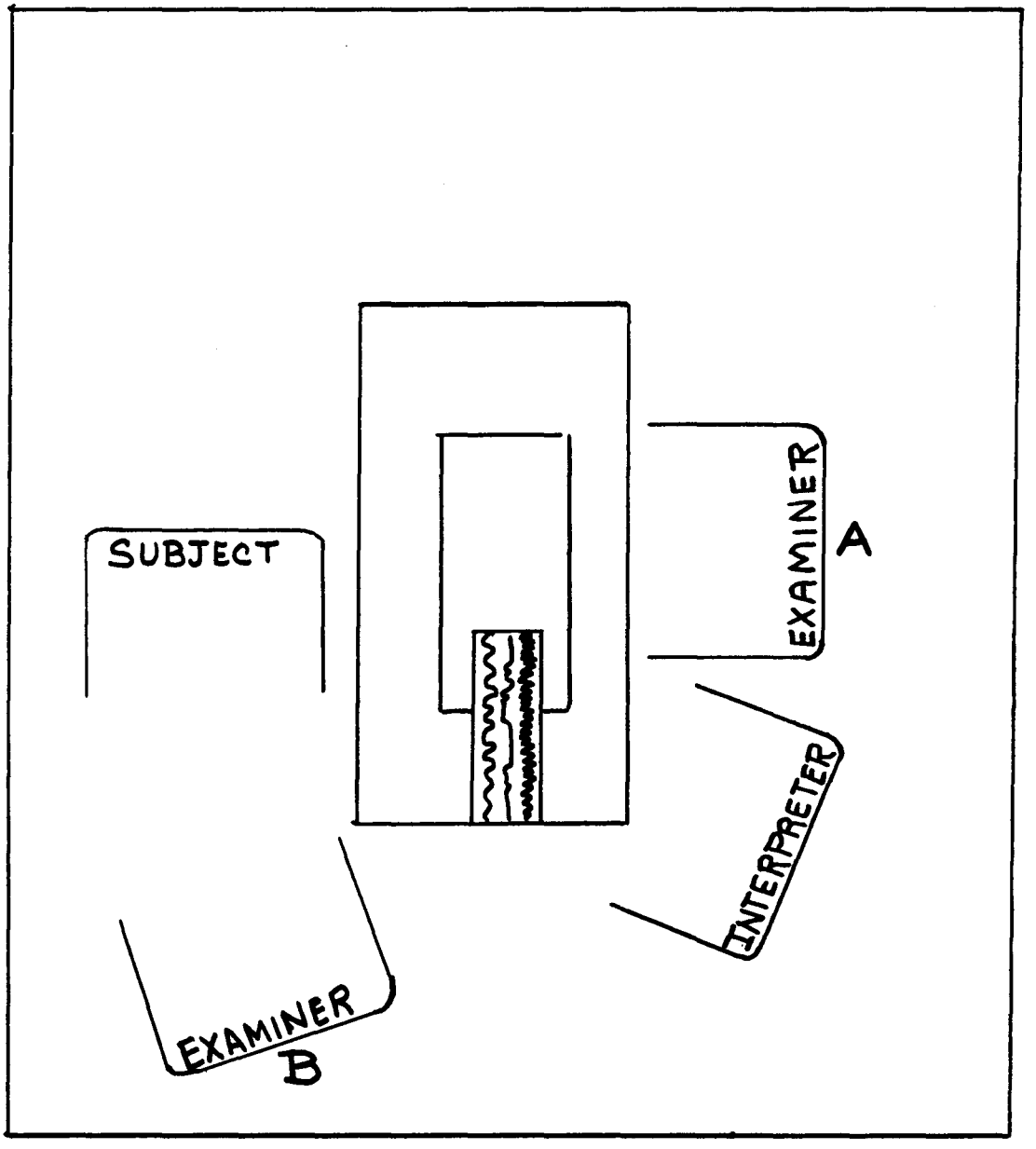
Conduct your post-test interrogation exactly as you would without the interpreter. Position yourself in front of the subject with the interpreter in the same position as during the testing phase. Look directly at your subject. Never look at the interpreter while the question is being repeated. Soon you will find the subject is also looking at you and no longer looks at the interpreter when talking.

Observation of these guidelines will make examination of those persons who cannot speak English or who speak limited English a rather pleasurable experience. You can become just as effective an examiner in any language. But remember, control the interview. Do not allow the subject and the interpreter to engage in any conversation that is not repeated in English. Do not go too fast. If the polygrams indicate deception, interrogate as you would any other subject.

Figure 1

Set-Up and Positioning of the Participants

Position "A" is the normal position of the examiner during the pre-test and test. Position "B" is the examiner's position during post-test.



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ELECTRODERMAL, VASOMOTOR AND HEARTRATE CHANGES AS CORRELATES OF EXTRAVERSION AND NEUROTICISM

By

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ABSTRACT

The types of physiological responses given by subjects who score high and low on neuroticism scales, and subjects who score high and low on scales of extroversion-introversion are considered. The responses are matched with the personality types and then studied in regard to their characteristics as to orienting reflex (OR), defensive reflex (DR), and habituation speed (HS). Responses are GSR amplitude, VMR pulse volume, and HR. Hypothesis incorporates aspects of Lacey's intake-rejection and Sokolov's views on orienting and defensive reflexes. [Ed.]

Since the pioneering work of Sokolov (1959, 1963) in the field of the orientation reflex (OR), much research has been done on individual differences in amplitude and habituation speed (HS) of the OR. This was caused primarily by the fact that Sokolov had presented a model for the function and working of the OR that invited translation to the terrain of individual difference and psychology of personality.

Sokolov describes the OR as a complex, non-specific reaction which results in optimal adjustment of the sensory systems to stimulation. The OR is directed towards heightening the stimulus input (". . . to increase the discriminatory power of the analysers . . . ", 1963). Other important functions of the OR are the "preparation for action" and optimalization of the conditioning process. The link between CS and UCS is more easily made if the reception of both stimuli is facilitated. This is actually the case

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because the OR increases the activation in the cortical centres of both CS and UCS.

The attempt has been made to relate individual differences in size and habituation speed of the OR to individual differences in other, more complex variables, such as cognitive styles, schizophrenia, neuroticism, extraversion, ego strength. Since we have worked exclusively with the variables of extraversion and neuroticism in our research, we shall limit ourselves to those factors here. For a review of the literature with respect to the other variables, see Schelhaas and Orlebeke (1972).

Anxiety and neuroticism.

When one assumes that anxiety is paired with increased autonomic physiological activity, then one can imagine that various researchers have looked for the relationship between orientation reflex size and anxiety. One can distinguish three kinds of anxiety: scale anxiety, actual anxiety and chronic anxiety.

Scale anxiety is the score on an anxiety scale or a neuroticism scale. We have taken the liberty of viewing scale anxiety and neuroticism as largely overlapping concepts; the supposition, based on factor-analysis that scale anxiety correlates as highly with extraversion as with neuroticism --two orthoganal factors-- is, we think correct. Repeatly we have primarily found a relationship between scale anxiety (IPAT) and neuroticism, and not between extraversion and scale anxiety (Orlebeke, 1972). It is an indication for a disposition to react with anxiety in certain situations.

Actual anxiety is defined as the anxiety determined by a threatening situation. Chronic anxiety is an anxiety situation that exists independent of the actual situation. In this paper we will refer only to scale anxiety or neuroticism.

Electrodermal Response

Koepke & Pribram (1967) found that anxiety as measured with Taylor's Manifest Anxiety Scale (MAS) correlated positively with habituation speed of the vasomotor orientation

reflex component. There was no relationship between MAS score and the GSR component of the orientation reflex.

Roessler, Burch & Childers (1966) also found no relationship between the scores on a number of anxiety scales and the GSR component of the OR. Lovibond (1963) found that persons with a high N score (MPI) showed a smaller first GSR and a slower habituation than persons with a low N score.

Coles et. al. (1971) showed that high N(neuroticism) subjects habituated to GSR more slowly than low N subjects. They found no difference between both groups in response amplitude.

Sadler et. al. (1971) found fewer responses in a habituation series in subjects with a high N score than in low N subjects (this index correlates with habituation speed [HS] although this was not apparent in the Sadler et. al. study.)

Orlebeke (1972) found a greater GSR and slower habituation with high N subjects in comparison with low N subjects.

The relationship between N on the one hand and OR size and habituation speed on the other is therefore not altogether clear.

Extraversion

According to Jones (1950), extraverts are characterized by a small GSR in comparison with introverts. He found with twenty-five children a correlation of $r = -.80$ between GSR amplitude and extraversion (measured not by questionaires but by evaluation scales filled in by a third person.)

Sadler et. al. found no difference in GSR size and habituation speed between introverts and extraverts. Crider & Lunn (1969) report a negative correlation between extraversion (Welch's R scale) and habituation speed. They do not mention amplitude.

Coles et. al. found no relationship between extraversion and orientation reflex size and habituation speed. Orlebeke

(1972) reports a correlation of r = -.32 between extraversion and OR size in a sample of n = 36. There was no relationship between extraversion and habituation speed. The relationship between extraversion and OR size disappeared when the sample size was increased to 60. Here, too, it appears that no clear picture of the relationship between extraversion and orientation reflex exists in the literature.

Interaction studies: E(Extraversion) x N(Neuroticism)

Crider & Lunn (1969), Sadler et. al. (1971), Coles et. al. (1971), Mangan & O'Gorman (1969) have drawn attention to the idea that autonomic physiological activity could be a more or less complex function of the interaction E x N. The results of their research are however scarcely homogeneous.

