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## PSYCHOPHYSIOLOGICAL RESEARCH OF STUDENTS' RADICALISTIC MOODS USING A POLYGRAPH

### Abstract

It is presented the results of a psychophysiological research of the radicalistic moods of students using a polygraph. The object of the study is the modern student youth. The purpose of the research: to conduct an applied psychophysiological research using a polygraph to identify the susceptibility of the students to radicalistic moods. The theoretical and methodological basis of the research is the general scientific principles of confessional determinism of mental processes and phenomena as a general paradigm of contemporary sciences. Research methods: theoretical and methodological analysis and the use of special methodological tools - polygraph – "Diana 7".

The results of the work and their novelty: a fundamentally new psychophysiological approach has been developed to identify the susceptibility of student youth to radicalistic moods; a model of a program for measuring susceptibility to radicalistic moods using a polygraph has been proposed and tested. The scope of application of the results: education; the Department of Religious Affairs under akimats, the system of professional development of teaching staff. The significance of the results - a model of a program for conducting psychophysiological research using a polygraph has been developed, aimed at diagnosing and monitoring the religious behavior of young people.

**Keywords:** psychophysiological research, polygraph, radicalism, radicalist sentiments, students, exposure to radicalist sentiments.

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## ПОЛИГРАФТЫ ҚОЛДАНА ОТЫРЫП, СТУДЕНТТЕРДІҢ РАДИКАЛИСТІК КӨҢІЛ-КҮЙІН ПСИХОФИЗИОЛОГИЯЛЫҚ ЗЕРТТЕУ

### Аңдатпа

Бұл мақалада полиграфты қолдана отырып, студенттердің радикалистік көңіл-күйін психофизиологиялық зерттеу нәтижелері келтірілген. Зерттеу нысаны-қазіргі студент жастар. Зерттеудің мақсаты: студенттердің радикалистік көңіл-күйге бейімділігін анықтау үшін полиграфтың көмегімен қолданбалы психофизиологиялық зерттеу жүргізу. Зерттеудің теориялық және әдіснамалық негізі Қазіргі ғылымдардың жалпы парадигмасы ретінде психикалық процестер мен құбылыстардың конфессиялық детерминизмінің жалпы ғылыми принциптері болды. Зерттеу әдістері: Теориялық және әдіснамалық талдау және арнайы әдістемелік құралдарды – полиграфты қолдану - "Диана 7".

Жұмыс нәтижелері және олардың жаңалығы: студент жастардың радикалистік көңіл-күйге ұшырауын анықтауға түбегейлі жаңа психофизиологиялық тәсіл әзірленді; полиграфтың көмегімен радикалистік көңіл-күйге ұшырауды өлшеу бағдарламасының моделі

ұсынылды және сыналды. Нәтижелерді қолдану саласы: білім беру; әкімдіктер жанындағы Дін істері басқармасы, педагог қызметкерлердің біліктілігін арттыру жүйесі. Нәтижелердің маңыздылығы-жастардың діни мінез-құлқын диагностикалауға және бақылауға бағытталған полиграфтың көмегімен психофизиологиялық зерттеу жүргізу бағдарламасының моделі әзірленді.

**Түйін сөздер:** психофизиологиялық зерттеу, полиграф, радикализм, радикалистік көңіл-күй, студенттер, радикалистік көңіл-күйге ұшырау.

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## **ПСИХОФИЗИОЛОГИЧЕСКОЕ ИССЛЕДОВАНИЕ РАДИКАЛИСТСКИХ НАСТРОЕНИЙ СТУДЕНТОВ С ИСПОЛЬЗОВАНИЕМ ПОЛИГРАФА**

### *Аннотация*

В данной статье представлены результаты проведенного психофизиологического исследования радикалистских настроений студентов с использованием полиграфа.

Объект исследования – современная студенческая молодежь.

Цель исследования: проведение прикладного психофизиологического исследования с помощью полиграфа для выявления подверженности студентов радикалистским настроениям.

Теоретико-методологическую основу исследования составили общенаучные принципы конфессиональной детерминированности психических процессов и явлений как общая парадигма современных наук. Методы исследования: теоретико-методологический анализ и использование специального методического инструментария – полиграфа – «Диана 7».

Результаты работы и их новизна: разработан принципиально новый психофизиологический подход к выявлению подверженности студенческой молодежи радикалистским настроениям; предложена и апробирована модель программы измерения подверженности радикалистским настроениям с помощью полиграфа.

Область применения результатов: образование; управление по делам религий при акиматах, система повышения квалификации педагогических работников.

Значимость результатов - разработана модель программы проведения психофизиологического исследования с помощью полиграфа, направленная на диагностику и мониторинг религиозного поведения молодежи.

**Ключевые слова:** психофизиологическое исследование, полиграф, радикализм, радикалистские настроения, студенты, подверженность радикалистским настроениям.

