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The Diagnostic Examiner – The Life and Breath of the Polygraph

By

John E. Reid

The detection of deception is as old as civilization itself. As soon as rules were imposed to regulate an orderly society, breaches of the rules inevitably occurred. When a suspected offender, in response to an accusation, denied breaking a rule, it was necessary to select a respected person in a high position to act as an arbitrator to decide who was telling the truth. The successor to the original arbitrator is the present day judge who attempts to decide from the evidence presented which of the opposing sides should prevail.

Approximately 80% of the evidence offered in a controversy is based upon the spoken word, and the decision rests in any controversy on the opinion of the judge (or a jury) as to which of the witnesses are telling the truth. Much of the ultimate decision will be based upon his observations of the defendant while testifying, as well as upon the testimony of other supporting or opposing witnesses. The demeanor of witnesses while testifying, such as their manner of speaking, facial expressions, and physical reactions, are critically observed for the purpose of evaluating truthfulness or deception.

Today the Polygraph ("Lie-Detector") Examiner must also decide whether suspected or accused persons are telling the truth. Somewhat similar to the observations and evaluations of a judge (or a jury), the polygraph examiner will consider a suspect's behavior prior to the test, and then later use those behavioral observations as a check upon the diagnosis to be made from the polygraph recordings. He will not rely solely upon his analysis of those recordings.

Throughout the long line of appellate court decisions regarding the issues of the admissibility of polygraph test results, in a vast majority of the cases the emphasis seems to be upon the instrument itself and the recordings it produces. In some of the cases reference is made to the fact that the instrument itself "cannot be cross-examined." Of course not, for the simple reason that the accuracy of an examiner's opinion depends not upon the "validity" of the polygraph instrument alone, but rather upon the qualifications of the examiner, the testing technique used, and his utilization of observations of the behavior of the person being tested. Most certainly, the latter is not the dominant factor, but one that is of indispensable value, primarily as a check upon the interpretations indicated by the polygraph recordings themselves.

Although the polygraph itself is a fine, precision instrument that accurately records the suspect's blood pressure, pulse and respiration, the basic parameters used in instrumental lie detection, it is fundamentally a medical instrument that has no direct relationship to detecting John E. Reid

lies until a questioning technique is applied by the examiner. When a suspect lies to an incriminating question, his emotions are stimulated to produce a change in those previously mentioned parameters. These changes in blood pressure and respiration are recorded in ink on a motor driven chart. However, regardless of how accurately the instrument records the physiological changes in deception, the polygraph is incapable, by itself, of automatically detecting lies.

The most important role in the detection of deception process is performed by the diagnostic examiner who gathers the pertinent information, arranges it for presentation, formulates and asks the questions, eliminates the honest uncertainties due to misunderstandings, and directs the suspect's performance from the beginning to end.

The competent qualified diagnostic examiner is actually the lie detector; the polygraph instrument is only the recording device.

Before describing the importance of the diagnostic polygraph examiner, it is appropriate to identify the required basic examiner qualifications. First of all, he must be an intelligent person with a good educational background - preferably a college degree. He must be endowed, of course, with adequate motor skills to manipulate the instrument controls while periodically observing the suspect's physical appearance and stressful concerns so that he can make the necessary test adjustments. When being considered as a trainee the applicant himself should be submitted to a polygraph examination in order to verify his own honesty and fitness of character before being entrusted to judge other polygraph subjects on their merits. He should receive training in the Control Question Technique, under the guidance of a competent experienced examiner who has a sufficient volume of actual cases to permit the student examiner to make frequent observations of polygraph tests. He should also be required to examine a considerable number of test records in verified cases.

During the first half of the course the student will undergo classroom instruction in the complete polygraph technique, including an intensive study of the behavioral symptoms of both the truthful as well as untruthful suspects. Along with this, of course, the student should have read and received instructions in the pertinent phases of psychology, physiology, and law as they relate to the polygraph technique and the expertise of the examiner. The second half of the training should be devoted to internship testing of both experimental and actual case subjects under the personal supervision of an experienced, qualified examiner. The minimum training time is approximately six months.

After the formal training is completed and the examiner is certified, he must subsequently devote the major portion of his vocational time to polygraph testing and the refinement of his own procedures. It is highly recommended that an examiner should engage in the actual testing process on a continuing full time basis in order to avoid any possibility of inactivity diminishing his newly acquired skills. As in any profession, unless one consistently practices and sharpens his techniques, that person's skills will likely become impaired regardless of the high quality education which he may have initially received. His work as an examiner should not be combined with any other scientific examination responsibilities. An analogy may be drawn between the function of a polygraph examiner in the testing of a suspect and the function of a medical doctor in diagnosing a patient's illness. Typically, when a person experiences a physical problem he or she will initially relate the manifestations of the illness in an objective fashion to the doctor. Thereafter, the physician will analyze that information and consider the possible causes. By the same token, a polygraph examiner will initially assess the fact of a criminal incident and consider objectively the suspect's relationship to that event.

At the time of his appointment, a physician will observe the patient for physical symptoms of the underlying malady. Similarly a polygraph examiner will observe his suspect in the same manner for behavioral symptoms characteristic of either truthfulness, or deception.

When the physician arrives at the point of measuring his patient's physiological functions, he will employ mechanical devices such as blood pressure instruments or electrocardiograms to record internal manifestations of the illness. When the polygraph examiner begins his examination of a suspect's physiological functions in response to incriminating questions, he, too, employs a mechanical device (The Polygraph) to record the internal emotional manifestations of truthfulness or deception.

Finally, we arrive at the most critical phase. To this point in both instances there exists mechanical evidence of either the patient's illness or the suspect's deception. But if the instrumental evidence appears contrary to the original diagnosis it may require further investigation as to its accuracy. Hence, in the case of the physician it is his own capabilities, i.e., the original diagnosis coupled with the instrumental assurances, which will determine whether his patient's illness is diagnosed correctly. If a disagreement is indicated between the diagnosis and the medical tests, it may be necessary to hospitalize the patient for further exploratory tests. The polygraph Examiner may also have to conduct additional tests.

It is the examiner's own capabilities, his study of the behavioral observations, along with the polygraph indications which will determine whether the suspect's truthfulness or deception is accurately identified. In the case of the physician, as well as the polygraph examiner, if the original diagnosis conforms to the instrumental indications, it is a reasonable assurance that the final diagnosis, when all factors have been considered, is correct.

Specifically then, some of the diagnostic considerations confronted by the polygraph examiner which require his special attention and expertise are embodied in the following sample inquiries.

- (1) Is the suspect's attitude and demeanor during the test acceptable, or is it necessary to better prepare the suspect before the test?
- (2) Are the instrumental test recordings operating within the normal range, or is it possible that they are distorted by

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some physiological or mental defect in the suspect?

- (3) Is the observed response caused by deception, or is it a result of some other type of emotional reaction not related to deception?
- (4) Is evidence of non-cooperation indicated on the test charts?
- (5) Are the test questions confusing? Will a lack of clarity cause a reaction even though the suspect agreed before the test that he understood the questions?
- (6) Is it possible that the suspect has a deep seated anger which was not immediately apparent but which now requires further attention?
- (7) Does the suspect require some type of stimulation to increase his test responsiveness?
- (8) Is the suspect overly responsive on the test?
- (9) Are the exaggerated charted test responses reliable, or is it necessary to further evaluate their reliability by using specialized tests - such as Guilt Complex Tests?
- (10) Are the selected Control Questions applicable, or does a lack of responsiveness to the Control Questions necessitate changing the Control Questions or correcting the Control Question terminology?
- (11) Have the test responses been repeated often enough to be assured of their reliability?

These and sundry other questions must be considered by the diagnostic examiner before the final pronouncement of truth or deception can be made.

Finally, do the suspect's polygraph reactions conform to his behavior symptom responses as indicated in the pre-test interview? If not, is it necessary to require additional outside investigation and probably a polygraph re-examination?

In addition, the diagnostic examiner's file must include the pre-test notations of the behavioral interview, the questions asked on the test, the charted polygraph reactions of the suspect's responses, and the correctional notations on the chart itself as permanent evidence to supplement possible court testimony. Such a polygraph policy provides ample crossexamination opportunities to the opposing counsel in every facet of the polygraph examination process. Furthermore, the pre-test notations as well as the permanent chart recordings are open to scrutiny by other diagnostic polygraph examiners for the purpose of either verifying the ultimate diagnosis or for objecting to the conclusions offered.

The unveiling of the examiner's true role should put to rest the insatiable search for an automatic machine that will detect lies. Refinements

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in the technology of the recording instrumentation have progressed as far as human physiology permits. Any further progress should now be directed toward new and refined techniques in procedure and application. No computer will ever replace the diagnostically well qualified polygraph examiner in his central role of determining truth or deception. The variables and combination of variables involved are intrinsically human and mandate human diagnosis.

The qualified examiner is the life and breath of the polygraph and the development and progress in the field will depend upon innovations in techniques introduced by future examiner diagnosticians.

* * * * * *

Jhe Pretest Interview and Its Role in The Detection of Deception

By

Philip A. Mullenix

and

John E. Reid

Abstract

The pretest interview is discussed with emphasis on its role in the process of detecting deception. Particular attention is given to conditioning the subject, selection of control questions, the use of behavior provoking questions, and the analysis of the subject's responses, both verbal and non-verbal. The authors warn that in evaluating behavior it is important to perceive clusters of behavior that are characteristic of truth or deception. The authors conclude that the chart tracings are the final product, and it is upon those tracings that he will base his opinion of truth or deception. [N.A., Ed.]

Introduction

According to the regulations promulgated by the Illinois Detection of Deception Examiner Act, an examiner is prohibited from administering any detection of deception examination without first conducting an interview with the prospective examinee. It is not uncommon for polygraph examiners to lose sight not only of the regulation itself, but, more importantly, of the significance of the pre-test interview within the context of an effective polygraph examination. The pre-test interview must be more than a mechanical review of the impending test questions in conjunction with a few stock behavioral provoking questions asked in rote manner.

The point of this discussion, then, will be toward answering why the pre-test interview is important in the whole process of detecting deception and how an examiner may more profitably utilize that short period of communication with the examinee in facilitating his final diagnosis of truth or deception.

It must be kept in mind, however, that the examiner's diagnosis of his subject's truthfulness will ultimately be determined by a full analysis of all relevant factors. The most prominent factors to be considered are the case facts, the subject's behavioral responses both before and during the examination, and, of course, the polygraph charts themselves. To ignore any of these factors in arriving at a diagnosis of truth or deception

Requests for reprints should be addressed to the first author at Reid College of Detection of Deception, 215 N. Dearborn, Chicago, Illinois 60601.

could easily lead the examiner to an erroneous conclusion. On the other hand, by intelligently incorporating all three of these factors into a single process of detecting deception, a polygraph examiner will certainly enhance the quality of his diagnosis.

It is toward that end that the pre-test interview plays its vital role. As you will see, the foundation for the entire examination is established during the interview through an in-depth analysis of the case facts with the subject, an objective appraisal of the subject's verbal and nonverbal behavioral responses, and by proper conditioning of the subject so as to obtain clear and unambiguous polygraph results.

Conditioning of the Subject

In that the final tangible product of a polygraph examination is the set of charted tracings which indicate the subject's emotional responses, the person on whom the test is to be conducted must be in a proper frame of mind in order for the test records to bear any conclusive results. Responsibility for ensuring that a subject's physical and emotional state is compatible with the testing procedure rests squarely upon the shoulders of the polygraph examiner. It is incumbent upon him to single out subjects who, for various reasons, may not be fit for testing at a particular time. Furthermore, the examiner bears full responsibility for stimulating the subject in accordance with the polygraph questioning technique which he chooses to apply (such as the Control Question or the Backster Zone Comparison Technique, etc.). These efforts by an examiner, which are generically referred to as means of "conditioning the subject", must be made during the pre-test interview.

The most frequent occasions in which the necessity of "conditioning" arises are those that are most superficial and easily observed by an examiner who is consciously aware of his subject's suitability for a polygraph test. Certainly, physical defects that impair a subject's ability to take a test should be immediately obvious to any examiner. But other influences are less apparent. Emotional disturbances, whether permanent or temporary, need to be recognized as do excessive nervousness or anger within a subject. If an examiner neglects to allay the nervousness of an overly apprehensive subject or calm the aggression of one who is experiencing anger at the prospect of taking a polygraph examination, the end result may be test records simulating deception but produced, in fact, by the subject's negative attitude toward the test. Additionally, the examiner must be aware of the possibility of alcohol or drug consumption by the subject, as well as any other influencing factors such as prior interrogation or some shocking experience which the subject might have undergone just prior to his examination. Such events could lead to emotional exhaustion by the subject and a concommitant inconclusive or deceptive polygraph diagnosis by an examiner who failed to perceive the existence of these interfering influences during the pre-test interview.

A slightly more sophisticated facet of the "conditioning" process lies in the proper stimulation of a subject by the examiner in accordance with the particular polygraph technique being applied. The object of the examiner's stimulation efforts is to convince an untruthful subject that his lies will most certainly be detected while simultaneously accentuating the responses characteristic of truthfulness in one who is, in fact, telling the truth.

For instance, under the Control Question Technique, it is imperative that the examiner use his pre-test interview to convey to the subject an impression of extreme concern for the control questions being asked. Development of effective control questions is undoubtedly the most critical thing that an examiner will do during his interview. If the examiner fails to work up his control questions properly, the strength of the technique will likely be diminished. A truthful subject deserves every opportunity to establish his innocence, and where the control questions are weak or ineffectively stated, their inherent ability to accentuate a person's truthfulness to the issue is dampened, if not entirely eliminated.

