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Dear Readers,

beginning with this issue, our *European Polygraph* will be available not only in hard-copy but also – free of charge – online at www.polygraph.pl.

With respect to the significant interest in polygraph examinations as such and consequently in our journal in Ukraine, Russia, Kazakhstan, and other countries of the former USSR, where Russian is more commonly used than English, again beginning with this issue, we will publish the titles of our articles also in Russian. We hope that this will facilitate access to *European Polygraph* in the aforementioned countries and expand the realm of its readers.

Jan Widacki
Editor-in-Chief



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Examiner Approach and its Impact on Polygraph Results

Подход оператора и его влияние на результат тестирования на полиграфе

Key words: polygraph examiner, polygraph results

When categorising the different approaches of polygraph examiners toward their examinees on a continuum, one end of the spectrum is taken by the interrogative approach, and the other by the diagnostic approach. What are they? Examiners practicing the interrogative approach perceive polygraph test as a way of extracting confessions from the examinee using the polygraph instrument as a threatening or intimidating tool making the examinee confess, while examiners holding to the diagnostic approach perceive the polygraph as a scientific tool that establishes the examinee's truthfulness or deceptiveness.

The two opposite points of view have a tremendous impact on examiner approach toward the examinee, which in return may result in the examinee's approach creating a vicious circle as clearly exemplified in the actual case discussed below.

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In 1990 when his friend and classmate Angela Correa was found raped, beaten, and strangled to death Jeffrey Deskovic from Peekskill, NY, USA was sixteen. Although Angela was not a close friend of Jeffrey, she was one of few classmates who were nice to him. Jeffrey's excessive crying in her funeral led the police to suspect him of her killing. In spite of the fact that the DNA in semen specimen found on Angela's body did not match Jeffrey's, he confessed to the crime after a polygraph test followed by a prolonged interrogation. In his trial, the prosecution convinced the jurors that the victim probably had sex with another man prior to her death and based on his confession he was convicted of rape and murder, and was sentenced to serve 15 years to life in 1991. During all his years in prison Jeffrey claimed innocence. In 2006 the DNA in the semen specimen was retested and matched to a prisoner serving life for another murder. The prisoner confessed to killing Angela, Jeffrey's conviction was overturned, and the innocent man was released. Upon release, he filed a civil right claim against the city of Peekskill, its police investigators, and polygraph examiner for an abusive interrogation and polygraph test that ended with his false confession and wrongful conviction. In 2012 he received a \$ 6.5 million settlement in a federal court. Federal District Judge Karas verdict shed some light on the dubious polygraph results and the false confession: "There is evidence that indicates that the Peekskill officers asked Stephens (the examiner) to conduct a polygraph examination specifically to elicit a confession, as Stephens testified that he was 'known in the department as someone that was good at getting confessions during a polygraph exam', and that he 'had a knack for it'. Indeed, Stephens' assertions are supported by numerous letters from police supervisors from other departments, thanking Stephens for conducting polygraph examinations in other cases that resulted in confessions [...]. While this evidence arguably goes only to the Peekskill officers' motivation for choosing Stephens, the manner in which the polygraph examination was conducted suggests that Stephens **conducted the exam to elicit a confession**. Stephens employed methods and techniques that he arguably knew could produce unreliable results, [...] notably: Stephens used the discredited Arther method and used an unreliable scoring method, despite being trained in more reliable methods; Stephens used improper terminology during the polygraph interview; Stephens conducted an exam that was excessively long; Stephens used various aggressive techniques that were not conducive to a valid exam." [Deskovic v. City of Peekskill et al].

Portrayal of the circumstances surrounding Jeffrey's polygraph test by Judge Karas portrays two aspects that eventually lead to an increased risk of a false positive result:

Peekskill officers' **prior expectations**, or, to put it in the examiner's words, [I am] "known in the department as someone that was good at getting confessions during a polygraph exam", and in order to deliver those expectations the examiner chose to

use an **Interrogative approach** during the test, or, in Judge Karas's words "despite being trained in more reliable methods (...) Stephens used various aggressive techniques that were not conducive to a valid exam".

Prior Expectations

Polygraph test clients seek to receive results that will solve or establish their notion regarding the guilt or innocence of the examinee that they send to the test. Doing that, they transmit verbally or nonverbally their expectations to the examiner. Assorted research (Barland 1975; Elaad et al. 1994; Ben-Shakhar et al, 1986, and Ben-Shakhar and Furedy 1990) found that prior expectation on the client's part tends to contaminate the examiner and influence them toward the expected outcome, which in return affects their behaviour in the examination room and their approach to the examinee.

Diagnostic or Interrogative Approach

While, prior to the test, both examiners are exposed to the same case data and the client's expectations concerning the outcome, the diagnostic examiner commences the test with no bias or prejudice as to the outcome of the test (NDI or DI), and their only concern is to conduct an effective test that will produce an accurate result, thus following to the dot a valid test protocol based on research. On the other hand the interrogative examiner commences the test with prejudice and perceives the polygraph as an interrogative tactical tool to elicit confessions, which consciously or subconsciously affects his approach to the examinee. As a result a biased examiner with a clear agenda tends to be aggressive, displays disbelief in the examinee during the pre-test, does not listen to what the examinee has to and wants to say, uses improper terminology, does not bother to discuss the comparison questions or try to assess their effectiveness, exacting and/or overlooking some reactions while scoring (if at all) etc. The results of such an approach on a truthful examinee leads to false positive result as clearly demonstrated in Jeffrey's case.

Almost all truthful examinees fear to fail the test (Fear of Error). This adds to their natural test anxiety that accompanies such a stressful and momentous circumstance as a polygraph test, whose consequences may be devastating. For such an examinee, an examiner with an interrogative approach is perceived as a "lost case" and as a barrier to pass the test. Consequently, such concerns are funnelled into the relevant questions and the examinee's attention is focused on the relevant questions rather than on the comparison ones.

