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AN ANALYSIS OF RESPONSES ON POLYGRAPH A DIMINUTION OF RESPONSES

By

Akihiro Suzuki and Yoshio Hikita

Problems

Two types of physiological information seeking methods are used to detect deception or intentional distortion of facts by the criminals. (Anastasi, 1964) The first type is the free association method and the second is the method of finding physiological changes caused by emotion. The latter is used more generally in the United States and Japan. Respiratory changes, GSR and pulse wave changes are used as indices in measuring physiological changes.

Physiological changes differ with individuals but in order to eliminate this, the POT, CQT and more recently the ZCT tests using critical and neutral questions are used for comparison. (Imamura, 1958; Inbau & Reid, 1953) The purpose of the test is to investigate the physiological changes which occur when an examinee makes a statement contrary to the fact and when he is questioned regarding the details of the crime, but these changes can also occur under other factors - the noise in the testing room, the slight movement of the body, a subject's psychological set or the fear of the test itself, and so on. These effects can become obstructions in making a right decision. A repetition of test series has been used to eliminate these effects, however, habituation of responses must be taken into consideration.

Strictly speaking, habituation in GSR significantly differs according to the positioning of stimulus, types of stimulus used, and individuals. (Gurtin & Wilhelm, 1954) In order to investigate the relative differences in the habituation of respiration, GSR and pulse wave, a mock crime experiment was performed.

This experiment began with "a total chart minutes concept" proposed by Backster(1963). Backster(1963) recognized the individual differences of examinees in the index reliability, or performance, which are caused by differences of habituation in each index, and stated that examiners can eliminate individual differences in index reliability and achieve standardization by taking this difference in adaptability into consideration, thus, achieving a higher rate of accuracy.

Procedures

Experiments were carried out from January through February of 1964 at the Nara Prefectural Police Headquarters. A TAKEI TRP-1 polygraph was used with 10 female and 20 male subjects.

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The tube for measuring respiration was attached to the abdomen or chest so that the pen movement registered over 5mm and less than 20mm. Α condenser circuit (60mA-80mA) was used for GSR reading. The electrodes were placed on the fingers of the right hand and a blood pressure cuff on the right upper arm for measuring pulse wave. After all 30 subjects were instructed to commit a mock crime, they were all given, separately, a test with 10 series of identical questions concerning the stolen property. The peak of tension (POT) test was made of 5 questions in which the third question was the critical question. A card test is the simplest method of establishing a deceptive scene but this was not used because of the unnecessary anticipation response stemming from the number sequence perceived by the subjects. The sequence of questions in each series was not changed in order to simplify the processing of results from the experiment; although this method is used in actual cases to detect anticipatory or delayed responses.

Processing Results

In a field examination, an interpretation of a polygraph is empirically done by an examiner. Various quantitative analysis of indices and formulation of authenticity indexes have been carried out by a number of researchers (Benusi, 1914; Gurtin & Wilhelm, 1954; Landis & Gullett, 1925; Landis & Wiley, 1926; Marston, 1917; Togawa, 1955; Yamaoka, 1963). However, the systematic analysis of respiration and pulse wave has not yet achieved an applicable level due to complicated problems. Responses cannot be analyzed by one specific yardstick. For example, when there are two kinds of responses, such as change in base line and fluctuation in amplitude on a respiration recording, a question of which should be given priority arises. (Hikita & Suzuki, 1963)

For this reason, the charts were evaluated by means of visual inspections. An evaluation was performed by the authors and adjusted by the first author. The basis for evaluation was by following the six stages given below.

- 5 points = shows peculiar response to critical question but not to control questions showing definite deception
- 4 points = shows peculiar response to critical question and also shows certain amount of response to 1 or 2 control questions detecting deception
- 3 points = shows peculiar response to critical question and also shows similar response to 1 or 2 control questions showing difficulty in diagnosis
- 2 points = shows responses to all showing disturbance and difficulty in diagnosis
- 1 point = shows no response to all showing difficulty in diagnosis
- -1 point = shows no peculiar reaction to critical question but to control question causing mistakes in diagnosis

Charts were evaluated by series and indices and the points were given based on the above criteria. Backster(1963) calculated the examination

time from the length of the charts by working backwards to evaluate according to time units but gave no consideration to the rest period between each series of questioning. We processed according to serial units since we thought there was very little difference from the Backster's system.

Results

Response evaluation points by series and indices are shown in Table 1.

TABLE 1									
EVALUATION	POINTS	BY	SERIES	AND	INDICES				

Indices	Evaluation/Series												
	Points	/	1	2	3	4	5	6	7	8	9	10	Total
Resp.	5		3	4	8	3	3	4	1	0	0	0	26
	4		5	11	11	12	2	1	0	0	0	0	42
	3		3	5	4	3	11	6	3	4	5	1	45
	2		0	0	0	0	2	3	4	4	2	4	19
	1		16	10	6	7	8	12	17	17	18	19	130
	-1		3	0	1	5	4	4	5	5	5	6	38
GSR	5		2	1	5	3	2	3	0	2	2	3	22
	4		2	7	4	7	4	5	4	1	1	0	35
	3		7	5	4	1	2	1	2	1	2	3	28
	2		10	4	1	6	4	3	2	3	4	3	40
	1		6	6	11	10	11	16	14	13	16	16	119
	-1		3	7	5	3	7	2	8	10	5	6	56
Pulse	5		0	0	0	0	1	2	0	0	0	0	3
Wave	4		4	3	6	8	3	3	3	1	0	0	34
	3		4	4	5	4	0	5	1	3	0	2	28
	2		3	3	1	1	1	1	2	0	1	1	14
	1		19	19	17	16	22	19	20	22	26	20	206
	-1		0	1	1	1	3	0	4	4	3	1	18

Response Characteristic By Index

The number of interpretable responses by indices is as shown in Table 2. The respiratory records showed the highest number, 68 times, followed by GSR with 57, and the smallest number 34, by the pulse wave records. In all indices, the (4)(response evaluation points) has the highest number of interpretable reactions. The (5) of pulse wave appeared only three times. The reaction which lead to mistaken interpretation (-1) appeared 38 times in respiratory, 56 times in GSR and 18 times in pulse wave. The ratio of (5) + (4):(-1) in the respiratory test was about 2:1, about 1:1 in GSR and about 2:1 in pulse wave, showing a distinctive feature of the 1:1 ration in GSR, as compared to 2:1 for both respiratory and pulse wave recordings.

TABLE 2DEGREE OF INTERPRETABLE RESPONSES

Indice/Evaluation Points	(5)	(4)	(5) + (4)
Respiration	26	42	68
GSR	22	35	57
Pulse Wave	3	31	34

Uninterpretable responses by indices are shown in Table 3. Generally speaking, uninterpretable is greater in the non-response result, but the ratio of (3) + (2):(1) in the respiratory and GSR is about 1:2, but about 1:5 in the pulse rate test.

TABLE 3 DEGREE OF UNINTERPRETABLE RESPONSES

Indice/Evaluation Points	(3) + (2)	(1)	Total
Respiration	64	130	194
GSR	68	119	187
Pulse Wave	42	206	248

In looking at the distribution of evaluation points, a response in the respiratory test can be readily created by a stimulus. It also shows more peculiar reactions toward deception, and less incorrect responses, than the GSR. The GSR responds quite readily to stimulis and shows a high number of peculiar reactions to deception, but the rate of mistakes is also high due to disturbances in responses. The pulse wave test shows little response to stimulus and peculiar response to deception, but the rate of mistakes is lower than in the GSR.

Degree of Interpretable Responses By Series

The frequency of interpretable responses (5) + (4) recording to indices is shown in Figure 1. Although all three indices show a certain amount of difference, a sudden drop in interpretable response is seen at the 5th series with respiratory test reading peaking at the 3rd series and and both GSR and pulse wave reaching the peak at the 4th series. All three reached a plateau between 6th and 7th and declined gradually from the 8th to 10th.

FIGURE I

INTERPRETABLE RESPONSES BY INDICES AND SERIES





When compared to Backster's "total chart minutes concept" results, the peaking of respiratory test at the early series and the faster decline in the degree of interpretable response coincide. However, in the Backster results, the GSR showed a higher degree of interpretable response at the later series, whereas, in our experiment, both GSR and pulse wave showed a similar degree of response. The ease of interpretation in both cases shows that GSR is easier than the pulse wave and that GSR, in respect of interpretable response durablity, is the easiest among all three indices.

A non-response tendency is greater in respiratory and pulse wave at the series of initial stage but the gSR shows greater disturbances to critical and control questions.

Anticipated Response

The frequency of anticipated responses of three indices is shown in Figure 2. The greatest degree of interpretable anticipated response is seen in the respiratory test, followed by GSR, and the lowest is registered by the pulse wave test.

FIGURE 2



DEGREE OF ANTICIPATED RESPONSES BY INDICES AND SERIES



Conclusion

Our experiment showed the degree of validity in a descending order from respiratory, GSR to pulse rate test. However, it is still too early to make any conclusion from this because of the contradictory results obtained by others. The differences are due to the analysis methods and individual examiners characteristics affecting the results. It is, therefore, necessary to come up with standardized results by evaluating the characteristics, etc., of examiners, but this is not a basic solution to the study of validity of indices used. It is also necessary to study a value and objective analysis method. Since the mock crime investigation and the actual investigation often produce different responses, it is necessary to study the psychological characteristics of persons being investigated.

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If a thousand old beliefs were ruined
in our march to truth we must still
 march on.
 - Stopford A. Brooke.

* * * * * *

Вy

Stanislaw Waltos and Jan Widacki

Introduction

The first three cases of polygraph use in criminal matters in Poland have already been described (Widacki & Romig, 1975). The reader may recall that one of these cases ended with the Supreme Court upholding the decision of the Voievodship Court, which had admitted the results of a polygraph examination. Although the Supreme Court (1964) did not expressly define its attitude concerning the admissibility of polygraph results, it at least did not consider it error for this type of examination to be administered and utilized as evidence. The Supreme Court's attitude was due to the fact that the then-binding code of criminal procedure, enacted in 1928 and repeatedly amended thereafter, did not provide for any closed evidence catalogue but instead provided for judicial discretion in the appreciation of evidence as its basic principle. According to this principle, the admissibility of proof was subject to the court's preliminary estimation of its fitness with regard to the matter in question.

The first polygraph examinations, as well as the first ambiguous rulings of the Supreme Court aroused a heated discussion within the law research and practicing lawyers' journals. The debate focused primarily on the diagnostic value of the polygraph and on its admissibility within the context of Polish criminal procedure. The discussion revealed that in the mid-sixties criminalistics was unable to answer crucial questions about the polygraph technique, and Polish investigative bodies and Polish courts were not prepared to use this type of procedure.

The Code of Criminal Procedure

On April 19, 1969 a new code of criminal procedure was enacted by the parliament of the People's Republic of Poland. It came into force on January 1, 1970. On the surface, it seemed to introduce no changes in the area under discussion. The fundamental principle of judicial discretion in the consideration of evidence remained undisturbed. According to Article 4 \$1 of the new code, "Judges shall make decrees on the basis of their own conviction which shall be founded upon the evidence taken and its evaluation with due discretion to the principles of science and personal experience." Only the bodies conducting the proceeding, and especially the court before which the proceeding is conducted may decide on the evidence which should be admitted.