Therefore, it is the examiner's responsibility during the pre-test interview to select control questions that not only relate to the underlying motive of the offense under investigation, but they must also evoke a degree of genuine concern on the part of the subject. This concern should be clearly visible to the examiner, for if the subject is able to easily deny ever participating in the conduct suggested by the question, the examiner must either select an alternature control issue or resort to asking whether the subject had ever tried or even thought about doing such a thing. In any event, the examiner must display a keen interest in the subject's answer to the control question as well as an attitude of expectation that the subject should have committed several such infractions throughout his lifetime. Any admissions made by the subject should be narrowed down to specifics, and the final version of the test question should be worded to exclude only those explicit admissions, thereby leaving the subject with a virtual known lie to his control question response.

Control question development is a vital portion of an examiner's pretest interview. He must first select an appropriate question, then he must pose it in a manner that will elicit sincere concern from the subject, and he must also be alert to whether the necessary degree of concern is prompted by that particular question. If the examiner falls short in this progression toward finalizing his control questions, his subject - particularly a truthful subject - has not been properly conditioned for the examination, and the examiner's ability to diagnose truth or deception has been hindered.

In addition to accentuating the truthful subject's test responses, an examiner should be equally concerned with the conditioning techniques available to him during the pre-test interview for the purpose of convincing an untruthful person that his lies will be detected. An effective tool which the examiner may employ is a simple explanation to the subject of the body functions being monitored by the polygraph instrument followed by a brief description of the physiological changes ordinarily precipitated by deception.

If a subject enters a polygraph situation under the assumption that he can "beat the test" by exercising supreme control over his own thought process, he may have an edge that could serve to minimize his responses. If that same subject, however, is told immediately prior to commencement of the examination that the physiological functions recorded by the polygraph are governed by one's autonomic nervous system, something over which a person can exercise no conscious control, then his own confidence gives way to a slight doubt. And if he is further told that a lie produces a specific type of response that becomes magnified by a person's attempts at inhibiting its occurrence, then that doubt becomes a more formidable stimulus to the subject as he perceives his ability to control the situation slip farther away from him. Thus, the examiner may, in a very deliberate fashion, take advantage of the pre-test interview to break down a subject's defenses to the polygraph instrument and the impending testing procedure.

The examiner's general demeanor throughout the interview will go a long way toward conditioning a subject, whether truthful or untruthful, for the upcoming examination. You know from your own life's experience that when you perceive someone within a service oriented business as being somewhat less than competent, you will be more inclined to find fault with the results of their work than if they had initially presented an image of quiet confidence. The same principle exists between subject and polygraph examiner during the interview. While the examiner is engaged in his business of questioning the subject, the subject is appraising the examiner in an equally critical manner for signs of weakness or inability. If an untruthful subject detects uncertainty in the voice and gestures of his examiner, he will believe that he can control subsequent events and thereby defeat the test. In the event that a truthful subject perceives undue hesitancy on the examiner's part, his confidence that the test would most certainly turn out favorable to him will naturally be shaken. In either case, "conditioning" of the subject takes a reverse direction, and the likelihood of an inaccurate polygraph interpretation may follow suit.

Therefore, it is not enough for an examiner during the interview merely to avoid having a negative influence on his polygraph results by keeping himself from appearing uncertain or at all hesitant. Instead, he must project his competence through an assertive voice and confident gestures with an organized train of thought so as to convey to a truthful subject that the test will indeed reflect their innocence. On the other hand, such action by an examiner will serve notice to an untruthful subject that the examiner is quite capable of detecting that person's lies, and, more importantly, signifies to the subject that the intangible element of control over the situation remains with the examiner and not with the subject.

Behavior Provoking Questions

Closely associated with the process of "conditioning" is the matter of eliciting from a subject during the pre-test interview certain behavioral patterns characteristic of one's guilt or innocence. The premise upon which is built the theory of the "behavior provoking question" is that the internal anxiety being experienced by an untruthful person at the time of a polygraph examination will be apparent to an observant examiner who notes the physical manifestations of that tension in response to casual questioning during the interview. Conversely, a truthful person will not experience that internal anxiety since he is well aware of his own innocence. Therefore, his outward behavioral patterns during the pre-test interview will be conspicuously devoid of the typically guilty expressions when asked the very same questions.

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It is the examiner's responsibility during the pre-test interview not only to ask the appropriate behavior provoking questions, but also to accurately categorize the subject's responses as being symptomatic of outright deception, guilty knowledge of some aspect of the offense, or mere apprehension over the testing situation. The remainder of this section, then, will focus upon two questions: 1) What "behavior provoking questions" need to be asked during the interview, and 2) How the responses are to be evaluated.

Ideally, a pre-test interview should be composed of non-abrasive and non-accusatory questions that force the subject to discuss his own personal attitudes toward the incident under investigation as well as toward the hypothetical offender. When the examiner poses questions in this regard, the subject will be required to produce an answer knowing, by virtue of the fact that he is being given a polygraph test, that there is at least some suspicion of his own involvement in the matter under investigation. For a truthful person, this creates no particular problem. His thought process will revolve around unlawful consequences which he, himself, did not produce. His view of the incident as a non-participant will be critical, direct, and punitive in tone toward the actual perpetrator. The truthful person's answers will generally be quickly offered and unaccompanied by uncertain or anxious gestures of the body.

An untruthful person, however, will typically respond in a far different manner. Of over-riding concern to him is the fact that he is being asked to very nonchalantly talk about himself and some unlawful act which he committed. This alone is a difficult task, but it becomes even more formidable when the thought of impending discovery through a lie detector test looms on the immediate horizon. Unlike the truthful person, whose answers are automatically produced by a natural confidence over their own innocence, a guilty person must first decide whether he should fabricate a harsh and critical approach toward the act which he committed. Then he must decide how to present that look of innocence in a convincing manner. This deliberation is usually accompanied by physical gestures indicating the subject's internal anxiety, and the verbal responses are generally far less convincing and offered with a greater degree of uncertainty than that which would be heard from a truthful person.

There exists no all encompassing formula of questions that will produce these results in every interview situation. There are, however, definitive categories into which inquiries can be made in order to elicit from the subject the desired behavior symptoms. Naturally, an examiner must incorporate into his evaluation the content of the subject's verbal answers as well as the outward physical manifestations of his internal emotional tension.

The first category of pre-test interview questions may be termed the direct inquiry in which a subject is asked point blank whether he committed the act in question. In that a guilty subject's apprehension over the polygraph test is ordinarily at its highest level soon after the person has been escorted into the examination room, the direct inquiry will have its greatest effect, insofar as producing strong behavior symptoms is concerned, if it is presented early in the interview. Typically, a brief synopsis of the issue of the examination is given whereupon the question is posed: "Mike, how do you stand on this?", or "Mike, did you kill Valerie Jones?"

The response of an innocent person will be an immediate unequivocal denial, and it will be accompanied by an alert posture and direct eye contact from the subject. The untruthful person, on the other hand, is just getting acclimated to a threatening environment and is wondering whether this question is even part of the test. While his verbal answer at this point will most assuredly be a denial, it will be offered weakly or with a qualification, and the subject will exhibit perhaps his most dramatic behavorial responses indicative of his own uneasiness. An untruthful subject may shift in his chair, cross his legs, or seek out something to manipulate within his hands. It is quite likely that he will divert his eyes away from the examiner the moment his verbal answer is offered.

Another behavior provoking question that falls within the "direct inquiry" category is one in which the examiner asks whether the subject believes he will pass the lie detector test. Here, a truthful subject will respond in a positive fashion, both verbally and behaviorally. But an untruthful person will volunteer nebulous excuses, either in his physical or mental makeup, that will cause the test to indicate deception. While one may earnestly question the reliability of a polygraph examination, it is generally an untruthful person who will argue that point as a reason why the test results will ultimately point an accusatory finger in his direction.

A second category of behavior provoking questions relates to the punitive aspects of the subject's own attitudes toward the person who committed the offense. When a polygraph subject is asked to convey his own personal opinion as to just what punishment he believes should be meted out to the guilty person, an innocent person is asked to evaluate a distant third party, who seemingly has broken the law. This emotional detachment which he feels at that moment from any one particular guilty individual will allow a truthful person to look at the matter objectively and quite critically. Therefore, he is likely to return an answer that carries harsh punitive measures. An untruthful subject, however, has been asked essentially to pass sentence upon himself. Thus, his verbal response may suggest that consideration should be given to the circumstances surrounding the event, or he may indicate a punishment that is ridicuously lenient by current social standards.

Associated with a subject's attitude toward punitive matters is his attitude toward the polygraph test in general. When an inquiry is made as to just how the subject feels about submitting to a lie detector test, a truthful person will welcome it as an opportunity to establish his innocence. An untruthful person will naturally respond in a defensive manner as he will perceive the test as a threat to his future well being. Thus, within the context of a pre-test interview, a truthful person will behave in quite a relaxed fashion when such an inquiry is posed while an untruthful person will display uneasiness and a defensive aggression in his verbal responses and physical demeanor.

The third category of behavior provoking questions involves providing the subject with an opportunity to cast suspicion away from himself and onto someone else. When a subject is asked if he suspects anyone in particular of having committed the act, an affirmative response will generally be characteristic of the subject's truthfulness. Truthful individuals will not only name suspects four times more frequently than their untruthful counterparts, but they will also provide plausible explanation to substantiate their feelings, for detailed information and a directness in delivery is symptomatic of the difference between the truthful and the untruthful subject.

But an examiner should be alert for the exception. While inquiries into such things as a person's honest suspicions are helpful in identifying truthful individuals, they serve a dual purpose of allowing a guilty party to imply that his own wrongdoings were more likely carried out by another. In fact, an untruthful person might eagerly answer a question as to his own personal suspicions by accusing individuals who, by the case facts, are incapable of committing the offense or are the least likely among all the suspects.

The final category of behavior provoking question deals with a person's own background relative to the incident under investigation. Specifically, to ask a subject during the pre-test interview whether he had ever thought about committing the very same offense will lead to a rather dramatic demarcation in answer and behavior between the truthful and untruthful individual. Whereas a truthful person will display some degree of annoyance at the insinuation coupled with a strongly expressed denial of having thought about it, an untruthful person will seek to convince the examiner that it would be abnormal for a person not to entertain such thoughts. Concurrent with this line of questioning, it would also be appropriate to inquire as to whether anything similar to this incident had ever happened to the subject during his lifetime. An affirmative response to this question, if nothing else, can alert an examiner to the possibility that the subject may be a repeat offender who feels little remorse for his conduct and even less fear of detection. (This, in turn, may necessitate application of certain stimulation techniques previously discussed in the section entitled "Conditioning".)

One additional question pertaining to a subject's background relative to the issue on the test is whether he told anyone beforehand that he would be taking a polygraph examination. Assuming that the subject had advance notice of the test and sufficient opportunity to advise friends and family members of the rather unique experience that he would undergo, a truthful person will likely tell anyone in whom he has any degree of confidence about the impending test. An untruthful subject, however, will certainly attempt to keep the test and its predictable results to himself. Furthermore, if a subject did tell someone about the test, it might be worthwhile for the examiner to follow that up by asking just what that other person's reaction was. It may turn out that the third person had innocently given the subject some erroneous information about the content or conduct of a polygraph examination that could conceivably disturb the subject during his test. Similarly, the subject might deliberately have sought out information on how to try to "beat the test." If the subject is questioned directly about this possibility, his behavior may belie his verbal negative response and thereby alert the examiner to the presence of outside influences as a factor when interpreting the polygraph charts.

The examiner's function throughout this process is quite obvious. For it is he who must not only ask the appropriate behavior provoking questions but also observe and record the verbal responses as well as the nonverbal physical symptoms of the subject's anxieties. Therefore, the examiner must find the right blend between the mechanical task of note-taking and the equally critical task of observing the subject's behavior. One area must not restrict the examiner's efficiency in the other area.

If the examiner spends all of his time during the interview furiously writing down everything that eminates from a subject's mouth, then he will lose out on behavior symptom observation. Conversely, if an examiner neglects the subject's verbal responses or fails to make written notations of the subject's behavioral changes as they occur, he will be unable to recall critical information during the process of rendering his final diagnosis of truth or deception. Therefore, it is incumbent upon the examiner to find, at his own pace, the proper balance for note taking on the significant responses so as not to diminish his fundamental capability of visually recognizing behavior symptoms characteristic of the subject's internal anxieties. Furthermore, the examiner must be mentally free to improvise or deviate from his prescribed line of questioning should the need arise. If he is consumed by excessive note taking, the examiner's ability to think extemporaneously and ask vital "follow-up" questions will suffer correspondingly.

In order to gain a full appreciation of the concept of the "behavior provoking question", it is wise to revert back to its underlying purpose within the context of a pre-test interview. The questions which have been outlined throughout the preceding paragraphs are intended to produce observable behavior that is symptomatic of the subject's guilt or innocence. The process of evaluating that behavior is a delicate one requiring the examiner to perceive clusters of behavior which are characteristic of either truth or deception. In the absence of these clusters, an examiner's behavioral observations assume merely a neutral significance in his overall function as a detector of deception. A single incriminating response, either verbal, non-verbal, or both, to a single behavior provoking question is in no way dispositive of a person's guilt or innocence. There must be an obvious tendency by the subject toward answering a majority of these questions in either an incriminating or an exonerating fashion before the examiner may draw any conclusions in reliance solely upon his behavioral observations.