Crider & Lunn (1969) found that impulsivity (measured with a number of MMPI scales that load high on an impulsivity factor) correlated negatively with habituation speed of the GSR. They draw the following conclusion: "Since impulsivity correlates positively with both anxiety and extraversion, electroderman stabiles (= fast habituation) can be described as neurotic extraverts and electrodermal labiles as stable introverts."

We find that this is a rather speculative conclusion, especially since we found a negative correlation between N and impulsivity in a repetion (Orlebeke & Feij, 1969; Orlebeke, 1972).

Mangan & O'Gorman (1969) measured E and N with the EPI. They divided their subjects into four groups: High N--high E, High N--low E, low N--high E, and low N--low E. Both low N groups had a larger first GSR than the two high N groups. With respect to habituation speed, there was an interaction E x N: High N--Low E and Low N--High E persons habituate more quickly than Low N--Low E persons.

In the second part of their experiment, Mangan & O'Gorman worked with a group of introverts and a group of extraverts who all had an average score with respect to N. Here it appeared that the Low E group showed a larger first GSR and habituated more quickly than the High E group.

For the determination of the GSR amplitude, Mangan and O'Gorman measured directly in mm. Not correcting for the initial value could very well have had an artificial effect with respect to the response amplitude. It is even possible that in fact the results must be reversed: i.e., introverts have a greater GSR than extraverts and High N people have a greater GSR than Low N people, if one assumes that Low E and High N people have a greater skin conductance and if one takes change in log conductance as response measure. Sadler et. al. (1971), who worked with virtually the same design as Mangan & O'Gorman, found neither an N nor an E x N effect with respect to habituation speed and orienting reflex size.

A further analysis in which the slope of the habituation curve over all trials was taken into account did bring an E x N interaction to light: the Low N--Low E and High N--High E groups had a greater GSR and a faster habituation that the Low N--High E groups. This result deviates sharply from that of Mangan & O'Gorman.

Coles et. al. (1971) found no interaction effect.

The consistency in these results is exceedingly small. Various causes for this can be indicated: the use of different stimuli and tests, the use of different GSR measures, the different ways in which experimental groups were formed. But also the fact that one keeps assuming a priori that one is busy measuring OR's. It is known that at higher stimulus intensities the orienting reflex (OR) changes over into a defensive reflex (DR). Apart from the stimulus situation, strong individual differences very likely exist in the more or less habitual reacting with an OR or a DR. It cannot be seen from the GSR whether we have to do with an OR, DR, or a mixture of both. If this assumption is correct, then it is possible that a slow habituation is caused by a relatively dominating DR component in the particular response, for not, or very slowly habituating, is characteristic of the DR (Sokolov, 1963). In other words, it is then possible that when a High N group shows on the average just as great a GSR as a Low E group, the interpretation of the responses in those two groups is different.

Sokolov (1963) distinguished OR and DR by plethysmographic measurements at the forehead. Dilatation of the peripheral blood vessels would be an OR, construction a DR. This method is rather difficult. Most researchers who have worked with it have not succeeded in measuring dilatation in the forehead.

Another possible way of separating DR and OR is by measurement of the phasic heartrate response. Although also here a somewhat controversial area is broached, there are nevertheless indications that heartrate deceleration is an OR component and heartrate acceleration a DR component. The literature is with respect to the exact form of both the response components, not completely unequivocal. For example, Davis et. al. (1955) found after the repeated presentation of a tone of 98 db averaged over ten trials with seventeen subjects, resulted in deceleration, maximal at heartrate 3; then acceleration followed, (maximal at beat 6), and finally deceleration of longer duration (maximal at beat 12 or 13).

On the other hand, Lang and Hnatiov (1962) found, after a tone of 85 db, acceleration (maximal at beat 4) followed by a longer lasting deceleration. Virtually the same result is reported by Zeaman, Deane & Wenger (1954) with a tone of 60 db and by Geer (1964) with a neon light as stimulus. Uno & Grings (1965) measured acceleration exclusively after certain tones (70, 80 and 90 db) and deceleration exclusively after others (60 and 100 db). Germana & Klein (1968) report within a period of 15 heartbeats acceleration - deceleration - acceleration, successively.

Because with most researchers (excluding Germann & Klein) it appeared that it is a deceleration component which habituates with stimulus repetition, and not the acceleration component(s), Graham & Clifton have hypothesized that deceleration is the orienting reflex (OR) and acceleration the defensive reflex (DR). Theoretically this is justifiable since this is congruent with the psychological interpretation of tonic heartrate changes: perceptual attention for the environment (intake) is paired with heartrate deceleration, whereas the more inwardly directed attitude with cognitive actively (rejection of the environment) goes with heartrate acceleration. This viewpoint, for which quite a bit of evidence has been gathered, is known as the "intake--rejection"

hypothesis and was first formulated by Lacey in 1959. Since the function of the OR is the heightening of stimulus input and that of the DR the lowering of the stimulus input, one is inclined to see here the phasic counterpart of the intake--rejection hypothesis (which is based on tonic relationships).

If this train of thought is correct so far, then we can, taking into account what on balance must be taken as most likely from the literature, formulate the following hypotheses:

1. High N subjects have a greater first GSR and show a slower habituation than Low N subjects (here we also remain within the general law, that size of the first response and habituation speed positively correlated. (Van Olst, 1971).

2. Low E subjects have a greater GSR and show a slower habituation than High E subjects.

3. The hypotheses 1 and 2 also hold for the vasomotor response (VMR).

4. The greater responses in High N subjects reflect primarily an OR; the greater responses with Low E persons reflect primarily a DR. This is apparent from the fact Low E subjects show a relatively large acceleration component in the phasic heartrate response and High N subjects a relatively large deceleration component.

The inwardly directed introvert should therefore be a "rejector" and the person who scores high on an N scale an "intaker." This last idea is based on the idea that someone with a high score on such a scale is a "sensitizer," i.e., someone who admits an N disposition, does not repress (that in contrast with the "repressor"). Therefore a greater OR is to be expected with sensitizers because their defense mechanism is in fact a clearly expanded perception.

METHOD

Subjects

E and N of a group of sixty-two male first year psychology students were measured with the Amsterdamse Biografische Vragenlijst---ABV--(Amsterdam Biographical Questionnaire) of Wilde (1962). Four experimental groups were formed on the basis of percentile scores:

Low E: Subjects with a score of less than 30 on the E scale;

High E: Subjects with a score of more than 70 on the E scale;

Low N: Subjects with a score of less than 30 on the N scale;

High N: Subjects with a score of more than 70 on the N scale.

Furthermore, for the formation of these groups, the following rule was also taken into account: only persons who had scored more than 30 and less than 70 on the N scale were admitted to the Low E and High E groups; only persons who scored more than 30 and less than 70 on the E scale were admitted to the Low N and High N groups. In other words, there were no extreme N's admitted to the E groups, and no extreme E's to the N groups. In this way it was possible to place 7 subjects in each group.

Apparatus

GSR, VMR and heartrate were measured with an Ahrend-van Gogh polygraph. Two zinc electrodes were used foe measurement of the GSR (constant current method). The positive electrode (3.8 cm^2) was attached to the palm of the left hand; the negative electrode (43 cm^2) to the left wrist. A 2.4% $ZnSO_4$ solution was used as electrolyte.

The resistance change in ohms could be read off the recorder.

Transformation to conductance units occurred later. The VMR was measured using a photo transducer attached to the right middle finger.

A photo transducer was also used to measure heartrate. This signal was transformed into a cardiotachogram, i.e., a tachometer registered anew the heartrate per minute after each R-R interval.

Stimuli were produced by a Farnell frequency generator and presented to the subject via earphones.

Procedure

All subjects underwent the same procedure. They sat in a soundproof room. After electrodes, transducers and earphones were in place, an adaption period of ten minutes followed. After this, a series of 20 tones of 60 db and 1000 cps were presented with a constant interval of 30 seconds. Each tone lasted one second.

Quantification of autonomic variables

The response amplitude is analysed for the first five trials. That is, for each subject, the average amplitude is computed over the first five trials. This is done because the response amplitude in the heartrate can hardly be reliably determined for one trial, due to the large amount of error variance in the heartrate (primarily as a result of breathing).

GSR amplitude. For the first five trials, the change in log conductance (Δ log C) was computed per trial. Conductance was expressed in micromho's x 1000. Pen deflections of less than two mm were not counted as responses. After this the arithmetic mean of these five amplitudes was determined. GSR habituation speed (HS). The number of trials after which for three consecutive trials no GSR was measured.

Vasomotor Response Amplitude (VMR). The average pulse volume at the post-stimulus heartbeats 2 to 5, inclusive, divided by the average pulse volume at pulse volume at post-stimulus heartbeat 6 to 9, inclusive, taken as response

measure. Responses thus computed which turned out to be less than 1.1 were not counted as responses. After this the arithmetic mean over the first five trials was determined for each subject.

VMR - Habituation Speed. The number of trials after which no VMR was measured for three consecutive trials.

Heartrate. The exact place of the OR and DR in the heartrate is still a controversial point. This has among its causes the use of different stimuli and designs, but also the possibly erroneous custom of analyzing the heartrate beat-to-beat; this means that events occurring in different moments of time are added together. We have assumed that, if OR is deceleration and DR acceleration, and if both of these components occur within a period of ten heartbeats, it must be possible to determine OR and DR for each subject per trial by determining minimum and maximum heartrates respectively in that period.