The 1969 code follows the example of the 1928 code in that it does not contain any catalogue of evidence admissible in the criminal

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procedure. This does not mean, however, that everything is admissible. On the contrary, the principle of judicial discretion in the consideration of evidence, which has to be based on human experience and indications of science, leads us to a conclusion that the evidence admitted at a trial must be:

1. Credible to a large extent. This means that on an <u>a priori</u> basis it must be possible to roughly determine whether the evidence is suitable for the statement of a certain fact and whether it is at all possible to realize its use. If it may be foreseen that certain evidence is of little use, it should not be admitted.

2. In accordance with the law. This means that the evidence was not obtained in any manner which would infringe upon the law, <u>e.g.</u>, an attorney's testimony concerning privilege in communication with the defendant. The same is true of evidence obtained illegally, <u>e.g.</u>, facts contained in documents which the opposing party stole.

3. Humanitarian. This means that the way the evidence is obtained must not infringe upon the dignity of man nor on basic standards of human rights in criminal proceedings.

The 1969 code does contain a privision not in the previous code. According to this provision, it is permissible to subject the accused to certain examinations. Article 65 of the code includes a rule according to which the accused is obliged to subject himself to psychological and psychiatric examinations, as well as "other examinations which do not result in the infringement of the integrity of his body," if such examinations are necessary for the purposes of evidence. The polygraph examination may doubtless be enlisted among the aforementioned examinations. Article 63 of the code guarantees the accused's freedom of expression. It states that "The accused is entitled to make statements, but he may, without giving reasons for doing so, refuse to answer particular questions during examination and/or refuse to testify." This freedom is strengthened by article 157 § 2 of the code which states that, "Explanations of the accused, testimony or statements given or made under conditions precluding the possibility of free expression cannot constitute proof."

From the outset, the cited rules admitted the results of polygraph examinations in Polish criminal procedures. The only requirement was that all conditions normally required for polygraph examinations be met. Article 65 may, therefore, be applied only jointly with article 63 of the code of criminal procedure. This means that the accused may ask for a polygraph examination, but he cannot be forced in any way to take part in it, as that would infringe upon his freedom of expression guaranteed by article 63 and article 157 § 2. Furthermore, it is known that the interpretability of the polygraph charts depends on the accused's voluntary participation.

Polygraph Usage

The modern application of the polygraph in Poland began in 1969, having been preceded by thorough research studies and numerous test examinations. (See Kubon, Wisniewski & Jozwiak, 1976; Widacki & Felus, 1979). During the period 1969 to 1978, the polygraph technique was used in approximately 300 serious criminal cases, mainly homicides and serious

burglaries, involving 1500 suspects. Most of these examinations occurred in the latter portion of the period indicated above. The number of examinations has increased each year. The examinations are conducted by the experts of university criminalistics departments as well as by Military Police examiners who are engaged in scientific research. The Criminalistics Department of the Silesian University in Katowice has conducted most of the examinations, and is responsible for about 90% of all examinations conducted in the universities. The examinations are conducted as early in the criminal investigations as possible, and always with the consent of the individuals who are offered the examinations. In practice, less than 1% of all who were asked declined to take the examination.

Most of the examinations have utilized the Reid technique. Recently, the charts have been scored numerically, using a system resembling that of Backster, although the lack of quantitative criteria to differentiate truthful from deceptive subjects is a limitation. At the moment, numerical evaluation is therefore applied as an adjunct to interpreting the charts. Apart from utilizing the polygraph in criminal investigations, experimental research is also conducted in Poland. The research includes the general diagnostic value of the polygraph technique, including variables which might affect that, such as its use with individuals who have organic CNS injuries (Widacki, in press).

Jurisprudence

The cases in which the polygraph technique was utilized did not come before the Supreme Court for a long time following the adoption of the 1969 code. When the Supreme Court received occasional cases involving the polygraph, it made no comment concerning the polygraph aspects. Probably the other types of evidence composed a sufficient basis for evaluating the facts in the cases in question. That is, even had there been no polygraph examination, the evidence was sufficient to decide upon the accused's guilt and the sentence that had been imposed. The polygraph results did not run counter to the evidence which laid the foundation for the court's decisions.

1976 was a turning point. In its sentence of September 25, 1976, the Supreme Court stated: "To adduce results of the polygraph examination in the appeal against a conviction is of no substantive significance in the sense that this kind of examination is of an accessory character. It cannot constitute an independent proof laying grounds for the determination of concrete facts. Such an examination serves primarily to prove an emotional link between a person under investigation and a given event."

The wording of this comment is very cautious and is full of reserve. The polygraph examination is not eliminated, but it is shifted to a distant background. According to this opinion, polygraph examination results may be only of accessory character and cannot represent an independent proof. It is difficult to reconcile that differentiation with Polish law, since there is no provision for a division of evidence into independent and accessory categories. The proof which is the subject of our discussion is simply a circumstantial proof. It points to an evidential fact which assumes the shape of an emotional link between an examined person and a crime which gave rise to the criminal proceeding.

On December 14, 1977, the Supreme Court again expressed an opinion on polygraph. Among other matters, it recognized that the court may use polygraph results as a proof. Yet it simultaneously subjected the use of the polygraph to a doctor's approval, following consideration of the suspect's physical and emotional health as well as to the conditions of his personality. This requirement by the Supreme Court has aroused criticism.

An Actual Critique

It would be wrong to think that polygraph examinations are universally accepted in Poland. Its admissibility and efficiency is often called into question. The opinions of this type, encountered in the publications of the practicing lawyers and even in some handbooks, are usually uttered with regard to the lack of research studies. For many years polygraph opponents have used the same arguments, based on such things as:

1. A questioning of the polygraph's accuracy. (Holyst, 1973).

2. A questioning of its legal admissibility. (Mazur, 1976).

On the other hand, investigation of the opinions of Cracow lawyers, advocates, judges, attorneys, and police investigators, showed that the number of polygraph opponents is equalled by the number of its adherents (Wojcikiewicz, 1978). The latter survey also concluded that the knowledge of the polygraph by practicing lawyers was extraordinarily low.

Conclusions

Polygraph examinations do, in fact, occur in Polish criminal proceedings. We are of the opinion that this is in accordance with the law and does not infringe upon the rights of the individual. An ever increasing number of research studies favor use of the polygraph (Daszkiewicz, 1965; Waltos, 1974; Hanausek, 1975; Widacki, n.d., 1976, 1977; Kubon, Wisniewski & Jozwiak, 1976). On the other hand, its opponents, although decreasing in number, are still strong. The Supreme Court appreciated the value of the polygraph results, although, as indicated by the cited decisions, some of the court's reserve is still observable. Nonetheless the unavoidable progress of science and technology influences the sphere of jurisprudence. This progress points out the future of polygraph application. The polygraph technique is neither a priori better nor worse than other proofs. Yet its efficient use has prospects in criminal proceedings and it does not infringe on the rights of the individual.

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He who seeks truth should be of no country. - Voltaire.

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THE POLYGRAPH A PSYCHIATRIC RESOURCE

By

Brian E. Lynch

Abstract

The present and future potential role of polygraphy in psychiatry is discussed. The author outlines the polygraphic technique in terms of its relationship to psychiatric assessment. The results of polygraphic tests given to psychiatric parents in a forensic psychiatric institution suggest that there are no real barriers to the full application of the polygraph to psychiatry. Additionally, the results suggest that the polygraph is a much needed psychiatric assessment technique for isolating and defining states of veracity. It is recommended that further exploration into the potential of polygraphy in psychiatry would be worthwhile for both disciplines.

The acceptance of new techniques is generally a slow, laborious procedure in most established disciplines. Nowhere is this more apparent than the plodding progress of the detection of deception in the field of psychiatry (Lynch, 1979). Its reluctance to embrace lie detection is not entirely psychiatry's fault. The field of polygraphy is still developing and therefore not fully understood by its own practitioners. Little wonder then, that psychiatry is hesitant to explore its potential as a psychometric tool.

As a means of clarification, let us digress slightly from the main focus of the discussion and consider the polygraph test in terms of psychological measurement. It is precisely this area of psychological measurement where a good proportion of the psychiatric misunderstanding rests. It is difficult to appreciate a test when it is misunderstood in terms of its function and potential. Psychiatry is generally accustomed to viewing psychometric tests from a particular point of view, e.g., IQ and personality tests. Unfortunately, polygraphic testing has not been perceived until fairly recently as anything but an extension of the field of interrogation and thus has not been considered in the same class as other psychological tests (Lynch, 1979). So before we explore polygraphy and its status within psychiatry, let us first examine the technique from the point of view of the very nature of psychological measurement.

Does in fact the polygraph test fulfill the criteria of a sound psychological test as David Lykken has suggested it does (1974)? By definition a test is a systematic procedure for measuring a sample of an individual's behavior (Brown, 1970). The polygraph test fits very nicely into the framework of this definition. Now if we break down the term systematic procedure we find ourselves confronted with three areas of concern: content, administration procedures, and scoring. Again, the detection of

Reprints of this article are available from the author at 2B Henfield Avenue, Nepean, Ontario, Canada K2J 1P2. deception technique incorporates all of these aspects in its testing procedures. In polygraphic testing, all persons are administered the same items with the variance stemming from the issue to be tested. For the most part, the administration procedure is standardized in that specific instructions are developed with respect to what directions will be given the person taking the test, how answers are to be recorded, time limits, and other relevant procedural matters. Scoring is objective to the extent that there are predetermined rules for recording and evaluating responses. The reason for these systematic procedures is of course to minimize the influence of irrelevant personal and environmental variables on test scores. An important concept to be remembered in any discussion of testing is that we do not measure a person's characteristics directly, but rather by inference. We measure autonomic functioning during a polygraph test while assessing verbal and non-verbal behavior and then we infer whether or not the person has been truthful. We are, in fact, not measuring deception, but rather inferring its status from a measurement of other functions.

At this point in the analysis of the polygraph test, it can be concluded that such a test fulfills the majority of the criteria necessary for an objective standardized psychological test. Therefore, we can now examine the purpose and uses of such a test and hence the potential. Psychological tests are often used in selection, placement, diagnosis, hypothesis testing and building, and in evaluation. Polygraphic testing incorporates various aspects of these usages such as selection (pre-employment and periodic screening), diagnosis and evaluation (determination of specific issue truths). In all cases of test usage the aim is to aid in decision making. Thus, tests should be evaluated in terms of their contribution to increased accuracy in decision making. Polygraphists have long appreciated that the detection of deception test addresses itself directly to the assessment of whether or not a person's account is truthful. Therefore, such an assessment, whether it be for police, business or psychiatry increases one's accuracy in decision making. It is perhaps this aspect of polygraphic testing that has the most appeal for psychiatry, particularly forensic psychiatry.

We must now try to identify the needs of psychiatry and in so doing, blend them with what polygraphy can offer. As clinicians, psychiatrists are interested in identifying and describing various behaviors and personality traits that make up the human personality. Obviously, the range of traits is quite wide and diverse in nature but there are common ele-It is precisely these common elements that afford us the opporments. tunity to distinguish between normal and abnormal. Psychiatry is asked to identify individuals who are abnormal and so try and deal with their respective deviances. We, in polygraphy, in our own work, try and deal with deviant truth telling, which is deception. Without much argument, most of us will agree that we usually tell the truth, albeit it, modified to meet the situation. However, when we lie, we have consciously deviated from our normal pattern of truth telling and become abnormal in that context. Psychiatry, which must deal with deception daily, would benefit greatly from a more objective measurement of malingering than is presently available.

