

## THE POLYGRAPH EXAMINATION FROM THE LEGAL PERSPECTIVE

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### ABSTRACT

*The aim of this article is to emphasize the main features of the polygraph examination within the Romanian Criminal process, by evaluating the legislation which makes possible to use it, the ground for doing it and the potential results which might be expected by the investigators in their aim of looking for the truth.*

**KEYWORDS:** *Polygraph examination, evidence, psycho-detection, simulated behaviour, bio-gram, psycho-physiological mechanisms, insincerity*

### INTRODUCTION

One of the issues that has arisen with the entry into force of the new Romanian Criminal Procedure Code is whether it legitimizes the use of the polygraph as evidence in the criminal process. Although the technique was also used during the period when the provisions of the previous Criminal Procedure Code were in force, the polygraph was not expressly mentioned among the evidences, as these were listed strictly and exhaustively. It should be noted, however, that the polygraph tests materialized in technical-scientific report which allowed them to be assimilated as evidence under the conditions of art. 64 paragraph (1) of the previous Code of Criminal Procedure. For this reason, uncertainties have been raised about the probative value of the polygraph test, which remained even with the entry into force of the new Code of Criminal Procedure, since polygraph testing was not expressly provided for by the new code as evidence.

However, with the entry into force of the new code, it can be seen that the formal types of evidence are no longer strictly listed, the judicial bodies being able to gather as evidence within the criminal file, any other means of proving the facts that are not prohibited by law (art. 97, para. 2, letter f) of the new Code of Criminal Procedure). Thus, it can be seen that the legislator did not clarify the problem caused by the polygraph test, but, by listing the evidence by way of example it created a more favourable framework for the use of this technique. The legislator, at the time of drafting the new Code of Criminal Procedure, took into account that the means of proof which can be evidence should not be explicitly listed. So, any expert reports that could help police to find out the truth in a specific criminal case, being admitted. We consider that the position of the legislator was objective because it took into account the development of science and technology, and it cannot restrict the area of evidence, it did not nominate only the evidence known at that time. It allowed the new technologies of the future to be assimilated as evidence without the need of modifying the law. In the Article 97, paragraph (1) of the new Code of Criminal Procedure, the legislator explicitly defines what is meant by evidence, while showing that there is no hierarchy of evidence in relation to a predetermined value, as follows: to ascertain the existence or non-existence of a crime, to identify the person who committed it and to know the circumstances necessary for the just settlement of the case and who contribute to finding out the truth in the criminal proceedings.

### THE POLYGRAPH AS EVIDENCE

Starting from the provisions of the Article 97, paragraph 1, of the Criminal Procedure Code and taking in account that in this way, following the polygraph test, it is possible to identify the person who committed a crime, or, in other circumstances, at list to found there is or there is not a certain crime, it can be obviously assessed as valuable evidence in the settlement of the case.

### **How to use the polygraph?**

The polygraph, also known as the "lie detector" is one of the most powerful devices used to detect simulated behaviour of the people. The polygraph is nothing more than a mechanical and electronic recorder, which pneumatically takes over the changes of the blood pressure, pulse, respiration, supplemented by a system for recording electro-dermal resistance (Buş, 2005: 155) and the micro muscle movements.

The polygraph does not detect in any way the "lie", as such, as it is wrongly considered by someone, but highlights the physiological changes caused by the emotions that accompany the simulated behaviour. The whole technique is scientifically based on the following aspects: when perpetrating a criminal act, the subject participates with his entire personality, mobilizing for his/her criminal success the entire cognitive, motivational and affective potential. It means that the criminal act does not remain on a random peripheral acquisition of consciousness, but integrates into it, in the form of a stable criminal structure with specific content and emotional load, with a well differentiated motivational role. Regarding the explanation of the phenomenon underlying the psycho-physiological reactions, three basic motivational-emotional theories have been formulated in the doctrine (Mitrofan et al., 1992: 260-261), namely:

- *The theory of conditioned response* - argues that the physiological response is nothing but the consequences of an emotional activation caused by a conditioned stimulus. When a given stimulus is associated with a strong emotion, a broad response will be expected. However, the theory does not explain why the detection of simulated behaviour takes place in conditions with low motivation and less threatening;
- *Conflict theory* - according to which, both the motivation to lie and the desire to tell the truth is found in the physiological area. The more intense the conflict, the broader the response.
- *The theory of punishment* – according to which, the physiological area during the simulation is activated by the fear of consequences if it were detected.