The pre-stimulus level was determined per trial for the first five trials. This was defined as the heartrate in beats per minute on the latest R-R interval before the beginning of the stimulus. Next, the deviation from the pre-stimulus level in beats per minute was determined for the first ten post-stimulus heartbeats per R-R interval. After this, the maximal and minimal heartrate within the ten beats period was determined per trial for each subject. Then an average of the five maximal values and an average of the five minimal values were computed for each subject.

RESULTS

The results are summarized in table I. The High N group has on the average a greater GSR than the Low N group (Mann-Whitney $U = 10$; $p = .036$) and does not habituate significantly more slowly than the Low N group ($U = 16$; $p = .159$).

Introverts (Low E) also have a greater GSR and a slower habituation than extraverts (High E): U's of 9 ($p = .027$) and 11 ($p = .049$), respectively.

As far as the VMR is concerned, it appears that only the response amplitude of the Low E groups is greater than

that of the High E group ($U = 13$; $p = .082$). The difference between Low N and High N is not significant ($U = 23$; $p = .45$). VMR-Habituation Speed did not differentiate between Low N and High N ($U = 24$; $p = .50$), nor between Low E and High E ($U = 20$; $p = .31$).

In the heart rate the High N group has a more marked deceleration than the Low N group ($U = 11$; $p = .049$). The two groups do not differ with respect to acceleration ($U = 18$; $p = .20$).

The Low E group shows a more marked acceleration than the High E group ($U = 10$; $p = .03$). The groups do not differ with respect to deceleration ($U = 22$; $p = .402$).

Since maximal and minimal values for the heartrate were also measured in absence of stimulation, the difference between groups could already occur as a result of differences in heartrate executed in an analogus way within the period of ten heartbeats preceding the first stimulus; that is, in a period of no stimulation. Here none of the U's appeared to have a p value of less than .31.

It was also checked if the heartrate arrhythmia during the non-stimulus period differed significantly between groups. For this the absolute average of the largest positive and the largest negative heartrate value was taken per subject. The differences between the four groups was tested with a Kruskal-Wallis one-way analysis of variance; it did not prove to exist ($H = 2.49$; $.30 < p < .50$).

If one assumes that the dominating response component in the Low E group is heartrate acceleration, and in the High N group, deceleration, then the question arises of whether there is a difference in habituation speed between the acceleration of the Low E group and the deceleration of the High N group. This can be seen in fig. 1. The acceleration of the Low E group hardly habituates (Friedman two way analysis of variance with the trials as conditions: $X_r^2 = 3.38$; $p < .30$) and does not reach the arrhythmia level without stimulation (for each subject the acceleration on the fifth trial appears to be higher than the average deviation

without stimulation). The deceleration decrease in the High N group is on the contrary much clearer:

($x_f^2 = 11.32$; $.02 < p < .05$).

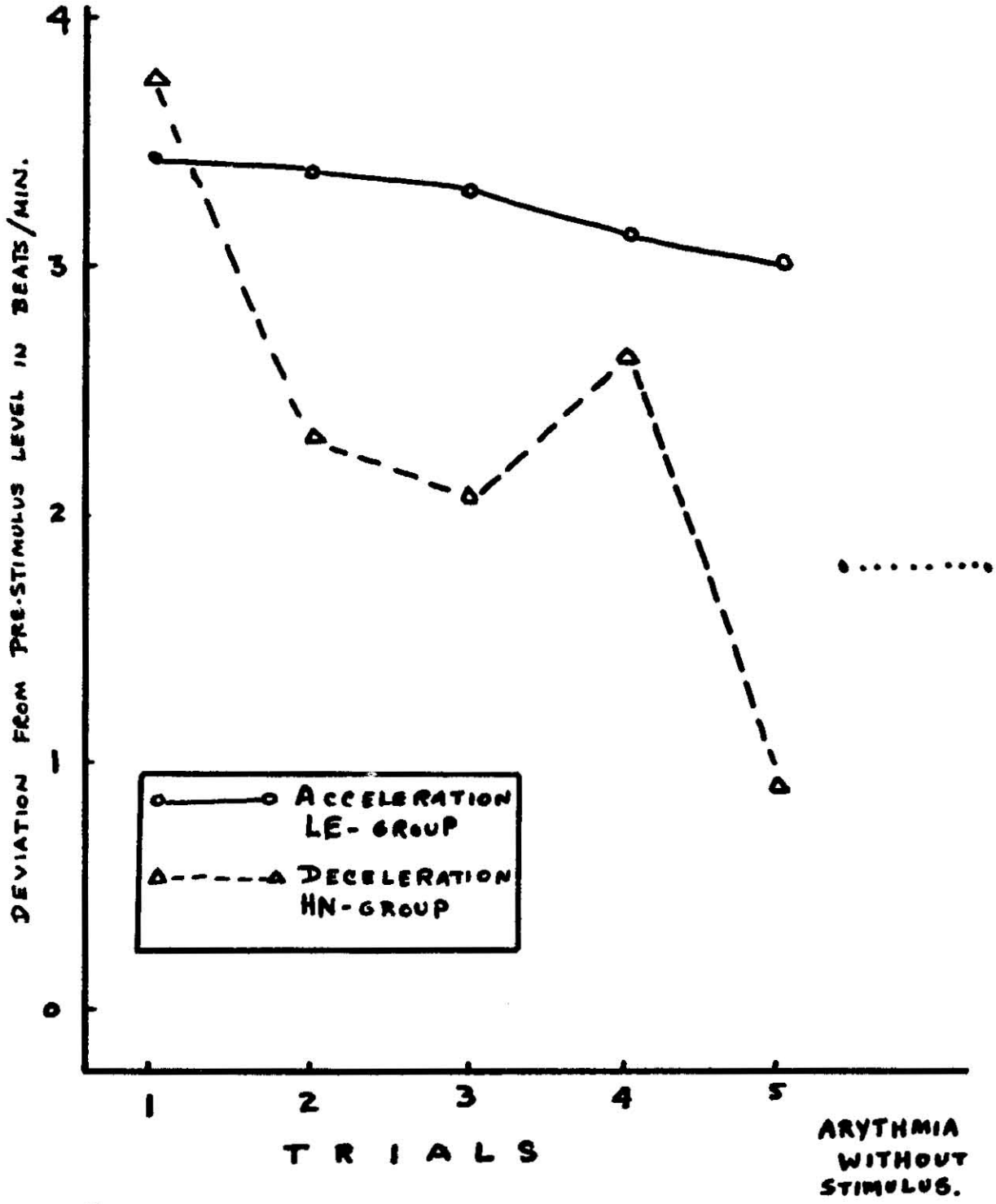

FIG. 1

Finally, it was investigated whether there was a difference between groups with respect to the pre-stimulus level, since Orlebeke (1972) has found evidence that its effect on acceleration and deceleration is considerable. This was tested with a Kruskal-Wallis one-way analysis of variance: $H = 2.04$ ($p < .50$).

DISCUSSION

Since the vasomotor response exclusively differentiated between Low E and High E (amplitude), this response aspect will be left out of further consideration.

On the basis of the fact that the High N group can be distinguished from the Low N group due to a relatively large deceleration, it can be said that the GSR of High N subjects includes a relatively large orienting response component. The habituation therefore, occurs rather quickly (6.1 trials), which is to be expected if the defensive reflex component is only present to a slight degree. In contrast, the Low E group differs from the High E group with respect to acceleration. This could therefore indicate that the defensive reflex component dominates in the Low E group. This is in agreement with the proportionally slow GSR habituation (11.4 trials) in this group.

In other words, of the four groups of subjects, Low E and High N subjects show heightened autonomic activity. With the Low E people, this activity serves primarily for limiting of stimulus input; with the High N subjects, this activity is primarily directed toward promoting stimulus input. That is, a difference in the way of information processing. One must remember here that by the laying of a link between OR and DR on the one hand and "intake" and "rejection" on the other, two possibly disputable assumptions have been made:

1. The pair of concepts OR-DR has, by interpretation within the framework of Lacey's theory, undergone an expansion of meaning, i.e., the DR is no longer, as with Sokolov, only a response to strong stimulation, but a response to stimulation in general.

2. Intake-rejection is in fact a special case of socalled stimulus response specificity. We have

assumed that it is justified to use this pair of concepts within the framework of individual response specificity.

Note: We are engaged in replicating this study, whereby besides the classification of subjects with respect to E and N, a classification with respect to the cognitive style dimension "leveling-sharpening" will be made. Because this in all probability is a behavioural variable which is more objectively measurable than E and N, it says something, about the means by which the organism incorporates sensory information, and is related to GSR size and habituation speed (Israel, 1970).

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TABLE 1: SUMMARY OF RESULTS

Experimental Groups	GSR-amplitude average of the first 5 trials	GSR-habituation speed (nr. of trials to 3x no response)	VMR amplitude average of the first five trials (pulse volume)	VMR-habituation speed (nr. of trials to 3x no reponse)	Heartbeat deceleration average of the first 5 trials	Heartbeat acceleration average of the first 5 trials
N L (n = 7)	11.2 **	5.0	1.34	3.1	-1.63 **	+1.73
N H (n = 7)	19.0	6.1	1.45	3.1	-2.44	+1.20
E L (n = 7)	23.4 **	11.4 **	1.62 *	2.7	-1.23 *	+3.13 ***
E H (n = 7)	13.7	6.6	0.66	2.1	-2.13	+1.38

* p .10
** p .05
*** p .01

CRIMINAL LAW CASES INVOLVING USE OR REFERENCE TO THE POLYGRAPH

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Where the polygraph was involved in determination of voluntariness of the confession and defense counsel indicated his desire to refer to the polygraph test without announcing the result, no mistrial is indicated as any error was created or invited by defense counsel. The court made every effort to protect the jury from counsel's error in referring to the polygraph by giving a warning and an instruction and it is presumed the jury abided by the instruction. People v. Smith, 500 P. 2d 1177 (Colo. 9/18/72).

