

**Dikaya L. A.**

## Development of Creativity Among Experts in Counteraction to Terrorism and Elimination of the Consequences of Acts of Terrorism

*The article substantiates the necessity of development of creativity among experts in counteraction to terrorism and elimination of the consequences of acts of terrorism. The author demonstrates the role of psychophysiological technologies in development of a creative potential. The author describes the technique of carrying out an alpha-biofeedback training for development of creativity among experts. 22 correspondence students of Southern Federal University (SFedU) and South-Russian Humanitarian Institute (SRHI) aged 35–44 were examinees in the research. They were former special detachment fighters who took part in elimination of consequences of acts of terrorism (special operations soldiers, snipers, shot-firers, sappers). The examinees have been divided into 2 groups: a control group (11 persons) and an experimental group (11 persons).*

*On the basis of the carried-out comparative analysis the author demonstrates the efficiency of the alpha-biofeedback training in solving non-standard problems of the professional activity of officers of special operations forces. The author draws a conclusion that after training in self-regulation of the alpha rhythm EEG by means of biofeedback training the level of creativity has been increases and situational anxiety has been decreased among the officers of special operations forces working within anti-terrorist activity.*

**Keywords:** counteraction to terrorism, anti-terrorist activity, development of creativity, biofeedback training, alpha rhythm EEG.

Terrorism is a system phenomenon of a complex political, economic, military, legal, and psychological nature. Thus its psychological component has started to play one of dominating roles in recent years. In modern conditions we need an essentially new system of the organization of the system of the struggle against terrorism, including the psychological support of anti-terrorist activity [1, 9, 14].

The psychological support of anti-terrorist activity is first of all a system of the complex and permanent highly professional qualified psychological assistance at all stages and levels of struggle against terrorism. The system of psychological support of the anti-terrorist activities should develop and apply psychotechnologies of identification, prevention, suppression of terrorist activity and minimization of its negative psychological consequences [17].

V. P. Zhuravel notes, "Being a dangerous social phenomenon terrorism constantly develops, improves itself. Experts note its creativity and innovation. Terrorism is increasingly distinguished by its insidiousness, unexpectedness, and unpredictability" [10, p. 6].

Owing to various reasons within the activity of the power bodies which intention is safety and counteraction to terrorism, the problem of the development of creativity among the officers of power structures is insufficiently covered in scientific literature.

Thus, the problems which young officers face during professional- psychological training in service in a zone of anti-terrorist actions are often connected with the



necessity of effective decisions in the non-standard, extreme conditions at the risk of their lives, as well as at the risk of citizens' lives: kidnapping, capture of hostages, blackmail, requirements of terrorists, insane persons, suicide explosion of suicide bombers, etc. [2].

Many of such situations may be potentially solved without use of weapons and human losses (negotiations, mediation, etc.), others – by the effective power actions of officers of special units minimizing human losses [6, 11].

This is a classic example of a creative solution by police officers of Houston (USA) of a situation with taking a hostage by a eighteen-year-old young man who threatened to kill her in a state of alcoholic intoxication. This situation was reduced to that when in some hours of negotiations police officers guessed that the extremist was tired and had a hangover they turned on powerful loudspeakers with a deafening melody, and the unfortunate terrorist gave up shivering [15].

However in some cases they neglect such opportunities because of the insufficiently considered and planned combatant operation which is often carried out at deficiency of time, material and human resources. The ability of officers of special police squad to work independently, effectively solving fighting problems is a pre-condition of the solution of such problems. The development of creative thinking, ability to foresee intentions of terrorists and to find non-standard ways in the tactics and strategy of neutralization of terrorist and extremist groups may promote this [16].

It concerns not only creative decisions when developing revolutionary technological decisions in modern means of war, communication systems, detection and destructions of the opponent, but also creativity of a military thought when developing new forms and methods of application of these means in struggle against terrorist groups [13].