At the Royal Ottawa Hospital's Forensic Service, psychiatrists are called upon to assess a person's fitness to stand trial, his intent during commission of a crime, and whether or not the individual is fully cognizant of his actions. When faced with assessing these forensic issues, psychiatrists have at their disposal the resources of psychologists, social workers and other allied health professionals (Lynch, 1979). Until recently they have not availed themselves of the services of a polygraphist. The problems they face as assessment clinicians are much the same as the ones faced by the various professionals they rely upon for assistance. With the exception of psychological testing, psychiatrists must depend upon various intuitive techniques from which they derive conclusions about a person's mental status and statement credability. It is precisely this subjective imprecision that sets the stage for the needed inclusion of polygraphic testing. As discussed earlier, a polygraph test is an objective standardized psychological test for assessing veracity. In the case of psychiatry, it is an excellent psychological tool for tapping some of the subtle aspects of psycho-legal issues. With the exception of hypnosis and sodium amytal, the psycho-clinician has only his educated subjective opinion on which to base his assessment of statement veracity. Therefore, polygraphic testing is a powerful addition to his battery of assessment tools.

One must understand that there is a certain degree of reluctance on the part of psychiatry to immediately perceive the worth of the detection of deception. Traditionally, the role of the ultimate assessor of personality has been almost solely their domain. Only slowly has there come about a move to a more eclectic approach to personality assessment. By drawing from various professional sources to arrive at a summated opinion they have enriched their own discipline. At present, such assessments almost routinely involve all of the previously mentioned allied health professionals as well as complete laboratory investigations including electroencephalograms, brain scans, and various blood analyses. At the Royal Ottawa Hospital, in addition to the previously mentioned tests most psychiatric assessments involve a polygraph test as part of the routine investigation.

At this point let us briefly discuss some of the findings and conclusions that we have arrived at in our usage of the polygraph with psychiatric patients. The Forensic Service is composed of a Minimum Secure Unit, a Medium Secure Unit, and Out- and In-Patient Service and a Family Court Clinic. Over the past three years we have conducted polygraph tests on over 200 cases referred from all of the above mentioned sub-sections of the Forensic Service. These cases were composed primarily of males, 75%, with females making up the remaining 25%. Their ages ranged from 11 to 58 with a mean age of 30 years. Virtually all patients were charged under the Canadian Criminal Code, with the exception of the few child custody cases from the Family Court Clinic. The charges were varied and included offenses from first degree murder down to being unlawfully in a public place. At least a third of all charges were confounded by excessive drugs and/or alcohol abuse during commission of the alleged crime. Although charged, the patients varied in their status within the trial process. Most of the patients were seen prior to trial, but some had been tried and were being assessed as an aid to disposition. The patients were diagnosed at the time of trial as follows: 45% no major psychiatric illness, 36% personality disorder (psychopaths, sociopaths), 13% depressive symptoms, 5% psychotic. It should be noted that these diagnoses were at the time of

trial and not at the time of polygraphic testing, so there may have been some diagnostic discrepancy. The cases spread themselves over the range of possible intelligence quotients but more than half were within the normal range of intelligence. The reasons for the polygraphic examinations fell into the four following broad areas: a) direct involvement in the offense b) confirmation of degree of involvement in the offense c) intent during commission of the offense d) memory status at the time at the commission of the offense.

All examinations were administered voluntarily and followed Backster's Zone Comparison technique, consisting of a structured pre-test interview, test proper, and when appropriate a post-test interrogation to clarify any assessed deception. All tests were conducted on a four channel electronic polygraph with measures of respiration, GSR, relative blood pressure, and peripheral blood flow. The testing of psychiatric patients did not pose any particular problems as might be expected. In fact, one of the strongest reasons for advocating polygraphic testing in psychiatric assessments is the very fact that it does not prove any serious problem to the examiner. Quite routinely, individuals imagine that the patients of a Mental Health facility are similar in behavior to those of the film "One Flew Over the Cuckoo's Nest." This is in fact, not so. With the advent of sophisticated psycho and chemo therapies, patients are capable of functioning quite normally. Obviously, there are still some very chronic patients that are extremely difficult to treat. In terms of polygraph, one is rarely asked to test such an individual for the following reasons. Firstly, the patient would be incapable of comprehending the test and secondly, such a person is most likely incapable of a criminal offense that would necessitate a polygraph test.

So what may we conclude from the use of polygraphic testing in a psychiatric setting? As mentioned earlier, there are various aspects to a psychiatric assessment and therefore the reasons for veracity testing. Ultimately, all reasons for testing were as an aid to assessing the individual's personality and credability, and thus what treatment regimen would be most beneficial. It must be understood that a Forensic Psychiatric Assessment Clinic is in actuality an extension of the court and therefore duty bound to assess the genuine status of an individual's personality regardless of what such an individual is claiming. It is this necessity of arriving at an exact picture of the patient's personality that warrants the use of the polygraph. As mentioned earlier, a psychiatrist is traditionally limited to assessing veracity by clinical intuition. Polygraphic testing however, which does not rely on intuition, goes right to the heart of the matter and objectively assesses truth. Therefore, in terms of prognosis and future behavior potential, the clarification of basic truths affords the psychiatrist a treatment foundation upon which to build.

In an effort to better explain how important a role polygraphic testing can play in psychiatric assessments, let me make reference to a rather unique case that was seen at the Royal Ottawa Hospital. The court had requested that the Royal Ottawa Hospital do a complete psychiatric assessment on a male patient charged with attempted murder, having stabbed his brother-in-law in the throat with a poker. The patient had proportedly been drinking and therefore claimed complete memory loss for the period surrounding the incident. This male had initially managed to convince the psychiatrist that he would benefit from further examination and that the Royal Ottawa Hospital was the ideal location. He was sent to the Royal Ottawa Hospital on a 60 day Warrant of Remand to undergo a psychiatric examination. During his stay, he was examined by at least two psychiatrists, underwent a complete psychological testing battery, social work assessment, occupational therapy assessment, and a complete laboratory analysis of body functions. In addition, he underwent an alcohol loaded EEG to try and assess if there was any biological basis for his violent behavior while under the influence of alcohol. Lastly, a polygraph test was requested to see if his amnesia was of a genuine nature or merely malingering.

On the day of the examination, which was coincidentally the day before his discharge, the patient had hardly entered the testing room, when he openly confessed that his purported memory loss was a sham. Furthermore, he launched into a discussion of how he had "snowed" the officials in his hometown and was also succeeding in doing the same at the Royal Ottawa Hospital. He said that he had decided to confess before taking the polygraph test because he felt that he was going to be found out anyway.

Interestingly enough, none of the staff, who had spent long hours assessing him clinically, was sure that his story had been fabricated. In fact, the psychiatrist in charge, had already prepared his preliminary court report recommending that this individual was not responsible for his actions due to the effect of alcohol. In essence, we have a case where one patient cost the government in this instance, countless professional nursing and laboratory expenses, only to find out that the person had made up his story to try and reduce the consequences of his actions.

Now there is no arguing that this is an extreme example, but we do not know how often this type of situation takes place with all parties concerned feeling that they have correctly identified the problem area and are prepared to suggest a future treatment program. The author is not suggesting that polygraphic testing will solve all the problems inherent in psychiatric assessments, but it most assuredly proves to be an indispensable tool in such assessments.

Why then has it not progressed farther in psychiatry? Well, in addition to the reasons listed previously, we are still faced with the problem that polygraphy is a relatively new technique in contrast to psychiatry, the older and more established discipline. Therefore, psychiatrists are reluctant to put full faith in a neophytic approach to credability testing.

From the point of view of polygraphy, the author has not encountered any insurmountable problems in testing in a psychiatric population. Therefore, there is no technical impasse to its expansion in psychiatry. There are however, a few aspects of polygraphic testing in psychiatry that warrant closer considerations. For instance, unlike a police setting, where quite often the examinee feels that the polygraphist is a more compassionate individual than the other police officers, in the forensic psychiatric setting, the polygraphist is often viewed as an extension of the police in a setting that up until the polygraph examination appeared, was all caring and understanding. This aspect of the test, necessitates careful pretest coverage so that the examinee does not feel so threatened that testing becomes difficult or impossible.



One positive feature to this reversal of examinee perception is that it forces the patient to view the test very seriously, in contrast to other hospital tests that he/she often sees as part of "playing the game." The example previously discussed is a good case in point. Up until the test, the patient had more or less laughed at the system for being unable to perceive his real motives.

In reference to testing psychotic or near psychotic individuals, as previously stated, the percentage of such individuals tested is low when compared to the number of persons tested without psychiatric illnesses or with personality disorders. It is suggested however, that psychotic individuals are difficult if not impossible to test due to the nature of their illness. In contrast, as the current literature suggests, there are no inherent problems in testing sociopaths.

It should be stated that the nature of court requested assessments necessarily dictates the testing of malingering and non-psychotic individuals. Therefore, this process of pre-selection reduces the number of truly mentally ill individuals being tested. This aspect of polygraphy in psychiatry is both good and bad. Although the psychiatrist acts as a preselection board for what patients he will refer for polygraphic testing he often does not fully appreciate the potential of the test, and fails to refer the most appropriate cases. In fact, quite often, as happens in other polygraphic applications, psychiatrists start to think, that polygraphic testing can do much more than it is designed to do.

The area of amnesia delineation is a very fruitful area for polygraphy (Lynch, 1980). With the ever increasing abuse of drugs and alcohol, it is to be expected that crimes committed under their influence will also increase. At the Forensic Service more than half of the patients assessed were involved with alcohol and drugs during the commission of their crime. In addition, nearly all of these patients claimed some degree of memory impairment due to alcohol or drug abuse. All cases of memory dysfunction are tested on the polygraph to try and ascertain the extent and degree of their amnesia. The author's preliminary research findings suggest that the percentage of patients having genuine amnesia is very small. Ouite often, the patients memory of the events surrounding their offense clears considerably during the polygraph test and in some cases before the Here the patient is confronted with a non-clinical situation for test. which he is not prepared. This unexpected situation serves as a perfect interrogation wedge and usually facilitates post-test interrogation.

One major drawback to polygraph in psychiatry is the tenuous position of interrogation. First, many psychiatrists do not like the term interrogation, although in essence, their interviews are precisely that. Second, they do not like to have their patients subjected to mental duress. Either rightly or wrongly they feel this is part of interrogation. Thirdly, when post-test interrogation is possible, the patient often does not feel the same pressure as in a police setting to remain and therefore will often simply get up and leave.

As it is with other applications of polygraphy, psychiatry would benefit from a better understanding of lie detection. As stated earlier, it is not solely their fault but rather the result of a complex of reasons. Therefore, much good could come to both fields from more research into the application of polygraphy in psychiatry. In essence, polygraphy is slowly coming of age in the broader field of psychiatry and in particular in forensic psychiatry. More and more, psychiatrists are seeing and reaping the benefits of a routine use of polygraph in their personality assessments. Although, there are some minor test modifications necessary in a mental health facility, for the most part the polygraph technique works very well in identifying many aspects of veracity in psychiatric malingering. It is hoped that polygraphy and psychiatry will continue to benefit from a growing association.

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He who tells a lie is not sensible how great a task he undertakes;

For he must be forced to invent twenty more to maintain that one.

Pope.

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THE ADMISSIBILITY OF POLYGRAPH EVIDENCE IN COURT SOME EMPIRICAL FINDINGS

By

Ann Cavoukian and Ronald J. Heslegrave

Abstract

Polygraph evidence is presently inadmissible in Canada and many jurisdictions of the United States. One of the major reasons for its exclusion lies in the belief (held by members of the judiciary) that jurors would accept such evidence without question due to its technical/scientific nature. The question of such blind acceptance was examined in two experiments on the influence of polygraph evidence on people's judgements of guilt. A second question that was also raised was whether a caution on the limitations of the polygraph would be effective in reducing people's weighing of such evidence. Although polygraph evidence was expected to exert some influence over judgements of guilt, it was not expected to be so great as to result in "blind acceptance." The results of both experiments supported this hypothesis. The inclusion of a caution was also effective in reducing the influence of such evidence. The implications of these findings are discussed in the context of the need to reexamine the admissibility of polygraph evidence in a court of law.