It was error for the court to request the defendant to submit himself to a polygraph test as a condition to granting of probation--thereby obtaining from the defendant the admission of prior criminal acts, ranging from taking of abandoned furniture to robbing while armed with a starter pistol, although no convictions. The case is thus remanded for resentencing. People v. McVet, 287 N.E. 2d 479 (Ill. App. 9/11/72).

Questioning witness on redirect examination by prosecutor as to having taken polygraph test does not constitute reversible error, where objection was sustained and the jury instructed to disregard and there was no answer as to what the results of the test were. People v. Parisie, 287 N.E. 2d 310 (Ill. App. 6/26/72).

The court erred in suggesting to the defendant that he take a lie-detector test in the course of a hearing on

the motion for probation and the hearing in aggravation and mitigation. The court, however, reverses the conviction on lack of reasonable doubt of guilt. People v. Lamkin, 291 N.E. 2d 512 (Ill. App. 12/20/72).

Eliciting testimony about witness (originally charged along with the defendant but pleading guilty to manslaughter and being sentenced therefor) taking a lie detector test (although not the results) presents an extremely close question of reversible error, but the error is deemed not so prejudicial as to require reversal as it is unlikely that such would contribute to any great degree in the jury's belief that the pre-trial confession of the witness was true and the present testimony untrue, and, furthermore, proof of guilt is great. State v. Refuge, 270 So. 2d 842 (La. 12/11/72).

The following cases have been excerpted from the Criminal Law Reporter:

On 6/7/72, the Washington Court of Appeals handed down a decision in the case of State v. Ross, 11 CRL 2333. It adopted the Arizona Rule from State v. Valdez, 371 P. 2d 894 decided in 1962. The court held that, upon written and signed stipulation of all parties, results of a polygraph test are admissible for the purpose of corroboration. Admissibility of such testing is still subject to the court's discretion. If the test results are admitted, the examiner is subject to extensive cross-examining. Further, the court is to instruct the jury that testimony of the examiner is not to be regarded as tending to prove or disprove any elements of the offense with which a defendant is charged. At most, the results tend only to indicate that defendant was not telling the truth at the time of the examination. It is for the jury to determine what corroborative weight and effect such testimony should be given.

On 10/6/72, the U.S. District Court for the Eastern District of Michigan handed down a decision in the case of U.S. v. Ridling, 12 CRL 2055-2057. The issue in this case was whether a defendant charged with perjury could offer opinion testimony by polygraph experts concerning the asserted truthfulness of the allegedly perjurious statements. The court observed that the polygraph had made great strides in recent years. Accordingly, the court was not inclined to follow earlier cases where the evidence was held inadmissible because of the unreliability of the machine. Of

particular significance was the court's view that this case was the best possible for testing the admissibility of polygraph testimony. The court ruled that evidence offered by the defendant would be admitted subject to the following conditions:

1. The parties would meet and recommend to the court three competent experts other than those offered by the defendant.

2. The court would appoint one or more of these experts to conduct a polygraph examination.

3. The defendant would submit himself for such examination at an appointed time.

4. The expert appointed by the court would conduct the examination and report the results to the court and counsel for both defendant and the government.

5. If the results showed, in the opinion of the expert, that defendant was truthful or untruthful on issues directly involved in the case, the testimony of defendant's experts and the court's expert would be admitted.

6. If the results of the test administered by the court's expert were inconclusive none of the polygraph evidence would be admitted.

On October 10, 1972, the U.S. District Court for the District of Columbia handed down a decision in the case of U.S. v. Zeiger, 12 CRL 2057-2059. Defendant was charged with assault with intent to kill while armed and other related offenses. Counsel for defendant desired to introduce into evidence the results of a polygraph examination conducted by the Metropolitan Police Department. The court ruled that the polygraph is now sufficiently reliable to render admissible testimony of an expert as to the results of adequate testing. The court expressed the opinion that cross-examination and careful instructions should overcome the danger that the jury might give too much weight to the testimony. Here, as earlier, the court said that the examiner could testify only to defendant's answers to factual questions concerning the crime and explain the basis for his opinion. As before, it was to be within the province of the jury to

attach whatever significance to the opinion of the expert that it believed was warranted.

On 11/9/72, the U.S. Circuit Court of Appeals for the District of Columbia reversed the District Court in the Zeiger case. The appellate court did not file an opinion citing reasons for the reversal. (12 CRL 2135).

On November 6, 1972, the California Superior Court for Los Angeles County handed down a ruling in the case of People v. Cutter, 12 CRL 2133-2134. In this case, a U.S. Marshall had made a warrantless airport search of defendant's suitcase after a metal detector had singled him out. The search resulted in the discovery of marijuana in the suitcase. Defendant's counsel moved to suppress the evidence claiming that defendant had not consented to the search as the marshall had claimed. The defense offered in evidence results of a polygraph examination showing that defendant was truthful in stating that he had not consented to the search. The court admitted results of the examination and granted the motion to suppress. In admitting the polygraph evidence, the court cited decisions in the Ridling and Zeiger cases. It is noted, however, that the Zeiger case was reversed on appeal only three days later.

On December 18, 1972, the New Jersey Supreme Court handed down a ruling in the case of State v. McDavitt, 12 CRL 2344. The court concluded in part as follows:

> "Polygraph testing has been developed to such a point of reliability that in a criminal case when the State and defendant enter into a stipulation to have defendant submit to a polygraph test, and have the results introduced in evidence, such stipulation should be given effect."

On April 11, 1973, the U.S. Circuit Court of Appeals for the Fifth Circuit handed down a decision in the case of U.S. v. Frogge, 13 CRL 2112. In this case, two defendants had been convicted in Federal District Court of attempted escape and assault on the deputy marshals who had them in custody. Defendants claimed they escaped by offering bribes to the officers and denied the alleged assault. The trial court refused to authorize polygraph examinations of the defendants and they appealed. The Fifth Circuit affirmed the convictions stating it was not error to deny the examinations. The court noted that a trend may be emerging towards

loosening the restrictions on polygraph evidence. However, the court observed that it is well established in Federal criminal cases that results of polygraph tests are inadmissible. This court saw nothing in the Ridling case that persuaded it to abandon what it regarded as "the traditional view".

On April 13, 1973, the U.S. District Court for the Central District of California handed down a ruling in the case of U.S. v. Urquidez, 13 CRL 2151-2152. In this case defendant was charged with two sales of narcotics to an undercover Federal agent. Defendant claimed entrapment by alleging that the agent had sexual intercourse with her to promote his attraction to her and make her more likely to sell narcotics to him. This was denied by the agent and defendant offered to introduce polygraph evidence to support her claim. The court heard testimony for three days on the reliability of polygraph tests but declined to admit into evidence the results of defendant's tests. The court stated that there were too many variables in polygraph tests in the manner in which they were given and evaluated. It commented that these variables would lead to endless inconclusive cross-examination and argument. The court further observed that even if the test results were admitted, the amount of reliance the court could justifiably place on them would not necessarily outweigh conclusions to be drawn from live testimony on the issue in dispute.

On April 18, 1973, the Texas Court of Criminal Appeals reversed a conviction in lower court in the case of Romero v. State, 13 CRL 2152. In this case, polygraph test results unfavorable to defendant were admitted into evidence by virtue of a pretrial written agreement and stipulation entered into prior to the test. Defendant objected to the test results being admitted claiming the operator was not qualified. He further claimed that, contrary to the agreement, he was given "Methadone" despite the fact that he was to receive no drugs for 48 hours prior to the test. The Texas appellate court concluded that it should adhere to the general rule of exclusion of polygraph tests.

(Note: For cases - 1967-1972 see Nedrud, Duane R. and Marguerite D. Oberto, "Criminal Law Cases Involving the Polygraph, 1967-1972." Polygraph v. 1, no. 3 (September 1972) pp. 176-179.

CONSTITUTIONAL RIGHTS AND THE POLYGRAPH

Statement of Mr. Victor C. Kaufman before the
New York State Senate
Committee on Labor on
October 13, 1973

Privacy and Self Incrimination

The question of Constitutional Rights always arises when one discusses polygraph examinations, and the amendments to the Constitution most frequently referred to are the fourth and the fifth.

I would like to quote directly from the United States Constitution, which states, after referring to an indictment by the Grand Jury and Double Jeopardy, "nor shall any person be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty or property without due process of law"

I believe that the words "be compelled in any criminal case to be a witness against himself", is the crux of that portion of the fifth amendment we are dealing with.

It is well known and an absolute fact that no one can be compelled to take a polygraph examination. Therefore, no one need incriminate himself by a polygraph examination.

