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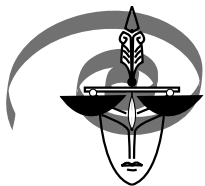
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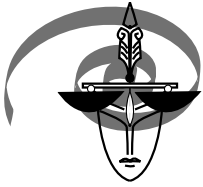
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## The Connection between Score Threshold, Rate of Inconclusives and Minimum Number of Charts Required for Decision of Truth or Deception

**Key Words:** truth or deception decision, polygraph chart evaluation, validity and reliability of polygraph examination

A comprehensive study on Validity and Reliability of Detection of Deception conducted by D.C. Raskin, G.H. Barland, and J.A. Podlesny (1978) for the National Institute of Law Enforcement and Criminal Justice that included field studies and laboratory experiments concluded that the optimal score threshold using the Utah Zone Comparison Technique format was a fixed<sup>1</sup> threshold of +/-6 which would result in an accuracy rate from 88 to 90 percent with an inconclusive rate of approximately 9 percent. Further, the study shows

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<sup>1</sup> A fixed score threshold is one wherein the score threshold does not increase with each chart collected as in the Quadri-Track ZCT, the Backster ZCT and the Integrated ZCT.

that as the scores increase, there is a moderate increase in accuracy reaching approximately 98 percent, particularly from  $\pm 9$  to  $\pm 12$ , but at the expense of an increase in inconclusives. Furthermore, in the Matte, Reuss 1989a<sup>2</sup> field study, tables 10a1, 10a2, 10b1, 10b2 and 10c show that as the scores increase the probability of error decreases, hence an increase in accuracy.

The Raskin et al study provides a graph that shows that as the score threshold increases, the inconclusive rate also increases and when the threshold reaches  $\pm 6$ , the inconclusive rate rises dramatically to 50 percent at  $\pm 12$ , hence the cut-off score threshold of  $\pm 6$  with an inconclusive rate of 9 percent and 90 percent accuracy was chosen in that study as the most utilitarian score threshold. Figure 1 shows the graph from the aforementioned Raskin et al study, which was modified to include the inconclusive rate of the Quadri-Track Zone Comparison Technique whose inconclusive rate, based on three published field research studies (Matte, Reuss 1989a, 1989b; Mangan, Armitage, Adams 2008; Shurany, Stein, Brand 2009) was a low 2.4 percent at the high score threshold of  $\pm 12$ . This exceptionally low inconclusive rate permits the use of the high score threshold of the Quadri-Track ZCT that requires a +3 or -5 per charts (+6 or -10 for two charts, +9 or -15 for three charts, +12 or -20 for four charts for truth or deception respectively with an overall accuracy of 98.8 percent and inconclusive rate of 2.4 percent. Interestingly, the average score per chart for the truthful and deceptive in the Matte-Reuss 1989 study was +6 and -9 per chart and in the Mangan, et al study was +7.1 and -10.0 respectively. This means that when two charts are collected the sum total would be +13 and -19, with an accuracy exceeding 98 percent, justifying the technique's minimum two chart decision requirement (Matte 2012).

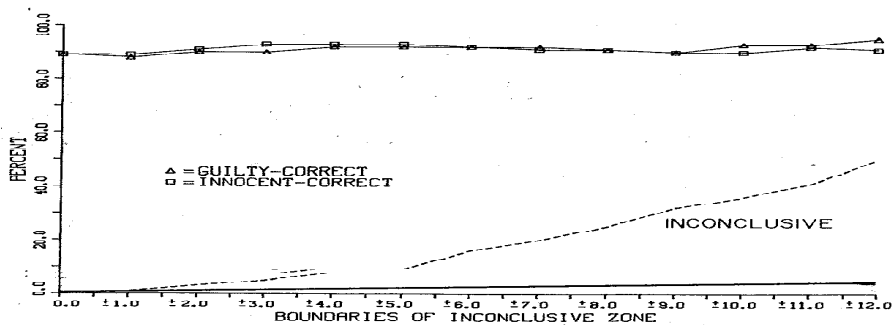


Figure 1. Rates of accuracy and inconclusives with different boundaries of the inconclusive zone. The above Figure 1 from *Validity and Reliability of Detection of Deception* study by D.C. Raskin, G.H. Barland, J.A. Podlesny June 1978, has been modified to include the Inconclusive Rate for the Quadri-Track Zone Comparison Technique studies by Matte, Reuss (1989); Mangan, Armitage, Adams (2008); Shurany, Stein, Brand (2009).

FIGURE 1

<sup>2</sup> Matte, Reuss 1989a 220-page doctoral dissertation and 1989b abridged version of same field study published in *Polygraph*, 18(4) 1989 are available for review and download at [www.mat-tepolygraph.com](http://www.mat-tepolygraph.com).

It becomes evident that the accuracy of decisions regarding truth and deception is directly connected to the overall score attained from the collection of the physiological data in uni-faceted single-issue tests. The higher the score threshold, the more accurate the decision making process. However, as required by the standards of the American Polygraph Association for evidentiary techniques, the inconclusive rate must not exceed 20 percent.

The Quadri-Track Zone Comparison Technique is not the only polygraph technique with a high score threshold. The score threshold in the Integrated Zone Comparison Technique is  $\pm 13$  for three charts and  $\pm 18$  for four charts (N.J. Gordon, personal Communication, January 4 and 5, 2013). The score threshold in Backster Zone Comparison Technique is  $+5$  and  $-9$  for two charts,  $+7$  and  $-13$  for three charts (Backster 1979),<sup>3</sup> and  $+9$  and  $-17$  for four charts (G.C. Adams, personal communication, January 28, 2013).

The use of a low fixed score threshold such as  $\pm 6$  or even  $\pm 4$  (Cushman 2010) may be necessary in some techniques to avoid an excessive inconclusive rate, but the accompanying consequence can be a reduction in accuracy that requires the collection of additional charts to augment its total score (Matte 2011, 2012), hence the minimum 3 charts requirement (Criswell 2012).

The lowest inconclusive rate in the Quadri-Track Zone Comparison Technique's is primarily due to its Inside-Track containing a *Fear of Error* Control Question and a *Hope of Error* Relevant Question whose scores are added to the other two control/relevant question pairs for a total score that is used for a determination of truth or deception. The data in the Matte, Reuss 1989a study tables mentioned above show a significant difference in the error rate when the Inside-Track is omitted or added to the total score of the Primary and Secondary tracks. The Matte, Reuss 1989a, 1989b field study found that with the confirmed Truthful the Inside-Track reduced the Inconclusives from 52 percent to 9 percent, and the confirmed Guilty from 17 percent to 3 percent.

Overall accuracy 100% with 6% Inconclusives.

In the Mangan, et al 2008 field study, the Inside Track reduced the Inconclusives for the Truthful from 32% to Zero, and the Deceptive from 12.3% to 2.2%. Overall accuracy was 100% with 2.2% Inconclusives.

In the Shurany, et al 2009 field study, the Inside Track reduced the Inconclusives for the Truthful from 31% to Zero and the Deceptive from 71% to Zero. Overall accuracy was 96.5% with Zero Inconclusives.

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3 Backster's Standardized Polygraph Notepack and Technique Guide (1969 and 1979) reflect score threshold for 3 charts. However when a fourth chart is required, the threshold continues to climb to  $+9$  and  $-17$ . (G. C. Adams, personal communication, January 28, 2013).

In the Matte & Reuss 1989a field study, the Fear of Error increased the total scores for the Truthful from +341 to +762 thus increasing the score by +421 points. The Fear of Error control question generated an adjustment to the 58 Innocent case scores by increasing the score by an average of +7.3 per case. The average total score per Innocent case without the Fear of Error adjustment was +5.89 and with the Fear of Error adjustment was +13.1. This shows that the “Fear of Error” factor is extremely significant and cannot be ignored in the scoring of Innocent cases. It also increased the average score per case for the Guilty from -19.7 to -25.1.

In the Mangan, et al 2008 field study, the Fear of Error increased the scores for the Truthful from a mean of +4.0 per chart to +7.1 and the Deceptive from a mean of -6.9 per chart to -10.0. When applied to the traditional case of 3 charts the score is NDI +21.3 and DI – 30.0.