Post-Test

Although the diagnostic approach should be implemented during the pre-test and the test once the test is over and the examiner noticed deceptive reactions in the charts, a post-test interrogation should be conducted. At first, the examiner should inquire: "What went through your mind when I asked you [name the relevant questions]?" If the answer is: "Nothing" that is the sign that a full scale interrogation should start immediately.

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History of Polygraph in the Republic of Belarus

История полиграфа в Республике Беларусь

Key words: polygraph of Belarus, of Belarus, history of lie-detection

Since 2001 the polygraph has been widely used in the Criminal Investigation Office of the Ministry of Internal Affairs of the Republic of Belarus to investigate various criminal cases. Earlier, the polygraph had only been used in the State Security Committee, where a specialist specially trained in Moscow used to conduct polygraph screening tests. However, due to the specialist's lack of experience in investigating criminal cases, the Belarussian Ministry of Internal Affairs asked colleagues from the Russian Federation to train such specialists separately.

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Positive results of polygraph examinations and screening carried out by polygraph specialists of the criminal investigation office led to the establishment of the Department of Psychological and Technical Support in Crime Investigation at the central administrative office of the Ministry of Internal Affairs of the Republic of Belarus which was announced on 14 March, 2002. By the end of 2002, such departments had been established in all regional centres.

After a series of heinous crimes was solved by the polygraph specialists from the criminal investigation office, polygraph has increased its popularity. Representatives of the Military Prosecutor's Office, State Border Service, Presidential Security Service, and other services relied on assistance of specialists of the Ministry of Internal Affairs in solving crimes and conducting screening in the agency.

Today, polygraph is used by almost all law enforcement and security agencies and services of Belarus such as the State Security Committee, Ministry of Internal Affairs, State Border Committee, Presidential Security Service, Investigation Committee, State Customs Committee, State Control Committee, and the State Medical Forensic Agency.

Each agency has its own regulations governing the procedure of polygraph usage.

Internal affairs agencies, which organise majority of polygraph examinations, apply decree No. 162 of 4 June 2008 On the approval of the Instruction on the arrangement of polygraph examination towards Belarussian citizens by internal affairs agencies, approved by the Ministry of Internal Affairs. The Instruction regulates the procedure of interrogating citizens with the application of polygraph as a part of investigation activities, and defines special psychophysiological research in professional psychophysiological selection of candidates to work in internal affairs agencies.

In addition to the aforementioned instruction, there is the Order approving the Instruction on the procedure of selection, training and access of internal affairs agencies officials to work with the polygraph, on the organisation of their work (defining technical requirements of the space in which citizens can be interrogated with the use of polygraph), and on the requirements concerning the drafting of documents and reports by the specialists, and on checking their work procedures.

According to the Instruction approved by this Order, only officials with higher education, at least 3-year experience in investigative activities, and certificates of good conduct can be selected for training for further work with the polygraph. All the candidates shall go through professional psychophysiological selection and interview,

and have their skills of logical thinking, communication as well as self-discipline, responsibility and other traits carefully studied. Upon graduation and on the grounds of the obtained diploma the commission set up in the Ministry of Internal Affairs authorises permits to work with the polygraph for one-year terms. The specialist holding a permit is allowed to interrogate citizens using polygraph under the supervision of a mentor, i.e. a specialist allowed to carry out polygraph interrogation independently. Activities on arranging, making tests, and preparing reports on polygraph interrogation must be conducted under the supervision of a specialist with more than one year's experience in the field. At the end of the year, a holder of a polygraph specialist permit submits polygraph interrogations and charts together with the recommendations of the mentor to the members of the commission for review and evaluation of his or her practical knowledge of the polygraph. Having studied all necessary documents, the commission holds an interview with the specialist. During the interview, his or her knowledge of conceptual issues indicated in the Instruction is ascertained. Conceptual issues determine what a polygraph specialist should know and how he should operate. Only then the commission decides whether a specialist could be allowed to interrogate people independently using a polygraph, or whether a candidate should be turned down. The specialists who have passed the exam successfully are issued certificates. After a certified specialist has conducted at least five hundred interrogations and after checking his polygraph skills, he or she can be issued a Polygraph Professional Card. The Polygraph Professional Card gives the specialist the right to teach and consult as well as the right to carry out research work in the field of polygraph interrogation tactics and development of new methods and practices of polygraph examinations. This is how the qualification of polygraph specialist is obtained.

The abovementioned documents strictly regulate preparation of interrogations and the work of a polygraph specialist in internal affairs institutions.

Today, the number of polygraph interrogations carried out by specialists in internal affairs structures is counted in thousands each year. By the end of 2014, specialists had conducted 40,601 polygraph interrogations, contributing to the solution of 4984 criminal cases, of which 873 were acts of murder and attempted murders (in 120 cases people were considered missing), 443 were cases of grave bodily hurts (including ones that led to the death of victims), 100 were cases of rape, 553 – of armed assaults and robberies, 2011 – of thefts (home burglaries, and car and other thefts), and dozens of other cases concerned combatting commercial crimes, trafficking of illegal drugs, and similar cases. Moreover, polygraph interrogations revealed more than 568 crimes that were unknown, or which the examined had not been sus-

pected of until the moment of polygraph investigation. The numbers do not include the solved cases in whose course polygraph investigations put an end to groundless suspicion against the innocent and helped to channel the investigation in such a way that they finally contributed to solving these cases.

Initially, internal affairs structures generally resorted to polygraph interrogation for special investigative activities to obtain necessary information contributing to solving criminal cases. The results of polygraph interrogations were of probabilistic nature and were not used as evidence in court, but since 2002 the results have often been presented to the court and taken into consideration by the judge, forming the internal conviction on the validity of facts that are to be proven during criminal case investigations. One of the first cases, where such results were decisive for pronouncing the sentence, was the interrogation concerning A.V. Kashpur, a taxi driver declared missing on 14 January 2002. A.I. Shakhrai, a police investigator, had revealed the crime before the body was found.