Research studies have shown that a polygraph examiner's accuracy in detecting deception may be dramatically enhanced through observation of a subject's behavior (Wicklander & Hunter, 1975). However, caution must be exercised in dealing with behavior symptom analysis not to lend excessive credence to one answer to a single question while ignoring a contrary trend of behavior that predominates the remaining questions. Additionally, an examiner must guard against the possibility of misinterpreting the content and accompanying behavior of answers born, for instance, of a meek or inherently forgiving personality.

Fact Analysis

An in-depth discussion on the evaluation of case facts is an extensive topic if taken by itself and is therefore beyond the scope of this paper. Instead, the purpose of its inclusion here is to create an awareness that allowing a subject to review the case facts during a pre-test interview can plan an integral role in the overall process of detecting deception.

From a purely technical standpoint, the fact analysis phase of the pre-test interview will provide a fundamental basis for the formulation of test questions. The most basic step for the examiner to take is to see that the subject's knowledge of the facts is essentially the same as that which the case investigator had previously provided. Any major discrepancy creates obvious problems in formulating appropriate questions that will resolve the issue at hand.

Furthermore, when a subject is given an opportunity to freely discuss the case facts in detail, an examiner can note the subject's own chosen vocabulary in reference to the names, places, functions, or other terminology relevant to the issue. The examiner is thereby able to alleviate any ambiguity between the language which the subject understands and those ideas which the examiner intends to convey. By incorporating the subject's own terminology (within the bounds of good taste and acceptable grammar) into the actual test questions, an examiner minimizes the chances of a subject misunderstanding the inquiries presented while simultaneously reinforcing the accuracy of his diagnostic results.

A review of the case facts with the subject also allows an examiner to observe in untruthful individuals certain behavioral responses characteristic of his anxiety over the fear of detection. Casual yet thorough questioning of the subject on the case facts puts a guilty party on the defensive. Certainly he will be concerned not to reveal too much about the incident, for to do so would be to incriminate himself by providing information that could be known only by the actual perpetrator. In fact, he may be mentally preoccupied with his efforts at maintaining fabricated alibis and excuses which he might have offered to the investigating officers on previous occasions. The doubts he may experience over the consistency of his version of the events will manifest themselves in hesitant voice and gesture as well as in a willingness to vacillate or change his story at the slightest suggestion of contradictory evidence.

In stark contrast to this, however, is the conduct of a truthful person as he recounts the facts of the incident as he knows them. Since an innocent party is either replaying verbally something which he witnessed or discovered or is relaying information that had been provided to him third party, that person's behavior will be unquestionably forthright and direct. When an examiner presents contradictory statements or evidence, whether authentic or fabricated as in a "baiting" technique, the truthful subject will adhere to his original version of the facts rather than exhibit the wavering uncertainty symptomatic of the self doubts in an untruthful person.

It is in the fact analysis stage of the pre-test interview that a polygraph examiner assumes the role of an investigator establishing the relationship not only between the subject and the even in question, but also the relationship between the subject and the remaining potential suspects. Naturally, the examiner should devote primary attention to the access (or lack of it) which the subject might have had in order to commit the unlawful act. That is most obvious. But on the fringes of this line of inquiry is whether the subject observed any peculiar behavior in other individuals within a given area at a specified time and whether any unusual activity occurred within that physical and temporal framework.

While this may ring familiar to you as a previously discussed behavior provoking question as to the subject's own suspicions, the point of these inquiries here is not so much to evoke physical symptoms of tension as it is to obtain valuable information on other possible suspects. In the event that the subject is innocent, there may be a vital piece of information on the guilty party which needs to be subtly drawn out of the subject during the fact analysis phase of the pre-test interview.

Ideally, a disinterested third party under the circumstances of a polygraph examination may provide answers to questions which otherwise might never have been asked by anyone. But this type of information can be extracted only if the examiner is alert to the potential of his interview by expanding the scope of his pre-test inquiries beyond the immediate question of the subject's primary responsibility for the unlawful consequences. Where an employee theft is motivated by feelings of insufficient compensation for services rendered, it is likely that another employee, who may also be subjected to a polygraph examination as a primary suspect, previously overheard the actual perpetrator remark that he would one day "get even" with the company for being underpaid. If the examiner then focuses his concentration during the interview solely upon whether this ultimately innocent subject committed the theft, he may correctly exonerate him. But in so doing, the examiner has lost a vital advantage toward resolving the crime and identifying the guilty party simply by ignoring a method of fact analysis at his disposal through the pre-test interview.

Interrogational Theme Discovery

At this point, it is appropriate to mention one aspect of the pretest interview which, though not directly related to the process of detecting deception, will benefit an examiner during the subsequent interrogation of an untruthful subject. In his approach to every pre-test interview, an examiner should exercise a certain degree of foresight toward the possibility of an interrogation by attempting to determine from the subject what factors might have motivated him to commit the unlawful act.

This process need not and should not assume an accusatory tone. The examiner may easily interject into his non-abrasive interview additional inquiries such as "Why would anyone want to do something like this?" A guilty subject can be taken aback by the personal nature of the question. For he has been asked to reveal his own private motivation for his actions, and frequently his answer will reveal precisely that. The subject may dwell on his answer and seek to minimize the moral significance of the offense by "convincing" the examiner that honorable intentions might have been behind the unfortunate consequences. If an examiner is alert to the significance of these questions and the answers which follow, he will have obtained through his pre-test interview the most sensitive and ultimately successful interrogational theme for use with that particular subject.

In the event that such questions are posed to innocent subjects, their answers may certainly reflect mere subjective speculation. On the other hand, the verbal responses may have been prompted by some piece of information which the subject has regarding a person who, within the subject's own mind, is the prime suspect in the case. If an innocent subject strongly suspects a particular individual, and that suspicion is born of a knowledge that the suspect, for instance, was in dire financial straights even before the recent arrival of his second baby, that information could be extremely helpful as an interrogational theme should the larcenous parent ultimately fail his own polygraph test.

Furthermore, when an examiner poses questions during the interview such as "Do you think it would be easy for a person to have done this?" or "How do you think a person could have done this and gotten away with it?" a guilty subject may "hypothetically" present the very means by which he carried out the offense. But even more important is the fact that such questions invite a subject to blame others, including the victim, for provoking the attack or acquiescing in security measures that beg the unlawful consequences. The subject's own statements may then be used verbatim by the examiner during a subsequent interrogation as a means of sympathizing with the subject for having been unfairly tempted to commit the crime.

Conclusion

Throughout this discussion, it has been our intention to illustrate the fact that a polygraph examination is not simply a mechanical procedure whereby questions are asked and answers are automatically interpreted as truthful or untruthful. Instead, the cumulative process of detecting deception is a direct result of an examiner's capabilities in areas that transcend the polygraph records themselves.

The charted tracings that constitute traditional polygraph results are the final product of an examiner's efforts, and it is upon those tracings that he will base his opinion of truth or deception. However, that which precedes the actual examination, namely the pre-test interview, is vital to the diagnostic examiner not only in obtaining unambiguous records but also in the overall interpretation of a subject's truthfulness. As we have seen, it is the examiner who bears the responsibility to condition and stimulate the subject before a proper polygraph test can be administered. It is the examiner who must elicit and observe those physical symptoms of a subject's inner anxieties or confidence over his own guilt or innocence. And most importantly, it is the examiner who must assimulate these factors together with the polygraph results into his ultimate diagnosis.

Therefore, in order to fulfill his responsibilities as a diagnostician capable of detecting deception, the polygraph examiner must utilize his pre-examination interview in those areas of fact analysis, subject conditioning, and behavioral observation. An examiner who consciously approaches each examination in this manner will not only enhance his own proficiency in obtaining definitive results, but will also lend greater credibility and consistency to the entire polygraph profession.

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* * * * * *

By

James Wygant

Abstract

The essential ingredients of the pre-test portion of a polygraph examination are identified and explained. The pre-test is completely described, with emphasis on four functions: explanation of the process, listening to the subject's version of the issue, permitting the subject to become accustomed to the examiner and the environment, and observation of the subject. [N.A., Ed.]

Polygraph examiners and the schools that train them are sometimes inclined to stress the importance of question formulation, test structure, and chart evaluation to an extent that implies diminished importance of that portion of an examination commonly known as the pre-test. There must be nearly as many different approaches to pre-test interviews as there are examiners. Since a credible pre-test interview ought to be tailored to suit the personality of the examiner, the variety is understandable. However, we should be able to identify certain common essential ingredients in any pre-test interview; otherwise there would be no apparent justification for routinely doing one.

In a recent Court of Appeals decision in Oregon, 42 Or App 607 (1979), the court recognized that a polygraph examination begins when the test subject enters the room. This decision was based in part on what the court believed to be the subject's perception of the examination procedure. In other words, if the subject believed it began when he entered, it did. Even without a court saying it, it seems reasonable that an examiner should consider the pre-test an integral part of the examination and not just a brief warm-up for what's to follow.

Any subject, whether potentially truthful or deceptive, will be in a state of anxiety upon arrival for a polygraph examination (unless overdosed on drugs). If we allow that part of the function of the pre-test to attempt to reduce that nonspecific anxiety toward a goal of reducing symptoms of general nervous tension on the charts, then we begin to arrive at some essential ingredients of the pre-test.

In general terms, the pre-test should serve all of the following functions:

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- 1) to educate the subject about the process;
- 2) to confirm the subject's version of the issue;
- 3) to permit the subject to become accustomed to the examiner and the immediate environment; and
- 4) to permit the examiner to observe the subject.

In other words, there are some trade-offs, the examiner is presenting himself and his alleged expertise to the subject and the subject is presenting himself and his alleged truthfulness to the examiner.

All four of those items are only a means towards establishing a pretest premise, which should be simply to build the subject's confidence in the examination - meaning primarily the ability of the overall procedure to detect lies and confirm truths. If the pre-test interview fails to accomplish that premise, none of the four items listed above will make any difference; if the pre-test succeeds in realizing its premise, it is only because each of the four things occurred in a way that contributed to that premise.

To begin with, the examiner must prepare himself for the test, remembering that any test subject, lying or truthful, wants to be believed. The examiner should expect that the sensitivities of his test subject are enhanced; the subject is watching for signs that the examiner believes he is lying or is not lying or signs that the examiner lacks the confidence to make a decision and may be manipulated. Those signs should not be apparent.

To avoid manifesting such signs, the examiner might remind himself that he has no investment in the test except to be able to vouch for its accuracy. An examiner who does not enforce his own objectivity may unknowingly convey his bias, whatever it is, to the test subject. We don't know the consequences of such perceived bias, but it does not seem likely that it would benefit the test. The strongest motivation for maintaining an objective attitude is that it makes it easier to reach a conclusion that can be sustained by independent review. An examiner who allows himself to be convinced by reports of a crime that the test subject is lying will not only have a difficult time hiding that from the test subject, but may find himself reading his charts in a way that can not be confirmed by other examiners. An examiner who permits a test subject's apparent believability to effect his judgment may encounter the same problem in reverse.

Even if all the evidence indicates that the test subject is guilty, the examiner ought to reserve judgment until he sees his charts. And he should do the same in cases in which the test subject is so appealing or convincing or pathetic that it seems impossible not to believe him.

An easy means of self-reinforcement of this attitude is for the examiner to state it to the test subject in the pre-test. "I have no investment in this test, except in its accuracy. I don't care if the results say that you're lying or telling the truth. I only want to be able to say that I am confident that those results are accurate. You want that too, I'm sure. I want you to understand that nothing I have read about your case and that nothing that you say will convince me that you are being either truthful or untruthful. You are the only one who needs to be convinced that you are telling the truth. If you are, the test will tell us that. If you are not, it will tell us that just as clearly."

Incidentally, that little speech illustrates the inappropriateness of an examination being conducted by the same person who has investigated the case. It might be difficult to convince the test subject of the sincerity of a claim of objectivity if the examiner making that claim has already acted toward the test subject in the non-neutral manner befitting an interrogator.

At the time any subject is first met by his examiner, the interaction between the two immediately begins. How the examiner exercises his options in those first moments may set the tone for all of what is to follow. Assuming that even liars are more responsive when treated with dignity, a confident greeting and self-introduction by the examiner are in order. Many examiners then proceed directly to an advisement of rights (when it is required) and to a personal data sheet. If we allow that we have a reasonable premise for conducting pre-test interview - that is, to build the subject's confidence in the examination - then it is probably self-defeating to ask the subject to sign a waiver form and give personal background as soon as he sits down.

Keeping in mind that any subject entering a strange room for a strange procedure with a strange person is going to be at least temporarily anxious and disoriented, it seems prudent to give the subject a few moments to settle down. If the examiner does all the talking for the first several minutes, he is at least offering that opportunity. A brief speech about how the test works and why is appropriate.

This speech is not just to educate the subject or to relax him or to get him accustomed to the sound of the examiner's voice, it is also to build his confidence. In that regard, delivery is just as important as content. It does an examination no good for an examiner to ramble on about how good he is or how great his technique is or how many famous cases he's run if he has lost sight of his premise and is talking more for the benefit of his own ego than for his test subject's confidence. Similarly it does an examination no good for an examiner to provide more instruction in polygraph technique than is necessary to create a basic understanding in a particular test subject. Every statement the examiner makes in the pretest, every question he asks, every response he gives, should be done in consideration of how both the content of what he is saying and the delivery will help build the subject's confidence in the overall examination. The examiner must appear at the same time dispassionate about the case and dedicated to the accuracy of his work; he must convey clearly the idea that, before testing, he is uncommitted to a finding of either truthfulness or deception.