Meantime, other opinions have emerged regarding the explanation of the origins of the psycho-physiological reactions involved in the simulated behaviour. It's about:

- *The theory of presumption of guilt* - argues that the psychophysiological reaction will be highlighted in the relevant question, due to the fact the subject is aware of his guilt;
- *The focus of attention theory* - it has been found that the psycho-physiological response to a stimulus reflects the degree to which the stimulus is expected.
- *The theory of dichotomization* - according to it, we can distinguish between two distinct categories of stimulus, namely the relevant and the irrelevant. Subjects who have information about the criminal act for which they are being investigated will focus on only one aspect of the stimulus presented, while ignoring the other aspects of the stimulus which informs the investigator about the degree of simulation of the subjects.

To any of these theories we refer, there is a level at which, they converge, namely the fact that psycho-physiological reactions certainly occur when a person hides the truth, so it is insincere. So, it turns out that we cannot talk about determining the guilt or innocence of the person through the polygraph technique, so we cannot use the results thus obtained as a proof of the person's guilt. Practically, the technique detects the emotion, indirectly, by capturing

the general activating reactions and involving central and peripheral psycho-physiological mechanisms, which, captured by the detector, will be the object of bio-information conversion.

### **The scientific basis**

Because the human health and survival depend on maintaining a balance of the concentrations of chemicals within the body fluids (this balance is called homeostasis), in the nervous system of human body there is an autonomous component of treating risk situations and maintaining normal physiological rhythms. This formation is called *hypothalamus* and is also called the "endocrine brain".

The sleep, oxygenation of the blood, body temperature, levels of potassium, calcium and magnesium salts in the blood, as well as the concentrations of all the chemicals that maintain cellular activity, are controlled by this formation. The vegetative nervous system is centred in the hypothalamus which is being responsible for all the so-called involuntary reflexes (for example: maintaining heart rate, constant blood pressure, muscle tone of blood vessels).

When the sense organs detect a threat, a nerve signal is sent to the autonomic nervous system and thus, the body is activated and the physiological rhythms is accelerated. With the disappearance of the stimulus and the situation perceived as threatening, the autonomic nervous system reduces physiological rhythms and restores homeostatic balance. This game between economic and high consumption is ensured by the two levers of the vegetative nervous system: sympathetic and parasympathetic. These two levers each act through chemicals called neuro-transmitters. Neuro-transmitters are secreted into body fluids and thus reach specific receptors in various organs, thus influencing their activity (inhibition / excitation) (Reid et al., 1996: 17).

In the polygraph test, the subject's ear is the receiver through which potentially threatening information reaches the subject. Through the auditory nerve, the stimulus reaches the temporal lobes of the brain, where the center of hearing is. Here, through the operations of thinking, the dangerous potential of the stimulus is established. When a question is perceived as threatening, impulses are sent from the frontal lobes of the brain to the hypothalamus, thus triggering a physiological alert reaction. In this way, a whole train of nerve impulses will be emitted, their role being to accelerate the heart rate, to change the distribution of blood volume in the body, to change the respiratory rate, etc. In a word, the stimulus perceived as threatening triggers the so-called physiological reaction "fight or flight", a reaction whose role is to energize the whole body to overcome the danger.

In the techniques of experimental investigation, the following psycho-physiological parameters are taken into account (together with the associated recording and measurement techniques) (*Methodology of polygraph activity in the Romanian police*, Bucharest, 2005: 13):

- electrical impulses in the brain: electro-encephalography
- muscular electro-genesis: electromyography
- variations in respiration: pneumography
- muscular strength: dynamography
- current and excitation time: chronaximetry
- the difference in electrical potential involved in eye movement: electroculogram
- variations in the volume of blood vessels: plethysmography
- electrodermal reaction: electrodermogram
- temperature variations:
- blood pressure:
- electrical rhythms generated by the heartbeat: electrocardiogram.