In October 2002 polygraph specialists from the Psychological and Technical Support in the Investigative Activities Department (PTSIAD) of the Criminal Police of the Ministry of Internal Affairs conducted the first judicial psychophysiological forensic expertise on a criminal case taken to court (murder of K.A. Koryavaya, reported missing on 10 November 2011).

In December 2014 the State Committee of Forensic Enquiries set up the Department of Psychophysiological Research dealing with psychophysiological researches in criminal cases against sexual freedom and immunity.

To perform high quality work while investigating and solving criminal cases and conducting forensic psychophysiological assessments, a polygraph specialist should have the knowledge concerning the work of the police agents, investigators and experts, operative-investigative activities, criminal procedures, criminalistics, and other special disciplines. Moreover, a specialist should study peculiarities of methods of investigating different types of crimes.

In this respect, the educational standard in higher education (N 1-93 01 74) on advanced training of special agents on the “psychological and technical support of investigative activities” specialisation with “specialists in psychophysiological research” qualification was designed and put into force. The training lasts for approximately 1000 hours spread over 20 months and is held at the Academy of the Ministry of Internal Affairs of the Republic of Belarus.

To provide professional security and support polygraph specialists with updated information, to analyse and disseminate advanced forms and methods of work, to improve professional skills and international cooperation in polygraph interrogations, a non-governmental organization Polygraphologist was set up in Minsk in 2004. It brings together experienced polygraph specialists mostly from various law enforcement agencies and some specialists that conduct private interrogations.

The Polygraphologist NGO works extensively with the Educational Institution Special Training Centre for Professional Advancement of Executive Employees and Specialists that provides special and counterterrorism training of special operation forces of Belarus and other countries. In cooperation with the Centre, the Polygraphologist conducts training of polygraph specialists in state agencies of different countries and of private polygraph specialists.

Training courses have been conducted for different law enforcement agencies and private specialists from Belarus, Lithuania, Russia, Kazakhstan, and some other Asian republics; while forensic experts have been trained for the Republic of Azerbaijan. Together, the Special Training Centre together and Polygraphologist trained polygraph specialists for Security Council of the Federal Republic of Nigeria.

During polygraph training, the practice of using polygraph in different countries is taught, and the rich personal experience of polygraphers in staff screening, and in different criminal cases and employee investigations is shared.

Nowadays there are more than 70 operative specialists working for law enforcement agencies, a great deal of them operate within the system of internal affairs agencies, and around 10 specialists are occupied with polygraph research and interrogations for private commissions.

Some major companies employ polygraph specialists on permanent basis, other companies invite a specialist to solve particular issues from time to time, when necessary. Although polygraph interrogations were earlier held as part of staff investigation, nowadays staff vetting is of highest priority as company managers realise that it is better to prevent serious violations of law and crimes than to have to solve them later.

The above tells the history of 15 years of application of polygraph in the Republic of Belarus as it steadily continues to strengthen its positions in various spheres of the country.



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Preparation to Experimental Testing of the Potential from Using Facial Temperature Changes Registered with an Infrared Camera in Lie Detection

Подготовка до экспериментальных исследований возможности использования изменений температуры лица, записанных с помощью тепловизионной камеры для детекции лжи

Key words: infrared camera in lie-detection, thermovision in detection of deception

The numerous organic changes related to emotions include fluctuations in blood pressure that can be observed and registered in alterations of pulse rate and blood pressure, and also as changes of blood flow in the bare parts of the body (face, back

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of the neck) that are visible with the naked eye. As changes in blood supply resulting from emotions are also accompanied by changes in the chemical composition of blood that result from the activity of endocrine glands issuing hormones into the bloodstream, changes in blood supply are also accompanied by changes of face temperature. The body temperature in a healthy human ranges from 36°C to 37°C, and its natural fluctuations may lie in the range of around 0.6°C (Konturek 2014: 495). Lowering of the body temperature is accompanied by dilation of blood vessels, sweating, and slowing or stopping of thermogenic mechanisms. Increase of temperature, on the contrary, is accompanied by the narrowing of blood vessels and increased thermogenesis (Konturek 2014: 498). Psychological and psychophysiological literature has long listed changes of body temperature as an indicator of emotions (see e.g.: Ax 1953; Hilgard 1972). Measurement of the changing temperature of individual parts of the face with classical methods, i.e. with the use of contact thermometers, was very difficult technically and impractical to the highest degree, hence it has essentially not been applied in practice. Such a measurement could have become relatively easier if a method of imaging heat radiation issued by physical bodies, i.e. thermography (thermal vision), were resorted to. This method is generally applied in various sciences and also for practical purposes. A device used for the observation and measurement of facial temperature changes in this method is an infrared (thermal vision) camera. It can be used to detect the temperature of an observed object and its changes.

It has long been postulated that an infrared camera could be used for observation and recording of temperature changes in the human face to detect emotions, and hence also for lie detection purposes. In Poland, such a generally formulated concept was announced as early as in 1979 by Hubert Kołecki (Kołecki 1979). The use of thermal vision for lie detection seems the more attractive as the method theoretically allows to perform such a detection without physical contact, and without attaching any sensors on the subject's body, and therefore, theoretically, also without his or her consent and even knowledge.

[This obviously gives rise to the development of new legal regulations, as all extant ones only refer to classical polygraph examinations, in which all the physiological correlates of emotions are observed with sensors installed on the body of the subject, and therefore require the subject's information and additionally consent. There is no room to discuss these questions here, as the presentation is limited to the discussion of the technical aspects of the exercise only.]