This initial instruction in the hows and whys of the test should recognize that almost all test subjects bring to an examination certain misconceptions about what is going to occur and a certain degree of ignorance about the ways in which their own bodies function. In other words, an examiner should not take anything for granted. It should be assumed that the test subject knows nothing about polygraph examinations or that what he knows is wrong, even if this subject has previously been tested. This does not imply criticism of any previous examination, only concern for the subject's recall of what he was told and what he perceived.

Included in such a speech should be some understandable explanation of the body's response to the threatening stimulus of lying, reference to the subject's own knowledge of his truthfulness or deception as the only key to the test, and a brief explanation of what the instrument does and how it will be attached. Of course, this speech should not sound like a speech but should appear to any test subject to be a sincere explanation, regardless of how many times the examiner has given it before.

For almost anything that is said in any circumstances there are two levels of content. The first level is the informational value of the data itself. The second level, which is possibly more important, consists of the implications which will be drawn by the listener from the fact that some one chose to present this particular data to him. For example, the best reporters in television news are cautious about giving an event undue importance simply by reporting it. In the context of the pre-test phase of a polygraph examination, the first level of content is the information about physiology and instrumentation (and later about the questions themselves); the second level is the examiner's apparent interest in his subject, the examiner's confidence with his procedure, his honesty and scrupulousness and his avoidance of any tricks. No examiner ever needs to pledge these things to a test subject and would probably do himself a disservice to do so; the message will appear most persuasively and enduringly by implication.

In this regard, it is well to stay as close to the truth as possible in explaining the test and the instrument. For instance, it does no harm to the examination to honestly tell the test subject that the polygraph is only a recorder of things happening in his body, that it does nothing by itself, that it does not even detect lies. If the subject understands that the examination is based on his own knowledge of the truthfulness or deceit of his answers, he may stop worrying about whether the instrument really works or whether or not he can "beat" it. A subject who plans on being deceptive should find himself in the impossible position of having to "beat" himself - that is to unknow what he already knows. For the subject who plans on being truthful, there is the reassurance that the examination does not depend on a cold, calculating instrument that he is not familiar with.

Having completed some initial explanation of the instrument and the anticipated procedure, the examiner is less likely at this point to offend a subject's dignity or sense of rapport by now completing any waiver forms and personal data sheets. Since the subject has not been given an opportunity to say anything about the test issue until this time, there is no danger of an inadmissible confession (although administration of a Miranda warning by a police examiner obviously needs to be made at any earlier time when a subject seems determined to confess).

Personal data sheets, like almost everything else in the pre-test, have multiple functions. First, they create a record of this test subject's identity: full name, date of birth, address and such other identifiers as

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file or case numbers. As a liability protection and as a minimum means of establishing the testability of this subject, there should be questions about physical or mental impediments to testing, if any. Beyond those basic entries, personal data sheets go on to ask a variety of other things. As a rule of thumb, if an examiner does not have any use for the information he is seeking, he shouldn't demean the test subject by asking him to provide it. Questions about level of formal education and kind of employment certainly help establish the subject's ability to comprehend the test procedure, but such data as name of employer and years of service are usually of no particular use to a polygraph examiner and may cause a test subject to feel suspicious about the reasons for asking.

Once all of the forms have been completed, the examiner should consider relinquishing control of the interview to the test subject. All of the preceding explanations and routine questions and answers, none about the test issue yet, have been partly intended to give the test subject a chance to burn off at least some of his disorientation and circumstantial intimidation. Now it's his turn to talk; and he should be as ready as he ever will be. As a preface, the examiner may want to remind the test subject that the examiner has obtained reports or other information about the test issue and therefore knows at least one version of it. Some obvious gesture at this point, to emphasize the examiner's interest in listening, is appropriate. For instance, the examiner could put his pen down, close his file, simply change the way he is sitting in his chair or make any other gesture that would indicate to the subject that he has the examiner's undivided attention. And, in fact, he should have it.

There's no point in taking notes at this point or fidgeting with a file. The case information should have been available before the pre-test interview began and preferably also information about which areas are disputed by the subject; in other words, what the test issues are likely to be. There is no reason not to give the subject full attention and there is every reason to do so. We can again refer back to the pre-test premise - to build the subject's confidence in the examination. No one likes to feel that he is at the mercy of some mechanism over which he has no control and into which he can make no contribution. But more than that, the examiner provides his own advantage, an ideal opportunity to identify attitudes and concerns of the subject that might be valuable in control question formulation and also the chance to clearly delineate the precise extent of the subject's admissions, if any. Obviously it would be fatal error to formulate relevant questions that did not allow for any partial admissions.

Some subjects want to begin their explanation by referring to something that happened when they were eight years old; others want to start with the issue itself and work outward from there. There is a temptation to the examiner to attempt to structure the subject's statements to the examiner's own ideas of how these circumstances ought to be related. There will be an urge to interupt, to tell the subject that something he is saying is not really relevant to the issue, to try to steer him into some orderly explanation of what he knows about the test issue. That urge should be resisted. This portion of the pre-test belongs to the test subject, for him to do with it as he wants. He is going to say the things that he believes needs to be said, in whatever order and in whatever detail he believes they deserve. There is often something to be learned just from the way he treats certain things he is saying in an uninterrupted monologue, even if there is always the uncertainty of whether something is genuinely important to him or he just wants it to appear to be important to the examiner.

Questions from the examiner should only be used to keep the subject going if he stops without completely covering the issue or if he is obviously attempting to delay the start of the test; and even then they should only be discreet reminders to return to the issue. The subject should not be interrogated and he should not be asked to repeat his story in a way that suggests that the examiner is looking for inconsistencies. If the examiner clearly understands the exact role that the subject describes for himself with regard to the relevant issue, then the examiner has gotten all the information of value to him in this segment of the pretest. That information, however, takes only a few moments to obtain and is usually known by the examiner even before the subject arrives for examination.

If the subject denies any involvement in or knowledge of the test issue (other than what he has heard or read), he is obviously in no position to carry on a lengthy monologue about it. The examiner should ask the subject to relate what he knows about the issue, even what he suspects happened, perhaps identifying areas that could be used for peak of tension testing. The important thing is to have the subject talking for a while.

If we accept the proposition that little reliable information that is new will come from the subject during this phase of the pre-test interview, then we must also accept that the purpose of having him talk is to support the pre-test premise, to build his confidence in the examination. By the time that the entire pre-test has been concluded and the test itself is about to begin, no subject should have to feel that he didn't have every reasonable chance to speak the truth about his involvement or lack of it.

Question formulation is all that remains. Many examiners routinely construct a set of relevant questions and some extras and let them "simmer" for several hours before the test, or even overnight, to contribute to a more detached and objective review of their suitability. An examiner who neglects familiarizing himself with the case information and has to construct his relevant questions while he is with the test subject risks a build-up of general nervous tension while the test subject waits silently for the examiner to decide what he's going to ask. There is also an enhanced risk of question defects due to lack of opportunity for thoughtful review. What may have been intended to be a display of examiner confidence and spontaneity may be interpreted as carelessness and uncertainty. Of course, no test subject should be presented with a set of relevant questions in a manner that suggests that there can be no changes. The subject should be advised that the questions are in preliminary form and that any words he does not like or understand can be changed, within the limits imposed by the necessity of resolving the issue.

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Introduction of control questions presents some unique problems. Since these questions do not refer to the test issue in a direct and specific way, as the relevant questions do, they are initially going to seem less important to any test subject. Some test subjects may also resent the use of questions which go beyond the scope of the relevant issue. The examiner has an obligation to offer an explanation that is at least intended to help convince the truthful test subject of their importance and necessity in the examination. This is actually fairly simple, but an examiner who only introduces the questions, quickly obtains the subject's answers and moves on - without any explanation - is likely to have some truthful subjects producing marginal or inconclusive results.

It is not necessary or desirable to explain to a test subject the application of the theory of psychological set to the use of controls or to explain exactly how the responses on each chart will be compared to reach a conclusion. However, it is well to tell the test subject that these questions are intended to reveal if he is the kind of person who would do something like the present offense and, if so, whether he would like to get out of it. These questions may be identified to the subject as character or background questions. The examiner's attitude should not suggest that he suspects that the test subject is "that kind" of a person; on the contrary, these questions should be offered as an opportunity for the test subject to establish that he is "not that kind."

Obviously this approach dictates that the examiner use controls that are related in theme to the relevant issue. If the issue is theft, it makes no sense to use sex controls or any other kind of controls which do not in some way reflect on stealing. A test subject will never figure out what the relationship (and consequent importance) of the controls is to the test if there is no relationship.

Admissions to the controls should be treated with obvious serious regard by the examiner, regardless of how petty, but no attempt should be made to extract additional admissions. The practice of conspicuously writing down any admissions has two benefits. First, the test subject sees that what he admits is being permanently recorded, establishing its importance and also discouraging further admissions; second, the examiner has a record of exactly what he excluded from the question. Any admissions must be excluded by the use of a phrase such as "besides what you told me" or the question must be redesigned or abandoned.

At some point shortly before the first chart is run it is helpful to stress the importance of all the questions in the test. If this is done before answers are committed on the controls, it can make it more difficult to avoid admissions. However, after all of the questions have been discussed and answers committed, it is appropriate to explain that the test is a formal procedure that requires for accurate results that all of the questions be answered completely truthfully. A test subject may be advised that the results of the test will be scored and that this procedure entails giving equal scoring consideration to every question in the test. In other words, in the formal test structure some questions are not more important than others - even though they may be after the test is completed - and deceit on any question will affect the final test score. Obviously it would be counter-productive to go on to explain in what ways the score might be affected. This explanation is not only a good stimulator of response to controls and relevants alike, it is also the truth, at least at far as it goes. At this point, a test subject should be ready for examination.

The overall pre-test procedure described here occupies anywhere from a half-hour to over an hour of time before the first chart is obtained. Actual time will vary according to how thorough the examiner is, how talkative the subject is, and how long it takes to settle on the test questions. At the end of the pre-test interview, the subject should be thinking about his answers to the questions, and no longer about how the instrument works, whether the examination is accurate, or how much of an expert the examiner is.

Perhaps the most critical consideration throughout the pre-test is what we began with, the premise. An examiner who enters into a pre-test knowing why he is doing it and what he hopes it to accomplish will find it easier to proceed effectively than one who tries to proceed only from convention. The premise discussed here - building the confidence of the test subject in the ability of the examination to detect lies and confirm truth is only one way of setting up some self-administered examiner guidelines. An examiner who proceeds systematically through his pre-test toward a goal of putting his subject in the most testable condition will have the added benefit of more readily being perceived by that subject (whether lying or truthful) as confident and knowledgeable. It follows that a test subject's non-specific anxiety will be reduced, the charts will exhibit fewer symptoms of general nervous tension and the results will be easier to interpret.

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The Numerical Evaluation of Polygraph Charts: Evolution and Comparison of Three Major Systems

By

Richard S. Weaver

Abstract

Undoubtedly, the numerical evaluation of polygraph charts represents a critical improvement towards scientific objectivity in the interpretation of polygraph charts. Provisions for quantification, blind evaluation, and elimination of bias based on case facts, subject's behavior or other non-objective factors underline an overwhelming justification for numerical scoring. Application of numerical evaluation towards further psychophysiological research connected with polygraph testing is but another advantage related to its use. However, often overlooked has been a close inspection and objective analysis of numerical scoring systems used commonly in laboratory experiments and actual field testing. Numerical scoring systems developed, utilized, and taught by the Backster School of Lie Detection, the United States Army Military Police School, and the University of Utah have been summarized in this paper. Although the numerical scoring of polygraph charts has demonstrated high reliability rates, a number of important differences are noted between the Backster, USAMPS and Utah approaches and applications of numerical evaluation. Differences are broken down into categories, which include the methods of comparison, interpretation criterion, and procedures for assigning, summing and establishing the cut-off points with numerical values.

Requests for reprints to the author at the Wisconsin Crime Laboratory Bureau, 4706 University Avenue, Madison, Wisconsin 53702.

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Richard S. Weaver is a polygraph examiner for the Wisconsin State Crime Laboratory in Madison, Wisconsin. He holds a B.S. Degree from Clarion State College, and is a graduate of the Backster School of Lie Detection, the U.S.A.M.P.S. Advance Course, and the University of Utah Workshop on the Detection of Deception. He is also a full member of APA and the Wisconsin Polygraph Association.

Introduction

During the past several decades, an increasing interest in laboratory and field research concerning the validity and reliability of the detection of deception has become apparent. A wide range of topics regarding the accuracy of particular techniques, the types of instrumentation utilized and the methods of interpreting polygraph charts have all been considered and explored. It is important to note that while some studies have been criticized for being structured defectively and loosely from a methodological perspective, and are extremely limited as to the extent of generalization, other projects have incorporated more stringent and object research designs, providing the capability for expanded inferences. (Horvath, 1976)

In 1947, Reid introduced and incorporated the concept of a control question into the existing forms of polygraph techniques. In view of the severe limitations in reaching determinations of truthfulness or deception based solely on physiological responses recorded by the polygraph when the relevant-irrelevant technique was utilized, Reid's control question technique has probably been the single most important contribution to the field of detection of deception. Although Reid has also made numerous other important refinements in interviewing and testing procedures, notably absent from his work have been efforts to establish a standardized, quantitative or objective system for the evaluation of polygraph charts.