In the Shurany, et al 2009 field study, the Fear of Error increased the total score of the Truthful from a mean +3.39 per chart to +5.39 per chart, and the Deceptive from -3.54 per chart to -6.08 per chart. When applied to the traditional case of 3 charts the score is NDI +16.1 and DI -18.24.

The significant increase of scores for the truthful examinees confirms the Fear of Error hypothesis by Dr Ekman and the National Research Council of the National Academies of Science. Furthermore the presence of the Inside Track within the construct of the technique addresses that variable listed under Category A, Identification of Variables (Matte 1996). Importantly, its presence for comparison with the Hope of Error relevant question addresses another variable concerning the legitimacy of reactions to the direct relevant questions in the Primary and Secondary tracks that often raises the issue of false positives.

Another factor that also contributes to the low inconclusive rate is the technique’s Dual-Equal Strong Reaction Rule, an evolutionary and progressive modification of Backster’s Either-Or rule (Matte 1996, 2010, 2011). The Dual-Equal Strong Reaction Rule demands that when the red (relevant) and green (control) zones being inter-compared both contain timely, specific, and significant reactions of maximum and equal strength, a minus one (-1) score is assigned to that spot. The rule is based on the premise that both zone questions appear to be equally threatening to the examinee, the degree of threat being proportionate to the degree of the responses, which indicate that while the examinee may be attempting deception to the relevant question, its neighboring control question may be too intense due to faulty structure, embraces a more serious crime, or a countermeasure attempt was made. A sophisticated guilty



examinee may be able to cause a reaction on the control question but cannot control an oncoming reaction to the relevant question.

The aforementioned Dual-Equal Strong Reaction Rule can significantly reduce the rate of inconclusives that hide the use of physical and mental countermeasures. Dr David Lykken (1998) in his book *A Tremor in the Blood* stated that “A much more effective method of beating the lie detector, however, is to augment one’s reactions to the control questions. However disturbed one may be by the relevant questions, the scoring rules require that the examiner cannot diagnose ‘deceptive’ if the control reactions are just about as strong or even stronger.”

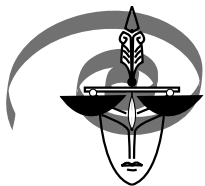
Using the Lykken scenario, the Quadri-Track Zone Comparison Technique would not assign a zero score but a -1 score in the pneumo and cardio tracings on all three track totaling a Minus -6. The electrodermal tracing is excluded from the Dual-Equal Strong Reaction Rule due to its volatility and sensitivity to extraneous stimuli. The score threshold for Deception is -5 per chart and since this minimum -6 score would apply to all charts, a Deceptive result would ensue. Furthermore, since the reaction to the relevant question must be significant to qualify under the Rule, it would be most difficult for the reaction to its neighboring control question to be twice as large in order to meet the 2 to 1 ratio required for a +1 score.

Furthermore, both the Quadri-Track and the Backster Zone Comparison Techniques employ the *Examination Reliability Rating Table* (ERRT) that uses a five-point system to determine which issue has the greatest likelihood of producing conclusive results, on the basis of its combined *Adequacy of Information*, *Case Intensity*, and *Distinctness of Issue* (Backster 1969, Matte 1980, 1996). After 41 years of experience in the use of the ERRT by this author which has been taught at the Backster School of Lie Detection since 1969, this author is convinced that compliance with this case evaluation system can minimise inconclusive results with the assurance that tests are conducted only in those cases where there is ample and accurate case information from which to formulate the test questions, and that the issue being covered is sufficiently distinct and intense to elicit the examinee’s psychological set without offering an opportunity for rationalisation.

The importance of a low inconclusive rate affects more than just its utility, and common sense logic suggests that it can also reduce the successful use of physical and mental countermeasures that are often the cause of inconclusive findings.

## References

- Backster C. (1969), *Standardized Polygraph Notepack and Technique Guide*, New York, NY, Backster School of Lie Detection.
- Backster C. (1989, September), *Backster Zone Comparison Technique: Chart Analysis Rules*, San Diego, CA, Backster School of Lie Detection.
- Criswell E. (2012, July), Quality Control, *The Police Polygraphist*, Journal of the American Association of Police Polygraphists.
- Cushman B. (2010), *Technical Questions*, Presentation at the American Polygraph Association Annual Seminar and Workshop.
- Lykken D.T., (1998), *A Tremor in the Blood – Uses and Abuses of the Lie Detector*, New York, Plenum Publishing Corporation.
- Mangan D.J., Armitage T.E., Adams, G.C. (2008), A Field Study on the Validity of the Quadri-Track Zone Comparison Technique, *Physiology & Behavior* 95 (1–2), pp. 17–23.
- Matte J.A. (1980), *The Art and Science of the Polygraph Technique*, Springfield, IL, Charles C. Thomas.
- Matte J.A., Reuss, R.M. (1989a), Validation Study on the Polygraph Quadri-Zone Comparison Technique, *Research Dissertation Abstract*, LD 01452, Vol. 1502, Proquest Information and Learning (formerly: University Microfilm International).
- Matte J.A., Reuss, R.M. (1989b), A Field Validation Study on the Quadri-Zone Comparison Technique, *Polygraph*, 18 (4), pp. 187–203.
- Matte J.A. (1996), *Forensic Psychophysiology Using the Polygraph: Scientific Truth Verification – Lie Detection*, Williamsville, NY, J.A.M. Publications.
- Matte J.A. (2010), A Field Study of the Backster Zone Comparison Technique's Either-Or Rule and Scoring System Versus Two Other Scoring Systems When Relevant Question Elicits Strong Response, *European Polygraph*, Vol. 4, 2(12), pp. 53–70.
- Matte J.A. (2011), Psychological Aspects of the Quadri-Track Zone Comparison Technique and Attendant Benefits of its Inside Track, *European Polygraph*, Vol. 5, 2 (16), pp. 41–60.
- Matte J.A. (2012), Minimum Number of Polygraph Charts Required to Reach a Conclusion of Truth or Deception in Psychophysiological Veracity Examinations. *European Polygraph*, Vol. 6, 2 (20), pp. 95–102.
- Raskin D.C., Barland G.H., Podlesny J.A. (1978, June), *Validity and Reliability of Detection of Deception*, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, US Department of Justice.
- Shurany T., Stein E., Brand E. (2009), A Field Study on the Validity of the Quadri-Track Zone Comparison Technique, *European Polygraph*, 1 (7), pp. 5–23.



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## Use of Polygraph in Ukraine

**Key Words:** polygraph examination in Ukraine, criminal justice in Ukraine

### History

In the Soviet Union, scholarly disputes over polygraph were substituted by political ones. The main opponent of polygraph detection in criminal justice was the then prosecutor general of USSR, A. Vyshynskiy who considered them an “unscientific underhandedness of bourgeois proceedings”, a return to the Inquisition, etc.[2] Due to such dominant ideological position in the state, polygraph research was suspended for decades.

When Ukraine gained independent, the polygraph became used increasingly both in law enforcement and in private sector.

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In 1997 Argo-A ( an official representative of American Lafayette Instrument Company Inc.) started providing polygraph services, and Alfa-shchyt was set up in 1998.

On 15th October 1998, taking the floor before the representatives of mass media, head of main headquarters of the Ministry of Internal Affairs of Ukraine, general V. Zubchuk disclosed information known to a limited number of journalists. In particular, that the Ministry of Internal Affairs of Ukraine had at its disposal a polygraph detector: "According to my data it [the lie detector] appeared in the Ministry of Internal Affairs in the previous year [i.e. 1997], but they decided not to disclose this information. Apart from the Ministry of Internal Affairs such polygraphs were actively used in Security Service of Ukraine and in some commercial firms having special licenses." [4]

In 1998, a group of employees of the Ministry of Internal Affairs completed a training at the Chief Administration of Internal Affairs of Krasnodar Territory in Russian Federation [18, p. 14]. In 1999, five English-speaking officers (V. Barko, O. Betsa, D. Davydiv, O. Oleksiyiv, and V. Shyshko) from the National Academy of Internal Affairs of Ukraine and Lviv Law Institute of Ministry of Internal Affairs of Ukraine completed education at the Academy of Judicial Psychophysiology in Largo, Florida. The initiator of this step to modernise Ukrainian law-enforcement bodies was colonel I. Rakovskyi, head of Police Association of the Ukrainian Americans (Chicago, US). In 2000, one more Ukrainian (D. Savochkin) completed the training and became the first Ukrainian to become a member of the American Polygraph Association. [23, pp. 5–6].