In the field of polygraph tests, the theoretical paradigms and working methodologies of experimental psychology were taken over. In this sense, the monitoring of the activity of the vegetative nervous system is performed by means of the following sensors:

- two sensors for thoracic and abdominal neuromuscular activity (pneumographs)
- a sensor for skin potential difference or galvanic skin reaction (GSR electrodes)
- a blood pressure sensor (blood pressure sleeve)
- a heart rate sensor (optical plethysmograph)

All these sensors obtain physiological recordings of the activity of the vegetative nervous system throughout the polygraph test, in response to the test questionnaire.

### **The object of judicial bio-detection**

The above mentioned object is represented by the simulated behaviour, which is an entity between the apparent and the unapparent aspect of the behaviour, expression of the psychological doubling in relation to oneself (unapparent aspect, strictly secreted) and in relation with the society (apparent-notorious aspect, displayed or naive, but insistent, with persuasive efforts). Simulated behaviour is defined as an attempt to hide or falsify the meaning of a psychosomatic (Bogdan, 1979: 187) background reality.

The bio-detection considers both terms of the simulation binomial and elaborates the methodology of operant conditioning of reactions in order to obtain the necessary information.

The concerns of judicial bio-detection include:

- the intentionally simulated behaviour, with aspects of appearance and non-appearance;
- the simulated behaviour binomial
- the credibility
- the existence of an error, as an aetiology of behaviours that are apparently simulated
- the existence or non-existence of the discernment of criminal acts
- searching for material evidence for conversion
- intentionality

### **The purpose of judicial bio-detection**

The data obtained from the polygraph examinations allow:

- excluding the suspects not involved in the investigated cases, preventing judicial errors, wasting time through unnecessary checks and avoiding the involvement of specialists in inefficient activities;
- identifying the perpetrators of crimes regardless of their gender;
- verifying the veracity of the statements of the persons involved in the process;
- establishing the sincerity of the defences formulated by the persons who perpetrated the crimes (cases that remove the criminal character of the deed, self-defence, state of necessity, factual error, physical or moral coercion);
- establishing the circumstances that qualify or aggravate some criminal acts;
- detecting the slanderous character of some criminal complaints;
- resolving the contradictions that appear between the statements of the parties when the classic procedure of confrontations did not reach to a result.

Other aspects of establishing the truth may arise in judicial practice, so that the polygraph technique can be used and adapted to any situation.

### **Method**

The polygraph technique is based on monitoring the activity of the vegetative nervous system (with its sympathetic and parasympathetic components), activity reflected in the psycho-physiological changes that occur in the human body. As a result of the thinking operations induced by the auditory stimuli associated with the polygraph test, representations are formed and updates of the memory of the examined subject take place. These psychological phenomena are governed by the free will, the subject being free to carry out any cognitive operations with test-induced information. The reverse of this freedom is the

inability to control the physiological alert reactions that occur when hearing potentially dangerous information (for example, information related to the involvement of the test subject in a criminal act). It is these psycho-physiological changes following a well-individualized stimulus (question from the polygraph questionnaire) that indicate the involvement / non-involvement of the subject in a certain activity with criminal relevance.

The method is non-intrusive, the five sensors used by the polygraph are just recording the psycho-physiological parameters in the immediate vicinity of the body of the examined subject and therefore is no need to insert any sensor into the skin or swallow activating substances.

### **Steps to do for the polygraph examination**

The specialist in task with doing a polygraph examination, have to go through some specific phases, like:

- the study of the file;
- the before-test discussion;
- the examination itself;
- the post-test discussion;

a) *The study of the file* is very important because the specialist must know every detail of the fact under investigation, the stage of it, what else evidence is gathered to the file, what kind of person is that who has to face the examination and, what are the questions, he/she must focus when do the examination.

b) *The before-test discussion* – is the phase in which the device is presented to the subject and the device is calibrated for each case, through specific tests, to identify the individual psycho-physiological parameters of the subject as a term to compare with subsequent simulations, as a result of dishonest answers. He/She shall be provided with some information from the file and, at the end of this conversation, the subject have to sign the statement of consent for being examined.

c) *The examination itself* – which is done following the specific rules and which can be interrupted at any time at the request of the subject. If he/she does not agree to go further, the examination will be ended.

d) *Post-test discussion* - during these mandatory steps, the subject may present a pre-test recognition, when he/she realizes that he/she cannot cheat the device or a post-test recognition, after being informed that he/she has had simulated behaviour, insincere to relevant critical questions or may further deny the offense.