In the several recent years many experimental works aiming at obtaining this goal have been conducted, yet only a handful of general works on the subject have been published in Poland (Staszek, Wojtarowicz, Zajac 2013). The first exercises conducted were not as much experimental research projects but simple demonstration of an infrared camera and the distribution of temperatures on the face obtained with it (Polakowski, Kastek, Pilski 2011). Available foreign literature is far richer and has

recently received a broad discussion (Gołaszewski, Zajac, Widack 2015). The results of experimental studies on the use of infrared camera for lie detection conducted so far seem fairly encouraging. It seems that changes of facial temperature could be at least another physiological correlate of emotions facilitating lie detection, besides such indicators as changes in the operation of the circulatory system, the breathing patterns, and the galvanic skin response (GSR). If facial temperature changes prove to be more diagnostic than the aforementioned physiological correlates of emotions registered by a classical polygraph, they could be considered an independent measure in lie detection or used in conjunction with other contactless (remote) methods (e.g. voice change analysis, eyeball tracking, etc.).

Yet the use of an infrared camera for continuous observation and registration of facial temperature changes in parallel with the application of a polygraph that would make it possible to compare the diagnostic values of facial temperature changes to the diagnostic value of a polygraph examination requires a parallel simultaneous registration of physiological variables with a polygraph and registration of facial temperature changes with an infrared camera. Running appropriate recordings simultaneously, however, encounters a number of difficulties of technical nature. The first is that the camera shows the image of the face, in which individual colours correspond to temperatures (see: **Fig. 1**). Temperature changes are displayed as shifting areas of colour. Therefore, the first technical problem is to select a number of points on the face, monitoring temperature changes in the selected points continuously, and representing temperature changes in time in the selected points in a graphic form. In other words, the first problem was the transformation of the changing image into a graphic form.

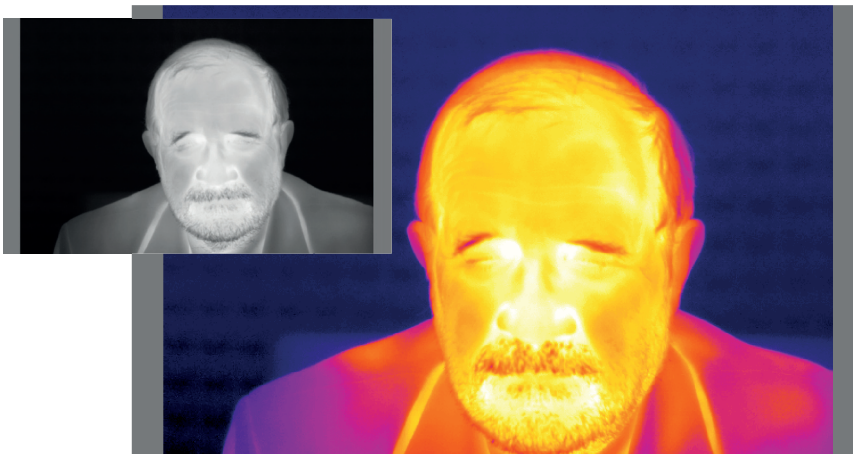


Fig. 1. Image of the face by infrared camera.

The following one, which needs a solution, is to have a fixed infrared camera continuously observe the same previously selected points on the face of the subject, especially as the subject may, often subconsciously, jerk the head when movements that result from answering the test questions occur. These cannot be eliminated, even if it were possible to stabilise the subject's head mechanically (e.g. with an orthopaedic device or some kind of brace), which in itself would be difficult, potentially hardly efficient, and furthermore highly impractical. The solution of the problem required writing a new piece of software that would make it possible to capture and record data from an infrared camera, and especially to present the temperature of the observed points in a graphic form along the time axis, simultaneously make it possible to denote on the graph the moment when the subject is exposed to a stimulus (test question). Moreover, the software must be constructed so as to allow continuous tracing of temperature changes in the previously selected points on the subject's face that are most diagnostic according to literature (see: Pollina *et al.* 2004; Pollina *et al.* 2006; Jain *et al.* 2012; Rajoub, Zwiggelaar 2014), and to do so, despite the movements of the subject's head and facial muscles. Application code was written in Matlab (2014 b) environment, which supports the FLIR (A655sc) infrared camera standard. Software development required also the use of Image Acquisition Toolbox support package. The data is transmitted from the camera to the computer over an Ethernet connection, the software grabs the "frames" (i.e. locations from which temperature measurement samples are taken) from both a digital and an infrared camera. The image from the digital camera is used for detection of the areas in which the infrared camera is to perform the measurements. Whenever an area has been correctly detected, the temperature is read from the corresponding "frame" of the infrared camera image. For temperature reading to be precise, the scanning area of the two cameras is shifted by the value that results from the physical distance between the two cameras mounted parallel to each other on a stand in an identical distance (120 cm) from the subject.

The processing capacity of the computer used (Dell xps 7021) proved a major limitation in the operation of the software. Initially, the number of acquisitions from the camera prohibited observation and calculation periods exceeding 15 seconds. This resulted from buffer overflow problems. To solve the problem, image transmission from the network camera to the laptop was limited to 9 kB MTU (maximum transmission unit). This provided a sufficient number of frames (12 frames per second, FPS) to conduct the necessary calculations, and extended the period of observation to 12 minutes, which is sufficient to run a polygraph test. After that time, the connection to the camera is refreshed, which clears the buffer. A following problem that called for solution was to devise an algorithm that could continuously trace selected points on the subject's face. The application makes use of Viola-Jones algorithm used

for detection of objects on video streams. In this way, the data obtained is fed into a calculation sheet, which in turn generates a graph showing temperatures from the sampling points.



Fig. 2. Armchair, polygraph, cameras on stand, subject in the armchair.