Since then polygraph has been used increasingly. Employees of Chief Administration of the Ministry of Internal Affairs of Ukraine in the Crimean Autonomous Republic were among the first who started using polygraph detector in practice. Some of them underwent training in the US, and others in Russia. [18, p.14].

In 2001, the minister of internal affairs of Ukraine Y. Smirnov issued the Order No. 743 "On conducting an experiment in using computer polygraph detectors in the course of activity of bodies of Internal Affairs of Ukraine". The polygraph was used in the activity of law-protection bodies in the Crimean Autonomous Republic, Dnepropetrovsk, Donetsk, Kyiv, Luhansk, Lviv and Cherkassy Regions (there were altogether 16 polygraphers in Ministry of Internal Affairs).

In February 2003, the prosecutor of Ternopil Region announced using polygraph in the course of investigating crimes in the further activity of his office. In August 2004, the representative of Obolon District Department of Internal Affairs in Kyiv demonstrated in public the possibility of using polygraph for protection of law. [23, pp. 7–10].

A contribution to the development of polygraphy in Ukraine was also made by L. Chernovetskyi, owner of Praveks Bank who actively introduced polygraphs into the work of his private companies. For instance, in 2005 Praveks Strakhuvannia accomplished what at the time was a record-breaking insurance compensation of 257,000 in a case involving the owner of stolen car after examining him with the polygraph. The polygraph was also actively used in the activity of Praveks Bank, which had its group of nearly 30 polygraphers. [23, pp. 15–16].

An affiliated branch of the Chicago Polygraph Institute (headed by A. Volyk) has worked in Kyiv with Argo-A, training Ukrainian and foreign polygraphers since 2006. In the same year, the International League of Polygraph Examiners and International Polygraph Examiner Association, also presided over by A. Volyk, started its operation. With Ukraine's approx. 300 polygraphers, the unions are Europe's largest by the number of members. [7]

## Legal regulations

Certain attempts to regulate the use of polygraph in law-enforcement bodies were made. In 2001, the Ministry of Internal Affairs issued the Order No.743 "On conducting an experiment in using computer polygraph in activity of internal affairs bodies of Ukraine" which was cancelled by the Order of MIA No.1460 of 24.11.2003 that adopted "The regulation on psychological provision of operating and employment activity of internal affairs bodies of Ukraine". It broadened the scope of psychological research in personnel administration and at the same time postponed the application of polygraph testing in crime detection and investigation till this issue is regulated at the legislative level, statutory and regulatory measures are adopted, and a medical database of using polygraph devices is made. The Order No. 1460 was in turn revoked by the Order of the Ministry of Internal Affairs No. 842 of 28.07.2004 "On further development of psychological provision of operating and employment activity of internal affairs bodies of Ukraine". [20] This order also adopted an

instruction manual regarding the use of computer polygraphs in the course of work with personnel of internal affairs bodies of Ukraine. [6]

Since 2010, the profession of “expert-polygrapher” was introduced into the classification of occupations (code 2144.2), and approved by the order State Committee of Ukraine for Technical Regulation and Consumer Policy. [19]

Legal regulations should be justified first of all by analysing the Ukrainian Constitution. Its Art. 28 states that nobody shall be subject to torture, cruel or inhuman or dishonouring treatment or punishment. No person shall be subject to medical, scientific or other experiments without his/her own wilful consent. [14] The article does not prohibit using polygraph or other scientific and technological means, it only creates certain guarantees of human rights and freedoms, which will be further analysed in greater detail.

Art. 9 of Law of Ukraine “On operative and investigative activity” states that using technical devices that suppress the will or are harmful to the health of people or environment is prohibited.[5] It appears that using a polygraph may be allowed a priori, as it neither suppresses the will nor is harmful to the health of people or environment.

However, such a regulation is not sufficient. It is worth to consider the opinion of D. Movchan who believes that to eliminate controversies regarding legitimacy of using polygraph in the course of investigating crimes it is necessary to provide such a possibility at the level of a legislative act [17, p. 261] (Criminal Procedural Code, Laws “On operative and investigative activity”, “On forensic examination”, etc.). Elaboration and adoption of subordinate legislative act regulating in details procedure of using polygraph in criminal proceedings of Ukraine would be a logical continuation.

## Doctrinal views

Majority of modern scholars are in favour of using polygraphs in criminal proceedings in Ukraine [3; 8; 9; 10; 17]. However, uncompromising opponents of any possibility of such usage still remain, in particular V. Konovalova, [11; 12; 13], O. Larin [16], and others.

All statements about inadmissibility of using polygraph in criminal proceeding may be presented in several groups and subsequently defeated:

*1. Absence of scientific foundations, inaccuracy and unreliability of results received with polygraph*

This argument does not correspond to the facts, as psychologists developed theories of how the polygraph works. Moreover, it was determined in the course of research that accuracy of polygraph examination exceeds 90%, depending on the type of approach used, and in the case of applying different approaches throughout the process of investigation of one person so as to minimise error, accuracy increases up to 95% (which is a rather high result).

*2. Violation of human rights in the course of polygraph examination, humiliation of examinee honour and dignity, physical and psychological abuse of the examinee, immorality and reactionary essence of the method etc.*

Human rights are not absolute in fact, and with certain grounds present they may be violated. In this case, it is necessary to follow certain procedural guarantees which would prevent from unreasonable violations. Such grounds may include crimes committed and the need for “a fast, absolute and impartial investigation and judicial examination for everyone who committed a criminal offence to be brought to responsibility to the extent of his/her guilt and for each innocent not to be accused or sentenced” (Art. 2 of Criminal Procedural Code of Ukraine) [15]. For performing different actions, various procedural guarantees are provisioned (court order regarding possibility of performing action, sanction of the prosecutor, etc.). In the use a polygraph, the examinee receives the almost most extensive guarantees of protection their rights. First, a polygraph test may be carried out only in the case of wilful consent of the person to be tested. Secondly, the whole process of inspection is video recorded. Thirdly, before the test, the polygrapher discusses every question to be asked with the person. Fourthly, the examinee has the right to refuse further examination at any stage.

But are human rights really violated to some extent through polygraph examination? We may, particularly, speak about violation of freedom from self-accusation (Art. 63 of the Constitution of Ukraine). But in such case this right is violated also during questioning of the accused who did not use his right not to give evidence. Since in both cases a person chooses voluntarily the line of their behaviour, namely, whether to provide or not to provide evidence, and whether to agree or refuse polygraph test. We may consider violation only when a person is forced to examination against their will. However, the voluntary nature of the procedure is the cornerstone of psychophysiological diagnosis in polygraph testing, which makes no sense without it.

The Art. 28 of the Constitution of Ukraine states that no one shall be subject to medical, scientific or other research without their wilful consent. Since in its essence polygraph examination is a psychophysiological test, this article too admits the possibility of using polygraph only with the consent of the examinee.

P. 2.1. of the Instruction manual regarding usage of computer polygraphs in the course of work with personnel of internal affairs bodies of Ukraine states that according to the principle of wilful consent, a polygraph specialist starts the polygraph examination only having received written consent, and having ensured that such a consent is indeed wilful and is not the result of force or psychological pressure of any third parties.[6]

This principle is also ensconced in p. 3.8.2 of the Practice Standards of the International League of Polygraph Examiners where it is stated that “a polygrapher shall receive written consent of the person under test before polygraph examination”.[22]

The instruction manual regarding usage of computer polygraphs in the course of work with personnel of internal affairs bodies of Ukraine also stresses the importance of adherence to the rights of the examinee, and states in p. 2.3 “Principle of overall support of human rights is of utmost importance for the polygrapher. A person has the right to refuse examination at any stage, to know why the examination is held, to be familiar with the subject of the testing, and to explain or not to explain what they believe to be the potential reasons for reactions. Securing human rights is achieved through steadfast compliance, with the duration of examination lasting from 9 to 16 hours, taking into consideration the condition of the person.”[6]

*3. In the course of polygraph investigation a person becomes an object of research.* However, a person is also an object of research in cases of conducting medical evidence, psychological expertise and forensic psychiatric examination, the taking of biological samples, etc. While in the process of taking biological samples and conducting medical evidence in court, it is the physical body of a person that is the object, in the process of forensic psychological expert examination or forensic psychiatric expert examination, the object is their psychological activity; their inner world, as to quote I. Kohutysh, in the process of polygraph examination “humiliating, and therefore immoral and illegal may be the artificially created atmosphere in which the examination is conducted,



the behaviour of the person who conducts the examination, if based on illegal or psychical acts of force.” [10, p. 314].