Introduction

Within the United States the admission of polygraph or "lie detection" evidence into the trial process varies across jurisdictions (Abrams, 1977). In Canada, however, such evidence is inadmissible at present (Phillion vs. the Queen, 1978). Some of the reasons for its inadmissibility are legal in nature requiring legal counterargument, and thus are not within the bounds of empirical investigation. For example, one legal

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During the course of this research, both authors were supported by Doctoral Fellowships from the Social Sciences and Humanities Research Council of Canada. In addition, this research was supported in part by a grant-in-aid of research to the second author from the Centre of Criminology, University of Toronto, from funds made available by the Solicitor General of Canada. The authors wish to thank Anthony N. Doob for his helpful comments during the early stages of this research, and Marco Katic and Julian Roberts for their help in the collection of the data. issue has been primarily concerned with the failure of polygraph evidence to satisfy the necessary requirements of expert testimony - most notably that such evidence not invade the domain of matters considered to be exclusively up to the trier of fact (R. vs. Phillion, 1973). This point is not, however, accessible to the tools of the empiricist. Rather, it could be argued that other experts also give opinion evidence on issues that the jury must decide (e.g., R. vs. Wong, 1977). For example, in a charge of threatening where the threat is conveyed by a letter, it is admissible for a handwriting expert to testify as an expert that, in his opinion, the accused was responsible for writing the letter.

There are, however, arguments for the exclusion of polygraph evidence that may be examined empirically. The principal argument open to investigation concerns the accuracy of the polygraph technique. It has been successfully argued in some jurisdictions that polygraph techniques are not sufficiently accurate to warrant acceptance as evidence. This accuracy issue has not only been predominant in the courts but has also been the theme of most psychophysiological research dealing with the polygraph as an instrument for detecting deception. A wealth of information is, therefore, now available on this issue. Even though there is considerable controversy over the "true" accuracy rate that is attainable by skilled scientists using laboratory paradigms (Abrams, 1975; Lykken, 1974, 1978, 1979; Podlesny & Raskin, 1977, 1978; Raskin, 1978; Raskin & Podlesny, 1979), it can be estimated that the polygraph, through objective quantification, can detect deception with accuracy rates between 64% (Horvath, 1977) and 96% (Raskin & Hare, 1978) against chance rates of 50%. Clearly, these detection rates define the technique as a legitimate phenomenon. Whether these rates of accuracy are sufficient to warrant the inclusion of polygraphers' testimony as evidence is a question that has both legal and empirical relevance. For the judiciary the question is whether these accuracy rates are adequate; for the research the question is whether this level of accuracy is at least as good as, if not better than, the accuracy attributed to other types of evidence. For example, one can investigate whether polygraph evidence is as accurate as detecting underlying psychological processes as subjective and projective tests, such as the Rorschach or Thematic Apperception Test. The latter are presently admissible pieces of evidence that may be introduced in support of expert testimony.

Little work has been done on this issue of relative accuracy. However, in the only study comparing polygraph evidence to other forms of evidence which are presently admissible in court, the polygraph fared very well. The accuracy of the polygraph as an investigative tool was compared with the accuracy of several other methods of identification: fingerprints, handwriting analysis, and eyewitness identification (Widacki & Horvath, 1978). The polygraph was found to be the most accurate method of those examined. As the authors state, "the number of correctly resolved cases (those in which the perpetrator and the three innocent subjects were correctly identified) was the greatest for the polygraph examiner, followed, in order, by the handwriting expert, the eyewitnesses, and the fingerprint expert" (p. 598). This finding should not be particularly surprising. The criteria for admissibility do not appear to rest upon empirical support for accuracy. As Silverberg (1979) notes, "many other forms of evidence that have traditionally been accorded uncritical judicial approbation are far less reliable [than the polygraph]. For example, the eyewitness account ... has a degree of unreliability horrifying to anyone

who still clings to the notion of objective certainty in the judicial process" (p.6).

The studies in the present article deal with an empirical issue to which very little attention has been directed. This issue concerns the effects of polygraph evidence on jury decisions. Even if the problem of the degree of accuracy is resolved in favor of polygraph evidence (as it has been in some jurisdictions), an independent issue concerns the effects of the inclusion of such evidence. If polygraph evidence has negligible effects on jurors, then the importance of the accuracy issue become severely curtailed. If, on the other hand, polygraph evidence has a significant effect, then the accuracy issue remains critical. In addition, research must then be undertaken to demarcate the limitations of this effect, i.e., under what circumstances does polygraph evidence significantly affect decisions? The initial goal of the studies to be reported here was to discover whether polygraph evidence significantly affected the judgements of individual people. The individual judgements of jurors prior to deliberation have been found to be one of the best predictors of final jury decisions (Doob & Cavoukian, 1977, p. 201; Kalven & Zeisel, 1966, p. 488).

Although most would expect that polygraph evidence has an effect on jury decisions, this assumption must be supported prior to acceptance. If we assume, however, that support is forthcoming, a more critical issue arises which has led to the inadmissibility of polygraph evidence in Canada and other jurisdictions (e.g., see. R. vs. Phillion, 1973). The problem as expressed by some members of the judiciary is that "the jury, by reason of the technicality of the evidence, might be tempted to blindly accept the witness' (polygraph expert) opinion" (R. vs. Phillion, 1973, p. 210) and therefore place undue weight on this type of evidence. A second goal of these studies, then, is to examine whether jurors blindly accept such evidence and whether undue weight is in fact placed on polygraph evidence by jurors. The only research on this issue has been of the quasiexperimental variety (Barnett, 1973; Carlson, Passano & Jamuzzo, 1977; Forkosoch, 1939; Koffler, 1957) and has yielded equivocal results[1] thereby demonstrating the need for an experimental approach to the problem.

The final goal of these studies is to examine and document any ameliorative influence on the effect of polygraph evidence that may occur due to cautionary statements concerning the accuracy of polygraph tests. Since jurisdictions which have ruled polygraph evidence inadmissible would be likely to include such cautionary statements if the admissibility status of such evidence were reversed, it is important to estimate the debilitative effect such statements would have on polygraph evidence. In addition, if such evidence were found to be unduly weighted by jurors, cautionary statements on the accuracy of the polygraph could effectively reduce the impact of such evidence. In the event that polygraph evidence did not carry undue weight, it would be expected that cautionary statements would have less influence; how powerful a debilitative effect such statements actually have is a separate empirical question.

^[1] The results of these studies are considered to be equivocal primarily because of their lack of proper control conditions as well as the fact that the results obtained fell in opposite directions with respect to the weighting and influence accorded to polygraph evidence.

Experiment I

The first experiment was designed to obtain some preliminary experimental data with respect to the three goals of the research program listed There were three different conditions in this experiment. above. The first condition (Basic) consisted of a summary of the major points of evidence in an actual case and the judge's instructions as to the laws pertaining to the case. Since the major precedent-setting case involving polygraph evidence in Canada was R. vs. Phillion (1973, 1975; Phillion vs. the Queen, 1978), it was decided to use this case as the basis for the summary. R. vs. Phillion is also an appropriate case to summarize in another respect, i.e., it did not contain polygraph evidence. In this case polygraph evidence was deemed inadmissible - a judgement that was later supported by the Supreme Court of Canada (Phillion vs. the Queen, 1978). This condition, then, provides a baseline level for the degree of guilt that the summary of the actual case engenders.

The second condition (Polygraph) was designed to examine the first two goals of this research. This condition consisted of the identical summary of the case used in the Basic condition plus the inclusion of polygraph evidence showing the accused to be innocent.[2] Since the only difference between the Basic and Polygraph conditions is the inclusion of the polygraph evidence in the latter, contrasting these conditions provides data on the first two goals of this research: the question of whether the admissibility of polygraph evidence has a negligible or significant effect is directly answered. Also, if it can be demonstrated that the presentation of such evidence results in a significant shift towards judging the accused as less guilty, the extent of the shift along the innocent-guilty continuum will enable the determination of whether this evidence is in fact "blindly" accepted.[3]

The third condition (Judge's Caution) was designed with respect to the last goal. This condition was identical to the Polygraph condition with one exception: a cautionary instruction was given by the judge that polygraph tests were about 80% accurate, a fact that they should bear in mind and be cautious about when weighing the evidence. Since the only difference between the Polygraph and Judge's Caution conditions was the inclusion of the cautionary statement by the judge, contrasting these two

[3] Although we refer to shifts in perceived guilt towards "more guilt" and "less guilt" on an innocent-guilty continuum, this continuum does not refer to the amount of guilt but rather refers to the probability that the guilt category of the innocent-guilty dichotomy is correct.

^[2] This experiment is not a complete factorial design since the polygraph only supports the accused by showing him to be innocent. The reason for this restriction is that in jurisdictions where such evidence is inadmissible, it is likely that the admission of such evidence would occur only if it were introduced by the defense to benefit the accused. This is especially likely since it can be demonstrated that errors in the outcome of polygraph tests are more likely to find the innocent guilty than the guilty innocent (Horvath, 1977). In fact, this was the condition of admission of polygraph evidence in the only Canadian case where it was admitted. The judge's opinion was that "polygraph evidence led by the Crown as evidence of guilt, not of innocence, should be excluded as highly prejudicial and less reliable" (R. vs. Wong, 1977, p. 6).

conditions provides evidence as to whether an appropriate caution by the judge is sufficient to effectively reduce the impact of the polygraph evidence providing, of course, that such an impact is significant.

Method

<u>Subjects</u>. The subjects were 150 visitors to the Ontario Science Centre who volunteered to participate in the experiment. Subjects were of both sexes and over 18 years of age.[4]

Procedure. Subjects were individually randomly assigned to one of the three conditions. Each subject was given a booklet containing a description of the case of R. vs. Phillion (1973) and a questionnaire. The variations in the three conditions were in the defense that was presented for the accused. In the Basic condition, the defense consisted of the testimony of two expert witnesses: a psychologist and a psychiatrist. Their evidence was directed at showing that the accused had a deranged personality, and that he had a tendency to invent and attest to circumstances which had never happened. These witnesses supported the defense's contention that the accused had been lying when he had confessed to the They testified that their conclusions had been reached on the police. basis of several psychological tests which showed the accused to be psychologically unstable.

In the Polygraph condition, subjects received the identical information contained in the Basic condition. In addition, the testimony of a polygraph expert was included. His testimony supported the testimony of the other experts since he testified that, in his opinion, the accused had not killed the victim. The polygraph expert testified that his opinion was based on the results of a polygraph test where the accused had answered truthfully when he responded "no" to whether he had killed the victim.

In the Judge's Caution condition subjects received the identical information to the Polygraph condition except that they were also given a cautionary instruction from the trial judge with respect to the limitations of polygraph evidence. The judge drew the jury's attention to the fact that polygraph tests had about an 80% accuracy rate, or that polygraphers were correct in their findings about 80 times out of 100. The judge then instructed the jury to be cautious and bear this in mind when weighing the polygraph evidence.