## **INTRODUCTION**

In the daily life of Kazakhstani society, radicalism manifests itself mainly in the form of radicalistic sentiments, which represent a system of views, emotional states, empathies of an extremist orientation, expressed in the form of hostility towards representatives of other ethnic and confessional groups, manifestations of latent hostility and verbal aggression[1]. This is facilitated by the deterioration of the social-economic situation, the weakening of the role of the family, the loss of former ideals, the devaluation and depreciation of spiritual and moral values in society, the low social status of young people, their social and economic insecurity, high unemployment, criminalization of society, and in general a decrease of the level of education of Kazakhstanis[2].

Corruption, which has engulfed many echelons of the Kazakh government, increasing awareness of social injustice among young people, leads to an increase in the activities of extremist and terrorist organizations, allowing them to spread radicalistic ideology and recruit young people

into the ranks of their groups. Due to the resulting vacuum, young Kazakhstani today become easy prey in the hands of radicals, extremists of various kinds. The involvement of young people in non-traditional religious associations in Kazakhstan, as well as the influence of foreign powers in the region interested in destabilizing the situation, create objective prerequisites for the emergence of conflict motivation in the field of confessional relations [3].

At the same time, it should be noted that the processes of youth radicalism in the Republic of Kazakhstan are latent and unexpressed, which does not always make it possible to diagnose and localize them in a timely manner, which, in turn, becomes a problem – it is impossible to predict the further manifestation or extinction of radical manifestations in the youth environment [4]. As a result, the problems of finding research methods are becoming more relevant today, which focus on the problems of the spread of radicalism and radicalistic sentiments, especially among young people. One of such contemporary research methods is a psychophysiological research of the susceptibility to radicalistic moods using a polygraph, which is a conversation conducted using special techniques with fixation of the psychophysiological reactions of the subject to the questions asked. The psychophysiological phenomenon is determined by the fact that an external stimulus that gives a person meaningful information about an event that is imprinted in memory causes a certain physiological reaction that exceeds reactions to related (homogeneous) stimuli presented under the same conditions, but not related to the mentioned event and not carrying situationally significant information to a person [5]. The function of the polygraph when using the method of Psychophysiological research is to register parallel physiological processes: respiration, blood pressure, biological currents of the brain and heart, galvanic skin resistance, pulse rate, etc. In this case, a change in the values of the parameters occurs in the presence of certain stimuli (stimuli) [6].

Therefore, addressing the phenomenon of psychophysiological research of students' susceptibility to radicalistic moods using a polygraph as a special subject of socio-psychological research directly on the materials of the Kazakh sample seems relevant both theoretically and in applied terms.

#### **MATERIALS AND METHODS OF RESEARCH**

Based on the general theoretical concept of the research, an experimental study using a polygraph was conducted based on the Laboratory of Psychophysiological and Polygraphic Research at the Department of General and Applied Psychology of Al-Farabi Kazakh National University to identify the possible presence of risk factors in students that determine their attitude to radicalistic sentiments.

The research was conducted in 2 stages. At the first stage, the development of batteries of tests for a polygraph survey was carried out to identify the possible presence of risk factors in the surveyed students associated with their relationships to various radicalistic trends.

The questionnaires created were aimed at studying:

- the relationship between certain types of psychological meaning of test questions and the probability of recognizing hidden information in persons with different individual psychological characteristics;
- identification of various types of psychological meaning on the topics of the survey on the probability of recognizing hidden information in the survey using a polygraph;
- establishing the relationship between psychosemantics and the probability of recognizing hidden information in a polygraph survey.

Based on the developed and tested questions, a model of a universal polygraph questionnaire was developed to assess the signs of non-traditional religious movements (Figure 1). The final developed questionnaire model consists of a set of test questions in Kazakh and Russian languages and divided into two main blocks.