In 1963, Backster explained the control question technique in terms of a psychological set (the involuntary focusing of the examinee's psychological attention towards the particular test question(s) which holds the greatest immediate threat to his well-being).(Bailey & Rothblatt, 1970) In an attempt to standardize the control question technique, as well as to provide a more objective basis for the interpretation of polygraph charts, Backster also introduced the first numerical scoring system. Numerical values ranging from +3 to -3 were assigned to each independent physiological tracing at each relevant test question position according to the perceived difference between control and relevant test question responses. Although Backster incorporated a rather complicated set of rules and guidelines for the assignment of numerical values, the basic concepts of the system can be summarized as follows (Backster, 1969a):

1) A (+) Value is assigned when the physiological responses are greater to the control question(s) than to the adjacent relevant test question. This reflects an indication of the examinee's attention being focused on the control question(s) rather than the relevant test question, and presumably an indication of truthfulness to the relevant test question.

A (-) Value is assigned when the physiological responses are greater to the relevant test question than to the adjacent control question(s). This reflects an indication of the examinee's attention being focused on the relevant test question rather than the control test question(s), and presumably is an indication of deception to the relevant test question.

A (0) Value is assigned when the physiological responses to relevant and control question (s) are of no apparent perceptual difference or magnitude. This provides no indication of the examinee's truthfulness to the relevant test question.

- 2) When a particular point value (0, 1, 2, or 3) is assigned to a tracing within each relevant test question, the value is basically dependent on the strength and clarity of the perceived difference between the relevant and control question(s) responses considered.
- 3) Numerical scores from each tracing of each polygraph chart are summed at the completion of the examination. If the total score accumulated is greater than a minimum (+) or (-) cut-off point established, then and only then is a definitive determination regarding truthfulness or deception permitted. Otherwise, when the numerical (+) or (-) total falls short of these minimum cutoff points established, no determination is permitted, and the examination must be considered inconclusive.

Backster's original purpose for introducing numerical scoring was to assist students in chart interpretation during training classes and workshop sessions. However, the concept of numerical scoring gradually became popular with examiners outside of the classroom. While Backster's introduction of a standardized, numerical scoring system for evaluating polygraph charts represents a significant improvement over previous techniques and methods, his efforts appear to be somewhat deficient in terms of scientific research supporting the validity and reliability of the numerical evaluation approach that he established. Rules and guidelines advocated for identifying criteria among the varieties of physiological responses recorded, for classifying these responses, for assigning particular numerical values to the appropriate responses within each physiological tracing, and for determining the critical cut-off points in reaching determinations seemed to be based on a great deal of practical experience in the field, but without any rigorous scientific verification at this time.

Later, in a project designed to provide information on the usefulness of polygraph techniques in detecting truth and deception in criminal investigations, researchers at the University of Utah concluded that the numerical scoring of polygraph charts produces higher rates of accuracy and reliability than other methods of chart interpretation. (Raskin, Barland, Podlesny, 1978). Among additional conclusions regarding other aspects of the detection of deception, recommendations were made that polygraph examiners throughout the country be given formal training in the numerical scoring of polygraph charts, and that the results of control question examinations always be determined by a numerical evaluation of polygraph charts.

In discussing the advantages of numerical chart analysis, it should be noted that several numerical evaluation systems and methods of scoring polygraph charts have emerged since the original system advocated by Backster was developed in 1963. Of particular note is the U.S. Army Military Police School's modification of the Backster scoring system, and the more recent University of Utah modification of the U.S. Army Military Police School scoring system.

Numerical Evaluation

Although there are a number of similarities among the above mentioned systems, often overlooked are some basic differences which exist, and which should be considered in assessing the relative utility and practicality of each system. When polygraph charts are described and discussed between examiners, and others, in terms of numerical scores accumulated, it is necessary not only to become aware of the particular scoring system used, but to also be cognizant of certain similarities and differences between each system. While advanced polygraph training, including instruction related to numerical chart evaluation, is available at work conferences offered by the Backster School of Lie Detection (San Diego, California), the University of Utah (Salt Lake City, Utah) and, to a limited extent, the U.S. Army Military Police School (Fort McClellan, Alabama), a summary and comprehensive comparison between numerical evaluation systems in use has not appeared previously in the literature. Unless otherwise noted, the information on these systems are from Backster(1969 a & b), Decker (1977), and Raskin (1978).

Technique Structure

Backster: (U-Phase Series)	Test Question Position	1	2	3	4	5	6	7	8	9	10
	Type of Ques- tion	(I)	(S)	(s/R)	(C)	(R)	(C)	(R)	(C) opt	(R) iona	(S) 1
	Question # used	13 14 or 15	25	39	46	33	47	35	48	37	26
U.S.A.M.P.S.: (ZCT)	Test Question Position	1	2	3	4	5	6	7	8	9	10
	Type of Question	(I)	(S/R)	(S)	(C)	(R)	(C)	(R)	(S)	(G/0 or (C)	C) (R)
	Question # used	l	2	3	4	5	6	7	8	9	10
Utah: (Control Question Technique Utah Version)	Test Question Position	l	2	3	4	5	6	7	8	9	10
	Type of Question	(I)	(Ś/R)	(S)	(C)	(R)	(Ċ)	(R)	(I)	(C)	(R)
	Question # used	l	2	3	4	5	6	7	8	9	10
Code: (I) = Irreleva Question; (S	ant Test Questic 5) = Symptomatic	on; : Tes	(S/R) st Ques) = Sa stion;	crif: ((ice R C) = (eleva Contr	nt Tea ol Tea	st st		

Question; (S) = Symptomatic Test Question; (C) = Control Test Question; (R) = Relevant Test Question; (G/C) = Guilt Complex Test Question.

Differences in the overall test question structure between the Backster, U.S.A.M.P.S., and the Utah systems appear to be minimal. Each system

incorporatea a basic ten test question sequence, advocating the interspersing of three relevant and three control test questions, and the incorporation of irrelevant and symptomatic (outside issue) test questions into the structure. Exclusive control questions (not overlapping the time span of the relevant test questions) are utilized in each of these systems, rather than the inclusive type of control questions. While the U.S.A.M.P.S. will apply numerical scoring to the MGQT test structure, discussion in this paper will be limited to the basic Zone Comparison Test Structure (ZCT), where a single objective relevant issue is evaluated within the structure (referred to as the "U-Phase Series" in the Backster system or the "Control Question Technique-Utah Version" in the Utah system). Attempts to arrive at determinations concerning more than one issue, or to explore and probe within the same issue are usually not made in the test structures of these systems. However, this does not preclude the possibility of administering more than one series, where a second issue may be evaluated. Although the Utah System may at times be more flexible in exploring different roles or levels of involvement in a crime situation by incorporating relevant questions including more than one issue, discussion in this paper will be limited to the single issue structure.

In each of these test structures, a minimum of two and usually three or more charts are collected before arriving at a determination of truthfulness or deception regarding the issue under consideration. (Minimum of three charts in the Utah System.) Rules for the formulation and introduction of relevant and control test questions are not significantly different; in each system differences between the three (3) relevant test questions formulated usually involve only semantical changes to prevent habituation. In each of these structures, it is also common for the specific relevant and/or control questions to be repositioned from chart to chart, although the overall positioning sequence of relevant and control questions does not change.

Among minor differences in technique structure between each of these systems are the positioning of the symptomatic test questions, and in the U.S.A.M.P.S. the recognition of the possible utility of a guilt-complex test question, serving as a third control test question.

Methods of Comparison

The Backster, U.S.A.M.P.S. and Utah Systems all follow the basic concepts of numerical evaluation introduced by Backster and explained earlier in this paper. A seven position scale of values (+3, +2, +1, 0, -1, -2, -3) is used by each system according to perceived differences between relevant and control test question responses after each comparison is made. However, methods used in determining which test questions will be compared with each other are somewhat divergent.

<u>Backster</u>: In each physiological tracing, when a presence of reaction occurs at a relevant test question position (position #5, #7, or #9) or (question #33, #35, or #37) (R) is compared to the adjacent control test question (C) which contains the least amount of reaction, unless one of these adjacent control test questions contains a reaction four (4) times greater than that of (R), which in this case could not be ignored, and must be used as the control test question zone of comparison.

When a lack of reaction occurs at (R) then (R) is compared to the adjacent control question (C) containing the greatest amount of reaction.

Following these basic rules, it is possible to use control test question #47 (position #6) twice as the zone of comparison, in numerically evaluating each physiological tracing of relevant test questions #33 and #35 (positions #5 and #7).

U.S.A.M.P.S: At all times, relevant test question responses at each (R) position are compared to the adjacent control question responses (C) containing the greatest amount of reaction.

It is also possible, following the U.S.A.M.P.S. system to use the control question at position #6 twice as the zone of comparison in numerically evaluating each physiological tracing of relevant test questions at positions #5 and #7.

Utah: At all times relevant test questions responses at each (R) position are compared only with the responses to the previous control question position (C). (Raskin, 1979)

Each individual control question is, therefore, utilized as the zone of comparison at least once, but not more than once, in the numerical scoring of relevant test question responses.

Interpretation Criteria

One of the more profound and complex differences between the Backster, U.S.A.M.P.S., and Utah systems is the criterion established for the identification of the presence of physioloigcal reaction, and the identification of the lack of physiological reaction, within each physiological tracing of each polygraph test question evaluated. In the interpretation of control and relevant test question responses, primary criteria of each system are summarized below.

Respiration:

Backster: Segments within the respiration tracing showing evidence of a psychological change from the subject's exhibited emotional level within the stress situation of the then current polygraph chart may be classified as a reaction tracing segment. Among respiration changes qualifying for classification as a reaction tracing trend and interpreted as possible indications of deception are:

1) A series of sustained suppressed respiration cycles (including blocking or apnea)

- 2) A series of baseline arousal respiration cycles
- 3) A series of ascending suppressed respiration cycles4) A series of descending suppressed respiration cycles

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It should also be noted that, in the Backster system, a series of hyperventilation respiration cycles (of a sustained, ascending or descending nature) is classified as a relief tracing segment, constituting a lack of reaction. In the Backster system, it is possible to assume the presence of reaction via deduction, when relief starts at a location "five seconds past point of answer" from the test question zone, inferring that some variety of reaction did occur to that prior test question. However, this is considered a secondary rule, and is applied rather infrequently as minor criterion.

U.S.A.M.P.S: Changes from the individual's "norm" which may be considered indicative of deception include:

- 1) Changes in rhythm or regularity
- 2) Changes in amplitude or volume
- Changes in inhalation/exhalation ratio strokes
- 3) 4) 5) 6) Notched or serrated inhalation or exhalation strokes
- Changes in baseline
- Loss of baseline
- 7) Hyperventilation
- 8) Suppression
- 9) Holding or blocking

Utah: Possible indications of deception in evaluating relevant and control question respiration responses include:

- 1) Apnea
- 2) Suppression
- Baseline increase 3)
- 4) Slowing of respiration rate

The most obvious differences in comparing these respective respiration interpretation criteria are the U.S.A.M.P.S.'s recognition of numerous possible indications of deception that are given little or no attention by the Backster and Utah systems. Another glaring difference is the interpretative approach to hyperventilation. While both the Backster and Utah systems recognize and treat hyperventilation as a lack of reaction, the U.S.A.M.P.S. lists hyperventilation as a possible indication of deception. Additionally, the Backster system's minor provision for inferring the presence of reaction when relief or hyperventilation appears "five seconds past point of answer" and/or within the zone of influence of the following test question, is not accepted by the U.S.A.M.P.S. and Utah systems, which refrain from making this sort of deduction.

Electrodermal Activity:

Backster: Changes qualifying for classification as an electrodermal reaction tracing trend and interpreted as possible indications of deception are limited to psychogalvanic reflex arousals, in terms of the height of the particular arousals. Height comparisons are made by the drawing of an "imaginary baseline" beginning at the commencement of the arousal, and terminating at the apparent completion of recovery point following the arousal (conforming with the general nature and trend of the arousal), and the calculation of tracing arousal magnitude units (@ 1/8 inch per unit) from the base of the imaginary baseline to the peak or highest point of the arousal.

<u>U.S.A.M.P.S</u>: Galvanic tracings which may be indicative of deception are as follows:

- 1) Vertical rise at the point of deception
- 2) Double saddle responses
- 3) Long duration and/or degree of response following point of deception
- 4) Plunging galvanograph tracing.

Utah: Main criterion in evaluating electrodermal activity is amplitude (height) of the responses. Height comparisons between relevant and control questions are accomplished by establishing a baseline that extends directly horizontal from the beginning point of the arousal, and the drawing of a vertical line, perpendicular to the baseline, to the peak or highest point of the response. Magnitude units in actual millimeters or inches are then measured from the baseline to the peak of the arousal by counting the units along the vertical axis. For evaluation purposes, the response must have occurred no sooner than .5 seconds after the first stimulus mark has been made (beginning of the test question). Minor criterion which are also considered in evaluating electrodermal activity include duration of recovery of electrodermal responses and multiple responses observed. (Barland & Raskin, 1975).

Similarities in electrodermal activity evaluation between the Backster, U.S.A.M.P.S. and Utah systems include primary emphasis (or sole emphasis in the Backster system) on the vertical height of the arousal, although the Backster and Utah systems differ slightly in their approaches for calculating the magnitude units of electrodermal activity. While the Utah and U.S.A.M.P.S. assign some weight, however minimal, to the duration and/or recovery of responses and multiple responses, one interesting difference of opinion appears to be the U.S.A.M.P.S.'s listing of a galvanograph plunging tracing as a possible indication of deception, which is not recognized as a criterion by the Backster or Utah systems.