The 80% accuracy level used by the judge was deemed reasonable by the authors. Although it has been stated above that accuracy estimates range from 64% (Horvath, 1977) to 96% (Raskin & Hare, 1978) against chance rates of 50%, the high levels of reported accuracy are probably overly optimistic. Accuracy estimates are affected by many factors, one of which is

^[4] Since the subjects used in these experiments were drawn from visitors to a science center, it is possible that such a group would tend to be middle class and fairly well educated. It may be the case that less welleducated people would have been influenced by the polygraph than those in this sample. This remains, however, only a speculation since no demographic information was available. Nevertheless, the authors felt that such a group would be more representative of those called to jury duty than a sample of college students.

that accuracy is directed related to the experience and training of the polygrapher (Horvath & Reid, 1971) and most have limited training (Lykken, 1974). Lykken (1974, 1978, 1979) has also raised several other problems with the determination of accuracy estimates. For instance, a polygrapher's decision is often a clinical judgement based on the entire knowledge from the examination (e.g., the demeanor of the subject) and the facts of the case rather than an objective, numerical assessment of the polygraph charts. Accuracy estimates are thus inflated due to increased knowledge on which to make a decision. Finally, accuracy estimates are often inflated since corrections for unconfirmed and inclusive cases, as well as baseline levels of deception, are often lacking. In view of these problems, an 80% accuracy level seemed reasonable since it was within the accepted range of accuracy, but short of the high levels reported. Τn addition, since the polygraph examination in this case showed the defendant to be honest, the level chosen was above the arithmetic average of the estimates due to the fact that errors occur less often in the false negative direction (Horvath, 1977; Lykken, 1979). In any case, the level chosen may have an effect on the outcomes regardless of how closely it resembles the true state of affairs, thus the stated level of accuracy should be a subject of enquiry in further research.

At the end of the written material in all three conditions, the subjects read the judge's charge to the jury in which he summariezed the evidence and instructed them on the laws pertaining to the case. He also instructed them on the standard of proof required in a criminal case, giving the traditional instruction on proof beyond a" reasonable doubt."

<u>Dependent Measures</u>. After reading the case, all subjects were asked to answer the following two questions. They were first asked to indicate how likely they thought it was that the accused was guilty of committing the murder (on a 7-point scale where l = definitely guilty, 3 = probably guilty, 5 = probably not guilty, and 7 = definitely not guilty). They were then asked what verdict they, as members of a jury, would give. All subjects were then thanked and given a debriefing explanation.

Results and Discussion

Figure 1 shows the mean perceived-guilt ratings, where a value of 1 indicates definitely guilty and 7 indicates definitely not guilty, and the standard errors associated with each group mean. An overall analysis of variance indicated that the differences among the groups were highly significant [F(2,147) = 6.22, p < .01].

Effects of Polygraph Evidence. One purpose of this study was to evaluate whether the admission of polygraph evidence showing the accused to be innocent would result in a significant shift along a perceived-guilty scale towards less guilt. Therefore, the Basic and Polygraphconditions were contrasted. As can be seen in Figure 1, the inclusion of polygraph evidence supporting the innocence of the accused resulted in the accused being perceived as significantly less guilty [F(1,147) = 11.62, p < .001]. The dichotomous verdict data shown in Table 1 support these results in that only 48% of the subjects in the Basic condition acquitted the accused whereas 72% of the subjects in the Polygraph condition voted for acquittal $[X^{2}(1) = 5.04, p < .05]$. It would therefore seem clear from both the perceived-guilt ratings as well as the resulting verdict decisions that the



Fig. 1. Mean perceived-guilt ratings and standard errors for each group (7-point scale ranging from 1 = definitely guilty to 7 = definitely not guilty; the greater the numerical rating, the less guilt perceived.)

inclusion of polygraph evidence had the effect of making the accused appear significantly less guilty. This point is critical since it defines a basic distinction between those jurisdictions that allow polygraph evidence and those that do not, thus leaving open the possibility of altered verdicts in those jurisdictions that do not allow such evidence.

Although there is a significant effect of including polygraph evidence, it is the absolute mean shift along the scale that is important in the judgement of whether the subjects "blindly" accepted the polygrapher's testimonv. If subjects blindly accepted the polygrapher's testimony of the innocence of the accused, especially since it corroborated the testimony of the psychologist and psychiatrist, it may be expected that a mean judgement of 6 or greater would occur. The actual result was significantly less than 6. As in any study, there are sampling errors involved; however, there is less than 1 chance in 1000 that the actual value of perceived guilty should even be 5 (probably not guilty) or greater (standard error = .185).[5]Therefore, it would seem that the subjects did weigh the polygraph evidence rather than blindly accepting it. Judgements of whether such evidence has an "undue influence" are largely subjective in nature, though the second experiment attempted to provide a more objective answer.

Table	1.	Distribution	of	Verdicts	in	Experiment	1
		(Frequencies	and	Percenta	ages	s)	

	Basic		Poly	ygraph	Judge's Caution		
	<u>N</u>	%	<u>N</u>	%	N	%	
Guilty	26	52	14	28	20	40	
Not Guilty	24	48	36	72	30	60	
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[5] These probability levels can be calculated using the standard error in Figure 1 for the polygraph group.

Effects of Judge's Caution. In the Introduction it was stated that in the event that polygraph evidence produced an effect, it would then be of interest to see whether a cautionary statement by the judge could mitigate this effect. In Figure 1 it can be seen that the Judge's caution condition resulted in the effect of the polygraph evidence being reduced somewhat, i.e., relative to the Polygraph condition the Judge's Caution results in the accused being perceived as slightly more guilty. Although the results were in the predicted direction, the difference between the Judge's Caution and Polygraph conditions was not significant. As in the case of the Polygraph condition, the Judge's Caution resulted in the accused being perceived as significantly less guilty than in the Basic condition [F(1,147) = 6.21, p < .02]. This result indicates that despite the judge's cautionary instruction, the polygraph evidence resulted in the accused being perceived as significantly less guilty.

The distribution of verdicts over the three conditions was found to vary significantly $[X^{\mathbb{X}}(2) = 6.00, p < .05]$ as presented in Table 1. In the Judge's Caution condition 60% of the subjects acquitted the accused. It is interesting to note that this result was not only in the predicted direction but fell midway between the Basic condition and the Polygraph condition. The judge's cautionary instruction reduced the influence of polygraph evidence by half. These results could be regarded as desirable since they suggest that people had, in accordance with the judge's caution, weighted the polygraph evidence with greater reservation and as a results gave fewer acquittals. If the results of both dependent measures are taken together, it would appear that the judge's caution reduced the effect associated with the inclusion of the polygraph evidence.

Experiment II

The first experiment provided the initial experimentally produced data on the effects of considering polygraph evidence as probative. It also provided information on the degree to which such effects could be attenuated by a cautionary instruction from the judge concerning the accuracy of polygraph techniques. However, this single demonstration cannot, by itself, necessarily be considered a convincing or reliable demonstration of a phenomenon. Therefore, the first goal of the second experiment was to attempt to replicate the findings of the first experiment in order to demonstrate the reliability of those effects. To accomplish this goal the three conditions used in the first study (i.e., Basic, Polygraph, and Judge's Caution) were replicated in this study. However, it was believed that the generality of similar findings in this study would be enhanced if a different basic case description was used in order to vary the baseline perceived-guilt levels. Thus a second case was used. The case chosen was R. vs. Wong (1977) - the only other reported Canadian case in which polygraph evidence had been an issue. [6]

Two new issues were also examined in this study. The first issue centered on the effect of the cautionary instruction by the judge in the

[6] In contrast to R. vs. Phillion (1973), the polygraph evidence was ruled admissible in this case. The Basic condition did not, however, include this evidence and only provided a description of the remaining facts in the case. The polygraph evidence was added in the Polygraph condition, as in the first study.

first experiment as well as the artificial nature of such a circumstance: if a polygrapher's testimony were accepted in a case as expert opinion evidence, it is unlikely that a judge's caution would be the only cautionary statement made. Quite often opposing testimony is brought forth with respect to the adequacy of the particular test and the examiner's opinion. This testimony would serve the dual purpose of providing a cautionary statement from an expert as well as relieving the judge from making such a statement which could, perhaps, later constitute grounds for appeal. Therefore, a fourth (Expert's Caution) condition was added to this experiment which was identical to the Polygraph condition except that expert testimony replaced the judge's caution. Although this statement was stronger than the statement used by the judge, both the judge and the expert referred to an 80% accuracy rate.

The second issue concerns the weight which jurors attach to the polygraph evidence. The first study supports the contention that people do not "blindly" accept polygraph evidence, and the replication of the same conditions in this study may provide further support for this assertion. However, this study attempted to objectively investigate whether polygraph evidence has an "undue influence." Since any important piece of evidence would be expected to shift the degree of perceived guilty, it is impossible to know how much of a shift would be considered as undue influence; only subjective appraisals are possible. For example, in Experiment I the inclusion of polygraph evidence shifted the perceived guilt 1.04 units along a 7-point scale towards less guilt. Subjective judgements can be made with regard to whether this shift is "too much," but such judgements will have great variation and different criteria. Therefore, to judge "undue influence" there must be an estimate of how much of a shift would be expected if an additional admissible piece of evidence was included. With respect to this question of "undue influence," the results of Experiment I are confounded since the difference between the Basic and Polygraph conditions is the summation of two types of influences which can be regarded as quantitative and qualitative. The quantitative influence can be interpreted as the effect of an additional piece of evidence showing the accused to be innocent, while the qualitative influence relates to the fact that this evidence was polygraphic in nature. It is not possible to partition how much of the 1.04 shift from the Basic to the Polygraph condition was attributable to the quantitative and qualitative aspects. In an attempt to answer this question in the context of the R. vs. Wong (1977) case description, a fifth (Alternative Evidence) condition was added which was identical to the Basic condition but included another piece of evidence supporting the accused. It was predicted that this evidence would also result in the accused being perceived as less guilty and the degree of this shift would pertain to the question of "undue influence."

Method

<u>Subjects</u>. The subjects were 250 visitors to the Ontario Science Centre who volunteered to participate in the experiment. Subjects were of both sexes and over 18 years of age.

Procedure. Subjects were individually randomly assigned to one of the five conditions. Each subject was given a booklet containing a short description of R. vs. Wong (1977) and a questionnaire. Although the case

was different from that used in Experiment I, both involved charges of murder, and the additional evidence introduced in the various conditions attested to the innocence of the accused. As in the first study, variations were introduced in the defense presented for the accused. The Basic, Polygraph, and Judge's Caution conditions were meant to replicate, using a different case, the essentials of those conditions in Experiment I.

The Basic condition involved a description of the evidence presented in the case. The facts presented to the subjects were similar to those in Four Chinese youths attempted to enter a Chinese New the Wong case. Year's party to which they were not invited. When the youths were refused admittance to the party outside the house, a fight ensued. Five men were injured in the fight, one of whom died on route to the hospital. An evewitness testified that as he was arriving at the party at about 11:15 p.m., he saw the fight and subsequent stabbing. Following the stabbing, the assailant ran past his car with the weapon. The witness identified the accused as the assailant and stated that he had seen him on previous occasions and was thus able to recognize him. The accused testified that on the way to the party he discovered that his friends had weapons on them and so had decided to remain in the car. He denied attempting to enter the party and denied stabbing the victim.

In the Polygraph condition, subjects received the identical information contained in the Basic condition. In addition, a police polygrapher testified that, in his opinion, the accused answered truthfully when he responded "no" to the questions "On January 23, 1976, did you cut someone with a knife?" and "On January 23, 1976, did you stab another man?" Further, a recognized expert in lie detection testified that had had reviewed the polygraph charts and was also of the opinion that the accused had responded to the questions honestly.