Thus, in some foreign special operations forces besides fighting groups commando they effectively apply actions of operators of psychological war for weakening and suppression of the opponent's will; these are the officers of a military course of psychological operations, possessing basic knowledge in a number of concrete areas, such as anthropology, sociology and psychology, and having certain characteristics, such as adaptability, creativity, flexibility, initiative and objectivity [12].

For example, analyzing the problems of vocational training of experts in negotiations in extreme situations, N. S. Khrustaleva with coauthors comes to a conclusion about a necessary combination of their creativity and high disciplinary claims, professionally important qualities and personal properties, existence of special knowledge in the field of psychology of crisis and extreme situations [18]. A. A. Ishutkina also demonstrates that distinctions between successful and unsuccessful negotiators, making serious mistakes and errors in negotiating in extreme situations, concern not only abilities to plan the solution of a problem (coping-strategies), ability to analyze difficult situations of the interaction of people (social intelligence), stress tolerance, abilities to resolve conflicts, and also good intuition [11].



Therefore, the development of creativity among experts in counteraction to terrorism and elimination of the consequences of acts of terrorism is caused by a high demand of this personal property in their professional activity.

Psychological trainings of the development of the creative potential of the person have a wide practical application nowadays. Noting the effectiveness of such trainings, psychologists emphasize the dependence of their result on a functional condition of its participants, on the level of their skills of self-control [7]. It is especially urgent for specialists in counteraction to terrorism and elimination of the consequences of acts of terrorism since conditions of their professional activity abound in the most powerful stress factors [14]. In this regard they need not only psychological, but also psychophysiological technologies for the development of creativity of such experts. In applied psychophysiology alpha biofeedback training of the EEG parameters gains a widespread application as a modern psychophysiological method of the development of creativity.

Researchers mark a key role of alpha activity of the brain of in the central regulation of cognitive functions. Modern researchers showed a compliance between the power of the EEG alpha waves of and efficiency of solving the cognitive problem demanding internal control of information processing, use of short-term memory or a musical-performing action, between the width of the wave's range, possessing alpha activity, and the success of solving semantic tasks and creativity, between the frequency of the maximum alpha peak at rest and intellectual working capacity [3, 4]. Therefore it is possible to note that the activity of waves in the alpha range is the universally recognized criterion of increase of the efficiency of regulation of cognitive processes of the central nervous system. Therefore, application alpha biofeedback training for the development of creativity among experts in counteraction to terrorism and elimination of the consequences of acts of terrorism it is reasonable.

The **research object**. 22 correspondence students of SFedU and SRHI aged 35–44 were examinees in our research; these were the former fighters of special operations forces who took part in elimination of the consequences of acts of terrorism (fighters of special mission units, snipers, explosives experts, sappers). They have divided the examinees into 2 groups: the control group (11 persons) and the experimental group (11 persons).

The **probing procedure**. The representatives of the experimental have had a five-day course of self-control of the EEG alpha rhythm by biofeedback training. One session of alpha biofeedback training lasted for 30 min. The session included three or four episodes of the EEG recordings with use of the EEG feedback sound protocols. We have registered indices of spectral power of the alpha rhythm in three tests: 1) quiet state with eyes closed; 2) wakefulness with eyes open; 3) a creative task solution in an insight way. We have fixed the EEG indices from four electrodes – bilateral occipital and central (O1, O2, C3, C4). Alpha biofeedback training of examinees was carried out through the same electrodes.



Model non-standard mission of searching weak points in the enemy's defences, detection of weak points in anti-terrorist protection of guarded object, search and neutralization of explosive device, planning of combatant operations in conditions of the deficiency of time and limited resources were the stimulus material for a creative task solution in an insight way.

During the alpha biofeedback training each testee have listened to 4 musical audiofragments (musical files) from 4 spatially divided dynamics corresponding to the electrodes (O1, O2, C3, C4), with the sound power level proportional to instant amplitude of the alpha rhythm. The signal of feedback has changed depending on the EEG alpha rhythm individual parameters in locus C4. At the deviation of the amplitude of the EEG alpha rhythm from a set value the sound signal in loudspeakers grew louder.