Cardiovascular Activity:

<u>Backster</u>: Changes qualifying for classification as a cardiovascular reactions include:

1) Changes in blood pressure (arousals) during the zone of influence, reflected in systolic tip changes

2) Changes in pulse amplitude (reductions) during the zone of influence

3) Changes in pulse rate during the zone of influence

4) Changes in dicrotic notch position during the zone of influence (Usually reflecting blood pressure arousals)

5) Changes in the overall trend of blood pressure during the zone of influence (minor criterion)

6) Changes from a stabilized cyclic blood pressure trend (minor criterion)

In addition to the above mentioned criteria, a series of extrasystoles occurring primarily within the same zone of influence, is interpreted as a relief and (via deduction) can be used as minor criterion to infer the presence of reaction to the previous zone or test question. This rule, however, is seldom applied and not stressed a great deal in Backster's teachings.

U.S.A.M.P.S: Cardiovascular tracings which contain the following forms of specific responses may be considered as possible indications of deception:

- Increases and decreases in blood pressure 1)
- 2) Increase only in blood pressure
- 3) Decrease only in blood pressure
- 4) Increase in pulse rate5) Decrease in pulse rate6) Increase in amplitude

- 7) Decrease in amplitude
- 8) Change in the position, or disappearance of the dicrotic notch
- 9) Extrasystoles

Other than specific responses considered as possible indications of deception are:

- 1) Distribution of reactions
- 2) Degree of reactions
- 3) Trend of gross curve
- 4) Rate of change of curve
- 5) Latent period of reaction6) Duration of reaction

Utah: The main criterion considered as an indication of deception is relative increase of blood pressure usually most clearly reflected in the diastolic tip changes. Recognition is given to systolic tip changes but defined as usually only further reflecting what is already apparent in diastolic tip changes. (Raskin, Barland & Podlesny, 1978).

Recognition is also given to pulse amplitude changes, but is explained in terms of merely reflecting increases or decreases in blood pressure - depending on cuff pressure in relation to changing blood pressure of the examinee, as concluded in research efforts by Geddes and Newberg (1977).

Once again, some obvious differences exist between the Backster, U.S.A.M.P.S. and Utah interpretation criteria. Most notable appears to be the U.S.A.M.P.S. extensive list of possible indications of deception when evaluating cardiovascular activity, without referring to the nature of the responses that generally indicate a presence of, or lack of reaction. While Backster and Utah criteria are similar, Backster's reaction via deduction rule as minor criterion and consideration of pulse rate, overall trend, and changes from a stabilized cyclic trend distinguish and highlight the differences between the two.

Numerical Evaluation

Assignment of Numerical Scores

Respiration:

Backster: Thirty-four pages of rules pertaining to the identification of respiration cycles and their interpretation have been compiled by Backster. Basically, a 1 is assigned when applying the presence of reaction via deduction rule to the test question preceding relief or hyperventilation cycles, or if there is a presence of reaction apparent in both the relevant and control question respiration zones being compared, yet one of which is notably larger or stronger than the other. A \pm 2 may be given when there is a distinct reaction present in either the relevant or control question respiration zones being intercompared (but not both or a lack of in both). A score of ± 2 may be upgraded to a ± 3 if the following conditions are met:

1) Respiration cycles forming a reaction, relief or tracing average trend are all in basic conformity with one another.

2) Zones being compared are free of tracing distortion and must consist of a minimum of three complete and consecutive undistorted cycles forming the presence of or lack of reaction tracing trend outside of typical areas of distortion (outside of time period when relevant and control questions are being asked and answered).

3) The respiration tracing, overall, of the two zones of influence being compared must be pure and stable.

4) Sufficient magnitude differences between the presence of reaction zone compared to the lack of reaction zone must be apparent.

5) Each question zone being compared must embrace between 23 and 32 seconds.

6) Relevant and control questions asked must be answered "no" by the examinee. A maximum of -2 may be assigned in instances where the examinee answers "yes" to control questions designed to elicit a "no" answer, and relevant test question responses are notably larger and/or stronger. A maximum of a \pm 2 may be assigned in instances where relevant questions are designed to elicit a "yes" answer.

U.S.A.M.P.S: No specific rules for assigning a 0, ± 1 , ± 2 , ± 3 to respiration responses other than:

0 = no notable or apparent difference -1 = small but apparent difference

- $\frac{1}{2}$ = large and clear difference
- +3 = dramatic, and distinct, difference

Utah: Respiration is evaluated for changes which may occur immediately after each stimulus (asking of relevant or control test question). Similar to the U.S.A.M.P.S. approach, a "O" is assigned when there is no significant difference between relevant and control respiration responses. A \pm 1 represents a small but definitely noticeable difference, a \pm 2 represents a strong and clear difference, while a ± 3 is assigned only if there is a very strong, very distinct, and very stable difference between control and relevant test question responses. A \pm 3 is seldom assigned

and usually only if the reaction to the relevant or control question evaluated represents the largest respiration reaction during the examination.

Clearly, advantages and disadvantages are apparent with each approach to respiration interpretation. While the Backster system attempts to offer objective and definitive rules for assigning numerical values to respiration responses, the rules themselves are difficult to follow and somewhat subjective to apply. Although the Utah and U.S.A.M.P.S. offer an easier set of guidelines for the numerical scoring of respiration, an amount of subjectivity also exists in defining, during each examination, what constitutes a small, large, or very strong response. Perhaps the number of criteria, and the difficulty in interpreting the respiration tracing (as compared to electrodermal or cardiovascular activity) make a certain portion of subjective observation and subjective application of scoring procedures inevitable.

Electrodermal Activity:

Backster: Since the height of electrodermal responses represents the major criterion in evaluating this tracing, ratio differences between control and relevant test question height responses are calculated. If the ratio is at least 2:1 between the responses, a ± 1 may be assigned (by counting the number of chart units upward from the imaginary baseline.) A ± 2 may be assigned when the ratio difference is at least 3:1. A ± 3 may be assigned only if a ratio of at least 4:1 exists, and additional criteria pertaining to tracing purity, question pacing distortion and answering of control and relevant test questions are met. Any ratio less than 2:1 must be given a value of "O". The 2:1 = ± 1 , 3:1 = ± 2 , 4:1 = ± 3 represents a change by Backster in 1976. Previously, ratio differences in evaluating electrodermal responses were established as 3:1 = ± 1 , 4:1 = ± 2 , and 5:1 = ± 3 .

<u>U.S.A.M.P.S</u>: Similar to the Backster system, less than 2:1 = 0, $2:1 = \pm 1$, $3:1 = \pm 2$, and $4:1 = \pm 3$, have been established in making height comparisons of electrodermal responses. Additional provisions for scoring (usually ± 1) have been made when differences between control and relevant test question GSR activity is demonstrated in the form of duration, double saddle responses, or plunging tracings.

Utah: Again, similar to both Backster and the U.S.A.M.P.S. systems, the less than 2:1 = 0, $2:1 = \pm 1$, $3:1 = \pm 2$, and $4:1 = \pm 3$ ratio differences are used. Differences in the duration of electrodermal responses can be considered and, at most, be given a weight of ± 1 .

It is apparent that the numerical scoring of electrodermal activity is much easier, much more exact and relatively consistent among the three systems. Because of the ability to calculate ratio differences, and because of the establishment of identical ratio rules for assigning numerical scores, it is expected that the numerical scoring of electrodermal activity, regardless of the system followed, will demonstrate higher reliability than the other physiological measures. It also appears, however, that slight differences in scoring will occur, depending on the system used, due to divergent methods of comparison.

Cardiovascular Activity:

Backster: Thirteen pages of rules pertaining to the interpretation and assignment of numerical scores to the cardiovascular tracing are summarized as follows: a ± 1 may be assigned when applying the "presence of reaction via deduction: rule (relief - in the form of increased pulse amplitude or the appearance of a series of extrasystoles five seconds past point of answer - when there is no reaction apparent to the test question.) Also, a ± 1 is assigned when there is a change in overall trend of the blood pressure, unaccompanied by any other meaningful criteria, or when a change or disappearance of a cyclic blood pressure trend occurs. A $\stackrel{+}{-} 2$ may be given when there is distinct pressence of reaction versus a lack of reaction between the relevant and control question being compared (but not a reaction in both, or a lack of reaction in both). Upgrading from a ±2 to a ± 3 may be appropriate only if criteria pertaining to the purity and freeness of distortion in the tracing, proper question spacing, and proper "no" answers to both relevant and control questions are met.

U.S.A.M.P.S: Considering the specific forms of responses listed as indicative of deception, the assigning of a 1 value is permitted when differences between control and relevant cardiovascular responses is small; \pm 2 when the difference is large and clear; \pm 3 when the difference is dramatic and distinct. A "O" value is assigned when there is no apparent difference in relevant and control cardiovascular responses.

Utah: Similar to scoring of respiration, increases in the level of the diastolic tips, accompanied with or without changes in the level of systolic tips, dicrotic notch, changes in rate of pulse, or in amplitude of pulse (reflecting an overall increase in blood pressure) are scored as follows:

- 0 = no noticeable difference +1 = small but definitely noticeable difference +2 = strong and clear difference +3 = very strong, very distinct, and very stable difference
- $A \stackrel{-}{=} 3$ is, once again, assigned infrequently.

Interpretation and assignment of numerical scores to cardiovascular activity differ noticeably more among the three systems than does the scoring of the electrodermal tracing. Again, specific rules and guidelines set forth by Backster remove some of the subjectivity involved, but certainly not all. The question also arises as to the consistency of ably applying the cardiovascular interpretation rules from one examiner to another. With the U.S.A.M.P.S., questions arise as to the larger amount of subjectivity in evaluating responses from their list of criteria, as well as the lack of any further specific guidelines. The Utah system, while simplyfying criteria and simplifying the assignment of numerical scoring to the cardiovascular activity, still contains a certain, inevitable amount of subjectivity. It also should be noted that despite differences of opinion among field examiners concerning the relative importance of the respiration, electrodermal or cardiovascular responses, each tracing is given equal weight in being assigned numerical values by the Backster, U.S.A.M.P.S., and Utah systems.

Summation of Scores

Backster: Until recently, Backster advocated the computation of all numerical scores, and the subsequent elimination of one of the three scores accumulated at each relevant test question position. The score to be eliminated would be the score closest to, or equaling zero, or the score furthest away from the gross trend of the other scores. This was based on the theory that, on the average, one tracing out of three being recorded during any one test is likely to be unproductive, or at least less productive, than the other two. For example, if question #33 revealed numerical scores of + 2, +2, +1 in the respiration, GSR, and cardio tracings respectively, the least productive (in this case the cardio score of +1) would be eliminated before summation. However, problems in explaining the elimination of numerical scores (especially the apparent arbitrary elimination of "+" scores during deceptive polygraph charts) resulted in an alteration of Backster's original system (Moreno, 1979). Currently, all scores are summed at the completion of the examination. When two relevant test questions are numerically evaluated and when there is a total of two polygraph charts collected, a \pm 9 or greater must be accumulated before a definite determination of truth or deception regarding the "target" issue can be rendered. A sum total falling between +8 to -8 inclusively must result in an inconclusive determination. If three or more polygraph charts are collected during the examination when two relevant test questions are numerically evaluated, ± 13 represents the minimum numerical total which must be reached before rendering a conclusive opinion (Moreno, 1979). Charts with total scores falling between +12 to - 12 inclusively must be considered inconclusive. If three (3) relevant test questions are numeri-cally evaluated during each chart, \pm 13 for two charts, and \pm 20 for three charts represent the respective cut-off points.

<u>U.S.A.M.P.S</u>: Regardless of the number of charts collected, numerical scores totaling \pm 6 or greater are considered sufficient for rendering a definite determination (truth or deception). Scores of \pm 5 through \pm 5 inclusively necessitate an inconclusive result. All scores are summed without elimination, similar to the current Backster approach.

Utah: Identical to the U.S.A.M.P.S., ⁺ 6 represents the cut-off points between conclusive and inconclusive determinations. Numerical scores of +6 or greater permit a truthful determination, and - 6 or greater permit a deceptive determination, regardless of the number of charts collected.

Discussion

This article has been presented as a descriptive and exploratory paper; its purpose has not been to criticize any one system of numerical evaluation, but rather to encourage familiarity and further research into the numerical chart evaluation systems described. With the Backster system, it has been mentioned that the system itself consists of sets of rather intricate and complex rules which may be difficult to follow. It should, however, be noted that many of the rules established are designed to foster a perpetual effort towards the collection of clear, adequately spaced, and properly adjusted physiological tracings, while others reflect the insight, research and experience of evaluating thousands of examinations. Likewise, the U.S.A.M.P.S. system has evolved during the training and experience of thousands of military polygraph examinations in which the largest quality control system in the field has been utilized. Advantages of the Utah system are the simplicity of application, the scientific research, and verification supporting its interpretation criteria methods of comparison, and principles of assigning, summing, and establishing numerical cut-off points. Preliminary studies concerned with scoring differences using different methods of comparison in evaluating the same set of polygraph charts have revealed some significant findings (Koll, 1979). Further research into interpretation criteria and methods of comparison are especially suggested.