One of the sections of the Code of Ethics of the American Polygraph Association states that: "Recognizing that a polygraph examination cannot be conducted on a person against his will, no member will attempt to conduct an examination when he has reason to believe the examinee has been subjected to coersion or duress. Further, no member shall conduct any examination on a person without first advising the examinee of the rights enjoyed by every American citizen against self incrimination and invasion of privacy." Indeed, the June 1973 report of the Committee on Labor and Social Security Legislation of the Association of the Bar of the City of New York, whose majority opinion, admittedly, was not pro-polygraph, stated: "We do not argue that a private employer's requirement that prospective or present employees

take polygraph examinations is one that violates the Constitution, we do argue that an individual's fundamental right to privacy when confronted with a polygraph should be given legislative recognition." However, the Fourth amendment to the constitution does provide that: "The right of the person to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated . . . "

I submit that polygraph examiners of the Polygraph Examiners of New York State sincerely try to respect the employee's right to privacy. We certainly do a better job than the usual neighborhood and previous employment investigation, whereby a disgruntled neighbor, a local tradesman, or a previous employer can maliciously or vindictively prevent an applicant from getting the job he is seeking.

The minority report of the Committee on Labor and Social Security Legislation, and we don't know the voting proportion of the 21 members of the committee, states accurately that: "There is simply no logical basis for distinguishing, on invasion of privacy grounds, between the personal interview and the polygraph". How then, can you state that the polygraph invades privacy and the personal interview does not, or vice versa? If the polygraph violates privacy, then indeed, so does the personal interview.

No one disagrees that the businessman has the right and obligation to inquire about the experience, skills, physical well being, character and honesty of job applicants. The only difference between polygraph inquiry and personal inquiry is that the polygraphist gets closer to the truth.

I feel the real problem here is that the polygraph examiner gets too close to the truth and it is this which many people fear. Perhaps we believe that it is better to outlaw the truth than to face it. This appears to be the problem, rather than the question of privacy or self incrimination.

While this committee is pondering "rights" I would respectfully remind them that the truckman and consignee have the right not to be hijacked; the parent has the right to make certain the school bus driver is neither a pervert nor an alcoholic; the apartment house dweller has the right to

know the superintendant is not a burglar; the stock broker has the right to know his employee is not a member of organized crime or employed by them; the airline passenger has the right to know that the pilot is neither an alcoholic nor a drug user; the stockholders of a mercantile establishment have the right to know that their employees aren't stealing from them. And in the current effort to reduce the drug traffic, does not the drug company or drug store have the right and obligation to keep users and pushers away from their stock of narcotics?

In view of these logical and overriding arguments, I feel that no anti-polygraph legislation should be enacted, but rather licensing legislation be passed so that polygraphists will be controlled as to their personal ethics, education, proficiency and experience.

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INSTRUMENTAL, CHEMICAL, AND PSYCHOLOGICAL AIDS IN THE INTERROGATION OF WITNESSES

By

Joseph F. Kubis

The primary requirement of testimony is that it conform to fact. But the complexity of even ordinary events and the intrinsic limitations of the human organism make this an ideal often difficult to attain. Even when the elements of a case are few and simple, sincere witnesses are known to disagree. This is understandable because observation is selective. In large part it is dependent upon the condition of the observer and upon his inner motivations.

It is precisely these inner motivations that can become an annoying complication in testimony. A witness' report may be given with seeming sincerity and yet appear suspiciously at variance with the facts. This is interpreted in various ways: deliberate deception, honest mistake, unconscious defense (or aggression), natural (or unnatural) forgetfulness. To determine the veracity and validity of baffling and conflicting testimony the lawyer can marshal new evidence, he can introduce new witnesses, or he can cross-examine. When ordinary procedures fail to resolve the doubt, the lawyer often seeks the help of experts. In general, the experts of presumed competence in this problem are psychiatrists and so-called "lie-detector" operators.

It is the purpose of this article to discuss several aspects of the problem of puzzling testimony. First to be discussed are a number of situations involving human testimony where the lawyer most likely would benefit from outside expert opinion. Then will be presented three techniques of alleged value in meeting the problem of questionable testimony. These are: lie detection, barbiturates or "truth serums," and hypnosis. Finally these will be evaluated and a specific delimitation of their use indicated.

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The emphasis is not upon the deliberate liar. It is hoped to clarify the problem of the witness who intends to testify truthfully but whose statements are open to question. For the purpose of this discussion a witness is one who has observed an event or one who has actively participated in an event he may be asked to describe.

Puzzling Situations

These are instances of apparently sincere human testimony which the lawyer finds difficult to believe.

1. Circumstantial Evidence. Here the person denies any complicity whatever in a possibly criminal situation to which there is no witness but himself. Consider the case of a man in whose home was found a woman who had been dead for several weeks. He explained that she died a natural death in a room upstairs, but he was afraid to report this to the police. The condition of the body made it impossible to establish with certainty that she died of natural causes.

2. Loss of Memory. With no apparent organic pathology the defendant claims that he doesn't remember what happened at the time a crime occurred and in which he apparently was involved. Such loss of memory is usually attributed to shock, emotion, alcohol, or exhaustion.

3. Non-diagnosable Illness. In many accident cases, illness or bodily complaints develop with no apparent organic foundation. Often the complainant is one who stands to benefit by his illness either from insurance or from private damage suits. Granting that malingering may occur, there are undoubtedly a number of earnest and honest witnesses whose medical examinations indicate no structural damage or malfunction.

Witnesses of Doubtful Reliability

In its attempt to assure the integrity of testimony, the law frowns upon the use of witnesses who may prove unreliable because of diseased mind, brain damage, or questionable intent. Often such a witness is difficult to identify. To the untrained observer he may appear neither pathological

nor disturbed. Furthermore, he may make a favorable impression upon the jury under ordinary questioning.

Davidson's excellent article describes a number of such witnesses and indicates how the psychiatrist may help the lawyer expose their inadequacies by skillful interrogation(5).

> The major clinical conditions affecting testimonial capacity are the psychoses, mental deficiency, drug addiction, alcoholism, personality disorders, certain organic involvements of the brain, and sometimes certain forms of psychoneurosis. (5, p. 482)

In most of these disorders there is a defect in observation, memory, or both. Several involve inadequate comprehension or expression. Some exemplify emotional distortions of reality due to inner needs, tensions, and drives. These witnesses may appear truly sincere. With the possible exception of the psychopath, they may even believe what they are saying.

But the pathological witness is not the only one whose testimony may be open to question. Karpman asserts that:

> . . . however it may be disguised by the thin veneer of social conventions, lying permeates our daily life, personal and social.. . . Our life is filled with lies and deceptions; and the line dividing this from anti-social and criminal reactions is often a very thin one. . . . Like other forms of human behavior lying is not entirely conscious, and deliberate. In its more overt form, it has all the earmarks of a neurotic symptom. . . . (13, p. 23)

This concept of lying is much broader than the conventional one, including as it does all types of deception, distortion, evasion, exaggeration, whether consciously or unconsciously determined. Karpman's position that deceptive behavior is part and parcel of living might imply that the human witness is rarely trustworthy when matters of comfort, security, and self-interest are involved.

There are, then, large numbers of people whose reliability as witnesses might be questioned by the courts. Davidson implies

that a substantial number of neurotics might be disqualified. Chronic alcoholics are a sizable group, constituting approximately eight per cent of the population. The appreciable numbers of penal institutions point up the existence of large numbers of psychopaths. Our aging population will inevitably increase the incidence of serious senile reactions. In addition, there are rehabilitated criminals, discharged mental patients, and draft rejectees. How much reservation should we have with respect to their testimony?

That he may be does not imply that an individual will be an unreliable witness. Furthermore, just as no witness is perfectly accurate and reliable, no witness is completely unreliable at all times. If, as may happen, the testimony of a so-called unreliable witness is the only available account, should not an effort be made to determine the reliability of this particular bit of testimony with regard to the specific circumstances of the case?

From a scientific point of view, the focus of inquiry should be the conditions under which reliable testimony can be elicited from individuals who may be deemed legally unreliable. A witness unreliable in one respect may be reliable in another. Furthermore, under other than ordinary interrogation, an otherwise unreliable witness may possibly yield information that is valid, or information that may lead to reliable evidence.

The several procedures to be described can be used to evaluate specific bits of information even though these may be given by a so-called unreliable witness. These techniques, it may be observed, are also used to unravel puzzling testimony (possibly unreliable) when given by an earnest and seemingly honest person.

Lie Detection Procedure

Some Relevant Facts. Lie detection procedures are essentially devices which measure some physical or physiological concomitant of an emotional reaction. This reaction is presumably associated with the specific incidents the individual is questioned about. It is a basic assumption of the lie-detector, that the person's conscious attempts to lie are

accompanied by reactions that can be distinguished from those he gives when he is telling the truth. Deception, or truth-telling is an inference the examiner makes after evaluating the instrumental charts. Strictly speaking, the term "lie-detector" belongs to the examiner and not to the instrument.

Among the many expressions of emotional reaction, the most frequently used for lie detection purposes are changes in blood-pressure (15), respiration (15), and the psycho-galvanic response (23). Different types of instruments are available to measure these changes. The instruments carry different trade names, such as polygraph, deceptograph, pathometer. There is, then, no lie-detector but many de-tection devices. However, where it may be convenient to simplify discussion the generic term, lie-detector, will be used.

The success of any lie detection device stems from the interrogation procedure. Questions of at least two types are used: those having specific relevance to the crime or issue in question; and those having no relation at all to the case. The reaction to these two sets of questions form the basis for deciding whether the person is lying or telling the truth. To minimize errors of interpretation, control questions are being increasingly used and new control devices are being installed in some instruments.

Lie detection procedures usually demand that the sub-ject be conscious, mentally alert, and emotionally responsive. However, a lie detection device has been used with hypnotized and drugged suspects (14).

Although it is difficult to interpret the reported figures (4), no self-respecting lie detection device adver-tises less than 95 per cent accuracy. This, of course, pre-sumes expert operation.