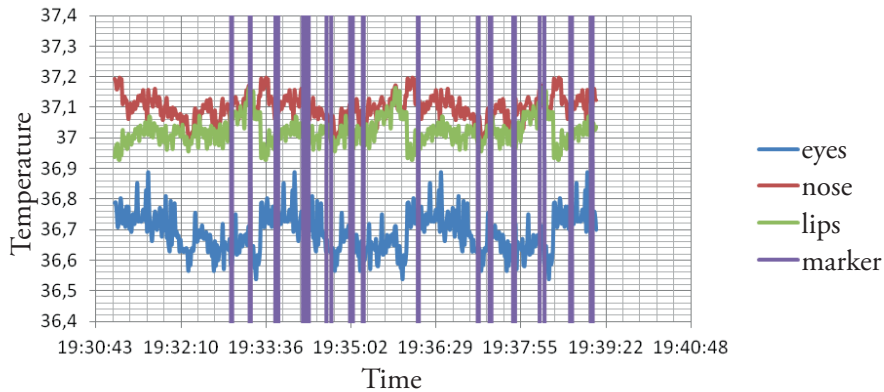


Fig. 3. A graph with the time and temperature axes with three temperature curves (eyes, nose, and lips).

In the study, we used Lafayette 4000 polygraph and a Flir Gige Vision A-600 camera. They were connected to a set composed of a Samsung R780 laptop, Dell Xps L702 X laptop, and a digital camera HIKVISION model DS.-2CD6026FHWD-A.



Fig. 4. Lafayette polygraph



Fig. 5. Infrared camera

Source: Images were taken from the websites of their respective manufacturers.

To allow parallel polygraph examination and tracing of facial temperature changes, an infrared camera was mounted on a stand, and focused on the face of the subject sitting in the polygraph examination room. The recording of the changes of temperature on the face was observed on a monitor by another expert in a separate room (i.e. not by the polygrapher performing the examination) and recorded. In this way, no people besides the subject and the polygrapher were present in the examination room during the polygraph examination, as required by good polygraph practice. The polygrapher and the expert observing facial temperature changes registered with an infrared camera can communicate throughout the experiment, using lan messenger 0.7 beta 4, which allows text messages exchanges between computers.

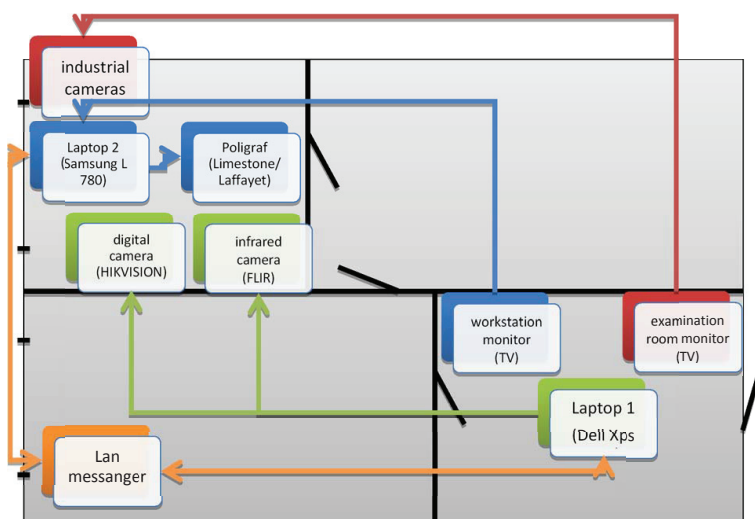


Fig. 6. Rooms where the experiment will be conducted plus listing of the basic equipment.

Source: The authors' own materials.

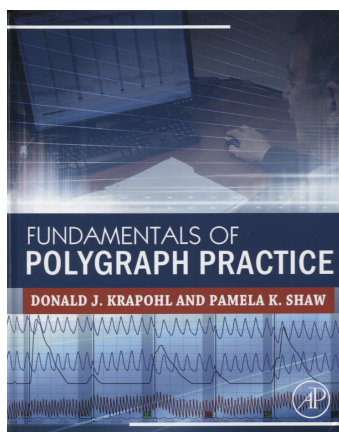
Only the overcoming of the aforementioned technical problems will make it possible to carry out the experiment aimed at comparing the diagnostic value of facial temperature changes with the diagnostic values of both complete polygraph examination and indications of its individual channels.

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Book review



D. Krapohl & P. Shaw:
Fundamentals of Polygraph Practice
[Основные принципы практики использования полиграфа]

San Diego, CA: Academic Press,
2015, 348 pp.

It has been said that when reviewers praise poor work, the mistake will eventually surface but when reviewers pan good work, the error may never be discovered. This assumes that reviewers have a significant influence over what is read, an unlikely assumption when it comes to technical writings. *Fundamentals of Polygraph Practice*, unequivocally, is a work all examiners can read with the expectation of learning something new. It is also a handy reference for numerous, basic polygraph issues. The opening chapter, a history of “lie detection,” is a useful overview of much that has been written before with a number of interesting additions. This is followed by a chapter by Joel Reicherter on Anatomy and Physiology. This chapter is thorough and does not require any special educational prerequisites to easily understand.

Chapters 3, 4 and 5, dealing with test question construction, data collection and analysis of polygraph data, respectively, are straightforward presentations of material

that would be found in most instructional documents used in training schools. In fact, it appears to us that much of what is found here was drawn directly from that material. For example, statements such as: “Adjust the gain so that the tracing amplitude is about three-quarters of an inch” and “The right amount of cuff pressure during testing is about 60-70mm Hg.” are representative of what is found in these chapters.

There are some evaluative and useful comments found in these chapters but in the main they are pretty prosaic stuff. However, some might find a special interest in explanations of the common problem of tracings that look like deceptive responses when they are not, e.g. how increasing the pressure in a blood pressure cuff, pressing down on the EDA electrodes or simply taking a deep breath result in significant EDA “responses.” While the photoplethysmograph is discussed as if it were a parameter equal to the standard three, it would have been helpful to mention the reason why it is not commonly used and why its use is not required by the APA: it simply doesn’t offer enough useful data to enhance correct test decisions, though this point is later generalized in subsequent material.

