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The possibilities of the polygraph application and search for the new alternative methods of the instrumental lie detection dedicated to prevent new terrorist threats

The article treats the possibilities of creating the alternative methods to the traditional polygraph checks, new methods of the lie detection with the help of the registration and the analysis of the evoked brain potentials, their application to verify the suspected people involvement into terrorist actions. It is underlined that the new methods have high reliability and validity to discover the hidden information about the terrorist acts at the stage of their planning.

Key words: lie detection, terrorism involvement check, evoked brain potentials.

While performing the task in order to prevent the terrorist acts we have largely used the special methods and technologies of getting information about resources and the character of the terrorist threats. They rather efficiently apply the instrumental lie detection with the help of the polygraph to achieve these goals. The possibility of the operational research using polygraph in order to discover the involvement into the terrorism of the people in the places of the large transport junctions (railway stations, airports) specify requirements to this kind of the checks: the operational surprise, mobility (possibility to be used in the field conditions) in combination with the high validity of discovering lie symptoms. So, for instance, the analysis of the results of the application of the polygraph checks in Krasnodar region showed, that this method allows successfully finding the concrete people, who are the members of the terrorist groups, and also details of the planned terrorist acts under short span time for the examination [7, 10]. Revealing the involvement into the activity of the terrorist groups is not necessary reduced to the illegal keeping of the weapon and the use of the weapon, explosive substances, it is often connected to the need of getting the information about the members of the terrorist groups, their places and plans [5].

In the operational plan, the traditional psycho-physiological instrumental method of the lie detection represents the permanent registration by the technical means of the vegetative human reactions, appearing in response to specially composed external stimuli (including the predeterminedly significant ones) and their following analysis about the presence or the absence of the secret information [11]. At present when they want to find the lie with the help of the polygraph, they register and analyze the changes of the electric skin activity (ESA) or psychogalvanic reflex (PGR), breath parameters, frequency of the arterial blood pressure (FAP), arterial pressure rate (APR) [6, 11].

However, the traditional method of the instrumental lie detection (or the method of the special psycho-physiological studies), based upon the complex registration of the psycho-physiological characteristics of the emotional state using the polygraph, has some defects. The accuracy of its application towards different tasks is about 80 %.



The main reasons of the mistakes while detecting the lies with the help of this method are the difficulties of the interpretation of the changes of the physiological indices, insufficient studies of concept of the lie discovering, shortcoming of the questionnaires, given to the man in the course of the testing. Besides, they have high requirements for the training, the level of the qualification and the degree of the specialists' objectivity, who carry out these studies [13]. When they speak about the reliability of the results after discovering the secret information, they should take into the consideration the state of the subject, character accentuation, particularities of the motivation and need sphere of the personality, particularities of the thinking style and lateral organization of the examined people [4, 6, 11, 15].

Due to this reason polygraph checks to the terrorism involvement have the multi-stage character: the identification of the person suspected as the guerilla who committed a crime; to identify the members of the terrorist group and the role of the person exposed to the testing; clarifying the unknown details, which permit to ascertain tactics and mechanisms of the terrorist actions; to discover the motives of the committed crime; to find the evidence and etc [10].

We think it is very important to choose, to combine the methods and tests for polygraph checks using the certain succession and keeping the exact informational and logic links. And though at the first sight the methods of the polygraph check of the people charged with the common crimes, doesn't differ from discovering people involved into the terrorism, there are some particularities in the last case.

So, U.G. Kasperovich, treating the personal and behavior particularities of the terrorists, underlines, that the terrorist behavior usually represents a kind of the bright and quite obvious variety of the antisocial, delinquent behavior. According to the general evaluation, this behavior to a certain extent is anomalous and inevitably includes some pathological components. It is generally accepted that the terrorist is — the personality with accentuation. It means that some certain personality features are expressed extremely powerfully, brightly; they deviate from the norm, which can in its turn tell on the symptoms of the vegetative reactions in the process of the lie detection [8].

It is important to distinguish the «real» emotions and «induced» which can be influenced by the numerous factors: the subject state, his intellectual and psychological features and so on.

Letting alone psycho- physiological aspect, the crucial compound of effective instrumental diagnostics of the lie is its methodic supply. If they want to test people, suspected in the terrorism involvement, they more often use the methods of discovering the hidden information (in different modifications), for example the test of the knowledge of the guilty and etc. «Prospecting test for the criminal past» is applied in the large scale [10]. It means that the methods of the knowledge of the guilty and other corresponding tests are oriented to the sufferings from the guilt after the antisocial act. The memory about this emotionally significant event is kept for a long time [1]. However, terrorists – religious fanatics, honestly believing in rightness of their actions,



do not feel guilty for committed criminal acts, which complicates their identification with the help of the traditional instrumental methods of the lie detection.