If the subject accepts the examination and no pre- or post-test confession is made, then the examiner will draw up the technical-scientific finding report with his/her conclusions on the sincere or insincere behaviour of the subject, or, if the case, by eliminating or including the person examined in the circle of suspects. The circumstances in which the polygraph specialist will discuss the test results with the examined subject depend on the overall architecture of the file, the personality of the examined subject and the operational opportunities in this case. It must be kept in mind that the use of persuasion techniques is a methodology whose limits are represented by the interaction personality of the examiner and the subject examined (Butoi et al., 2006: 278).

In order to carry out the examinations with a high degree of accuracy and objectivity, the following rules (Cucos, 1997: 125) will be observed:

- The complying with the specifications of the paragraphs on polygraph requirements, laboratories and polygraph equipment.
- The polygraph examination can be requested at any time of the investigations, but not before a minimum of activities specific to the police work have been carried out, which should concretely establish the issue and the objectives of the investigation.

- The specialist must be provided with the necessary file and information, so that the detailed knowledge of the events allows to establish the most pertinent questions in relation to the issues requested for investigation.
- Within the laboratory, during the examination, access of persons, other than the examiner and the subject, is not allowed, except for translators in those cases in which some foreign nationals are involved.

In what regarding the persons to be subjects of examination:

- a) previously have to be assured conditions of rest and normal nutrition;
- b) they have to be in a normal psycho-medical condition;
- c) they do not have to be subjected to prolonged investigations and, in the case such situations occurred, the investigations will be interrupted at least 3 days before the test;
- d) they do not have to be threatened with the polygraph examination, because it determines the appearance of parasitic reactions that prevent the formulation of certain indices;
- e) persons who are under the influence of alcoholic beverages or drugs that influence the functions of the central nervous system, will not be tested;
- f) against the persons brought to the test, no threats, constraints, promises or exhortations will be made, factors that can vitiate the test result;

The following categories of persons will not be tested (Butoi, 1997: 152):

- pregnant women, those who are breastfeeding in the period preceding the test or the moment of requesting the polygraph examination;
- minors under 18 years of age;
- chronic alcoholics;
- people with mental illness regardless of the diagnosis made in medical documents;
- persons under medical treatment who cannot be interrupted;
- any other persons about whom the expert deems motivated that they are not fit to face the examination.

### **Interpretation of the results obtained at the polygraph**

Interpreting the results obtained from the polygraph test or interpreting the diagrams is perhaps the most difficult and at the same time the most important part of the whole polygraph testing operation. The process of interpretation is an unfolding of reasoning in which the intuitive intertwines with the scientific and which is based on knowledge of experimental psychology, psycho-physiology and a rich experience in the field. In detail, the correlations being made on the one hand between the qualitative characteristics of the routes of the answers of distinct questions and on the other hand between the quantitative parameters (amplitude, frequency, duration, etc.) of the same route characteristics, thus based on reasoning of inductive, educational and analogical type on the structure of the relevant syndrome (Butoi, 1997: 59-60).

In one opinion the interpretation of the diagrams (Mitrofan et al., 1992: 219) has several distinct phases, namely:

#### *1. The primary phase* comprising:

- establishing the route segments that highlight the sincere answers, that is, those without emotion and that correspond to neutral questions, without confusion;
- finding the particularities of the route segments that highlight the insincere answers (that is, where the voltage peaks are signalled on the diagram), respectively to the questions with incriminating load, directly accusatory;
- following the selective detection of the characteristics of the route segments to the related investigative questions and the detection of those that highlight the state of emotional tension.

- finally, the specific features of the route segments are identified, which highlight the insincere answers (in which the emotional tension is present) to the control questions with the general load, namely those that present “normal reactivity under test conditions”.