Chapter six, dealing with polygraph screening examinations, begins with a very unbalanced rebuke of how private examiners’ greed and abusive practices resulted in the EPPA. While those topics were mentioned in the dispute, it was the political pressure of labor unions and the severe—and mostly unsupported—assertions of academic critics of polygraph screening on this and other anti-polygraph policy, such as the “Police Officer Bill of Rights,” that were far more telling in the passage of the legislation. In this chapter the authors also indicate that multiple issue screening tests have not been shown to produce high accuracy. They suggest, therefore, that the terms “significant response” and “no significant response” be used in lieu of “deception” and “no deception indicated.” While this is accepted practice in some, but not all, situations, it is the failure to note the need for the grammatical artifice that is missing here. In screening exams generally there are no case facts, no complainants, no physical or other evidence nor any other diagnostically-helpful information that is typically available in event specific examinations. In short, and in general, screening examinations typically suffer from the lack of a helpful context. Moreover, the relevant questions are very general and may appear to be somewhat ambiguous, precisely the qualities desired in comparison questions. In fact, many of the relevant questions included in screening examinations could be used as comparison questions in specific issue testing. Moreover, how they are introduced and subsequently understood by the examinee varies widely from one situation to the next. It is issues such as these and the role they play in producing accurate testing outcomes that needs attention; those are not provided in this chapter. The authors

propose the use of a “Successive Hurdles” solution to the shortcomings in screening settings. While the idea seems to have some merit, it is demanding of time, staff, financial and other resources and is impractical in many field settings, perhaps with the exception of governmental environments. In addition the value of such a solution is unknown and difficult to assess in real life situations since ground truth is usually not known or knowable.

Chapter seven covers the topic of specific issue testing techniques and provides the reader with a general overview of some standard protocols with a focus on three favored procedures: the Federal Zone Comparison Technique, the Utah Probable Lie Technique and the Air Force Modified General Question Technique. In chapter eight, the use of recognition tests, applied in event-specific situations, is presented in an uncomplicated and easy to follow way. It is curious to note that in this chapter, the authors explain how the previous terminology for this approach, the Guilty Knowledge Test, evolved into the present day Concealed Information Test. They fail to follow this same pattern in explaining how the terminology for a stimulation test became the acquaintance test. While the term “stimulation” appears in the titles of cited references, this term is simply omitted as a test type from the text, Glossary and index. The same inconsistency appears in the use of the term “control” to describe a type of question in recognition testing without mentioning that throughout the polygraph literature the term “control question” was used far more often to refer to Reid’s original contribution even though Reid himself initially used a “comparative response” appellation. Finally, on the same point, the terms “global evaluation” and “global analysis” appeared in the literature at least as early as 1982 and have been discussed in detail at APA Seminars as recently as 2013. The authors not only fail to present this historical and traditional use of “global evaluation” but also neglect to use it to limn one of the principal points of difference in schools of thought about polygraph testing.

Chapter 9 is devoted to a short discussion of “scientific issues.” The coverage here is focused on what might be seen as primary concerns; these include validity, reliability, the effect of base rates and an overview of some of the extant “theories” regarding polygraph testing, particularly the Comparison Question Test.

Gordon Vaughn’s *Legal Issues*, Chapter 10, with a noted contribution from New Mexico Judge Charles Daniels, is concise, well annotated and succinct. It leads to the conclusion that polygraph admissibility in the United States has less to do with proof of scientific accuracy than with other factors primarily important to the judiciary. Unfortunately, the chapter lacks discussion of American employment law even though we learn in the text that screening tests are the most prevalent

type and a section of the text (Appendix A) provides a complete overview of the Employee Polygraph Protection Act (EPPA). Certainly examiners would benefit from a presentation of options on how to reconcile conflicts among employment law case decisions, Equal Employment Opportunity Commission (EEOC) directives and the American Polygraph Association (APA) Standards of Practice. A basic understanding of the legality of employment practices is more important today than ever since pre-employment polygraph testing is increasing as more restrictions are being placed on alternative information gathering methodologies. In addition, many federal agencies previously exempt from the numerous federal employment laws are now being required by Executive Order or agency policy to conform to the same laws and restrictions other government and private employers have had to negotiate. It might also have been useful to forewarn examiners about possible legal attacks on polygraph scoring algorithms as is currently happening with certain forensic techniques.

While no text can possibly include everything about polygraph testing, there are some critical omissions as seen, for instance, in chapter 11 dealing with “advanced topics.” While going into great detail about how to address dwarfs or how to place attachments on subjects with a prosthesis, nowhere do the authors describe how to properly place and use audio/visual equipment, seemingly dismissing the topic as trivial. There are both positive and negative effects in the use of a/v equipment and, of course, there are legal restrictions under various state eavesdropping laws. Also, there are other important issues that examiners should be aware of in the use of a/v equipment. We would submit that some of these are more important in practice than some of the points made to seem significant in this chapter.

In their discussion of the Marin Protocol, a topic that seems to have little interest in recent days, the authors suggest a single method to establish examiner competency: cite a validity research study in which he or she has participated and demonstrated an ability of 86% or better at blind chart analysis. What’s missing here, among other things, is the more democratic option of simply having an examiner wishing to qualify as competent in “chart interpretation” achieve a specified accuracy level by analyzing a random sample of a number of verified charts, a procedure that one of the book’s authors actually administered for many years in promotion of the Marin Protocol.

In their discussion of using interpreters, the authors suggest a procedure requiring the examiner and interpreter to use question cards (Cards on which test questions have been written down, word for word, indicating what the interpreter should ask.) rather than simply to cite a letter or number referring to the desired question in a listing. The problem with what the authors recommend is that when the examiner

unexpectedly needs to change the question order or needs to add an extra irrelevant question, the use of question cards is awkward. The chance of creating undesired artifacts increases when there are noises created behind the subject's back or odd delays as the examiner and interpreter shuffle and pass cards between themselves. There is no reported evidence of undesired artifacts when an examiner first speaks a question reference letter or number before the interpreter reads the question, the time tested method for conducting tests with interpreters. Also, it is difficult to square the authors' explanation of placing interpreters who sign in front of the subject but language interpreters behind the subject. It has been our experience that locating the language interpreter out of the subject's direct line of sight, to the side but not behind, produces more than satisfactory examination results.

