

## The Essence of the Polygraph Method and its Usage in Bulgaria

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Received: 25 May 2020 ▪ Accepted: 22 June 2020 ▪ Published Online: 10 July 2020

### *Abstract*

This paper discusses the nature of the polygraph method, the scientific research in connection to the validity of the technique and its ability to discriminate between truthful and untruthful statements. The essence of the procedure is presented, its stages as well as the types of tests and their purpose. A review of the literature shows the development of the method and its usage in the public and private sector in Bulgaria.

*Keywords:* polygraph, lie detection, public sector, private sector, screening, scientific method.

### 1. Introduction

Lie detection, as a procedure which aims to differentiate between truthful and deceitful statements, does not start with the invention of the polygraph method. Lie detection is as old as human kind is. It is a universal problem and our civilization has always looked for and found ways to discriminate between lies and truth telling. For example, in their book on fundamentals of polygraph practice, Krapohl and Shaw (2015) describe ancient traditions in regards to detection of deception. Early societies believed that goodness always prevails on evilness, just because of the divine energies – good is stronger than evil. During the Inquisition one way to discriminate between lie and truth telling was to give bread and cheese to swallow – if the “suspect” swallows the bread and cheese, he/she is telling the truth. Other societies used dry rice in the same way – making the suspects eat it, if they could, then they were innocent of the crime. Those are just a few to mention.

The use of a machine in the application of deception examinations had to wait until the nineteenth century when single parameters were employed first, and then added together to bring about the equipment used today. The real use of multiple simultaneous channels of physiological data in deception examinations was first reported by Larson (1921). He constructed an instrument that simultaneously recorded on a smoked drum chart the respiration wave forms and a second tracing for relative blood pressure and pulse. Larson used this device with a relevant-irrelevant test question sequence on actual criminal cases and reportedly solved several crimes (Larson, 1921: 390-399).

Today the technology has advanced and the polygraph equipment weights no more than one kilogram altogether and could be transported easily. In the recent years a lot has been

done in terms of scientifically testing and proving what techniques and types of test are actually valid and accountable. There are many polygraph techniques currently used in the field. Understandably, examiners want to use the most accurate techniques available and with today's more educated examiner, the focus has shifted more toward science than in years past. Because to date no list of validated methods has been published, examiners are left to employ more informal methods of selection. While the scientific threshold for validity is often set at anything with a robust effect above chance level, the threshold according to standards of the American Society for Testing and Materials (ASTM, 2005) is 90% for evidentiary polygraph techniques and 80% for investigative polygraph techniques, inconclusives excluded. Both evidentiary and investigative polygraph techniques are permitted an inconclusive rate of up to 20% of all cases.

The American Polygraph Association defines three separate phases of the polygraph examination: the pretest interview, the in-test data collection /instrumental phase/ and the analysis of the test data. Each of those phases has equal important effect on the accuracy and the usefulness of the test results. This is why the procedures are considered fundamental and are based on knowledge, evidence and published theories.

## 2. Types of polygraph tests

No matter if the polygraph examiner is a police officer with high school educational level or an experienced psychologist for example, it must be made clear that the polygraph method does not measure lies, it does not measure personal traits or characteristics neither. It cannot be used as a substitute of a job interview, a personality inventory or an IQ test. The only thing a polygraph is capable of is to record psychophysiological data which vary significantly in response to the different types of stimuli in the test, as a function of truth-telling or deception (Nelson, 2014). Those different test stimuli are called relevant and comparison questions. Each validated technique today has different types of test questions and combinations but what is common among all of them is the comparison between the recorded psychophysiological reactions on the charts of the relevant and the comparison questions. There are, in general, two types of tests – screening and diagnostic. Screening tests are conducted when there is no known incident and mostly for pre-employment. Diagnostic tests are conducted then there is a particular crime under investigation or.