### *2. Secondary phase*

After establishing in the first phase the existence of positive bio-information, the relevant segments are compared with the neutral ones and the detailed ones with the neuter ones, thus concluding, based on the graphic analysis between these segments or the non-existence of the simulated behaviour. At the same time, the segments corresponding to the control questions are compared with the neutral ones and the differences are established and to what extent they are corroborated with the relevant segments.

In this phase, a meticulous process of detecting the most sensitive changes in the routes of the tested functions takes place, drawing the first qualitative conclusions. It also proceeds to the effective processing of data with the notification of all significant variations that occur in their constituent parameters such as: amplitude, latency, duration, frequency, etc., thus resulting in quantitative conclusions this time.

The parameters followed by the examiner-psychologist in order to correctly interpret the polygraph diagram are, in an opinion, the following:

- Latency of response - involves the existence of the time between the utterance of the word stimulus and the actual response of the subject over 4 seconds;
- The absence of response involves delaying the subject's response to the word stimulus by more than 30 seconds;
- The absurd reaction is a change of direction, voluntarily introduced by the person examined during the associations;
- An abnormal superficial association when the subject gives a superficial, banal association, in the middle of correctly established intrinsic associations;
- Repeating the word stimulus is a method of gaining extra time to prepare an answer considered by the subject difficult;
- The repetition of the answer words means a specific connotation of the repeated word for the subject;
- So is perseverance.

### *3. Tertiary phase*

In this final stage of the interpretation, a diagnosis is established for the diagram which can be one of the following:

- positive bio-diagram - suitable for conversion into evidence of guilt;
- negative bio-diagram - unfit for this conversion, but suitable for evidence of innocence;
- uncertain bio diagram - does not offer possibilities for conversion into evidence.

Following the end of the stage of interpreting the results, the post-test discussion takes place, separately from it. As said before, it is a stage in which the tested subject interacts with the examiner, but the relationships are reversed. The subject will express his/her opinion on the test and the results of the bio-gram, which is presented on this occasion. It is also an opportunity for the subject to testify, which is often the case, especially if he/she is shown his own positive bio-gram. In case of counting, in order for the positive results to be used in the judicial investigation, so if there is a contradiction between the positive bio-diagram and the negative post-test discussion, the conversion of information from the bio-informational complex will be used as simulated behaviour.

Other authors (Buş, 2005: 155) appreciated that in order to process and interpret the values of the physiological parameters recorded on the polygraph diagram, the “Numerical evaluation system” can be used. The aim of this method is to highlight the differences in amplitude and length (of the order of millimetres) of the physiological changes, obtained in the answers given by the subject to the relevant and control questions. For this, the authors, psychologists and specialists in the field of detection of simulated behaviour took into account

four psycho-physiological parameters, namely: thoracic and abdominal breathing, electro-dermal reaction and pulse-joint tension.

## CONCLUSIONS

The investigation of crimes is a very complex activity, and the discovery of the perpetrators of the criminal acts depends on the way in which it is carried out. The criminal investigation bodies, on the one hand, are directly interested in finding the shortest way to find the perpetrators of the crimes, because their stay at large means a social danger. In the other hand, they are interested in using legal tools, efficient, and, at the same time, rigorous scientific as much as possible (Dumbrava, 1999: 221). At the same time, it should be emphasized that the criminal investigation bodies, in their complex activity, need to clarify as soon as possible, the hypothetical versions of the criminal acts and the suspected authors.

Moreover, the parties involved in the judicial process are people with different interests whose structure includes the two classic types of behaviour - the apparent and the unapparent. However, the real concern of those called to do justice is to find out the truth contained in the unapparent (hidden) behaviour.

The criminal activity is marked by a mental strain, characterized by an exacerbation of the senses and attention which makes the course of events during the act, to be irrevocably and independently of the will of the perpetrators, at the level of memory in the form of information. All this data (sensory perceived information) defines the criminal matrix and is found in the mode of operation, representing a special class of "traces" that are much more stable over time than the categories of classical traces, but which require specific methods of "sampling" and interpretation. All this problem was successfully answered by the bio-detection of the simulated behaviour, using the polygraph technique.

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