A problem is also perceived in the possibility of “receiving information which does not concern the case under investigation but rather the personal sphere, coercive or covert intrusion which contradicts human rights and freedoms guaranteed by the Constitution of Ukraine. Prevention of such possible distortions is one of the conditions for elaborating rules for using the polygraph and establishing guarantees of legitimacy of using its results.” [10, pp. 314–315]. To prevent this problem in the course of polygraph examination two guarantees are provided: 1) all questions are previously discussed with a person; 2) the examinee has the right to refuse further continuation of procedure at any moment of the examination.

Therefore, the examinee may protect themselves from frivolous penetration into their inner world.

*4. Giving consent to polygraph investigating, the accused takes over the burden of proof of their innocence, excusing the prosecution from duty to prove their guilt.*

A statement that also seems to be an exaggeration. Since in such case we may say the same about taking over the burden of proof of their innocence in each case of evidential activity on the part of the accused. If a person gives denunciative evidence regarding themselves, they take over the burden of proof and release the prosecution from the duty to prove their guilt, provide proofs and release the prosecution from the duty to prove their guilt, etc.

Giving consent to a polygraph examination, a person may be guided by different motives: a will to prove their innocence, a hope for error in the course of examination (in case a guilty person) etc. Yet such a consent cannot be interpreted as taking over the burden of evidence.

*5. Polygraph suppresses the will of the person.*

Associating polygraph with applying hypnosis or psychotropic drugs (“truth serum”) that suppress the will of a person is rather widespread. Using such methods is prohibited in Ukraine. Section 16 of Art. 9 of Law of Ukraine “On operative and investigative activity” guarantees that “for obtaining information it is prohibited to use technical equipment, psychotropic, chemical or other substances suppressing the will or being harmful to the health of a person or environment”, [5] as mentioned above.

Associating polygraph with methods listed above is deeply erroneous; it neither suppresses the will of a person under examination in any way nor does it affect their mind or mentality. As it was already mentioned, polygraph only registers the flow of physiological processes in an organism. In other words, it is virtually a combination of several medical instruments. A person preserves the ability to think in clear mind and take decision freely throughout the course of the procedure.

### Judicial practice

The results of enquiry in polygraph are rarely used in court. In most cases they provide only general bearings, and head investigation into the right direction. The polygraph is used in particular for reducing the number of people suspected of committing a crime, or establishing evidential value of the assembled evidences, finding locations of persons or things, identifying unrecognised bodies, detecting missing people, identifying place of residence of people, investigating undetected crimes of past years, etc.

However, individual cases of recognising polygraph results as evidence in court still exist. In particular, according to the sentence of Luhansk Court of Appeal in a criminal case on intentional homicide (No. 1-13/2010) the conclusion of a psychophysiological expert examination, which proved the truth of confessing guilt by the accused, acquired evidential significance. [1] The trial considered expert findings to be veracious, properly justified, and corroborated by other evidence investigated by the court. A similar position is reflected in a number of other judicial decisions.

### Instruments

Mostly used in Ukraine are polygraphs of American (Lafayette, Axciton, Stoelting) and Russian (Diana, Epos, Polarg, Kryz, Ryf, Barrier) make. However, Ukraine has also developed its own inventions in the field. Currently, an Ukrainian scientist, Dr Petro Slynko, claims that upon request from the KGB he developed a lie detector in the 1980s. His polygraph was based on the Galvanic Skin Response (GSR). According to Dr Slynko, due to the collapse of the Soviet Union, his project was abandoned. [23, p. 3].

Moreover, scientists of the Kharkiv Aviation Institute of the National Aerospace University developed ReoCom Stress, a computer polygraph designed for recording of changes in physiological parameters of a person under the influence of external stimulating factors aiming to diagnose stress conditions of the person under examination. [21, p.105] ReoCom Stress enables simultaneous registration of indicators of 18 physiological parameters of the examinee.

## Conclusions

Polygraphs are actively used by private companies (banks, insurance companies etc.) in Ukraine for testing employees before hiring them and for regular testing in internal investigations.

Polygraphs are also used by law enforcement bodies (however, basically in areas related to employment), and rarely used for investigation of crime. The reasons being the absence of adequate legal regulation, insufficient development of scientific capacity for using instrumental methods of psychophysiological diagnostics in Ukrainian legal doctrine, distrust towards the polygraph on the part of employees of law-protection bodies and some scholars, etc.

Even more rarely the results of polygraph examination are used as evidence in court. However, the number of such cases is increasing with the increased interest of scholars and practitioners in polygraph.

## References

1. Вирок апеляційного суду Луганської області від 13.04.2010 року по кримінальній справі № 1-13/2010 [Електронний ресурс] // Режим доступу до документу – <http://www.reyestr.court.gov.ua/Review/9218792>
2. Вышинский А. Я. Теория судебных доказательств в советском праве. Москва, Государственное издательство юридической литературы, 1950. 308 с.
3. Гончаренко В. Г. Критерії допустимості психологічного впливу на досудовому слідстві / В. Г. Гончаренко, С. В. Гончаренко // Вісник Академії адвокатури України. 2010. № 3 (19). С. 107–116.
4. Детектор лжи – на службу в МВД! // Сегодня. – Вып. № 200 (203) за 17.10.1998 г. [Електронний ресурс] // Режим доступу до документу – <http://www.segodnya.ua/oldarchive/dc9f8e7ac9f0b8f1c225669f003e89f1.html>

5. Закон України «Про оперативно-розшукову діяльність» // Відомості Верховної Ради України. 1992. № 22. Ст. 303.
6. Інструкція щодо застосування комп'ютерних поліграфів у роботі з персоналом органів внутрішніх справ України [Електронний ресурс] // Режим доступу до документу – <http://zakon1.rada.gov.ua/laws/show/z1373-04>
7. Історія детектора брехні [Електронний ресурс] // Режим доступу до документу - <http://www.argo-a.com.ua/ukr/history.html>
8. Клименко Н. Возможности использования в расследовании злочиинв деяких не-традиційних криміналістичних та спеціальних знань і методів / Н. Клименко, О. Клевцов // Право України. 1998. № 1. С. 95–103.
9. Когутич І. І. Допустимість використання в процесі розслідування у кримінальних справах інструментального методу діагностування негативних обставин. Львів, 1999. 24 с.
10. Когутич І. І. Криміналістичні знання, їх сутність і потреба розширення меж використання. Львів, Тріада плюс, 2008. 420 с.
11. Коновалова В. О. Алгоритмізація в теорії криміналістики / В. О. Коновалова // Вісник Академії правових наук. 2007. № 1 (48). С. 173
12. Коновалова В. Е. Допрос: тактика и психология. Харьков: Консум, 1999. С. 134–135.
13. Коновалова В.О. Моральні засади судочинства / В. О. Коновалова // Вісник Академії правових наук. 2006. № 2 (45). С. 180.
14. Конституція України // Відомості Верховної Ради України. 1996. № 30. Ст. 141.
15. Кримінальний процесуальний кодекс України [Електронний ресурс] // Режим доступу до документу – <http://zakon1.rada.gov.ua/laws/show/4651%D0%B0-17>
16. Ларин А. М. Криминалистика и паракриминалистика. Научно-практическое и учебное пособие Москва, Издательство БЕК, 1996. С. 148.
17. Мовчан Д.А. Питання імплементації в Україні зарубіжних підходів до нормативно-правового регулювання застосування поліграфа у процесі розкриття та розслідування злочинів // Науковий вісник Київського національного університету внутрішніх справ. 2009. № 5. С. 256–262.
18. Морозов А. М. Некоторые аспекты современного состояния полиграфологии в Украине // Эксперт криминалист. 2011. № 1. С. 14–16.
19. Наказ Державного комітету України з питань технічного регулювання та споживчої політики від 28.07.2010 р. за № 327 «Про затвердження, внесення змін