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Comparison of Psychological Stress Evaluator to Polygraph In Evaluating Iruth Or Deception In Criminal Cases: A Pilot Study

By

Robert Peters

Abstract

Twenty criminal suspects were given polygraph examinations utilizing the Reid Control Question Technique, and the charts were scored numerically by a trained polygraph examiner. The interview was taped and a trained PSE examiner analyzed the tapes with a PSE 101. Of the 18 cases in which both examiners rendered opinions, the PSE examiner said 17 were deceptive and one was truthful; while the polygraph examiner said 11 were truthful and only 7 were deceptive. They agreed on only 8 of the 18 cases (44%). [N.A., Ed.]

Since the introduction of the Psychological Stress Evaluator (PSE) in 1971, there has been considerable disagreement as to whether or not it is capable of determining the truthfulness of statements made in connection with criminal investigations. There have been two reports of highly accurate judgments of truth or deception based on evaluation of PSE data (Kradz, 1974; Heisse, 1976). These same researchers have reported a high degree of agreement among various examiners in evaluating the PSE charts which indicate these judgments were based on an objective criterion. However, there have been several reports of research projects which found the PSE incapable of determining truthfulness of statements (Kubis, 1973; Horvath, 1978; Barland, 1978). There has also been one study which, in addition to reporting low accuracy, was critical of the PSE instrumentation and warned of the many possible outside influences on the types of vocal recordings evaluated by the PSE (Brenner, Branscomb & Schwartz, 1979).

This study was designed to compare the decisions of an examiner utilizing a PSE against those of a polygraph examiner as to the truthfulness of individual's statements regarding serious criminal offenses. Research studies have indicated polygraph recordings of respiration, relative blood pressure and the skin resistance response, when utilized with

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The author is a Polygraph Examiner with the Wisconsin Department of Justice. Address requests for reprints to: Wisconsin Regional Crime Lab, 15725 W. Ryerson Road, New Berlin, Wisconsin 53151.

Robert Peters

control question procedures, are a highly accurate means of determining the truthfulness of specific statements. The question of polygraph validity in determining the truthfulness of criminal suspects has been studied in laboratory settings and by evaluating field testing with consistent reports of highly accurate test results. (Bersh, 1969; Raskin, Barland & Podlesny, 1978; Widacki & Horvath, 1979).

Method

Twenty individuals suspects of committing serious crimes or claiming to be victims or witnesses of serious crimes were administered polygraph examinations at the request of law enforcement agencies in order to determine the truthfulness of specific statements they made regarding crimes under investigation. Standard Reid Control Question procedures were utilized in administering the polygraph examinations (Reid & Inbau, 1977). The tests began with a thorough interview dealing with the examinee's background, attitude toward the exam and relation to the crime under investigation. All actual test questions (relevant, control, and irrelevant) were reviewed with the subject during the interview. The second stage of the exam consisted of recording the subject's respiration, relative blood pressure and skin resistance response while the subject answered the test questions. The polygraph charts obtained during the examination were numerically scored (Raskin, Barland & Podlesny, 1978). Decisions of the polygraph examiner were based solely on the numerical evaluation of the polygraph charts. Total scores of +6 or higher were ruled truthful, -6 or lower were ruled not truthful and scores in the +5 to -5 range were given an inconclusive rating. During the polygraph examinations tape recordings were made of the examiner asking the actual test questions (relevant, control, and irrelevant) and the subject answering those questions while the polygraph charts were being recorded. Included on each tape was a description of the subject's sex, age and status (suspect, victim or witness) in relationship to the crime being investigated. These tape recordings were forwarded to the PSE examiner for evaluation. The results of the polygraph examination were not made known to the PSE examiner. After completing his evaluations, the PSE examiner reported his conclusions as to the truthfulness of the subjects' answers to the relevant test questions.

The polygraph examiner was trained at the Reid School of Polygraph, Chicago, Illinois. He used a standard four channel Stoelting Polygraph, model # 22500, which recorded respiration, skin resistance response and relative blood pressure. The PSE examiner was trained at Dektor Counterintelligence and Security, Inc., Springfield, Virginia. He used a PSE 101, which is said to measure involuntary frequency modulations resulting from a microtremor in muscles utilized for speaking (Dektor Counterintelligence and Security, Inc., 1977). This microtremor is said to be inversely related to the amount of stress in the speaker, and therefore can be used as a physiological means of lie detection similar to the polygraph recordings of respiration, skin resistance response and relative blood pressure.

After the passage of two years, the investigative and prosecuting agencies who requested the polygraph examinations were contacted in order to determine the final disposition of the criminal investigations of which the polygraph tests were part.

Results

As can be seen in Table I, there was considerable disagreement between the polygraph and PSE examiners.

TABLE I

Comparison of Decisions on Individual Cases

Polygraph Examiner's Decisions

		Т	NT	Total
PSE	Т	1	0	1
Examiner's	NT	10	7	17
Decisions	Total	11	7	18*

T = Truthful NT = Not Truthful

* The polygraph examiner and PSE examiner each reported inconclusive results on one of the twenty cases in the study.

Of the eighteen subjects on which both examiners rendered opinions, the PSE examiner found all but one to have been not truthful while the polygraph examiner concluded eleven subjects were truthful and seven were not truthful. There was agreement on only eight or 44% of the cases on which both examiners rendered opinions as to the subject's truthfulness. This is an extremely low incidence of agreement. Although the study was not designed to evaluate the accuracy of polygraph examinations, it is interesting to note that in twelve of the nineteen cases in which the polygraph examiner rendered decisions there were significant developments which indicate the opinion of the polygraph examiner was correct. After two years, no information was developed to indicate any of the polygraph examiner's opinions were incorrect. However, there were developments which indicate at least five of the PSE examiner's decisions were incorrect. Perhaps as significant as the low rate of agreement was the fact the PSE examiner concluded all but one of these eighteen subjects were not truthful, while the polygraph examiner concluded eleven of the eighteen subjects were truthful. This suggests a significant degree of false positive opinions on the part of the PSE examiner.

Discussion

Despite the PSE examiner's low rate of agreement with the conclusions of the polygraph examiner, the results of this study should not be interpreted as a total condemnation of the PSE. Despite the PSE examiner's

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training, it is possible he was not highly skilled in evaluation of PSE data, and therefore, the study results may be as much a comment on the abilities of the PSE examiner as they are of the capability of the PSE equipment.

However, the reliability in the area of chance displayed by the PSE examiner in this study coincides closely with the accuracy of near chance found in the laboratory projects (Kubis, 1973; Horvath, 1978; Brenner, Branscomb & Schwartz, 1979) and an agreement rate of chance reported in another study of criminal suspects (Barland, 1978). The low rate of agreement found in this project casts considerable doubt on the capability of the PSE to determine the truthfulness of recorded statements made in connection with criminal investigations. The results indicate the PSE should not be used independently in criminal investigations without further research as to its capability to determine truthfulness.

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* * * * * *

A Note on the Diagnostic Value of the Dicrotic Pulse

By

Ben A. Silverberg, Ph.D.

The universally accepted method for indirect measurement of arterial blood pressure is sphygmomanometry. Mean arterial blood pressure and heart rate are the hemodynamic variables of the cardiovascular system routinely measured by conventional polygraphs. An extensive empirical correlation of the indirectly measured arterial pressure with normal circulatory dynamics and with the psychophysiologic changes has made this parameter an important one in the detection of deception. While students of polygraphy are taught the variables that affect the accurate recording of blood pressure and clues to the recognition of many deceptive-type patterns, little study has been directed toward an understanding of the twice-beating pulse.

The twice-beating pulse or double beat is applied to an abnormal arterial pulse when two waves are palpated during each cardiac cycle (O' Rourke, M., 1971; McLean, 1964). The additional wave may occur during either systole or diastole. The former type is of less significance because the double beat is characteristic of idiopathic hypertrophic subaortic stenosis (obstructive cardiomyopathy) and is difficult to palpate in peripheral arterial pressure pulses. When the second pulse wave is produced during diastole by an accentuated and palpable dicrotic wave following the close of the aortic valve, the pulse is referred to as a dicrotic pulse. A dicrotic pulse may be easily recorded in the peripheral vessels such as the brachial artery, and is characterized by an extra dicrotic notch.

Not all underlying eticlogies of a dicrotic pulse are fully understood and data on its frequency are scant. Reid and Inbau have made reference to the "rate occurrence of two dicrotic notches in each pulse," and noted that "satisfactory deception tests can be made on such subjects." A dicrotic pulse is especially likely to be present when the peripheral resistance and the dicrotic pressure are low, as with fever. Mild or moderate aortic regurgitation - blood leaking backward through the faulty valve into the left ventricle during diastole - occasionally may be associated with an accentuated and recordable dicrotic pulse. It may occasionally be observed in normal individuals during exercise, or hypertension due to anxiety.

The following case examples of subjects administered routine preemployment polygraph examinations illustrate that perceptive use of the presence of a dicrotic pulse may provide clues to the subject's state of health.

The author is Director of the Applied Polygraph Sciences, Inc., 10 Foxbar Road, Toronto, Ontario, Canada, M4V 2G6. Address requests for reprints to the above address.

Case History No. 1

Personal Profile: female, age 31; Puerto Rican; married with four children; no stated health problems; no use of narcotics; infrequent consumption of alcohol; applying for position as store clerk.

The subject's chart indicated deception concerning her present state of health (Figure 1). During the post-examination interview the subject admitted that she had withheld information concerning a recently detected heart murmur for which daily doses of nitroglycerin had been prescribed. As part of a routine follow-up investigation, the subject's physician reported the diagnosis, three years earlier, of rheumatic mitral stenosis and regurgitation.

The most frequent cause of valvular heart disease is rheumatic fever, a disease that results from an immune reaction to toxin secreted by streptococci bacteria. Sometimes the valve openings are so greatly narrowed by scar tissue that blood flows through the opening only with great difficulty. This is called stenosis. If the mitral valve becomes stenosed, blood dams up in the left atrium and lungs. Equally as often the valves become so eroded that backward flow or regurgitation of blood occurs.

In this particular case, the presence of a dicrotic pulse seems to have reflected both valvular heart disease and the consumption of daily doses of nitroglycerin. Nitroglycerin has no direct effect on heart contraction or heart rate(Darby, Sprouse & Walton, 1958). Blood pressure usually decreases when large doses of nitrites are given. The reduction in blood pressure results from decreased venous return and cardiac output and from arteriolar dilation. Because of the indirect effect of nitroglycerin in dilating blood vessels and thus lowering blood pressure, there may be pronounced increases in sympathetic activity in the heart and peripheral vessels (Mason & Braunwald, 1965).

Case History No. 2

Personal Profile: male, age 29; Caucasian; married with no children; casual use of marijuana and alcohol; complained of breathlessness, palpitations, frequent coughs and sweating; poor employment record; applying for position in general maintenance.

The subject's chart indicated deception concerning his use of alcohol (Figure 2). During the post-examination interview the subject admitted chronic abuse of alcohol over the past several years. He had been fired from work on two occasions because of his drinking problem.

Alcoholic cardiomyopathy, a disease affecting myocardial contractile processes (Evans, 1964; Burch & Giles, 1971; Sackner, Lewis, Robinson & Beelet, 1961), is typically seen in males who regularly drink to excess for a number of years. The early symptoms of alcoholic cardiomyopathy, also referred to as congestive cardiomyopathy, are breathlessness and palpitations. Cough is frequent. There is excessive sweating, particularly at night. Tachycardia, defined as a heart rate over 100 beats per minute, is characteristic, often with premature heart beats; the combination of tachycardia and premature beats should arouse suspicion of alcoholic cardiomyopathy (Sanders, 1970). The striking occurrence of a dicrotic pulse in alcoholic cardiomyopathy has been noted (Brigden, 1957; Shah, Gramiak, Kramer & Yu, 1968).

Case History No. 3

Personal Profile: female, age 18; Caucasian; single, no stated health problems; frequent use of hashish and marijuana; excessive consumption of alcohol; applying for position of store clerk.

A portion of this subject's polygraph chart is illustrated in Figure 3. Although other causative factors cannot be absolutely eliminated, the examinee's excessive alcohol abuse does support the research linking the alcohol with the incidence of a dicrotic pulse (Brigden, 1957; Shah, Gra-miak, Kramer & Yu, 1968).

Case History No. 4

Personal Profile: female, age 26; Caucasian; single, no stated health problems; frequent use of marijuana and cocaine; moderate alcohol consumption; applying for position of sales representative.

A portion of this subject's polygraph chart showing a dicrotic pulse is illustrated in Figure 4. The applicant was deceptive concerning her use of narcotics and in the post-examination interview she admitted to sniffing cocaine just prior to entering the polygraph suite.

Although the literature provides no clue to a correlation between the presence of a dicrotic pulse and cocaine use, it has been established that cocaine increases heart rate, raises blood pressure, and may cause an ir-regular heart beat (Costa & Garattini, 1970). The applicant was judged in good health at the time of her last medical examination, two months prior to taking her pre-employment polygraph test.

Summary and Conclusion

This report has illustrated that accurate and perceptive use of a dicrotic pulse may provide clues to the examinee's state of health. The complications and risks involved in the testing of subjects with heart conditions are well known in the polygraph profession. Caution should be exercised should a dicrotic pulse be indicative of a severe cardiac abnormality. Apart from its significance in drawing attention to possible underlying heart disease, the dicrotic pulse often offers an extra dividend in pre-employment testing since it can be reflective of life-style characteristics such as alcohol abuse and dependence.