There are several perplexing omissions in this book, not the least of which is any meaningful discussion of field studies and practices as they actually apply in field settings. This results in an overreliance on laboratory studies to justify conclusions. For example, in Chapter six, there is a detailed narrative suggesting use of pre-recorded, automated question presentation as a useful practice. While there might be merit in doing this, there is little evidence showing a significant advantage in field conditions. Similarly, while the authors provide a script for introducing "Directed Lie Comparison Questions", there is no such script provided for the use of the far more common probable lie comparison questions. Clearly, as observant examiners know, there are critical differences between examiners in the way probable-lie comparison questions are introduced and "worked up," a term the authors use but fail to define. Laboratory studies typically employ a very rote approach in an attempt at "standardization" while field studies detail a more clinical approach tailored to individual subjects and unique case facts. Such an approach is hinted at in this book but it is left to the reader to determine how, for example, one would determine whether the Goldilocks test has been met, that is, how one would know in advance of testing if a probable lie question is "too hot" or "too cold."

Then there is the elephant in the room. While the authors warn against procedures unsupported by research, they proceed to recommend the opposite or at least to suggest that doing so is okay. For example, they point out, correctly, that the use of either a sacrifice relevant question or a symptomatic question is not supported by evidence in either case. Yet both of these question types are included in the recommended techniques without any notice of the possible effects of the included questions, positive or negative. Similarly, the authors clearly indicate that the directed lie procedure should be relegated only to screening tests where there are no diagnostic opinions but, in the glossary, they point out that one of their recommended "techniques" for diagnostic purposes makes use of the directed lie approach.

The closing chapter of this book might be the one of greatest interest to those who already know the mechanics of conducting a proper polygraph examination but don't know what alternatives are now being considered. The 2003 report on "lie detection" by the National Research Council told us that in spite of the shortcomings in polygraph testing there does not seem to be anything on the horizon that is ready to replace it. Those technologies and methods that seem most likely to have that potential, though, are briefly reviewed in this chapter. Some of these might be seen as complements to and others as substitutes for the polygraph. Included here are such things as measures of brain activity (Fmri, ERP's), thermal imaging, and laser doppler vibrometry, among others.

Because this book is devoted entirely to the topic of polygraph testing and it attempts to cover a range of topics related to the history, the underlying 'theory' and the processes involved in the administration of polygraph examinations, we feel compelled at the end of this review to offer a number of what are, to us, significant points with which we, and we think in some instances the evidence, disagree. In doing so we acknowledge that our training and understanding of some aspects of polygraph testing differ, or appear to differ, from that of the authors. We focus on only a few items of concern, those which to us represent points that should be of interest to persons new to the field of polygraph testing, the apparent intended audience of interest to this books' authors.

First, a small but yet important correction. On page 16 the authors point out that the Frye decision in 1923 was a "case [that] was ultimately taken up to the US Supreme Court. On December 21, 1923, the Supreme Court rendered what became known as the Frye Decision (or General Acceptance Standard), denying Frye's appeal and setting a standard for the admissibility of scientific evidence that would remain well in to the 1990's." This case is very well known in the polygraph community and, of course, across the forensic sciences. It has been widely discussed in recent years in light of the Daubert (1993) decision. Of importance here though is that the authors indicate erroneously the Frye decision was handed down from the U.S. Supreme court. This, of course, is not true. Fortunately, the careful reader will note that the correct information is provided in a subsequent chapter dealing with admissibility issues, though the conflict regarding the court decision is not evident. In our view the Frye case is so critical that readers ought not be misled as to its source.

One of our concerns regarding this volume has to do with the unevenness of the material that is covered. In some places the writing and the material is somewhat analytical and well- considered whereas in others, as we have pointed out, it is equivalent only to what might be found in examiner training documents. It is

highly dogmatic and instructionally descriptive, often presented without a proper foundation or no foundation at all. Such a ‘how-to-do-it’ approach has a place but in this case it detracts from the text offered at a different level. The “polygraph-in-a box” approach can be obtained from many sources online and while much of that may not be what is said to be “best practices,” without a proper foundation there is no reason to believe that the basics offered here are anything more than just accepted, not necessarily “best,” practices.

We have commented on this already but are compelled to follow up on what we’ve said because it is central to a foundational point regarding polygraph testing in real-life situations. The term “global” in one sense refers to relating to or embracing the whole of something, or a group of things. To us, it refers to a proper understanding of a polygraph examination, and how all of the major components that make it up (e.g., collection of factual information, examinee information, pre-test interview, polygraph testing, and, in some views, a post-test interview) fit together and interact with each other such that the basis for confident decision-making is evident. Even though it is the polygraph data themselves, properly collected, that are the principal source of data providing the basis for an outcome they do not, without considering the context in which they are obtained, lead to the most accurate outcomes. One of us (SS), in fact, authored an entire article on this topic alone. In this article it was shown why global assessment is important, in contrast to these authors who use the term “global analysis” as a sort disparaging term to refer to a desultory, unstructured, perhaps casual and informal review of collected polygraph data,. The term in this reviewed book is defined in the glossary in two ways. First, as an “evaluation of the polygraph recordings as a whole, as opposed to making systematic comparisons among questions. Second, global evaluation is also used to refer to a process that includes the “use of extra-polygraphic information...when rendering a polygraph decision.”

We don’t know of any procedure that makes use of the first method, although the authors state that “a form of global analysis” (p. 122) is applied when the testing involves Relevant- Irrelevant testing. Even here, however, there is typically systematic comparisons among questions, even though these may not be expressed in a formal way or with the use of numerical values.