- та скасування нормативних документів» [Електронний ресурс] // Режим доступу до документу – <http://zakon1.rada.gov.ua/laws/show/v0327609-10>
20. Наказ Міністерства внутрішніх справ № 842 від 28.07.2004 р. «Про подальший розвиток служби психологічного забезпечення оперативно-службової діяльності органів внутрішніх справ України» [Електронний ресурс] // Режим доступу до документу – <http://zakon1.rada.gov.ua/laws/show/z1365-04/ed20040728>
  21. Розроблено комп'ютерний реограф РеоКом Stress // Криміналість первопечатный. 2011. № 2. С. 105–106.
  22. Стандарти практики Міжнародної ліги поліграфологів [Електронний ресурс] // Режим доступу до документу – [http://www.polygraph.org.ua/standards\\_ukr.html](http://www.polygraph.org.ua/standards_ukr.html)
  23. Volyk A., History and development of the Polygraph in Ukraine, Lafayette, Indiana, US, 2006.



Reprints







Tuvya T. Amsel<sup>1</sup>

## Comparative Review of Polygraph and Other Diagnostic Tools and Methods\*

*A lie can travel halfway round the world  
while the truth is putting on its shoes*  
Attributed to Mark Twain

### Abstract

Unlike the polygraph, many diagnostic tools and methods are admissible in court in spite of being as accurate as, or less accurate than, the polygraph. The data on various forensic and medical diagnostic tools and methods reviewed in this article conclusively leads to the conclusion that time has come to recognize the polygraph as an admissible forensic diagnostic tool.

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Since the Frye decision in 1923 it seems that polygraph validity is haunted by what Justice Van Orsdel said: “The systolic blood pressure deception test had not gained enough standing and scientific recognition among physiological and psychological authorities to justify its admission as evidence in courts of law.”<sup>2</sup> Justice Van Orsdel’s words were repeated too many times by jurists, researchers and other interested parties sometimes disguised in a humanitarian outfit. For too many decades polygraph has been on the defense without any favorable chances. Whereas fingerprinting and DNA are evidential royalties, polygraph is not even a commoner. While being realistic enough to face the polygraph flaws, in the same token when comparing the polygraph to other forensic and medical diagnostic tools and methods recognized by courts, one cannot avoid but cry, “The King is naked.”

## Latent Fingerprints

Although they are considered as “heavy weight” admissible evidence, the following case exemplifies its reliability: In the trial of *United States of America v. Byron Mitchell* (1999), a latent print examiner testified to identification between two latent prints lifted from a getaway car and the 10-print card of the defendant. The defendant claimed innocence and challenged the accuracy of the fingerprint evidence. The FBI attempted to demonstrate the scientific certainty of the identification between the defendant’s 10-print and the two latent prints found in the car. As part of the demonstration presented at trial, the FBI sent the two latent prints, together with the defendant’s 10-print, to 53 different law enforcement agencies around the United States, told them that this request was very important, and asked that their most “highly experienced” examiners determine whether any identifications could be made. This was a unique opportunity for a demonstration of concurrence among experienced examiners. Thirty-nine agencies returned analyses of the prints to the FBI. Nine of them (23%) found that either one or both of the latent prints did **not** match any of the prints from the defendant’s 10-print card.<sup>3</sup>

In 1994 the American Society of Crime Laboratory Directors (ASCLD) Proficiency Advisory Committee contacted the International Association for Identification (IAI) and asked for assistance in the manufacture and review of future testing materials. The IAI contracted with the Collaborative Testing Services (CTS), and, from 1995 to the present, the external latent fingerprint

<sup>2</sup> *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

<sup>3</sup> L. Haber, R. Haber (2003), *Error Rates for Fingerprint Comparisons*, [in:] N.K. Ratha (ed.), *Advances in Automatic Fingerprint Recognition*, New York, Springer Verlag.

examiner proficiency test used by ASCLD has been administered by CTS, and designed, assembled, reviewed, and authorized by the IAI. Its format still consists of a number of latent prints and 10-print cards and the only responses required are identification or elimination. The summary responses reported by CTS combine consensus reports from laboratories and from individual examiners. The overall results for the seven years from 1995 to 2001 are listed in the following table:<sup>4</sup>

Year of Test	Number of Examiners	All Correct Responses %	One or more Erroneous ID %	One or more Missed ID %
1995	156	44	20	36
1996	184	16	3	81
1997*	204	61	6	28
1998	219	58	6	36
1999	228	62	5	33
2000	278	91	4	5
2001	296	80	3	17

\* Respondent made more than one kind of error

## DNA

If fingerprints are the queen of evidence then the DNA is definitely the king, or is it really? As a result of quality control case reanalysis, the Illinois State Police discovered an error rate of 25% in negative biology/DNA work. In other words, biology/DNA cases that were really positive for semen were being reported as negative.<sup>5</sup> “The Houston Police Department (HPD) shut down the DNA and serology section of its crime laboratory in early 2003 after a television exposé revealed serious deficiencies in the lab’s procedures, deficiencies that were confirmed by subsequent investigations. Two men who were falsely incriminated by botched lab work have been released after subsequent DNA testing proved their innocence. In dozens of cases, DNA retests by independent laboratories have failed to confirm the conclusions of the HPD lab. The DNA lab remains closed while an outside investigation continues. In Virginia, post-conviction DNA testing in the high-profile case of Earl Washington, Jr. (who was falsely convicted of capital murder and came within hours of execu-

<sup>4</sup> *Ibidem*.

<sup>5</sup> Illinois State Police (2005), *DNA Testing Accountability Report*, [see in:] [www.isp.state.il.us/docs/05dnareport.pdf](http://www.isp.state.il.us/docs/05dnareport.pdf).

tion) contradicted DNA tests on the same samples performed earlier by the State Division of Forensic Sciences. An outside investigation concluded that the state lab had botched the analysis of the case, failing to follow proper procedures and misinterpreting its own test results.

- In 2004, an investigation by the *Seattle Post-Intelligencer* documented 23 DNA testing errors in serious criminal cases handled by the Washington State Patrol laboratory.
- In North Carolina, the *Winston-Salem Journal* recently published a series of articles documenting numerous DNA testing errors by the North Carolina State Bureau of Investigation.
- The Illinois State Police recently cancelled a contract with Bode Technology Group, one of the largest independent DNA labs in the country, expressing “outrage” over poor quality work.
- LabCorp, another large independent lab has recently been accused of botching DNA tests.

One chronic problem that is now being recognized is the uneven quality of forensic DNA laboratories. Laboratories vary greatly in the care with which they validate their methods and the rigor with which they carry them out. Another problem now emerging into the light is an unexpectedly high rate of laboratory errors involving mix-up and cross-contamination of DNA samples. Errors of this type appear to be chronic and occur even at the best DNA labs. A third problem now emerging is dishonest DNA analysts who falsify test results. I suspect this third problem is closely related to the second problem: DNA analysts are faking test results to cover up errors arising from cross-contamination of DNA samples and sample mix ups.”<sup>6</sup>

Of the 2,749 victims of the 9/11 WTC attack, 1,592 were identified by a variety of forensic techniques. Although the identity of the missing persons were known and although the families provided DNA comparison samples, only 111 (4%) missing persons identifications were made from the 23,608 extracted DNA samples recovered from the WTC site.<sup>7</sup>

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<sup>6</sup> J.C. Thompson (2006, January/February), *Tarnish On The ‘Gold Standard’: Recent Problems In Forensic DNA Testing*, *The Champion Magazine*, 10.

<sup>7</sup> E. Lipton (2005, April 3), *At the Limits of Science*, *New York Times*.