Lie detection devices have been used extensively in criminal and civil cases, usually on a pre-trial basis. There is no general legal recognition of lie detection procedures as valid sources of legal evidence. There are, however, several instances of acceptance in lower courts (12).

Possible Use with Sincere Witnesses. Lie detection devices have been used to exonerate innocent suspects more

often than to identify guilty ones. As for witnesses with pathology, the lie detection device can be used at least to establish whether the person really believes what he is saying. In some cases such as alcoholism, brain-injury, and incomplete amnesia, the patient may not be too certain of his response even though he may have to give a "Yes" or "No" answer. The confusion in the minds of these witnesses would picture itself as a "doubtful" type of response on the lie detection chart. These reactions are not as intense nor as consistent as the lying responses; neither are they similar to the truthful ones.

Some writers are disinclined to believe that neurotic witnesses are completely unaware of their deceptions and rationalizations (13). To the extent that this may be true, the lie detection procedure would probably obtain reactions that would reflect doubt in the mind of the neurotic. But if the allegations of the patient are truly determined by unconscious motives, the lie-detector would most likely indicate that the person consciously believes what he is saying. A similar line of reasoning holds for the imprisoned criminal who either develops psychotic defenses as to his participation in the crime or so deludes himself that ultimately he believes that he is innocent (7).

In these cases the lie-detector could evaluate the specific testimony of witnesses who might be considered unreliable in one sense or another. Even with psychotic patients it has been found that psychogalvanic reactivity could be evaluated in direct proportion as they become more communicative and responsive to the demands of reality (9).

Critical Evaluation. Lie detection procedures are of definite value for the sincere witness whose testimony may appear dubious and who has no substantiating evidence. In amnesias the lie-detector can be used at least to verify whether the witness believes his own statements (which may or may not be congruent with fact). The same would hold for those individuals (e.g. psychotics, some neurotics) whose dubious assertions are presumably due to unknown or unconscious influences.

To obtain valid results with lie detection devices, expert operators are required. Unfortunately there are very

few experts. There is no standardization of instrument, procedure, or training program. A more serious defect is the inadequacy of basic research on the critical phases of lie detection: instrumentation, methodology, and deception indices. Whatever research is done is sporadic and woefully lacking in scientific control. In particular, no well controlled research has been reported on criminal groups, the very area where such instruments have widest use.

Unless a program of basic research is begun and unless unqualified practitioners are eliminated, this potentially powerful technique will fall into disrepute.

Interrogation with Drugs-Narcoanalysis

Some Relevant Facts. It has long been known that narcotic drugs diminish the self-protective inhibitions of many patients. Under slight sedation, such individuals feel impelled to talk and often reveal personal matters they would otherwise conceal. Alcohol has this effect upon some people.

Aside from its proven value in medicine, scopolamine was one of the first drugs to be recommended for use in criminal investigations (11). More recently, the barbiturate, sodium amytal (also sodium pentothal) has been suggested for a similar role because of its uncovering or releasing powers. The dramatic confessions obtained with the use of these drugs have given them the popular but inaccurate designation of "truth-serums." It is no wonder that the sensational self-accusations publicized in trials in the totalitarian states have aroused speculation as to the use of similar drugs.

Barbiturates, such as sodium amytal, are injected into the vein very slowly so as to produce slight sedation and relaxation. An attempt is made to maintain communication with the patient for as long a period as possible. The depth of narcosis increases with dosage and narcotic sleep may be achieved. As the effects of the drug begin to wear off, communication is again possible. In most narcoanalytic sessions, however, light dosages are preferred. Even light dosages produce an amnesia for the period of narcosis(10).

These are hypnotic drugs and render the patient highly suggestible. Consequently, more than ordinary caution

is required for the phrasing of the questions and for the manner in which they are asked. Otherwise the "facts" elicited may only reflect the suggestions of the interrogator.

Narcoanalysis is essentially diagnostic and therapeutic. It has been used to gain access to patients who have been uncommunicable for a long period of time. It has helped in uncovering either repressed or lost memories. Since the released material is difficult to interpret without th case-history, personality structure, and deep motivations of the patient as a reference base, the technique attains maximal value only in the hands of a skilled psychiatrist.

Much that is revealed under the influence of the barbiturates is not necessarily true or relevant. Phantasy and wishful thinking often contaminate the narcoanalytic interview to such an extent that it is difficult to differentiate fact from fancy (8, 18, 22).

Possible Use in Examining Witnesses. Narcoanalysis can be used with almost any type of witness, healthy or pathological, reliable or unreliable (10). With a sincere and cooperative witness, forgotten or repressed facts are potentially retrievable under narcosis. Even where symptoms appear simulated or malingering is suspected, the drugs offer the physician an opportunity to observe behavior under circumstances that are not completely under the control of the subject (17). With decrease in control and freeing of inhibition, ordinary waking defenses become vulnerable.

In the criminal area, the drugs have been used to gain admissions of guilt or complicity (20, 21). But there are inherent dangers of error and formidable difficulties of interpretation. Ambiguity, confusion, fancy, and delusion limit the value of the drug interviews for legal testimony (8). From a psychiatric point of view, narcoanalysis has greater value as a procedure for understanding the criminal, his motivations and unconscious trends (1).

It has been the conviction of a number of investigators that the lying witness will continue to lie under narcosis. Experimental results suggest that normal individuals more than neurotics are capable of maintaining their lies under

the influence of the drug (22). This experiment, however, is criticized on the ground that subjects can maintain their lies under slight sedation, but not under deep narcosis (21).

There are additional reasons for questioning the value of "truth serums" in criminal work (18). The pronounced suggestibility of innocent suspects may lead to confession of crime never committed. Those who confess in the drug interview would most likely confess under normal conditions to a skillful interrogator. It is the criminal who stands to benefit from this technique. He may so contaminate the interview with conflicting information that the physician may become genuinely puzzled as to the validity of his story. And, the creation of a doubt as to his guilt is all in favor of the guilty.

Critical Evaluation. This is as yet a relatively unexplored area of witness interrogation. Clinical observation is sparse and controlled experimentation insignificant. Associated with the use of these drugs are a number of serious difficulties: (a) understanding the mumbled, jumbled, emotionally colored speech; (b) controlling suggestibility; (c) discriminating delusion and fantasy from truth and reality; (d) identifying and eliminating the intentions to deceive and distort. Only an expert can salvage some valid information from this procedure.

The legal implication of drug procedures have been thoroughly examined (6). It is of interest to note that the National Academy of Medicine in France is on record against the use of narcoanalysis for any legal purposes whatever--even though the witness requests it or the courts recommend it (26).

In a more positive vein, narcoanalysis would seem to be of value in true amnesias, especially those of psychogenic origin; namely, in repression rather than suppression. Too, the behavior of the suspected malingerer can be better studied under narcosis. Furthermore, narcoanalysis is a potentially valuable source of information if used (a) as additional

independent corroboration of other reasonable testimony, and (b) as a source of leads toward obtaining legally admissible evidence. With proper safeguards it can be a definite adjunct to the investigative process.

Interrogation Under Hypnosis

Some Relevant Facts. Dramatic and intriguing hypnotism has encountered difficulties in disentangling itself from fraud, myth, mystery, and spectacle. Minimally, hypnosis involves the control over a person's attitudes and behavior through suggestion. Explanations have utilized the concepts of sleep, suggestion, dissociation, and a deep interpersonal relation between the subject and the hypnotist. The literature has been extensive (3, 25).

In its clinical applications hypnotism is definitely related to narcotherapy and narcoanalysis. In fact many investigators prefer to use various narcotic drugs as aids in the easy and successful induction of a hypnotic condition in the subject. That this is equivalent to a hypnotic trance has not been established.

The induction of a hypnotic trance requires care, persistence, and skill. From the nature of the cooperation required, not all persons can or should be hypnotized: many psychotic patients cannot be; those on the verge of psychosis should not be (3). Among the non-psychotic, those who do not wish to be hypnotized will usually find means of resisting ordinary suggestions in that direction.

Through ignorance and fear, the popular attitudes undoubtedly exaggerate the dangers associated with hypnosis. The consensus of informed opinion seems to be that a hypnotized person cannot be persuaded to commit a crime which he would not commit under similar persuasion in the waking state. It is claimed that, despite appearances to the contrary, the hypnotized person is playing a game of limited cooperation with the hypnotist and is always, in some sense, aware of what he is doing (24). In particular, the subject will resist attempts on the part of the hypnotist to uncover what he is not yet ready to reveal. Some experimenters, however, believe that a hypnotized person can be made to perform an apparently anti-social act if this is suggested to him as non-evil and necessary (19).

Hypnosis can be used in the traumatic and other neuroses, with the possible advantage of having the patient feel that he is an active participant in the achievement of cure. Psychogenic amnesia and the recovery of lost memories would seem to fall within the purview of hypnotic procedures. (Because they are not relevant to this discussion, the many other uses of hypnosis are not mentioned.)

Application to Interrogation of Witnesses. The use of hypnosis as an aid to interrogation is similar to that of narcoanalysis. Under proper conditions, repressed and forgotten material can be brought to light. Where the motivation of the witness is not self-protection or deceptive, the material evoked under hypnosis suffers little contamination except that provoked by the hypnotist. Just as in light narcoanalysis, the suggestibility of the witness is the factor of unreliability in the testimony.