In this case, the method of the special psycho-physiological studies is the indirect method of studying lies, and the studied vegetative reactions are too slow and conducted with the delay, they are closely connected to the changes of the functional state and emotions which aren't specific towards the stimuli and tasks. Many critics insist upon the fact that the polygraph method of studying special psycho-physiological indices shows more often the emotions that the knowledge about some event [3, 12]. Besides, the intellectual particularities, character accentuations, the characteristics of the motivation and need sphere of the personality, particularities of the interhemispheric brain functional asymmetry and other factors may have the influence upon the development of the psycho-physiological processes, reflecting the lie reactions in their diversified displays [2, 3, 14]. The elaboration of the new reliable methods of finding out the secret information, based upon the registration of the objective neurophysiologic reactions, specific to the lie phenomenon display could solve this problem [2, 3, 11, 14].

The idea of using the special mental correlates while detecting a lie occurred to the scientists searching for the alternatives of the polygraph studies. As one of the alternative and perspective methods of the lie detection, the analysis of the bioelectrical activity of the cortex, the more accurate analysis of the «evoked potentials» (EP) in response to the presented stimuli is regarded. The advantages of this method consist in the fact that its application would allow to reveal the specific changes of the bioelectrical activity of the certain brain parts, connected to telling a lie. It is established that the lie process is accompanied by the changes of the evoked potentials N400 and P300, which can also reflect the reaction towards the occasional seldom exposed stimulus in the succession, the reaction of recognizing, appreciating of the stimulus significance, attention redistribution and data processing [16].

Basing on the results of the studies of the EP brain processes, connected to the lie, some contradictory theories were suggested. For instance, some scientists believe that the process of the lie is accompanied by the changes of the attention mechanisms, or changing the loading upon the memory mechanisms, or resolving conflicts, appearing between the processes of the perception and memory [3]. The search for the specific brain mechanisms, reflecting the realization of the false answer by the method of the registration of the evoked potentials, shows specific indices of the brain activity, which are special cases of the universal brain reactions to the realization of the incorrect action [9].

In the foreign publications they give already practical results of the application of the methods in response to the analysis of the event linked potentials (particularly, waves P300) to discover the hidden information, to find out the details of the planned terrorist attacks]. So, in the laboratory tests the experiments participants – «conventional» terrorists – were told about the details of conducting large terrorist act in several towns of the USA. They wanted to know the degree of remembered



information that's why the participants had to give the account of the detailed plan of the terrorist attack in written. In the process of the registration and the analysis of the component P300 among the participants of the experimental group («conventional» terrorists) and the control group (people who didn't know anything about the terrorist action) when the testers knew the details of the plan of the terrorist attack, conventional «terrorists», who participated in its elaboration, were found with the accuracy of 100 % [17]. It is necessary to underline, that the researchers for the first time used the methods of the registration of the evoked potentials P300 in the experiment scenario, where participants– conventional «terrorists» – were just about planning the terrorist attack, they didn't commit a terrorist act. But even during the experiment, when the researchers didn't know about the plans of the conventional «terrorists», the technology of finding out the secret information gives the possibility with the accuracy of 83 % to discover the members of the terrorist group and the critically important elements of the hidden information. Herewith, under laboratory conditions the participants were given only 30 minutes («conventional» terrorists) get familiar with the details of the forthcoming terrorist attack. It is suggested that the real terrorists think about and many times study the details of the planned terrorist act, it leads to a deeper encoding of the memories at the neurophysiologic level connected to this event, and so far correspondingly, with high EP feedback to the presentation of corresponding stimulus, which increases the reliability of finding out the terrorist intentions.

The above enumerated, let us conclude that the elaboration and modification of the technology of the lie detection by the application of the neurophysiologic methods will allow to increase the objectivity of the detection of the hidden information in order to prevent terrorist threats at the stage of their planning. The combination of the traditional polygraph checks, oriented to the registration of the vegetative reactions of the people suspected into the terrorist attacks, with the new alternative methods, based upon the registration of the dynamics of the bio-potentials of the cortex, will allow increasing the validity and reliability of the check to the involvement into the terrorist activity.

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