## Comparative Bullet Lead Analysis (CBLA) a.k.a Compositional Analysis of Bullet Lead (CABL)

The CBLA was first used in 1963 in JFK's assassination investigation. The CBLA matches the chemical composition of a bullet lead found in the scene with bullets and/or bullet box found in the suspect's possession, under the assumption that the molten (melted lead alloy) source has a uniform chemical composition throughout, so no two molten sources have the same chemical composition. CBLA is considered a scientific, flawless and accurate technique. Since its first use the FBI Crime Lab performed about 2,500 analyses that led to conviction. Due to on-going critique by defense lawyers and the press the FBI finally asked the United States National Academy of Sciences to research the scientific merit of the process. The Academy conclusion was that, "Variations among and within lead bullet manufacturers make any modeling of the general manufacturing process unreliable and potentially misleading in CABL comparisons."<sup>8</sup>

## Medicine

Research regarding the cause of diagnostic error in medicine found that, "We argue that physicians in general under-appreciate the likelihood that their diagnoses are wrong and that this tendency to overconfidence is related to both intrinsic and systemically reinforced factors."<sup>9</sup> The error rate in some instances is alarming.<sup>10</sup>

Some excerpts from the research:<sup>11</sup>

- "126 patients who died in the ICU and underwent autopsy, physicians were asked to provide the clinical diagnosis and also their level of uncertainty. Clinicians who were 'completely certain' of the diagnosis before death were wrong 40 percent of the time."

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<sup>8</sup> United States National Academy of Sciences' Board on Chemical Sciences and Technology, (2004), *Forensic Analysis Weighing Bullet Lead Evidence*, The National Academies Press, Washington D.C.

<sup>9</sup> E.S. Berner, M.L. Graber (2008), *Overconfidence as a Cause of Diagnostic Error in Medicine*, *The American Journal of Medicine*, (121)5, S2.

<sup>10</sup> *Ibidem*.

<sup>11</sup> *Ibidem*.

Conditions	Findings
Pulmonary TB	Studies that have specifically focused on the diagnosis of pulmonary TB; 50% of these diagnoses were not suspected ante-mortem
Pulmonary embolism	Of 67 patients who died of pulmonary embolism, the diagnosis was not suspected clinically in 37 (55%)
Ruptured aortic aneurysm	Of 23 cases involving abdominal aneurysms, diagnosis of ruptured aneurysm was initially missed in 14 (61%); in patients presenting with chest pain, diagnosis of dissecting aneurysm of the proximal aorta was missed in 35% of cases
Subarachnoid hemorrhage	Updated review of published studies on subarachnoid hemorrhage: 30% are misdiagnosed on initial evaluation
Cancer detection	Of the 250 malignant neoplasms found at autopsy, 111 were either misdiagnosed or undiagnosed
Breast cancer	50 accredited centers agreed to review mammograms of 79 women, 45 of whom had breast cancer; the cancer would have been missed in 21%
Melanoma	Second review of 5,136 biopsy samples; diagnosis changed in 11%
Bipolar disorder	The initial diagnosis was wrong in 69% of patients with bipolar disorder and delays in establishing the correct diagnosis were common
Appendicitis	Retrospective study at 12 hospitals of patients with abdominal pain and operations for appendicitis. Of 1,026 patients who had surgery, there was no appendicitis in 110 (10.5%); of 916 patients with a final diagnosis of appendicitis, the diagnosis was missed or wrong in 170 (18.6%)
Cancer pathology	The error rate of pathologic diagnosis was 2%–9% for gynecology cases and 5%–12% for non-gynecology cases
Endometriosis	Digital videotapes of laparoscopies were shown to 108 gynecologic surgeons; the inter-observer agreement regarding the number of lesions was low (18%)
Psoriatic arthritis	1 of 2 SPs with psoriatic arthritis visited 23 rheumatologists; the diagnosis was missed or wrong in 9 visits (39%)
Atrial fibrillation	Review of automated ECG interpretations read as showing atrial fibrillation; 35% of the patients were misdiagnosed by the machine, and the error was detected by the reviewing clinician only 76% of the time
Infant botulism	Study of 129 infants in California suspected of having botulism during a 5-yr period; only 50% of the cases were suspected at the time of admission

- Lack of knowledge *per se*, such as seeing a patient with a disease that the physician has never encountered before. More commonly, cognitive errors reflect problems gathering data, such as failing to elicit complete and ac-

curate information from the patient; failure to recognize the significance of data, such as misinterpreting test results; or most commonly, failure to synthesize or put it all together.

- “The breakdown in clinical reasoning often occurs because the physician isn’t willing or able to ‘reflect on [his] own thinking processes and critically examine [his] assumptions, beliefs, and conclusions.’ In a word, the physician is too ‘confident.’”

## Courts

Gelman et al. (2004) examined 4,578 appeals of death sentences in U.S. states between 1973 and 1995 and found that, “... the overall rate of prejudicial error in the American capital punishment system was 68%. In other words, courts found serious, reversible error in nearly 7 of every 10 of the thousands of capital sentences that were fully reviewed during the period... Capital trials produce so many mistakes that it takes three judicial inspections to catch them leaving grave doubt whether we do catch them all. After state courts threw out 47% of death sentences due to serious flaws, a later federal review found ‘serious error’ undermining the reliability of the outcome in 40% of the remaining sentences.”<sup>12</sup>

## Psychiatry

In order to avoid punishment in criminal trials a defendant’s use of the insanity defense is where s/he claims not being responsible for her/his actions due to mental health problems which are being determined by psychiatrists. The “Rosenhan experiment”<sup>13</sup> examined the validity of psychiatric diagnosis. The study consisted of two parts. The first involved eight “pseudo-patients” – people who had never had symptoms of mental disorder – who, as part of the study, briefly reported auditory hallucinations in order to gain admission to psychiatric hospitals across the United States. After admission, the pseudo-patients no longer reported hallucinations and behaved as they normally would. The pseudopatients remained in hospital for 7 to 52 days. None of the pseudo-patients were detected, and all but one were admitted with a diagnosis

<sup>12</sup> A. Gelman, J.S. Liebman, V. West, A. Kiss (2004), *A Broken System: The Persistent Patterns of Reversals of Death Sentences in the United States*, *Journal of Empirical Legal Studies*, 1(2), 209–261.

<sup>13</sup> D.L. Rosenhan (1973), *On Being Sane in Insane Places*, *Science*, Vol. 179, 250–258.

of schizophrenia and were eventually discharged with a diagnosis of schizophrenia in remission. Although they were not detected by the staff, many of the other patients suspected their sanity (35 out of the 118 patients voiced their suspicions). In the second part of the experiment staff at a teaching hospital, who had learned of Rosenhan's above results, were informed that one or more pseudo-patients would attempt to be admitted to their hospital over an ensuing three-month period. Out of the 193 admitted 41 patients were subsequently identified as likely pseudo-patients but in fact no pseudopatient had been sent at all.

### Polygraph Compared to Other Forensic and Diagnostic Tools

Widacki & Horvath (1978) examined in laboratory conditions the relative validity of the polygraph with three other common methods of criminal investigation. The table below represents their findings.<sup>14</sup> Crewson (2003)<sup>15</sup> reviewed 1,158 articles and abstracts (145 fit the objectives of the literature review, yielding data on 198 studies) which compared the validity of polygraph with other medical and psychological screening and diagnostic tools. The comparison revealed the following data:

Diagnostic Tool	Correct	Incorrect	Inconclusive	False Positive
Polygraph	90%	5%	5%	1.30%
Handwriting	85%	5%	10%	1.40%
Eyewitness	35%	20%	45%	9.10%
Fingerprint	20%	0%	80%	0%

Diagnostic Tool	Sensitivity	Specificity	Combined	Studies (N)
<b>Polygraph (Diagnostic)</b>	<b>0.92</b>	<b>0.83</b>	<b>0.88</b>	<b>37</b>
MRI	0.86	0.88	0.87	17
CT	0.83	0.89	0.86	19
US	0.84	0.87	0.86	38
X-Ray	0.77	0.85	0.81	12
MAST	0.64	0.92	0.78	3

<sup>14</sup> J. Widacki, F. Horvath (1978), *An Experimental Investigation of the Relative Validity and Utility of the Polygraph Technique and Three Other Common Methods of Criminal Investigation*, *Polygraph*, 7(3), 215–222.