In the Judge's Caution condition, subjects were given the same information contained in the Polygraph condition plus a caution from the judge that was identical to the first study. Specifically, the judge drew the jury's attention to the fact that polygraph tests had about an 80% accuracy rate, or that polygraphers were correct about 80 times out of 100. The judge then instructed the jury to be cautious and bear this in mind when weighing the polygraph evidence.

The Expert's Caution condition was identical to the Polygraph condition with additional testimony from a recognized expert in lie detection cautioning the jury about the accuracy of polygraph tests. He testified that "under the best conditions polygraph tests are only about 80% accurate, that is to say they correctly identify the truth about 80 times out of 100. Also, the 80% accuracy figure is based on laboratory studies and there is virtually no information on how accurate polygraph examinations are in real life situations though it is likely that they are even less accurate." He also said that the results should be treated as skepticism.

The final Alternative Evidence condition was identical to the Basic condition except that another witness testified in support of the accused's testimony. One of the four youths involved in the fight testified that the accused had stayed in the car when the others tried to enter the

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party. The rationale for this additional piece of evidence was that it corroborated the accused's testimony in a similar manner to the Polygraph evidence. However, since eyewitness identification has been shown to exert a great deal of influence when introduced as evidence (Loftus, 1975), one of the youths involved in the fight (whose credibility was somewhat suspect) was chosen as the eyewitness in order to reduce the otherwise powerful effects of such testimony.

At the end of all five conditions, the subjects read the judge's charges to the jury in which he summarized the evidence and instructed them on the laws pertaining to the case. He also instructed them on the standard of proof required in a criminal case, giving the traditional instructions on "reasonable doubt".

Dependent Measures. After reading the case, all subjects were asked to answer several questions. They were first asked to indicate how likely they thought it was that the accused was guilty of committing the crime (on a 9-point scale where 1 = definitely guilty, 3 = probably guilty, 5 =uncertain, 7 = probably not guilty, and 9 = definitely guilty). They were then asked what verdict they, as members of a jury, would give. Finally they were asked how confident they were in their judgements (on a 9-point scale running from 1 = very confident to 9 = not at all confident).

Three general questions were also asked; subjects were instructed to disregard the case description when answering these questions. Subjects were asked how familiar they were with polygraphs (1 = very familiar to 9 = not at all familiar); how accurate they thought polygraph tests were (1 = very accurate to 9 = not at all accurate); and whether they thought polygraph tests were more, or less, accurate than psychological tests (1 = polygraph tests much more accurate, 5 = about the same, and 9 = psychological tests much more accurate).

Results and Discussion

The first goal of the second experiment was to replicate the effects of Experiment I with the use of a different case, which may have resulted in a different baseline level of perceived guilty, in order to determine whether those effects would generalize. The results of this experiment clearly replicate the first study, as will be demonstrated. The overall results and standard errors associated with each group mean are presented in Figure 2. An analysis of variance revealed significant differences among the mean perceived-guilt ratings for each group $[F(4,245) = 3.47, p \le .01]$.

Effects of Polygraph Evidence. In order to specify the effects of the inclusion of polygraph evidence, the Basic and Polygraph conditions were compared on the perceived-guilt rating scale. The results from this study replicated those results obtained in Experiment I and revealed that the accused was perceived as significantly less guilty when polygraph evidence attested to his innocence was included [F(1,245) = 4.37, p < .05]. The verdict data, however, cannot be compared for these groups due to the anomalous responses of the Basic group: these subjects responded with a surprisingly low conviction rate considering their mean perceived-guilt ratings. Specifically, all subjects who responded with a perceived-guilt rating of 1 or 2 convicted the accused. However, excluding the Basic

group, 81% (25 out of 31) of the subjects who responded with a rating of 3, which was labeled "probably guilty," also convicted the accused. For the Basic group, only 36% (4 out of 11) of the subjects rating the accused as probably guilty convicted, which is a significantly low conviction rate $[X^{\prime}(1) = 5.52, p < .05]$.

The question as to whether subjects "blindly" accepted the polygraph evidence also arises in this experiment. Figure 2 shows the mean and standard errors associated with the Polygraph condition (standard error = .261). If, as in Experiment I, it is estimated that "blind acceptance" should result in a mean of at least 8 on this 9-point scale, it can be seen that the result is significantly below 8. In fact, the results is also significantly below 7 which was labeled "probably not guilty" (p < .001). It would seem that subjects did not blindly accept such evidence. Although both experiments show that the inclusion of polygraph evidence shifted the level of perceived guilty, the effect was not potent enough to move the level of perceived guilt significantly close to the value of probably not guilty.



Figure 2. Mean perceived-guilt ratings and standard errors for each group (9-point scale ranging from l = definitely guilty to 9 = definitely not guilty; the greater the numerical rating, the less the perceived guilt.)

Effects of Judge's Caution. Figure 2 shows the effect of the cautionary statement by the judge. Although the effect of the judge's caution was in the predicted direction - showing the accused to be slightly more guilty - the magnitude of the reduction from the Polygraph condition was small. As was the case in the first experiment, the difference between the Polygraph and Judge's Caution conditions did not reach significance (F < 1). The verdict data in Table 2 also showed that the Judge's Caution did not significantly increase the number of guilty verdicts relative to the Polygraph conditions [$X^2(1) = 1.86$, p < .10]. These results indicate that although the cautionary instruction from the judge did not have a significant effect, its influence was in the predicted direction in both experiments, i.e., towards more guilt.

Effects of Alternative Expert Testimony. As stated in the Introduction, rather than the judge merely cautioning the jurors about possible errors involved in polygraph evidence, it is more likely that an alternative polygraph expert would be called to testify about the inadequacy of the polygraph evidence. Therefore, the Expert's Caution condition was included to estimate the mitigating effect of such testimony on polygraph evidence.

On the perceived-guilt scale in Figure 2 it can be seen that the expert testimony completely eliminated the effect of the polygraph evidence. It is found that alternative polygraph expert testimony significantly shifted the level of perceived guilt in the direction towards more guilt when compared to the Polygraph condition [F(1,245) = 7.39, p < .01]; the Expert's Caution and Basic conditions did not differ significantly (F < 1). In addition, when the Expert's Caution condition was compared to the effects of the Judge's Caution, it was found that the testimony of the expert reduced the effects of polygraph evidence significantly more than the Judge's Caution [F(1,245) = 5.05, p < .01]. The verdict data also supported these results: compared to the Polygraph condition, the Expert's Caution condition resulted in a significantly greater number of convictions $[X^2(1) = 4.16, p < .05]$, as shown in Table 2.

It must be added, however, that the content of the two cautions was not identical: the Expert's Caution was purposely somewhat stronger than that given by the judge, as noted earlier. The expert added two additional comments in criticism of the polygraph. Although both the judge and expert used the same degree of accuracy in their cautions, the expert went on to say that this 80% figure was based on laboratory studies and that there was practically no information on the accuracy of polygraphs in real-life situations, though such evidence would likely be even less ac-The expert also added that, in his opinion, the results of the curate. polygraph test should be treated with a great deal of skepticism. The difference in the effects of the two cautions may not then be solely attributable to differences in the source. The additional comments in the Expert's Caution may have contributed to the great success of the expert in reducing the influence of the polygraph.

	Ba	sic	Polygraph		Judge's Caution		Expert's Caution		Alternative Evidence		
	N	%	N	%	N	%	N	%	N	%	
Guilty	7	14	5	10	11	22	14	28	12	24	
Not Guilty	43	86	45	90	39	78	36	72	38	76	

Table 2. Distribution of Verdicts in Experiment II (Frequencies and Percentages)

Does Polygraph Evidence Unduly Influence Jurors? The other issue in this experiment was to determine whether polygraph evidence unduly influenced jury decisions. Data have been provided to demonstrate that jurors do not appear to "blindly" accept such evidence; however, it was stated that the appropriate method of determining whether such evidence

had an "undue" effect was to compare the polygraph evidence to a qualitatively different type of evidence, so that the amount of evidence in favor of the accused would be equivalent. However, this other piece of evidence in the Alternative Evidence condition (namely, the corroboration of the accused's testimony by another witness) must at least minimally have moved the perceived-guilt rating and verdicts in the same direction as the polygraph evidence, that is towards less guilt and more acquittals. The Alternative Evidence condition in this experiment failed on other counts and so failed to provide an appropriate control condition. The question of undue influence thus remains open to empirical investigation. Subjectively, however, shifts of 1.04 on a 7-point scale and .80 on a 9-point scale do not seem to constitute an "undue influence".

Additional Dependent Measures. Four additional questions were asked. Subjects were first asked how confident they were in their judgements. There were no differences among the groups with respect to this question and the mean rating of confidence was 3.98 on this 9-point scale. However, if subjects responded to the confidence question in a consistent manner with their perceived-guilt rating, they should have been more confident in their judgements the further they moved towards both ends of the scale. To examine whether this internal consistency was achieved, a quadratic function was fitted to the mean confidence rating at each level of the perceived-guilt scale. This result was highly significant [F(1,241) =58.00, p < .001] indicating that subjects were more confident in their ratings as their perceptions of the accused became more polarized towards guilt or innocence.

Subjects were also asked three general questions related to polygraph tests: how familiar they were with polygraph tests, how accurate they thought polygraph tests were, and how accurate they thought polygraph tests were relative to other psychological tests used by psychologists and psychiatrists. The mid-point of the scale on the last question was labeled "about the same." In terms of group responses, there were no differences among the groups on any of the questions. Subjects responded that they were somewhat familiar with polygraphs (mean = 5.44), thought polygraph tests were somewhat accurate (mean = 4.62), and felt that polygraph tests had about the same accuracy as other psychological tests (mean = 4.98). It is interesting to note from these results that subjects did not think that polygraph tests were very accurate, despite the fact that three of the groups were told the accuracy rate was about 80%. They also thought that polygraph tests were about the same as psychological tests in terms of accuracy. This suggests that polygraph tests are generally not blindly accepted or even carry a great deal of weight relative to other psychological tests, which are presently admissible in court.

Using trend analysis to interrelate these dependent variables, it was determined that all significant interrelations involved significant linear components alone - all involving the question of polygraph accuracy. In summary, the more accurate subjects viewed polygraph tests: (a) the more they thought polygraph tests were better than psychological tests [F(1,241) = 65.06, p < .001]; (b) the more familiar they were with polygraph tests [F(1,241) = 8.78, p < .01]; and (c) the more they viewed the accused as innocent [F(1,241) = 8.91, p < .01]. Taken together, these results would suggest that in general most subjects viewed polygraphs as only mildly accurate and about the same in accuracy as psychological tests.

However, as they came to regard the polygraph as more accurate (possibly because of increased familiarity), they weighted it more strongly than psychological tests, and altered their perceptions of the guilt of the accurate (in the direction of greater innocence).

Conclusions

As stated in the Introduction, there were three questions which these studies attempted to address: (a) does polygraph evidence affect jury decisions; (b) if so, do jurors "blindly" accept such evidence, and (c) if jurors are cautioned about the accuracy of polygraph tests, does this caution reduce the effect of polygraph evidence? The results of both experiments provide consistent answers to these questions.

Both experiments revealed that the inclusion of polygraph evidence showing the accused to be innocent resulted in people perceiving the accused as being significantly less guilty in terms of both perceived-guilt ratings and verdicts. Similar results were obtained even though different case descriptions were used, and the accused was perceived as being differentially guilty in the two cases. These results suggest that significant differences could arise between jurisdictions on the basis of the admissibility or inadmissibility of such evidence. Thus, such evidence could, depending on how guilty the jurors perceived the accused to be, raise a reasonable doubt where none existed before.