We understand that some examiners assert that the use of extra-polygraphic information, data aside from what can be seen in the physiological data, ought not to be done, primarily because it is seen to be unscientific, unreplicable and subjective. We disagree; it is none of those. And, in our view, those who deliberately ignore such information are more likely to be in error in their outcomes and the empirical

evidence, we think, clearly shows that. But, that is beside the point here. A book devoted entirely to the topic of polygraph testing that does not at the least consider what actually occurs during a polygraph examination, from the assessment of investigative information, the interaction between the examiner and the examinee, and how they relate to the outcome is not conveying what is fundamental to the process. While the prevailing view in the field might be that polygraph testing is strictly objective and “scientific”—relying exclusively on an assessment of collected physiological data—it is easily shown that that is not typically the case in fact in field settings.

With respect to the use of extra polygraphic information it is commonly assumed that this includes observations of examinee behavior, often collected in what is referred to as a “structured pre-test interview” (SPI). The SPI makes use of stimulus items called “behavior provoking questions” or “behavioral observation questions,” terms used to refer to the same concept by different names depending upon which training facility is at issue. The SPI developed into what has now become known as the Behavior Analysis Interview (BAI), parts of which are taught in many polygraph training facilities, including the National Center for Credibility Assessment and the Canadian Police College polygraph training school. In spite of this widespread usage, this volume doesn’t touch on the use or value of behavioral observations; in fact, it devotes approximately one of 348 pages to the topic. We understand this omission in light of what we believe might be the authors’ preference for ignoring such information. Yet, as we have already stated behavioral observations are part of our reason for preferring the idea of “global analysis” as a descriptive term referring to decision-making, not “chart” evaluation. To be clear, however, we do not advocate the use of global analysis to provide for a way to overrule what careful analysis of polygraph data reveal. We believe that properly applied global analysis is most useful for avoiding errors that sometimes occur even when polygraph data are analyzed as they should be but are for whatever reason misleading. In fact, one of the authors of this book (DK), along with another person, devoted an entire article to showing how in one case a serious error was avoided by careful attention to extra-polygraphic information. This, in our experiences, can be seen as a regular observation in field testing. In addition, we note that almost all careful observers of the field research regarding CQ polygraph testing agree that field examiners decisions tend to be correct more often than those of blind evaluators of field- collected polygraph data. This, we believe, is because in actual field cases examiners make use of important diagnostic information that is not evident in analysis of polygraphic data alone.

We certainly favor the application of numerical scoring systems in polygraph testing for analysis of the collected physiological data. We also favor the use of automated

computer scoring algorithms. In fact we welcome the use of any scoring-scheme that requires careful, assiduous attention to the data and that extracts diagnostic information from those data. In our view, though, the scoring of the data is a necessary but not sufficient basis for rendering a decision. Data evaluation and decision-making are two related but separate processes and when both are properly applied, the outcome is more apt to be correct than otherwise.

The authors write about “numerical scoring” as if it is a panacea for all shortcomings in field polygraph testing. They fail to note that such scoring, while valuable for some purposes, is not, in itself, sufficient justification for field decisions. Whatever method of numerical scoring is done in the field, the outcome—as we have already noted—ought to be guided by but not determined only by a “score” that reaches a specified threshold, as some advocate. Such scoring does not overcome the problems that surface when the test administration and the examinee’s perception of the situation are inconsistent with expected standards. In addition, the authors’ description of the genesis of numerical scoring is incomplete. They write as if what is now commonly known as “numerical scoring” simply emerged from nothing. In fact, what is not mentioned even in passing is that the idea of numerical scoring was derived from the work of the late Richard O. Arther. When Cleve Backster associated with Arther in the 1950’s, Arther steadfastly advocated the use of a “check mark system” (which he learned from his association with John E. Reid) to “score” polygraph charts. This system requires an examiner to assess response data not with numbers but with “check marks,” each mark differing in size from small, medium and large, to indicate the intensity of a response to each test question to be “scored.” Backster simply modified this system by assigning numbers instead of check marks to indicate response intensity. He further developed a scale against which the numerical totals could be compared in order to render a “chart-based” outcome. In spite of the many shortcomings of this method it is still widely used and has been one of the developments that has enhanced the consistency with which physiological data are evaluated. However, we note that the scientific evidence, in spite of some claims to the contrary, is not clear with respect to the purported benefits of Backster’s (or other similar systems) over other methods of assessing polygraph data.

In this book the authors present information relevant to three methods of specific issue CQT polygraph testing. These, they say, are their focus because they are “employed by the overwhelming majority of field examiners, and collectively have the most supporting research.” (p. 151). While we don’t know if this is true, we believe that to advance the idea (by implication) that some of the CQT methods of testing are distinct from others with respect to their accuracy and our knowledge regarding how CQT methods function is misleading.

Inspection of the APA's meta-analytic report (It is worth noting that the two authors of this book were also co-authors of that report), included in this volume as Appendix 2 in a revised and summarized way, shows that the differences between procedures is actually small. There is no "technique" (as defined in the meta-analytic report.) that is actually inherently more accurate than others. In fact, to our knowledge there is only one study in which two different Comparison Question "techniques" were assessed in the same conditions; the results showed no difference between them with respect to their accuracy. One of the things we have learned from the extant research, in our view, is that regardless of a "format" and a specified method of data analysis, as long as both are consistent with what has become accepted practice the outcomes don't differ much; the way in which the testing is administered appears to us to be more determinative of differences than is the "technique" that is applied. Finally, one will find in this book's glossary a definition of the term "technique" that we believe is far more consistent with our position on polygraph testing than is the way in which "technique" was defined in the APA's meta-analytic report. This would suggest that the authors now see the situation differently from the way they did in their preparation of the meta-analytic report. This, we believe, is worth noting. If a reader is interested enough to explore this issue in some depth it will become evident that we need to know much more about polygraph testing than we do now in order to have much confidence in the dogmatic, doctrinal assertions found in this book as well as in other publications on "lie detection."

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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.

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