<sup>15</sup> P.E. Crewson (2003), *Comparative Analysis of Polygraph with other Screening and Diagnostic Tools*, *Polygraph*, 32 (1), 57–85.



<b>Polygraph (Screening)</b>	<b>0.59</b>	<b>0.9</b>	<b>0.74</b>	<b>2</b>
DSM-IV	0.72	0.68	0.7	1
MMPI	0.68	0.65	0.67	17
MMPI (Screening)	0.7	0.53	0.61	5

*see next page for a description of diagnostic tools*

In addition, a reliability (inter-rater agreement) comparison was made and revealed the following data:

	<b>Polygraph</b>	<b>Medicine</b>	<b>Psychology</b>
Agreement	91%	81%	88%
No. Subjects	102	150	174

## Validity and reliability of the polygraph

A compendium of various researches done by Ansley in 1983 and later in 1990 averages the validity and the reliability of the polygraph around 94%.<sup>16</sup>

**Sensitivity** – The proportion of diseased cases with a positive test (perfect accuracy = 1.0) i.e. the test identifies the sick. Polygraph identifies guilty subject as guilty.

**Specificity** – The proportion of non-diseased cases with a negative test (perfect accuracy = 1.0) i.e. the test identifies the healthy. Polygraph identifies innocent subject as innocent.

**MRI** – Magnetic resonance imaging is a test that uses a magnetic field and pulses of radio wave energy to make pictures of organs and structures inside the body.

**CT** – Computerized tomography imaging, also referred to as a computed axial tomography (CAT) scan, involves the use of rotating x-ray equipment, combined with a digital computer, to obtain images of the body.

**US** – Ultrasound imaging is a common diagnostic medical procedure that uses high-frequency sound waves to produce dynamic images (sonograms) of organs, tissues, or blood flow inside the body.

<sup>16</sup> N. Ansley (1983), *A Compendium on Polygraph Validity*, *Polygraph*, 12(2), 53–61; N. Ansley (1990), *The Validity and Reliability of Polygraph Decisions in Real Cases*, *Polygraph*, 19(3), 169–181.

**MAST** – Michigan Alcohol Screening Test is one of the oldest and most accurate alcohol screening tests available.

**MMPI** – The Minnesota Multiphasic Personality Inventory is one of the most frequently used personality tests in mental health. The test is used to assist in identifying personality structure and Psychopathology.

**DSM IV** – Diagnostic & Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition, is a manual published by the American Psychiatric Association (APA) that includes all currently recognized mental health disorders.

### Additional Pro-Polygraph Considerations

The efficiency of the polygraph as an investigative tool aid was demonstrated in the Light and Schwartz (1993) study. 1,069 forensic examinations involving 920 felony investigations conducted in the second half of 1990 by the US Army CID were surveyed. Eight primary forensic disciplines that were used in support of the investigations were used in this study. Of those forensic examinations, 584 (55%) were in traditional laboratory disciplines combined, and 485 (45%) were with the polygraph. The polygraph provided the investigator with 432 (89%) opinions that contained positive results and the laboratory disciplines provided positive results in 431 (74%) examinations.

<b>Tool</b>	<b>N</b>	<b>Positive Results</b>	<b>Negative Results</b>
Polygraph	485	89%	11%
Latent Finger Prints	154	59%	41%
Questioned Documents	145	72%	28%
Illicit drugs	133	93%	7%
Firearms	51	76%	24%
Trace Evidence	51	65%	35%
Serology	40	85%	15%
Photographic	10	50%	50%

The polygraph was the most utilized and effective of the individual disciplines.<sup>17</sup>

<sup>17</sup> G.D. Light, J.R. Schwartz (1993), *The Relative Utility of the Forensic Disciplines*, Department of Defense Polygraph Institute, Fort McClellan AL.

#### Additional considerations:

- Due to its mobility polygraph tests can be executed almost everywhere without the need of an expensive laboratory.
- In comparison to fingerprints and DNA, which disqualifies over 50% of specimens, almost none are disqualified by the polygraph (inconclusive tests are solved by re-examinations). Yet, if examiners want to play it safe and increase the numerical scoring threshold the error rate would be around 2%.<sup>18</sup>
- The fact that about 69% of specific test examinees are found truthful<sup>19</sup> leads to the conclusion that the polygraph assists the innocent to prove their innocence.

#### Final Note

The data detailed in this article bear no intention of discrediting any of the described diagnostic tools or methods. It is offered to highlight the fact that tools and methods which are less accurate than polygraph are being accepted by the legal community while the polygraph is not, which in turn raises the question: why? Some apparent explanations might be:

- Conservatism – Insistence on preserving the legal framework results in conservatism (and in some rare instance in stagnation), and to a slower pace of adopting innovation (take the Frye precedent as an example). “Beyond a shadow of a doubt” exemplifies the legal system point of view.
- Fear of Unemployment – No matter how simplistic it sounds the fact remains that excessive utilization of polygraph tests to determine guilt will downsize the legal system workforce as automation did to production lines.
- Self – Preservation – Nowadays the legal system is more concerned with protecting and preserving its bureaucratic procedures than making justice as in setting free a serial rapist or a serial murderer for technicalities and letting him endanger society. The objective of making justice was sacrificed in favor of sacred means.
- Unrealistic Expectations – Unlike courts that decide upon an accused’s guilt after tedious long sessions, polygraph examiners do it in about an

<sup>18</sup> D.J. Krapohl (1998), *A Comparison of 3 and 7 Point Scale, Polygraph*, (27)3, 210–218; E.M. Harwell (2000), *A comparison of 3 and 7 Position Scales, Polygraph*, (29)2, 195–197.

<sup>19</sup> E. Elaad, M. Kleiner (1992), *The Police Use of Polygraph Examinations in Israel, Policija i Sigurnost* (Police and Security), (1)6-5, 418–430.

hour. This speedy decision making on such sensitive issues creates normally a very high level of expectation to the point of requiring 100% accuracy, which in return leads to zero tolerance of mistakes, but a 100% accuracy, the polygraph cannot provide.

While these explanations are but circumstantial, the direct and last nail in the polygraph's inadmissibility coffin is:

- Exclusivity (Monopolism) – Unlike the polygraph examiner, all forensic experts' opinion points **indirectly** at the accused's guilt. For example a specimen of an accused latent fingerprint and/or DNA found in the scene of crime does not prove her/his guilt but merely her/his presence there, providing an undiscriminating logical explanation to the accused's presence obsoletes the forensic expert's opinion.

The polygraph examiner expert's opinion is the **only** forensic expert opinion that actually points **directly** at the accused's guilt. By doing so the examiner penetrates the court authority and interferes in a decision that is exclusively granted to the court and juries.

## Conclusion

*"Imperfection is the only perfection"*

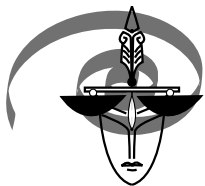
Polygraph should not be judged in absolute terms but in relative terms and its relative accuracy is at least as good if not better than any other forensic diagnostic and non-diagnostic tools or methods which are being accepted as admissible evidence.

Approximately two out of three examinees are found truthful which from a social point of view is significant, especially when an accused has no other mean to prove her/his innocence.

Polygraph is the most cost-effective (time, cost, results, availability) diagnostic tool. In an era where sacred cows, admissible evidence, is bleeding (some of them to death), the time has come for the legal community to embrace the polygraph and use it in its quest for truth, internalizing Aristotle's perception: **"The whole is greater than the sum of its parts."**

# Book reviews





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*Piotr Herbowski, Badania poligraficzne  
jako metoda weryfikacji wersji śledczych  
(Polygraph examinations as a method  
for verifying investigative scenarios)*

*Wydawnictwo Centralnego Laboratorium  
Kryminalistycznego Policji  
Warszawa 2011, pp. 271 (text in Polish)*

The book published in Poland concerns polygraph examinations and their investigative value. It was written by Piotr Herbowski, Ph.D., a polygraph examiner and police academy lecturer. The publishers are Centralne Laboratorium Kryminalistyczne Policji (Police Criminal Investigation Laboratory).