With respect to the question of whether such evidence was "blindly" accepted, neither study found evidence for such blind acceptance. The shifts in the level of perceived guilt with the inclusion of polygraph evidence were statistically significant but not overwhelming. In fact, in neither study did the perception of guilt shift significantly close to the point on the scale labeled "probably not guilty." These findings are in line with the conclusion arrived at by Tarlow (1975), where he stated that "the concern for the 'overwhelming impact' of the polygraph is greatly exaggerated and totally unjustified" (p. 968). In addition, it was demonstrated that people did not consider the polygraph to be very high in accuracy nor did they consider it to be superior to other types of psycholo-These results suggest that the admissibility of polygraph gical tests. evidence should not foster great concern since people did not appear to have blindly accepted such evidence, even when it was presented without cautionary instructions.

Finally, even though polygraph evidence was not blindly accepted and did not appear to have had a great influence, the effect of including polygraph evidence was diminished by including cautionary statements about the accuracy of such evidence. A caution from the judge produced a small reduction in the effect of polygraph evidence in both studies. A stronger caution from the testimony of a polygraph expert in the second experiment completely eliminated the effect of the polygraph evidence. Although these specific results were likely related to the level of perceived guilt attributed to the accused, the results clearly demonstrated that alternative expert testimony was influential in reducing the effect of polygraph evidence.

Of course, further research in this area is necessary to establish some of the limiting parameters affecting these conclusions. If, however,

the present findings are replicated, then jurisdictions in which polygraph evidence is presently excluded should reconsider the question of admissibility with specific reference to some of the parameters observed in these Although the inclusion of such evidence may serve to raise a studies. reasonable doubt, under certain circumstances, such evidence would not, in the opinion of the authors, raise an unreasonable doubt.

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The moral law is written on the tablets of eternity. For every false word or unrighteous deed, for cruelty and oppression, for lust or vanity, the price has to be paid at last. J. A. Froude

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POSITIVE CONTROL QUESTION TECHNIQUE PRE-TEST INTERVIEW AND CHART INTERPRETATION

By

Dorrance Howland

The Positive Control Question Technique Pretest Interview is similar in many ways to other standard techniques. That is, procedures such as signing of forms, explaining the physiological concept of "fight or flight," explaining the instrument, and preparation of the relevant and irrelevant questions are performed in the usual manner. However, control questions are not prepared.

Instructions

Subsequent to the usual phases of the pre-test interview, the Subject is instructed in the procedure of the PCQT examination. He is told that each question will be asked twice in a row. The first time he hears the question, he is told to tell a deliberate lie. At this point, the examiner should pause to assure that the Subject understands what is being asked of him. During the entire interview up to this point, the examiner has stressed truthfulness. There is usually a brief moment of doubt or confusion on the part of the examinee as he ponders this. The examiner should make full use of this for the purpose of clarifying the examination concept to the Subject. It is not the fact that the person taking the test answers "yes" or "no" but that he will know which answer is the real lie and which is the real truth. Explain to the examinee that because each question is asked twice in a row, the impact of nervousness will be the same each time he hears the question. Explain to the Subject that any reactions caused by general sensitivity he may feel toward the question matter is averaged into the polygraph technique by asking the question two consecutive times but with one truthful and one deceptive answer. Point out to the Subject that the difference will come from within himself. The design of the technique is that his deceptive answer will create disturbance above any reaction caused by mere sensitivity to the question it-If he says that merely hearing the questions creates a response, self. and it may, explain that this responsiveness to the question becomes his baseline and the evaluation will be based on his change above that baseline. It may be helpful to explain to the Subject that each person's recording is different, and because of this, he will be evaluated only against his own baseline. Present the technique as a balance which is tipped with the magnitude of his lie response, thereby overriding the baseline sensitivity. Tell the person that the technique provides for a greater range in individual responsiveness, particularly in separating a person's natural sensitivity from his reaction caused by deception.

After initially receiving the basic instructions, the examinee may argue that his concern continues to be the fact that he wants the examiner and anyone else involved to believe his requested truth answer. He may add that answering with a requested lie, when both he and the examiner knows he is only following instructions, does not have the impact of actual deception. The examiner should explain that our society teaches the virtue of truthfulness. By following the instructions, the Subject is reversing this teaching. Direct the Subject to think about what he is saying. Ask the Subject to consider, that after a great deal of time and discussion has been spent on arriving at what the Subject says and the examiner hopes is the truth, he will now be asked to deny all of that information in the first answer of each two-question set. The Subject has to be made to realize that he knows which of his answers is the truth and which is a lie. It is, therefore, his responsibility to see this; and that you know he will react more when he is deliberately lying, than when he simply tells the truth. Explain to the Subject that as he goes through the test and answers with a lie, he will know it. For example, when the truthful Subject says "yes" he committed a particular crime, when he knows that he, in fact, did not, this will create more of a disturbance than when that Subjects answers "no," and reaffirms his innocence.

Administration of this examination requires more concentration, both on the part of the Subject and the examiner, than other polygraph techniques. Tell the Subject he will have to pay strict attention to his answering sequence. Explain that for a question requiring a denial to the relevant side or portion of the PCQT set, the answers will be in a "yesno" sequence. However, other question sets may require a "no-yes" response.

Emphasize to the Subject that he must stay alert in order to have successful exam results. Subsequent to the above, pretest several or all of the previously prepared and reviewed questions in the PCQT manner. Just how much review is necessary will depend upon the examinee's ability to grasp the concept and follow directions.

In terms of administration of the examination, it has been found helpful to place written instructions in front of the Subject. For example, on a 3 x 5 card write "lie lst" and under that write "truth 2nd." As an alternative the examiner may preface the control or first question in the Positive Control Set with the request to "tell a lie," followed by the question. The second time the question is asked, it may be prefaced with the request to "tell the truth."

Specific Tests

In a specific test situation, explain to the Subject that you will ask additional questions in the same manner as described above, the correct answers to which you, the examiner, are reasonably certain. That is, you will ask, in two-question sets, questions about his name, age, whether he ever smoked a cigarette, has a license to drive a motor vehicle, has ever gone to school, or had a job, or questions of a similar nature. The reason for this, you explain, is to determine the types of reactions and trends which identify his lie and subsequent truth patterns.

In this test, this is also a control procedure as it demonstrates that the Subject's psychological set is on the lie; and that his recorded reactions are to the lie and not to the truth. With the irrelevant questions you know the ground truth; and you can tell if the Subject is following instructions, and if the technique works with him.

Screening Tests

In administration of this examination for screening purposes, it is useful to run at least two charts in the standard relevant-irrelevant (R/I) manner for the purpose of identifying problem areas. In preparing

the PCOT series, add to the DI questions one or two questions that have appeared NDI. This will provide the examiner with some flexibility in the test. That is, start a test with a PCQT "set" or pair of questions using the Subject's name. The question interval should be 15 seconds. Next. insert one of the questions that has not been a problem, followed by one of the sensitive issues. This will provide time to establish some normal trends in the Subject's tracings and get him into the rhythm of the technique. Also, inserting a relatively non-sensitive issue between two "problem" areas on the charts or after large responses, serves much the same purpose as inserting a "norm" after a reaction in R/I testing. By directing the Subject to "lie" about a potentially sensitive area, but one to which he has not shown reaction on the previous R/I series, such as the question on serious crimes, will give the examiner an indication of the examinee's ability to react. The norm or non-sensitive specific issue may be used as a "pivot" point in the charts after which the examiner may wish to repeat the first half of the test for the purposes of obtaining some consistency of reaction patterns. The last question set on an individual test should be a a general truth question, such as "have you deliberately withheld any pertinent information from me during our conversation," or any similar question. This gives additional continuity to the overall evaluation in that, if the Subject is reacting to the control side of this general truth question and the specific questions, it reinforces an opinion of NDI.

Conversely, if the examinee shows more sensitivity to both the relevant side of overall truth question set and one or more of the relevant question sets, the DI call is more clearly suggested.

Speaking in general terms, an average chart will contain seven or eight question sets. As with other techniques, two charts should be run as a minimum. Should the first PCQT chart tracings be flat or non-responsive in nature, a standard stim test is suggested.

Chart Interpretation

In terms of chart interpretation, the general rule is to look for the largest response between two questions of a set. Basically, if the individual's "psychological set," as indicated by the larger reaction, is in relation to the control or requested lie side of the set, he is presumed to be NDI. Conversely, should the Subject exhibit larger disturbance to the second time he hears the question, <u>i.e.</u>, his requested truth answer, after having had the opportunity to deliberately lie to it, he is presumed to be deceptive.

Although a study needs to be conducted, experience indicates that responses of equal magnitude in both the control or relevant side of the set or responses which initiate with the first question of the set and carry through the relevant question area, may also be indicative of actual deception.

Anticipation seems to play a part in chart interpretation for Positive Control. That is, when the Subject hears the first question in any positive control set, he automatically knows what the following question will be; <u>i.e.</u>, a repetition of the first question which requires a requested truth answer. For the truthful Subject, a sense of relief should begin as the Subject anticipates the relevant portion of the PCQT set. However, the DI Subject is now confronted with the greatest threat to his well-being, in that he can see the real lie situation approaching. This dilemma, I believe, reasonably allows for some anticipatory response or the "carry through" response described above.

In analyzing the technique, the truthful Subject should have a clear understanding of his position as it relates to each test question issue. The request to lie should be automatic, accompanied by a thought that he is thereby making a deliberate statement against his personal interest. The subsequent opportunity to express his innocence will provide the Subject with some sense of relief.

The DI Subject has to perform some degree of mental gymnastics to first position himself in the non-deceptive position and its "correct" answer, and from that point determine the answers which he wil profess to be first, the lie, and second, the truth. Given the situation whereby a denial to the relevant or second question of the set would be a truthful person's response, the deceptive individual has to admit "yes" as the requested lie. In actuality, for the DI individual, this is an admission, though grudgingly given, to culpable involvement. It is at this point that some DI Subjects confess. Additionally, the presense of significant control responses with the DI Subject may be caused, I think, by the involved and sometimes confusing mental activity he has to perform. This is unlike the lie or doubtful answer deliberately produced by the traditional type of control known in standard testing. In both instances, however, the result is reaction.

Reali, at his Philadelphia school, suggests a "two out of three rule" for chart interpretation. Comparatively speaking, the balance of the question set is measured by observing whether reactions occur in at least two of the three physiological parameters in either the control or relevant side of the question set.

To establish a numerical evaluation, a system of plus or minus one value for each channel may be used. If the larger response can be seen in the control side of the parameter the score is +1; if the greatest response is observed at the relevant side, -1. A +2 or +3 score, for example, would indicate truthfulness while a -2 or -3 would indicate deception. Zero would be inconclusive. You may also employ the Backster or the Army Zone system of + or -3 for each reaction in each channel, treating each pair as a zone. However, the scores are cumulative only for repetitions of the same questions, as is done with MGQT totals.

In evaluating the reactions, the examiner may wish to observe the tracings following the requested truthful answer. Specifically, that involves the two patterns associated with one Positive Control Set and the first pattern of the following set. The requested truth answer is then bracketed on each side by what is claimed to be a deliberate lie. The sequence of the three response areas, from left to right, is a requested lie, requested truth and another requested lie. For the NDI person the largest reaction should be on either side of the requested truth or middle tracing of this 3 pattern "spot." For the DI Subject, the middle response appears larger than those flanking it.