Before the training we have instructed each testee on the procedure and explained the dependence of parameters of a feedback signal on changes of psychoemotional state. We have offered a testee to remember the state when the parameter made a necessary change.

Representatives of the control group have also solved creative tasks. We have also measured their indices of the EEG alpha rhythm. However we haven't carried out it is biofeedback training with them.

Representatives of both groups underwent psychophysiological and psychological testing before carrying out alpha biofeedback training.

**Research techniques.** We have carried out alpha biofeedback training by means of a rehabilitation psychophysiological complex for the training with biofeedback "Reakor". We have estimated the degree of originality of examinees by the test of non-verbal creativity of Torrens [5]. We have measured the degree of situational and personal anxiety of examinees was by means of the technique by Spilberger-Khanin [8]. We have carried out the expert judgment of the quantity and originality of versions of solving non-standard problems. Standard computer methods of mathematical statistics have ensured the accuracy of empirical results. The comparison of average values of a variable in two groups of examinees was carried out by means of Student's t-criterion).

**The research results.** The comparative analysis of the obtained indices of originality in the experimental and control group before carrying out alpha biofeedback training haven't revealed significant differences. The representatives of these two groups have had no significant distinctions in expert judgement of the quantity and originality of versions of solving non-standard problems. Comparison of the degree of originality after carrying out alpha biofeedback training enabled us to conclude that among the participants of the experimental group the originality degree have increased both in comparison with the control group ( $t = 2,346$ ;  $p < 0,05$ ) and in comparison with the initial level of originality of representatives of the experimental group before carrying alpha biofeedback training ( $t = 3,812$ ;  $p < 0,01$ ).

The analysis of changes of the level of situational and personal anxiety before carrying out alpha biofeedback training have revealed that the level of situational anxiety



ety of 67 % of examinees from the experimental group has considerably decreased in comparison with initial values before its carrying out. This decrease in the level of anxiety in the experimental group was very significant ( $t = 6,636$ ;  $p < 0,001$ ) whereas in the control group after 5 days of expectation there was insignificant increase in the level of situational anxiety only among 20 % of examinees.

The comparative analysis of indices of situational anxiety in the control and experimental groups at the end of "forming" experiment have ascertained a reliably lower level of anxiety among representatives of the experimental group in comparison with the control group ( $t = 5,331$ ;  $p < 0,01$ ).

The comparative analysis of the level of personal anxiety in the experimental and control groups alpha biofeedback training have not revealed reliable distinctions.

After the comparison of expert judgements of the quantity (fluency) and originality of versions of non-standard problems solving of the professional activity by the former officers of special operations forces before and after alpha biofeedback training we have revealed very significant increase in these indices ( $t = 5,357$ ;  $p < 0,01$  и  $t = 3,672$ ;  $p < 0,01$  respectively) that confirms the efficiency of training of the degree of the alpha rhythm self-regulation by alpha biofeedback training for creativity development.

Thus, carrying out alpha biofeedback training not just significantly reduces the level of situational anxiety as we see it from the results of the comparative analysis of this variable among representatives of the experimental and control groups, but also raises the nonverbal creativity level, the number of generated ideas and the degree of their originality at solving non-standard tasks within the professional anti-terrorist activity of officers of special operations forces. The obtained conclusions are similar to the results obtained in researches of other authors [3, 4, 7, 19, 20, 21] where they confirm a positive influence of alpha biofeedback training on the decrease in the degree of intensity and the increase in the degree of the development of creative potential. Thus, we may formulate, at least, two important conclusions about the efficiency of the influence of training of self-control of the alpha rhythm of the EEG by alpha biofeedback training among officers of special operations forces working within the anti-terrorist activity: the increase in the level of creativity and decrease in situational anxiety.

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