## 3. Polygraph pretest interview

The aim of the polygraph pretest interview is to orient the examinee to the purpose of the test, its procedure and all of the questions in the tests ahead. The basic premise of interviewing holds that people will report more useful information when they are prompted to do so by an interested listener who builds rapport through the use of conversation and interview questions. Polygraph pretest interviews are intended to allow truthful examinees to become accustomed to - or habituated to – the cognitive and emotional impact of hearing and responding to test stimulus questions that describe their possible involvement in problematic behaviors, while also sensitizing or increasing the awareness and response potential of deceptive examinees to test questions that describe their past behavior. The polygraph pretest interview is a process, involving several steps including: a free-narrative interview, semi-structured interview, or structured interview, a thorough review of the test question stimuli, and a practice or orientation test. A practice test or acquaintance test should be conducted as part of standardized field practice. Research by Kircher, Packard, Bell and Bernhardt (2001) has shown that this can contribute to increased test accuracy. The next stage of the pretest interview will be a free-narrative interview, a structured interview or semi-structured interview. Free narrative interviews conducted during polygraph testing may include direct or probing questions regarding a known or alleged incident, before proceeding to

construct polygraph test questions. Free-narrative interview strategies are useful during diagnostic investigations, but are not well suited toward use in polygraph screening tests which are conducted in the absence of a known or alleged incident. Pretest interviews for screening exams conducted during polygraph screening exams, whether pertaining to operational security, law enforcement pre-employment, or post-conviction supervision, will take the form of either a structured interview or semi-structured interview. Structured interviews differ from semi-structured interview in that structured interviews are conducted verbatim, without deviation from the interview protocol (Nelson & Handler, 2015). In contrast, semi-structured interviews are conducted using a structured content and question outline, for which the interviewer is permitted to present interview questions in a manner that is individualized based on the personalities, education levels, and rapport between the interviewer and interviewee. In the last stage of the pretest interview – following the free-narrative interview or semi-structured interview – the examiner will develop and review the test questions with the examinee (Nelson & Handler, 2015). Test question language will be adjusted to ensure correct understanding and to account for information or admissions that the examinee may provide during the interview or while developing the test questions. Relevant questions will describe the possible behavioral involvement of the examinee in the issue or issues of concern. These questions will generally avoid issues related to memory, intent, and motivation. When a polygraph examination consists of multiple series of test questions, the examiner will review each series of questions separately, then conduct the in-test data collection phase for each question series questions before reviewing and collecting data for each subsequent question series. When a polygraph consists of multiple series of test questions, there is no evaluation or discussion of the results of any individual series of questions until all test question series have been fully recorded and analyzed. If an acquaintance test was not conducted earlier it may be conducted after reviewing the test questions and before proceeding to the in-test phase of the exam.

#### 4. In-test data collection

The second phase of the polygraph examination is that of in-test data collection. This may be accomplished using any of a variety of validated diagnostic or screening test formats. All screening and diagnostic polygraph techniques include relevant questions (RQs) that describe the examinee's possible involvement in the behavioral issues under investigation. Effective relevant questions will be simple, direct, and should avoid legal or clinical jargon and words for which the correct meaning may be ambiguous, confusing or not recognizable to persons unfamiliar with legal or professional vocabulary. Each relevant question must address a single behavioral issue. Multi-issue screening polygraphs, conducted in the absence of a known allegation or incident, may be constructed with relevant questions that describe distinct behaviors for which the external criterion states are assumed to vary independently (i.e., external criterion states are assumed to be exclusive or not interact and affect one another). Most polygraph examinations in the United States today are conducted with some variant of the comparison question technique (CQT). The CQT was first described in publication by Summers (1939) while he was head of the Psychology Department at the Fordham University Graduate School in New York. The CQT was popularized within the polygraph profession by Reid (1947) and Backster (1963). It is the most commonly used and exhaustively researched family of polygraph techniques in use today. In addition to RQs, these polygraph techniques also include comparison questions (CQs; referred to in earlier polygraph literature as control questions). When scoring a test, examiners will numerically and statistically evaluate differences in responses to RQs and CQs (Nelson & Handler, 2015).