The self-protecting witness may not wish to reveal facts that are or may prove embarrassing to him. Under hypnosis he will attempt to evade or by-pass the crucial areas with synoptic and partially true responses. To maintain the trance, the hypnotist may refrain from direct questioning and may sometimes accept such partial answers. However, if the witness is sufficiently guilt-laden but ashamed to admit the facts he has so consistently denied while conscious, the hypnotic trance may afford him a way out of his dilemma. For he may believe that, while he is "not himself," he is not completely responsible for what he says. This may apply to informers who can be reassured under hypnosis as to their safety before any attempt is made to obtain necessary information. Clinical observations indicate that if the matter about which a person previously lied is embarrassing but not overly threatening, the truth may be secured by an indirect approach in the hypnotic trance (2).

Whether a person who committed a serious crime will confess under hypnosis has not been adequately investigated. In two murder cases, admissions of guilt by the defendants were not admitted in evidence because the confessions were presumed to have been obtained by the use of hypnotic techniques. Similarly, the courts would not accept information obtained under hypnosis which was favorable to the defendant (16).

Critical Evaluation. In hypnotism, more so than in narcoanalysis, the witness is reputed to have some element of control over his utterances. Because of this and because of the cooperation required, the technique would seem to have limited value in examining witnesses who are definitely unwilling to reveal pertinent information.

Where the witness is sincere and where punishment or gain is not involved, hypnosis would be a useful adjunct in obtaining information that has been traumatically repressed or naturally forgotten. It may be of significant value in the examination of potential informers. But resistance and suggestibility may make the task of hypnotist-interrogator an extremely difficult one.

A hypnotic interview may uncover leads whereby acceptable legal evidence may be obtained. Before it is acceptable as reliable, any information secured from hypnotic procedures should be objectively corroborated. At the least, it should fit into a body of consistent and verified fact.

-- Comparative Critique --

Whereas lie-detectors demand a conscious subject, drugs and hypnosis work best when the conscious ego begin to nod. But even the lie-detector attempts to elude the conscious ego by attaching instruments to the involuntary reactions of the body.

Essentially lie-detectors are not fact finding instruments. They are "belief-verifiers," attempting to discover if the person believes what he is saying. On the other hand, the drug and hypnotic techniques attempt to get the subject to reconstruct the facts of the situation as he once saw them.

Whatever the differences, all three techniques depend on the way the person interprets the primary perceptual datum he experiences. If, in a highly emotional episode, the witness honestly mistakes a pipe for a gun, and if he remembers it as such, it is difficult to see how the gun can ever be dispelled from the testimony-no matter which of the techniques are used to clarify the picture.

As yet these techniques have been used more or less independently of each other. In view of some preliminary

experimentation, it is recommended that a more integrated use of them be made. This may be on a supportive basis as when the lie detector indicates true amnesia, and narcoanalysis (or hypnosis) is then used to resuscitate the amnestic material. Or they may be used in a more interactive manner. The lie-detector may be used before, during or after the drug or hypnotic session. Research in the combined use of these supplementary techniques may help clarify the difficulties inherent in each procedure.

The disturbing fact is that so little experimental research has been done concerning the validity of the testimony when witnesses are subjected to these interrogation techniques. The lack of basic research has led to the lack of agreement among scientists as to the validity of these procedures. Under the circumstances the law has no alternative. It cannot accept the testimony of the "expert" (lie-detector, drug, hypnotism) as legal evidence.

Along with continued basic research on the devices to be used as aids in interrogation, a complementary attack must be made on the problem of the unreliable witness (as used in this discussion). Since the unreliable albeit sincere witness will always be with us, every attempt should be made to study the conditions under which he can testify with reasonable accuracy. The results of such study would be particularly valuable in situations where the only testimony available is from the so-called unreliable witness.

It is, of course, easy to obtain a halo of scientific respectability by continually suggesting that "more research is needed." But when scientists disagree, there is no other course of action.

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EXPERT TESTIMONY FOR POLYGRAPH FOUNDATION

BOOK REVIEW

By

Raymond J. Weir, Jr.

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One of the signs of the coming of age of a scientific discipline is its acceptability as legal evidence by the courts. In 1923 in the case of Frye v. United States, the U. S. Court of Appeals affirmed the conviction of Frye and the exclusion by the trial court of a "systolic blood pressure deception test" on the grounds that this test had not reached general scientific acceptance. Marston had no instrument per se; he pumped up a standard blood pressure cuff and took a systolic blood pressure reading after each question of a relevant-irrelevant series.

While it is not surprising that the courts were reluctant to accept Marston's pioneering efforts as evidence, it is a judicial anomaly that the Frye decision is still cited as the controlling authority fifty years later. The vast changes in polygraph instrumentation and techniques which have occurred since 1923 have been piously ignored, and the concept of justice, where truth is an area at issue, has suffered as a consequence.

It is entirely possible that the reluctance of the courts to accept expert polygraph testimony reflects something more than the normal conservatism of the judiciary. In popular opinion the polygraph goes to the heart of the matter and answers the crucial question, "Did he do it?" If this were actually the case, the polygraph would vastly simplify the judicial process -- and create heavy unemployment among lawyers and jurists as a by-product. We just don't seem to see this happening.

In the final analysis the question which the polygraph really answers is, "He believes he didn't (or did) do it." And the answer is accurate within the limits of accuracy of the polygraph technique and the expertise of the polygraph examiner. This leaves several areas which need to be established in direct testimony and which can be vulnerable during cross-examination by the opposition attorneys. We

can expect that prosecutors and defense attorneys increasingly will have done their homework and will be prepared to conduct a searching inquiry into the credentials of the examiner and the manner in which the examination was conducted.

Len Harrelson has performed a noteworthy service in obtaining transcripts of testimony in the case of United States v. Errol Zeiger and in publishing them in this volume for the education of polygraph examiners. This is not the first transcript of efforts to qualify a polygraph examiner as an expert witness and to secure the admissibility of his testimony.

The Michigan Polygraph Association published and distributes at cost the transcript of State of Michigan v. Peter N. Lazaros. This case, conducted by famed attorney F. Lee Bailey, chronicles a determined effort to secure admissibility of polygraph evidence favorable to the client. The court declined to admit the testimony, but Lazaros was acquitted, and there was no basis for carrying the refusal of the court to admit the testimony to appeal. The primary expert testimony in Lazaros was given by Lynn Marcy, with corroborative testimony by Dr. William Yankee, John E. Reid, and Leonard H. Harrelson. Citing Frye as the controlling authority, Judge Churchill barred the admission of the proffered testimony.

At the same time, the judge indicated that he had come to the case skeptical concerning claims of scientific reliability for the polygraph. He was personally convinced by the direct testimony, for which the prosecution offered no rebuttal, that evidence for the scientific reliability of the polygraph was impressive.

Although polygraph evidence was barred in this case, Lazaros was found not guilty, and there was no reason to take the case to appeal. This has occurred in all of the cases where F. Lee Bailey laid down an extensive foundation in preparation for an appeal based on the denial of polygraph evidence favorable to the accused.

The second of the transcripts was edited by Charles H. Zimmerman from testimony at the court-martial of Captain Ernest Medina in August 1971. This booklet is available from B.H.F., P. O. Box 83, Auburndale, Mass., 02166 at the reproduction cost of $3.65. The defense counsel in the case was F. Lee Bailey, for whom the editor, Charles Zimmerman,

has done a great deal of polygraph work.

At the time of the Medina court-martial the American Polygraph Association (APA) was holding its annual seminar in nearby Atlanta. A group of civilian and military experts, who were in attendance at the APA seminar, testified at the Medina Trial. These included Cleve Backster, John Reid, Dr. Lemoyne Snyder, Clay Lowry, Leonard Harrelson, Milton Berman, and Robert Brisentine.

As in the Lazaros case, the experts established an impressive foundation for the scientific reliability of the polygraph. Captain Medina was acquitted of the charges against him and the polygraph evidence was barred. Once again Attorney Bailey and the polygraph field were frustrated in their efforts to overthrow the Frye decision. As in the Lazaros case, the prosecution made no vigorous effort to rebut the testimony of the polygraph experts.

This was not true in the retrial of the Case of Zeiger v. U.S., which is reported in this book. The U.S. Attorney, John F. Evans, had done his homework and was fully prepared to attack the testimony and the expertise of the witnesses. A very distinguished panel had been assembled by the APA and defense counsel, Dr. Frederic Barnett for the case, consisting of Lynn Marcy, John Reid, Warren Holmes, F. Lee Bailey, David Raskin, and Cleve Backster. Dr. Martin Orne appeared as a government witness, and Hamilton Shoop, who administered the first polygraph examination to Zeiger, also testified. The court refused to permit Leonard Harrelson, who gave a second test to Zeiger, to testify, since the U.S. Attorney was not advised of this second test far enough in advance to prepare properly for cross-examination.

This book should be must reading for all examiners who might be required to testify in court concerning their cases. We may expect in the future that opposing counsel will take advantage of the research done by Mr. Evans in Zeiger. Examiners must be ready to answer some pretty searching questions concerning their training and experience, their depth of understanding of polygraph practice and theory, and the techniques used and results in the case in question. Among typical questions which the examiner must be prepared to answer are the following:

Is any scientific research being conducted in the polygraph field? Are you familiar with this research? Why not? Why is such little research being done?

Should an examiner be a psychologist? A physiologist? Why not? Must he have a college degree? In what fields? Do you have a degree? How much psychology and physiology have you studied?

What is the purpose of the pre-test interview? How long should it be? The question review? What is the polygraph theory in regard to question formulation? Control Questions? Relevant-irrelevant questions? What is the effect of lengthy questions?

What are stimulation tests? Must they be used? How many charts must be run in each examination? Why?