The work consists of five chapters (I – basic information on polygraph examinations, II – investigative and evidential activities, III – investigative and evidentiary application of polygraph examinations results, and IV and V – a study on the Polish criminal procedure science and crime sciences expert insights into the utility of polygraph examinations results).

On the first pages, Herbowski states the general advantages of polygraph in excluding selected inaccurately suspects. On the other hand, he depreciates the value of evidence testing (possibly because of the fact that the author, as a policeman, naturally concentrates rather on investigation than lawsuit).

The author presupposes that the significance of polygraph examinations is primarily of investigative nature. Besides, he recognises the problem with the attitude of the science community towards this forensic method. It would be difficult not to agree that differences in this field exist between forensic scientists and specialists in matters of legal procedure. The latter are afraid of using an ostensibly poorly-known method as an incriminating evidence. Many Polish jurists actually do not understand the essence of psychophysiological detection of deception (PDD) due to the lack of access to sufficient professional knowledge (or simply because of indolence) – even though polygraph examinations have been carried out in Poland for decades. Contrary to the author I strongly believe that polygraph deserves its place also during *in-rem* and *in personam* proceedings. Moreover, considering polygraph results both exonerating and damning in the context of other evidence is also fully justified at the present level of science and technology.

In the first chapter of the book, the author explains the meaning of memory and emotional traces in the consciousness (nervous system) of an examinee who tries to conceal them so as not to reveal an involvement with a given case. This is a concept slightly different from Backster's psychological set or the most recent – differential salience. Unfortunately, readers are not informed about any of these. Apart from the basics of PDD, the author provides a general description of the testing environment, measurement sensors, stages of a typical examination, and charts evaluation rules.

Herbowski makes an attempt to describe the main polygraph techniques. He mentions Reid's control questions technique (RCQT) and guilty knowledge technique (POT, CIT). He also claims that these techniques are used most frequently by Polish experts. This actually may be confusing to the reader. Comparison (control) questions technique is certainly commonly used among Polish polygraphers but it goes beyond Reid. Remembering Reid's merit as the author of control questions concept, it must be remembered that his technique was not included into the American Polygraph Association list of validated techniques. In fact, among recognition tests conducted in Poland one can find peak of tension (searching and known-solution as well) and rarely concealed information tests. Whereas prevailing deception tests include such CQT techniques as: Utah Zone Comparison Test, Air Force Modified General Questions Test, Directed Lie Screening Test and indeed Reid test. The choice depends on particular agency's policy, type of sector (public or private) and expert training, of course. Until recently, relevant/irrelevant technique was also widespread.



Herbowski could at least make some references to the ample world literature concerning omitted polygraph techniques. In addition to this, one cannot turn a blind eye to a mistake he made in the question used as an example of primary relevant question: "Did you take A's life?" A polygraph expert should not ask such a question. Instead, one may ask: "Did you hit A." or "Did you stab A.?" etc. In the last part of the first chapter the author discusses the diagnostic value of RCQT and GKT techniques. He proved that there is no rationale for the belief about high false positives rate of control questions technique (such opinions existed in Poland some time ago) and suggests to use both (CQT and GKT) methods as complementary during an examination.

The second chapter of the book is devoted to evidence theory and mutual relations between investigative and evidentiary activities. The author describes in detail basic notions: evidence, evidentiary activities, clandestine operations, and investigative actions.

Evidentiary activities are divided into three groups: searching, revealing and controlling proof. The opinion of a polygraph expert with its verification and discovering functions belongs to the second group. Not less important is also a visual inspection, viewing a crime scene that provides information useful at constructing GKT.

Investigative actions are taken in both stages of criminal proceedings: *in rem* and *in personam*. At first they are concentrated on finding the perpetrator(s) and sources of proof. The next step relies on broadening and verification of the evidence base. Developing investigative versions (scenarios) makes it possible to choose directions of conducting criminal proceedings. The topics of such versions include the legal classification of the event, the perpetrator's motive, *modus operandi* and personal versions. Determining *modus operandi* plays crucial role while designing GKT.

There is no doubt that the polygraph testing has many applications for the purposes of investigation, e.g.: ascertainment of roles of participants in an event, verification of victim's story, testing the alibi, and testing the informers.

The third chapter is the longest and the most interesting part of the book. One of the main goals of the author was a review of the legal regulations and controversies regarding admissibility of polygraph results in court. Moreover, this part of the book broadens the scope of the previous chapter. Herbowski emphasises the benefits from using polygraph in investigative efforts made by

law enforcement personnel. In this chapter, the reader can also find information about history of polygraph – both in Poland and in the world; however the latter area is covered only to a degree.

Let us remain for a while in the realm of evolution of views among Polish forensic scientists, psychologists, and lawyers regarding polygraph examinations. In the early 1950s, the Ministry of Public Safety purchased a Keeler polygraph. In the 1960s the machine was used in some cases during the judicial stage. As a consequence, discussion started relating to using polygraph results as an incriminating evidence, whereas *in rem* stage and exonerating purposes were ignored. In 1968, the first methodologically correct examinations were conducted in a case concerning espionage. In the 1970s polygraph tests were applied by the Internal Military Police and experts from University of Silesia during criminal investigations. The first scientific conferences devoted to polygraph were held in Toruń (1976) and Katowice (1978). In the opinion of law enforcement officers, polygraph examinations were less bothersome to examinees than traditional operational-investigative activities. In 1976, the Supreme Court explicitly recognised the admission of polygraph examination evidence. In the 1980s the number of such examinations decreased due to political situation. According to the Polish code of criminal proceedings amendment of 2003, the main objective of polygraph test is to exclude the people not involved in the crime from the circle of suspects. Moreover, this approach is not contradictory with the evidentiary usage of polygraph expert opinion.

Polygraph is commonly used at the stage of investigation in many countries in the world. However, with just a few exceptions, it plays marginal role in Western Europe because of the lack of appropriate knowledge and sometimes it is put at par with hypnosis or narcoanalysis. Even in Poland one may encounter absurd demands for absolute accuracy of polygraph tests. A fairly intelligent man should be aware of the fact that using polygraph is not different than any other forensic method, and that nothing is 100% accurate in forensics. It is worth mentioning that the polygraph examination is a repeatedly validated, evidence-based forensic examination method. The majority of polygraph techniques have quantified mean accuracy (significantly greater than chance, up to more than 90%), error rates, sensitivity and specificity.

The author proposes mandatory polygraph testing to be administered to people detained on serious crime charges in order to eliminate false admission. Further, he suggests including topics related to polygraph into curricula for the

faculties of law at universities and police academies. One cannot but agree with this idea.

On the other hand, the statement that, when one uses control questions technique (Reid), the subject of examination is an indication of emotional traces is questionable. Emotional connection with the investigated event actually means nothing. Everyone who takes polygraph test has such a connection because of the examination itself. As far as I know, comparison questions test is effective due to the different levels of threat, prominence or cognitive engagement represented by the different classes of questions, for truthful and deceptive examinees. This is the result of cognitive processes (memory, attention), emotions and behavioural conditioning. Therefore emotions are only one group of key components of the physiological measures indicative of deception.

Chapters IV and V look rather bizarre. Every section starts with a full name, and in each of them the author tries to present subjectively selected views of Polish forensic scientists or experts on penal proceedings. Some of them do not have any idea about the real essence of polygraph examinations but present assertive opinions (usually prejudiced against polygraph).

The bibliography presented at the end of the book are mostly examples of Polish literature. It could have been broadened with some materials published in United States: the place where polygraph examinations are most advanced. Despite that, it must be admitted that the bibliography is extensive.

Summing up, the publication is a decent source of knowledge on the potential applications of polygraph for investigative purposes. The language is clear and each of the chapters is rather comprehensive in scope. Disregarding some weaknesses, the volume has its value.

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For example (in references):

Reid J., Inbau F. (1966), *Truth and Deception: the Polygraph ("Lie-detector") Techniques*, Williams & Wilkins, Baltimore.

Abrams S. (1973), *Polygraph Validity and Reliability – a Review*, Journal of Forensic Sciences, 18, 4, 313.

and (Reid, Inbau, 1966), (Abrams, 1973) inside text.

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