Ben A. Silverberg

Explanation to Figures

Figure 1 - 4: Cardio tracings illustrating dicrotic pulse characterized by two dicrotic notches in each pulse. All tracings were obtained using a Lafayette Model 761-99X Polygraph equipped with both mechanical and electronic cardio modules. The electronic cardio module provides for enhancement control of the dicrotic notch.

Figure 1: Cardio tracing obtained with 68mm cuff pressure. The extra dicrotic notch is evident in the electronic cardio recording (lower tracing) but indistinguishable in the upper mechanical cardio tracing at this cuff inflation pressure. Note the baseline rise when the examinee was asked Question 3, "Are you now lying about your physical condition?"

Figure 2: Electronic cardio tracing obtained with 42mm cuff pressure. At Question 14 the examinee was asked, "Are you now lying about how much you drink?" In addition to the erratic extra notch, note the presence of occasional extra-systoles.

Figure 3: Mechanical (upper tracing) and electronic (lower tracing) cardio recordings obtained with 78mm cuff pressure. The regular presence of a second dicrotic notch is evident in both cardio re-cordings.

Figure 4: Electronic cardio recording obtained with 52 mm cuff pressure shows the presence of an irregular dicrotic pulse. At Question # 8 the examinee was asked, "Are you now lying about your use of narcotics?"

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Reviews: Books and Journals

By

Norman Ansley

George L. Mosse(Ed.) <u>Police Forces in History</u>. Beverly Hills, California: Sage Publications, 1975. Paper 8.95, cloth 17.50, 333 pages. Order from Sage, 275 South Beverly Drive, Beverly Hills, California 90212.

A remarkable book for its breadth of selections. The authors have written of such diverse periods and topics as Hitler's Personal Security; The Ottoman Police; the Tzarist Political Police in Europe; The German SD; policing Palestine 1920-1936; the Irish underground; a comparison of the Berlin Police in the Weimar Republic and police forces in cities of the United States; the Northwest Mounted Police and the Klondike Gold Rush; the political role of the police in society; and police professionalism in the war against crime. These topics and others are treated with scholarly attention, and most of the articles are supported with footnotes and annotations. Students of law enforcement, security, intelligence and criminology will thoroughly enjoy this unusual work. It is one of those books you can read piecemeal, as there is utterly no relationship between chapters. It has one serious flaw: there is no index.

Nicholas Groth with H. Jean Birnbaum, <u>Men Who Rape: The Psychology</u> of the Offender. New York: Plenum Press, 1979. 227 pp. \$15.00 hardbound, Plenum Publishing Corporation, 227 West 17th St., New York, N.Y. 10011.

If you conduct polygraph examinations of either the suspects or victims of rape, you should read this book. It is vital to the understanding of these cases. The authors differentiate patterns of assault among offenders and examine clinical aspects of their rape behavior, such as the selection of the victim, the determination of the sexual act, and the offender's reaction during the assault. The work includes gang rape, child rape, male rape and marital rape; the latter now an offense in some states. The authors draw upon over 15 years of clinical experience with more than 500 sexual offenders and victims in writing about the psychodynamics of rape. The book does much to dispell some of the stereotypes about rapists and victims, and suggests new and useful categories. The work is an important contribution to a field of literature about which there has appeared a considerable amount of misinformation, and some pure garbage, in the guise of clinical reporting.

Norman L. Farberow, <u>The Many Faces of Suicide: Indirect Self-</u> <u>Destructive Behavior</u>, New York: McGraw-Hill Book Company, 1980. 446 pages \$18.95, hardcover. McGraw-Hill, 1221 Avenue of the Americas, New York, N. Y. 10020.

This book is not about suicide in the ordinary sense. Instead, it is a systematic examination of self-destructive behavior including the abuse of alcohol, tobacco and other drugs; the disregard of patients for prescribed medical regimens which will alleviate or cure diseases, and those social occupations and hobbies which have a very high risk of injury and disaster. Twenty-eight experts have contributed to this compendium of selfdestructive behavior in chapters which are thoroughly annotated and generally well written. The Editor points out that certain stress-seeking behavior, and a variety of seemingly irrational responses to medical treatment by persons suffering from somatic illness, appear to be more rational when viewed as types of indirect self-destructive behavior. The concept, drawn from the early works by Durkheim in 1897, brought through the works of Freud, and more fully developed by Karl Menninger, is pulled together with an introduction by Dr. Farberow. The book will be worthwhile to all who are interested in the aberrations of human behavior; a far wider audience than the psychologists and psychiatrists for whom it may have been intended. Polygraph examiners, policemen, investigators, social workers, and those in the correctional field will find this a useful work.

Richard Evans Schultes and Albert Hofmann, <u>Plants of the Gods</u>: <u>Ori-</u> <u>gins of Hallucinogenic Use</u>. New York: McGraw-Hill, 1979. 192 pp., \$34.95, hardbound. McGraw-Hill, 1221 Avenue of the Americas, New York, N.Y. 10020.

This book is not for the casual reader or an investigator with a passing interest in hallucinogenics. It is a thorough text on the origins of hallucinogenics, and their uses throughout the world. The authors are scholars, and the publisher has done a splendid job in illustrating the fascinating text with exceptional color photographs, useful tables, and a complete index. Richard Evans Schultes is the Director of the Harvard Botanical Museum and a professor of natural sciences at Harvard University. Albert Hofmann is former head of the pharmaceutical and chemical research laboratories of Sandoz, Ltd. in Basel, Switzerland. Their research included 14 years in Latin America studying hallucinogenic plants and their ceremonial use by Amazon Indians. The complete discussion of over 90 hallucinogenic plants includes information on how they have shaped the societies of many preliterate peoples. The book describes where each hallucinogen is used, by whom, under what circumstances, how it is prepared, and how it acts. Dr. Hofmann, now retired, is the discoverer of LSD, and is known for his extensive work in isolating numerous psychoactive alkaloids, contributing greatly to the study of the chemistry of the brain. Altogether, an impressive work and thoroughly readable.

Roy D. Ingleton, <u>Police of the World</u>, Charles Scribner's Sons, 597 Fifth Avenue, New York, New York 10017, 192 pp., \$12.95 hardcover.

The author, a Superintendent of the Kent County Constabulary in England, has compiled a description of approximately 200 police forces located throughout the world, with a brief description of the nation, a short history of the law enforcement agencies, a description of the police organization, and in most cases a photograph of the uniforms and a description of the badges and insignia. The photographs are excellent, the text clear although somewhat brief, and the printing of superior quality. Worthwhile as a reference book for those who need to contact foreign police agencies, and a useful book for general and police libraries.

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Police Magazine, published bimonthly by Criminal Justice Publications, Inc., 801 Second Avenue, New York, New York 10017. David C. Anderson, Editor. Subscription \$11.97, 6 issues; \$21.97 12 issues. Advertising. Nonprofit publisher.

Only a little over two years old this fine magazine has maintained a consistant format of excellent articles supported with interesting photography and art work. This is probably the best of the general purpose police magazines now on the market. It has a wide range of interests of timely and vital topics. For example, the November 1979 issue titles included "Preventing Crime," "Reasonable Doubt"(jurors), "They're Marching Again in Birmingham," "Addicts and Crime," "Cincinnati: Torn by Grief and Anger," and "Three Mile Island, Who Was Prepared - and for What?" The March 1980 issue titles are "A Fistful of Dollars: Police vs. the New Bank Bandit," "People Are Always Asking Me What I'm Trying to Prove" (policewoman), "Whitecollar Crime: Arrest by Appointment," "Missing Persons: If the Police Won't Search, Who Will?" and "Sex Crime Units."

Each issue has feature pages entitled "Roll Call" with brief items of current interest; "Police and the Law," "Labor News," and "Letters." The advertising is well prepared and in good taste, without dominating the magazine. The uniformly high quality of the journalism is in part a sign of good editing, and in part attributable to the production of many of the articles by staff members. In all, an excellent magazine.

Police Product News, published by Police Product News, 6200 Yarrow Drive, Carlsbad, California 92008. Subscriptions, P. O. Box 28897, San Diego, California 92127, \$13.95 for 12 issues, monthly. Advertising.

This is an advertising magazine, one of the many new slick that have found that the secret of success is to carry as much advertising as they can. Although subscriptions are sold, you may find yourself on the free mailing list if you order information from an advertiser through a reader information card. Unlike some of the advertising magazines, this one has fairly good articles, some professionally written by staff writers. The photography is excellent but the art work is cartooned, usually with a sexual overtone. The professional quality of the magazine is considerably marred by a centerfold (meant to be torn out) that has a sexy girl and a calendar for the month. The centerfolds are meant to be humorous rather than pornographic, but achieve neither.

The articles are quite short, easy to read, and of general interest to most officers. Topics in recent issues have included shooting, fastfood eating, lifting latent prints, electronic surveillance, private detectives, traffic, Alcatraz, capital punishment, and check fraud. There are regular features in each issue on survival, shooting, books and films, new products, law and traffic. If you get it free, it is worth looking at; but is overpriced at \$13.95 a year, as there is much more advertising than text.

<u>Trial Diplomacy Journal</u>, published quarterly by the Court Practice Journal, Inc., 30 West Washington, Chicago, Illinois 60602. Subscriptions \$18.00 per year, 4 issues.

Reviews

The journal states that each issue "offers bread and butter advice on ways to improve your trial practice, win cases, and earn a better income." The authors are experienced trial lawyers who write about their techniques. Topics include such issues as having the defendant testify, reaching the hearts and minds of jurors, arguing damages, getting along with trial judges, strategies of opening statements, principles of cross-examination, and preparation of medical proof. The promotional issue of this new journal featured an article by one of our favorite authors, Henry B. Rothblatt, on the topic of "The Defendant, Should He Testify?" It was candid, straightforward advice on the issue, with no nonsense. The journal includes photographs of the authors and cartooning of surprisingly good quality and interest. The approach is one of good advice for everyday practice. It is not a scholarly journal for research, and does not pretend to be. Trial lawyers among our readers will find this magazine very useful.

Law and Human Behavior, published quarterly by Plenum Publishing Corporation, 227 West 17th St., New York, N.Y. 10011. Personal subscription rates are \$20.00 and institutional rates are \$35.00 per year, 4 issues. Published with the assistance of students at the Law School, University of Virginia and the College of Law, University of Arizona, in cooperation with the American Psychology-Law Society.

The journal is a multi-disciplinary forum for discussion of issues arising out of the relationship between law and the behavioral sciences. Authors are from the fields of law, psychology, sociology, criminology, psychiatry, political science, anthropology and related disciplines. Contents of one issue involved articles on the defendant's progress through a magistrates' court, the ideology and limitations of mediation as an alternative to criminal prosecution, imprisonment vs. the death penalty as a deterrent to murder, children visiting their parents in prison, and public gardianship of wards of the court. The articles are thoroughly annotated; the scholarship is good, but not outstanding; and the layout is professional. I suspect that few of our readers will want personal subscriptions, but more will occasionally find it useful for reference in their law or university library.

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Man's Character:

The measure of a man's real character is what he would do if he knew he would never be found out.

Macaulay

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Abstracts

Voice Stress

VanDercar, D.H., Greaner, J., Hibler, N.S., Spielberger, C.C. and Bloch, S. A Description and Analysis of the Operation and Validity of the Psychological Stress Evaluator. <u>Journal of Forensic Sciences</u>, 1980, <u>25</u>, 174-188.

Noting the considerable interest in the Psychological Stress Evaluator (PSE) since its introduction in 1971, the authors have presented a detailed description and analysis of the instrument. They reported that the circuit functions as a simple, passive, low frequency filter. The machine takes audio signals which are rectified and switched to one of four filters. The first three filters, modes 1, 2, and 3, are no more than a single resistor and capacitor, while the fourth mode adds an inductance coil. The filtered signal is then amplified by a #749 operational amplifier and fed to power transitors that drive the pen motor. The authors note that the circuit contains a poorly regulated power supply and some components that have no obvious utility. To illustrate the simplicity of the PSE circuit, VanDercar duplicated the PSE tracings with a resistor, a capacitor, and a diode, amplifying the signal through a standard research polygraph. The pattern was identical to that of mode 3 of the PSE.

The authors conducted two experiments with the PSE. The results indicated that the PSE, if properly used, can, under certain circumstances, differentiate between groups of subjects who differ with respect to A-state anxiety. In the first experiment, the PSE was found to compare favorably with heart rate and self-reported measures of anxiety. That did not occur in the second experiment, and the discrepancies point to the limitations of the instrument. The results obtained from the four PSE raters were disappointing in the second series, even though their inter-rater reliability was high, as they failed to differentiate significantly between the control and shock threat groups. This might have been due to the reduced data available, as the second experiment produced only two charts as opposed to the three of the first experiment. The authors also speculated that the use of a female experimenter in the first series may have been more stressful to the bare chested males than was the use of a male experimenter in the second series.

Although the PSE was effective when several samples of speech had been collected and compared, from a relatively large group of subjects who had been exposed to a high level of stress, threat of intense painful shocks, this did not prove that the instrument was effective for the purpose for which it is sold. The authors stated, "It does not necessarily follow that this instrument is sufficiently reliable to detect deception in individuals in the more normal settings."

The authors also reported that the process employed in the chart analysis is subjective and poorly understood, which creates difficulties in assessing the competence of PSE examiners.

Reprints of the article may be obtained from Dr. D. H. VanDercar, Dept. of Psychology, University of South Florida, Tampa, Florida, 33620. [N. Ansley]