## 5. Test data analysis – Scoring of polygraph examinations

Prior to informing the examinee or others of the results of the polygraph examination, the examiner must analyze the test data. Procedures for test data analysis are designed to partition and compare the sources of response variance: variance in response to RQs and variance in response to CQs. Responses are numerically coded and the result is compared to cutscores that represent normative expectations for deceptive or truthful persons. The overarching theory of polygraph testing is that responses to RQs and CQs vary significantly as a function of deception and truth-telling in response to the RQs. Numerical scoring was popularized within the polygraph profession by Backster (1963) as the seven-position scoring system, and has been subject to further development and refinement through empirical study. Today, most of the polygraph examiners use the ESS (Empirical Scoring System), which is the only empirically proven scoring system so far, suitable for scoring all standardized types of tests, both diagnostic and screenings.

## 6. History of polygraph in Bulgaria

The polygraph methodology and technology came relatively late to Bulgaria compared to its usage in USA. The first polygraph instrument – a six-channel Stoelting – arrived in 1968 (Zanev, 2009). This instrument was for the needs of Bulgarian intelligence to develop a system for training in deceiving the polygraph. In 1972, Bulgaria bought another Stoelting Ultrascibe. After the creation of a laboratory (and later institute) of psychology at the Ministry of the Interior, all polygraph experiments were conducted there.

Up to 1989 the mainstream of development of the polygraph was creation of techniques for countermeasures. Training in the use of polygraph examinations was based on books and local experiments, and a small number of people was able to work with the polygraph. This was critical for the first years of the 1990s, because these people retired, leaving no successors to continue their work. In practice, the polygraph was used in this period in a few criminal cases and for selection of officers for a new service for fighting organized crime (Zanev, 2009).

In the spring of 2007, Paul Redden, then senior polygraph examiner at the San Diego police department and representative of Lafayette Instruments, arrived at the institute. That opened the door for official education in an APA accredited school in USA of two experts from the Institute of psychology. All this started the process of finding an appropriate place for polygraph examinations in Bulgaria. After 1997, the use of the polygraph increased considerably. In the following years polygraph examination became decisive in the resolution of many criminal cases – murder, serial assaults, robbery and burglary. From 1999, the first results from polygraph examinations were presented before court. They were presented as “psychological expertise for the investigation of truthfulness”. This is the only legal way to introduce polygraph examination in the court system since Bulgaria until this day has no law on the usage of polygraph. In 1998 the Bulgarian Polygraph Association (BPA) was established. It was declared to be a professional body of people who work in the field of polygraph examinations. In 2004, the BPA organized its first international conference. This conference, which had a major influence on public opinion, hosted guests from the USA, Russia and Israel. The conference generated fruitful discussion on the regulation of polygraph use in the court system leading to greater acceptance of polygraph examination results (Zanev, 2009).

Since 1996, in the Institute of Psychology, polygraph examinations have been situated in the Department for psychological expertise and support of criminal investigation, Department of criminal psychology today. Along with polygraph examinations, this department also works in criminal profiling, prevention of suicides and hostage negotiations. The key assignment of the department is investigation of murder, missing people cases, rape, robbery, burglary cases etc. Polygraph examinations from 1997 until today have played a role in resolving a number of murder

cases and cases of organized crime, which has led to great popularity and acceptance of the results of the polygraph.

In the last ten years, private polygraph examiners, most of them, experts who used to work in the Institute of psychology, started working with the business, resolving cases of unloyal behavior, thefts, robberies etc. Also, prevention is a main focus, thus polygraph became part of the pre-employment procedures of numerous companies in the country. Both the government and the private sector conduct thousands of examinations each year.

The biggest company in the private sector who is doing polygraph examinations for both private sector and government, supporting police and testifying in the court as experts, is Assess Ltd. Also, the company is an official dealer for Lafayette instrument and the only official representative of an APA approved American school – the PEAK C.A.T.C, owned by Lafayette Instrument. With the help of Assess and the Basic and Continuing education courses the company provides, both sectors use standardized polygraph types of tests and ESS (Empirical Scoring System) for the main part. There are a few companies in the private sector, comprising of one-two employees who say they use Russian polygraph methodology, however, have no certification, but this is yet not illegal since there is no law in regards to the polygraph usage in the country.

#### Acknowledgements

This research did not receive any specific grant from funding agencies in the public commercial, or not-for-profit sectors.

The authors declare no competing interests.

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