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For this type of evaluation in a specific test, the set following the target issue should be a norm item. In screening, this third position of the spot could be either the control portion of a norm set or one of the areas of the screening test to which the Subject is NDI. The point is, the examiner will want to be reasonably certain of the ground truth in comparing the control response with the preceeding requested truth pattern.

My experience has been that persons who plan to practice deception often exhibit resistance to being examined by the Positive Control Technique. That is, when the DI Subject is confronted with instructions to answer with a requested lie and the requested truth to the same issue, and told that his largest reaction will be seen at the point of actual deception, he attempts to avoid the situation through a belligerent attitude.

In the situation where a deceptive person has denied involvement in an incident, this person will sometimes literally follow the instruction to "tell a lie," the first time he hears the specific question and at that point, spontaneously answers "no," instead of "yes." This confusion on the examinee's part is significant, and useful in the post-test interrogation. In screening you will point out that he has had no similar problem with other specific issues asked during the test. In specific cases you will point out that he was so confused by his act of lying that he has confessed.

SAMPLE PCQT SERIES FOR SPECIFIC TEST

Chart Markings	Questions	Answers
aC aR	Is your first name Ralph? Repeat aC	No Yes
ЪС	Is your last name Ball?	No
bR	Repeat bC	Yes
1C	When that money was taken from the company safe were you there?	Yes
1R	Repeat 1C	No
2C	Did you take any of the money from the company safe?	Yes
2 R	Repeat 2C	No
dC dR	Have you ever gone to school? Repeat dC	No Yes
3C	Have you received any of that money taken from the company safe?	Yes
3R	Repeat 3C	No
4C	Do you know where any of that stolen money is now?	Yes
4R	Repeat 4C	No

SOME THOUGHTS ON LYING AND CONFESSING

By

Special Agent Francis M. Connolly Federal Bureau of Investigation

In a presentation made to the American Polygraph Association Seminar at Las Vegas, Nevada, in August 1977, Warren D. Holmes, a Miami, Florida polygraph expert, said he believes the followers of his profession should utilize a three-fold approach to determine truth and deception. Holmes described the approach as (1) case analysis, (2) subject analysis, and (3) chart analysis. "If each supports the other," he said, "we come closest to establishing what is certainly true." This writer subscribes to Mr. Holmes' premise and has found it to be effective in the conduct of polygraph examinations. Successful case analysis is dependent, of course, on the thoroughness of the investigation. Chart analysis will succeed or fail on the skill and training of the particular examiner. Subject analysis must of necessity involve physical as well as psychical considerations. It is the psychical or mental consideration I wish to discuss here, and which can present us the most difficulties if not properly understood.

The origins of deception, as well as the innate need to confess that deception are associated with this cerebral or psychical consideration of "subject analysis." We know that deceptive behavior appears early in our lives, even before the development of any consciousness related to our deceitful behavior. Appearing at the same stage of life is an unconscious need for self punishment, which finds partial gratification in the need or compulsion to confess. If we are able to analyze and understand this dichotomy and are able to verbalize it to others, we may be in a position to achieve what Warren Holmes talks about in establishing "what is true."

In her book on lying, Sissela Bok defines a lie as "any intentional deceptive message which is stated." Mrs. Bok, the wife of the President of Harvard University, and herself a teacher of Ethics at Harvard Medical School, emphasizes that the intent to mislead is the crux of the matter, not the truth or falsity of the statement itself. She tells us of the initial imbalance in the evaluation of truth telling and lying the following words: "Lying requires a reason while truth telling does not." We know from experience that lying is in itself a defense mechanism, and, that at one time or another, we all depend upon certain forms of deception in our contacts with others. In order to lie we must of necessity have some understanding of the truth and have a deep conviction that what we are saying is contrary to what we know and believe.

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The distinguished French psychiatrist Marcel Eck, in his book, <u>Lies</u> and <u>Truth</u> tells his readers, "the person who lacks imagination or intelligence would be incapable of lying." He also writes, "we must recognize that the most intelligent are often the most deceptive and the most capable of lying." Most students of human behavior would, I feel, agree substantially with Dr. Eck in this regard. When we discuss lying from the viewpoint of the polygraph technique, it is important to distinguish between deliberation and pathology as the foundation of the counter truth. To lie without deliberation is to perform in a pathological or sick manner. To lie with deliberation is to be aware of the truth and to have the ability to deny it. Both forms of lies may or may not be discovered during the polygraph examination, depending, of course, on the expertise of the polygraph examiner. The deliberate or intentional lie appears more readily detectable, again depending on the skill of the examiner.

Each of us is aware to some degree of the various reasons people have when they lie. It appears fundamental that the "why" of the lie should be considered of significant importance. The "what," "where," "for whom," and "how" are likewise paramount considerations. How many of us would disagree with Dr. Eck when he concludes, "of all lies, the lie to avoid punishment is by far the most common." If we have a sound understanding of the anatomy of the lie and we are able to discuss that understanding in concise terms, are we not well assisted in our goal of establishing in our subjects that state of mind Cleve Backster termed "psychological set?"

A review of Sissela Bok's Lying: Moral Choice in Public and Private Life appeared in the June 1979 issue of Polygraph. The reviewer, Clarence H. A. Romig, exhorted polygraphists "to become better acquainted with the viewpoints of others toward lying and deception if they would hope to gain more support for the polygraph technique from the scientific community."

Discussing the need or compulsion to confess, as a manifestation of the need for self punishment, would better be the province of psychiatry. This is not to say that laymen cannot obtain some understanding and appreciation of this second phase of the dual phenomenon under consideration here. Certain psychoanalysts have concluded that the unconscious need for self punishment in man must be considered one of the more important emotional forces shaping his destiny. Freud states it somewhat simply when he says, "self betrayal oozes out from all pores," because "we mortals cannot keep secrets." If we are not uncomfortable with this theory, can we not agree with some of these analysts that this need for punishment can find partial gratification in the compulsion to confess? As people who ask the questions, we seek to capitalize on the fear of punishment existing in those being questioned. We know we deal constantly with defense mechanisms, displacement not the least understood of these behaviors. Therefore, we should be aware that, through anxiety, our subjects can transform the fear of punishment into the fear of confession. They can succeed in having the confession itself, as the very thing which precedes the punishment, become the more terrifying consideration. It behooves us all then to recognize this possiblity and, in eliciting confessions, to be patient and skillful in order to ease or remove this burden facing our subjects. If we can recall the knowledge that in each of us exists that unconscious compulsion to confess, with its concomitant need for punishment, we might then more readily understand the need we have to make the conscious confession.

We need not study only the works of psychiatrists and psychologists to understand why we lie and why we confess. Literature is replete with documentation of this dichotomy. Over a hundred years ago, Dostoyevsky showed uncanny insight into the soul, when in "Notes From Underground," he wrote:

In every man's memory, there are things which he does not reveal to everyone but only to his friends. There are also things which he does not reveal to his friends, but at best to himself and only under a pledge of secrecy. And finally there are things which man hesitiates to reveal even to himself, and every decent person accumulates a considerable quantity of such things. In fact, you might say the more decent a person is, the greater the number of such things that he carries around with him."

Shakespeare, perhaps, best depicts the pressure of conscience and the need for expiation, in the words of McBeth, who is addressing himself to the earthly physician over the guilt he feels for his murderous activities, laments as follows:

Cans't thou not minister to a mind diseased, Pluck from the memory a rooted sorrow, Raze out the written troubles of the brain And with some sweet oblivious antidote Cleanse the stuffed bosom of that perilous stuff That weighs upon the heart?

Paul Westhead, the head coach of the World Champion Los Angeles Lakers and a former professor of Shakespearean literature, is reported to have experienced great success in reaching his players by quoting Shakespeare during chalk talks. Who knows what could happen if we polygraphists were to quote the Bard of Avon during our examinations and interrogation?

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BOOK REVIEW

By

Gordon H. Barland, Ph.D.

Surwillo, Walter W. <u>Experimental Design in Psychiatry: Research</u> <u>Methods for Clinical Practice</u>. New York: Grune & Stratton, 1980. 170 pages, with 15 appendices. Indexed. \$19.50.

Surwillo's text on experimental design consists of a number of chapters detailing a variety of statistical tests which are particularly appropriate for polygraph research, plus several very useful chapters such as how to intelligently read and interpret research articles, how to design research studies, etc.

The chapters on statistics cover a variety of tests, and emphasize the nonparametric tests which are usually easy to calculate with a hand calculator, and are especially suited for many polygraph research applications. For example, let us suppose that one wished to conduct a study to determine whether a subject's nervousness makes charts harder to interpret. At the end of the pretest interview each subject is classified as "very nervous," "moderate nervousness," or "relaxed." The polygraph charts are later rated as "very easy to interpret," "average interpretability," or "difficult to interpret." The frequency with which the various combinations occur are noted. Surwillo's book could then be consulted for the appropriate test to determine the significance of the results of this and other types of research designs. Chapter 5 contains an excellent discussion of factors governing the selection of the appropriate statistical test for the data that have been collected.

The statistical portion of the book could have been improved by having more attention being paid to organization. It occasionally appears a bit disjointed. To cite one example, Surwillo mentions on page 18 that the chi square test can be used, when corrected for continuity, if tabular entries are small (say, 5 or less). He then casually mentions some 18 pages later that the chi square test cannot be used if the frequency in a cell is less than 2. The book would also have been materially improved if it had included a table similar to that in Siegel's classic <u>Nonparametric Statistics for the Behavioral Sciences</u>, summarizing the applicability of each type of test, and indicating the pages wehere the detailed description of each test is located.

Chapter 10 is of particular importance to all readers of this journal. It deals with how to critially read and understand research articles. Surwillo describes those critical details which must be included to make the article useful. This chapter can profitably be read by all polygraphists intending to write research articles for publication in a journal. Moreover, those polygraph schools which feel some responsibility toward developing an interest in research amongst their students should seriously consider including a bloc of instruction on research methodology and how to read and write research articles, using this book as a text. Perhaps the most valuable chapter in the book is the last one, dealing with how to design a research project. Surwillo takes the reader step by step through the entire process, pointing out various traps and pitfalls that must be avoided if the results are to be of value. His discussion points out the difference between statistical significance and substantive significance. This chapter is masterfully written and displays considerable wisdom. This one chapter is well worth the price of the entire book!

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ABSTRACT

Blood Pressure/Pulse Transit Time

Geddes, L.A., Voelz, M.H., Babbs, C.F., Bourland, J.D. and Tacker, W.A. "Pulse Transit Time as an Indicator of Arterial Blood Pressure." Psychophysiology 18(1)(January 1981): 71-74.

The relationship between pulse-arrival times and diastolic blood pressure was measured in 10 anesthetized dogs. The pulse-arrival time was measured using the R-wave of the electrocardiogram (ECG) as a time reference. Pulse-transit time was also measured between the carotid and femoral pulses. Blood pressure was raised with epinephrine injected intravenously and lowered with vagal stimulation. In all cases, pulse arrival and transit times decreased with an increase in diastolic pressure for diastolic pressures ranging from 15 to 260 mmHg. The correlation between pulse-arrival time and pressure was poorest when the ECG was used as a timing reference. The best correlation was found with true pulse-transit time and diastolic pressure. When pulse-transit time was used to compute pulse-wave velocity, it was found to increase nearly linearly with blood pressure. From 90-100 mmHg, the pulse-wave velocity increased typically by slightly less than six percent. [author abstract]

Requests for reprints should be addressed to Dr. L. A. Geddes, Biomedical Engineering Center, A.A. Potter Engineering Center, Purdue University, West Lafayette, Indiana 47907.

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Book Review

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