What are the standards of the APA for admission? Do you meet these standards? What about men who were "grand-fathered?" Do you approve of any waiver of standards?

How many tests have you run? Have you ever made an error? How many? What do you believe is your percentage of accuracy? Prove it. Are there any inconsistencies between your present testimony and that offered in previous cases? If so, explain.

The above list, though not complete, provides some insight as to the need for careful preparation for court testimony. We may expect that attorneys will be eager to attack the expertise of the examiner as the best means of attacking the results of the examination. The implications for the polygraph field are quite clear. Every examiner who may be scheduled for court testimony should be familiar with the Lazaros testimony, The Polygraph in Court, and especially Expert Testimony for Polygraph Foundation, since the prosecution will probably be ready to ask the same questions as the attorneys in these cases.

The results of the effort in the Zeiger Case were not decisive. The original trial judge in the case set aside a guilty verdict by the jury and ordered a retrial. The second trial judge (this transcript), in a memorandum opinion, ruled the polygraph evidence to be admissible. This was reversed on the appellate level without comment. Zeiger

was acquitted by Judge Parker in the second trial, so there was no opportunity to mount a full-fledged attack on the Frye decision at the appellate level.

There were some positive benefits derived from Zeiger, however. The first of these is the memorandum opinion by Judge Parker which states flatly "Accordingly, the Court holds that on the facts, the requirements for the admission of expert testimony based on the results of the defendant's polygraph examination, as mandated by Frye and by the general rules of evidence, have been satisfied."

Another very valuable contribution to the field came in the testimony of Dr. Martin Orne, a government witness. Dr. Orne, a research psychiatrist and psychophysiologist, is one of the leaders in psychophysiological research regarding the polygraph. This is what he had to say regarding the accuracy of the polygraph: "Now if you ask me whether it works better than fifty percent, yes. If you ask whether it works better than eighty percent, probably. I would place it maybe eighty-five percent, maybe higher. I don't honestly know; but without hard evidence, I don't think we should assume it is higher than that."

The book closes with a paper on the Psychology of Suicide by Omar Kenyon, M.D. which puzzled the reviewer, since it had nothing to do with laying a foundation for expert polygraph testimony. A call to Leonard Harrelson revealed that the paper by Dr. Kenyon was included in this book through a printer's error. Still, it may be of interest to the amateur psychologists among us.

I commend this book to your attention. Together with The Polygraph in Court and the Lazaros Testimony, it should be in the library of every polygraph examiner.

ABSTRACTS

ELECTROLYTE CONCENTRATION AND SKIN POTENTIAL

Don C. Fowles and Gerald Johnson, "The Influence of Variations in Electrolyte Concentration on Skin Potential Level and Response Amplitude," Biological Psychology 1, 1973, 151-160.

The application of electrolytes of low concentration to the palm causes hydration of the epidermis with swelling of the skin, closure of the sweat gland pores, and reduction of skin potential level (SPL). Solutions of high concentration are known not to produce poral closure. Previous reports of increases in SPL with increased concentration of electrolyte did not control for possible effects of hydration associated with differences in concentration. The experiments reported here compared the effects of varying concentration with and without holding hydration constant. The results indicated that the effect of concentration on both positive and negative skin potential response amplitude can be attributed to hydration, whereas the effect on SPL is not influenced by hydration. The effect of concentration on SPL was the same whether measured during rest or during periods of considerable sweat gland activity. This last finding is difficult to interpret in terms of the traditional assumption that the membrane responsible for the concentration-potential effect lies deep in the epidermis, and it was suggested that the membrane may be located in the upper sweat gland duct. [Author Abstract.]

Comment: The article also contains an excellent summary of the current theories on skin potential, together with a useful list of references. Reprints may be obtained by writing to Don C. Fowles, Ph.D. at the Department of Psychology, University of Iowa, Iowa City, Iowa 52240 or Gerald Johnson, Ph.D., University of Oklahoma Medical School, Oklahoma City, Oklahoma. [Ed.]

Robert M. Stern and Takami Watanable, "A Select Bibliography of 'Polygraph' Detection of Deception." Department of Psychology, Pennsylvania State University, University Park, Pa. 16802.

A 430-item bibliography of "polygraph" detection of deception is presented for the use of both field and laboratory workers. Articles from scientific and professional journals are included as well as items from popular publications. The bibliography contains an author index and subject index. An attempt was made to review all references published up to the spring of 1972. However, the following references were excluded from the bibliography: judicial decision cases, local government regulations regarding the polygraph, newspaper articles, and reports of limited circulation. Several articles published in foreign languages were also excluded. (author abstract).
[Copies available for $2.00 from: American Psychological Association, 1200 17th St., N.W., Washington, D.C. 20036]

Robert J. Cutrow, Arthur Parks, Nelson Lucas, and Kathryn Thomas, "The Objective Use of Multiple Physiological Indices in the Detection of Deception." Psychophysiology, Volume 9, Number 6, November 1972.

Psychophysiological measures -- breathing amplitude (BA), breathing cycle time (BCT), eyeblink rate (EBR), eyeblink latency (EBL), finger pulse volume (FPV), heart rate (HR), palmar galvanic skin response (GSR_p), volar-forearm galvanic skin response (GSR_v), and ^{p} voice latency (VL) -- were evaluated for effectiveness in detecting deception with 63 college students. A relevant-irrelevant stimulus presentation format was used with three treatment conditions: personal words, neutral words, and items involving money. All physiological variables were found significant indicators of deception, $p < .01$ or $p < .05$ through objective techniques. A combined effect index of six variables provided an advantage over any index taken separately. No significant treatment or sex differences were found between stimulus conditions except for the GSR_v measure. (Author abstract).

Leslie E. Fisher and Harry Kotses, "Race Differences and Experimenter Race Effect in Galvanic Skin Response," Psychophysiology, Vol. 10, No. 6, November 1973.

The present study was designed to ascertain whether racial differences exist in the several components of the skin resistance response and to assess the importance of the role of the experimenter's race in determining the subject's responsiveness. Basal measures, GSR magnitude, and spontaneous GSR activity of 12 Negro and 12 Caucasian Ss were recorded by 2 Negro and 2 Caucasian experimental assistants matched for age, physical stature, and dress. Following a 15 min resting phase, all Ss received 14 1-sec bursts of 75 dB white noise. Variable stimulus intervals were employed.

Significant subject-race effects, but no experimenter-race effects, were found for base level measures. Negro Ss evidenced significantly higher basal resistance levels. Conversely, experimenter-race effects, but no subject-race effects, were apparent in the GSR magnitude data. White Ss showed a significantly slower rate of response magnitude decrease over trials when paired with black Es. A significant decrease in spontaneous activity over time was observed for all Ss. (Author abstract.)

Rybak, Boris. "Instrumental Methods for Minimum Interferance Physiology," Transactions of the New York Academy of Sciences, Series II, vol. 33, no. 4 (April 1971), pp. 371-386.

Rybak discuses the problem of biological reactions to apparatus. The problem of biological time vs. recording time constants, and the related statistical difficulties. He proposes a new methodology in which he uses the object of the study as the tool for the study. Thereupon, he describes in detail the instruments and techniques he has developed for correlating electrical and mechanical heart phenomena, including direct intravascular photometry (in a rabbit), a polarographic electrode catheter to measure oxygen and pH, and a microelectrode measuring PO_2 and he also comments briefly upon the application of radio telemetry. (N. Ansley)

Denis Abelson and Victor Meyer, "A Dopplercardiometer with Electronic Gate," Transactions of the New York Academy of Sciences, Series II, Volume 33, Number 6, pp. 564-575.

Those interested in research instrumentation will find in the description of an ultrasonic doppler cardiometer by Abelson and Meyer a design which produces quantitative recordings of the velocities of blood flow in arteries near the heart. The system permits selection of a signal from the R-waves of an electrocardiogram, measurement of the amplitude of the signal, and a display or recording of it. The combination includes a 2-MHz dopplercardiophone (a "Doptone" fetal pulse detector, Smith, Kline Instrument Co.) with a zero crossing detector, a signal selecting and processing unit, a two channel oscilloscope (with digital and analog meters) and a two channel ECG recorder. [N.A.]

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David T. Wells, "Large Magnitude Voluntary Heart Rate Changes." Psychophysiology, volume 10, Number 3, May 1973.

An experiment was performed to demonstrate methods for enabling subjects (Ss) to produce large magnitude heart rate (HR) changes under conditions which include adequate controls for basal HR changes and elicitation of the HR response by breathing changes. The methods used were an attempt to optimize motivational, feedback, and practice variables. Of 9 Ss, 6 displayed mean HR increases ranging from 16.7 bpm to 35.2 bpm. The greatest mean HR decrease for any S was 3.1 bpm. Control procedures indicated that breathing changes accompanying large increases in HR were not sufficient to account for the magnitude of HR change. (Author Abstract.)

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Israel Lieblich, Sol Kugelmass, and Gershon Ben-Shakhar, "Psychophysiological Baselines as a Function of Race and Ethnic Origin," Psychophysiology, Vol. 10, No. 4, July 1973.

Basic skin conductance and pulse rate measurements were obtained from groups differing in race and ethnic origin in Israel. The results suggest higher skin conductance in Caucasians than in Negroes, and in Bedouins than in non-Bedouins. There is some suggestion of an interaction between race and ethnic origin in relation to skin conductance. Both Caucasian and Negroid Bedouin tend to have lower pulse rates than the Jewish sample. (Author abstract.)

- INDEX TO CASE CITATIONS -