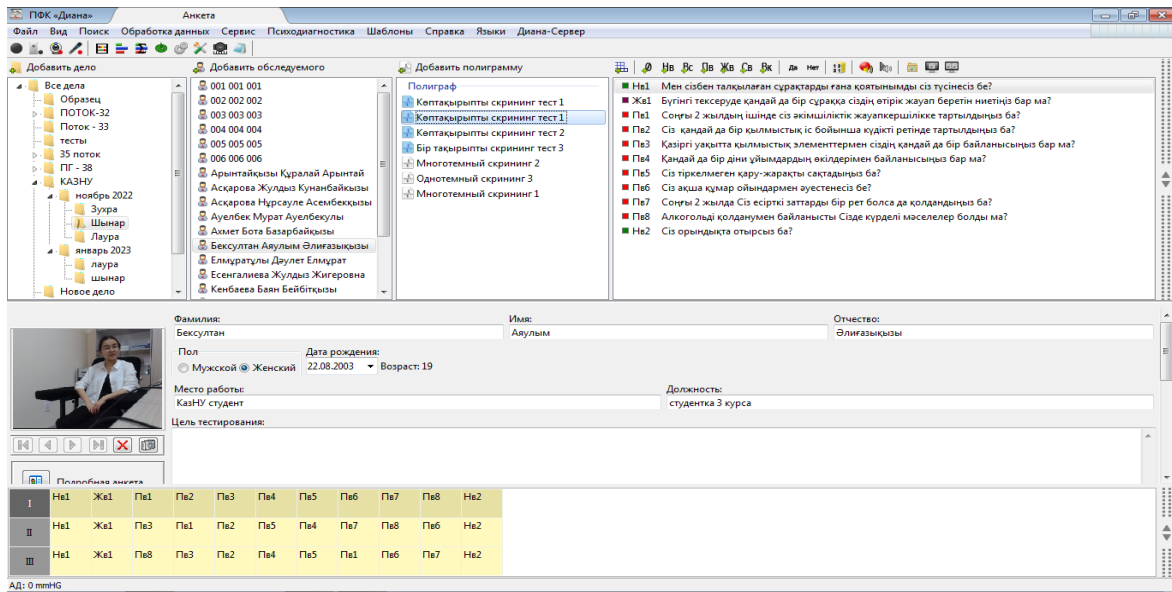


Figure 1 - A model of a universal polygraph questionnaire of signs of non-traditional religious movements for evaluation in laboratory conditions of al-Farabi Kazakh National University

### THE RESULTS OF THE STUDY

The first block is the questions for the multi–topic screening of ART (ALL Relevant Technique), consisting of 16 questions (2 tests - Tables 1 and 2).

Table 1 - Questionnaire No. 1 - Multi-system screening option 1 (ART)

Type	The content of the question
1	2
O	Do you understand that I will ask only those questions that we discussed?
H1	The day of the week today is _____?
ЖВП	Will you answer honestly the questions related to the security of the university where you study?
ПВ1	Have you been held administratively liable for the last 2 years?
ПВ2	Have you been involved in any criminal case as a suspect?
ПВ3	Do you currently have any contacts with criminal elements?
ПВ4	Do you maintain any relationship with representatives of any religious organization?
ПВ5	Did you keep unregistered weapons in your possession?
ПВ6	Are you interested in gambling for money?
ПВ7	Have you used any narcotic substances for the last 2 years?
ПВ8	Have you had serious problems with alcohol consumption?
H2	Are you sitting on a chair?

Table 2 - Questionnaire 2 - Multi-system screening option 2 (ART)

Type	The content of the question
1	2
O	Do you understand that I will ask only those questions that we discussed?
H1	The day of the week today is _____?
ЖБП	Will you answer all the test questions honestly?
ПБ1	While studying at a higher educational institution, did you commit any actions that you were ashamed of?
ПБ2	Do you have additional sources of income?
ПБ3	Have you ever attempted suicide?
ПБ4	Have you ever falsified any documents?
ПБ5	In order to solve your problems, have you given anyone any rewards?
ПБ6	Have you carried out any instructions from a representative of a religious organization?
ПБ7	Have you committed any violations for your own benefit?
ПБ8	Have you ever been suspended from work because of negative actions?
H2	Are you sitting in an armchair?

The second block is a single–topic screening with questions of comparison of the "controlled lie" DLST (Directed Lie Screening Test) with three comparison zones to determine the direct relationship of the subject to the fact in question (Table 3).

Table 3 - Questionnaire 3 - Single-issue screening DLST

Type	The content of the question
1	2
HB1	Do you understand that I will ask only those questions that we discussed?
HB2	Are you currently in Almaty?
ЖБП	Will you answer honestly all questions regarding your possible involvement in a religious organization?
БҮЖ1	Have you ever deceived your close relatives in anything?
ПБ1	Are you affiliated with any radical religious organization?
ПБ2	Are you a supporter of any non-traditional religious movements?
БҮЖ2	Have you ever bragged about looking your best in the eyes of others?
ПБ1	Are you affiliated with any radical religious organization?
ПБ2	Are you a supporter of any non-traditional religious movements?
БҮЖ1	Have you ever deceived your close relatives in anything?
ПБ1	Are you affiliated with any radical religious organization?
ПБ2	Are you a supporter of any non-traditional religious movements?
БҮЖ2	Have you ever bragged about looking your best in the eyes of others?

At the second stage of the research, 306 respondents took part - students of the 1st to 4th courses of Al-Farabi Kazakh National University. The research was conducted directly in accordance with the requirements established by the legislation of the Republic of Kazakhstan and methodological recommendations (voluntary consent to undergo the procedure, age over 18 years, lack of physical restrictions, etc.).

The program of psychophysiological research of students' radicalistic moods with the help of a polygraph consisted of several stages:

1) questioning of students using a computer program based on a questionnaire developed by us;

- 2) processing of the received personal data and determination of the circle of individuals subjected to polygraph examination;
- 3) the examination procedure using a polygraph;
- 4) processing of the results of the received polygrams;
- 5) conclusions.

The experimental research was conducted using a computer polygraph machine "Diana-07", the conditions met all the established requirements (noise insulation, ventilation, absence of distractions, etc.). The polygraph procedure was carried out in several stages:

stage 1 - preparation for the research (familiarization with the task and the order of the upcoming work);

stage 2 - conducting pre-test procedures (pre-test interview, installation of sensors and setup of the polygraph, explanation of the principle of operation of the polygraph, introductory test);

stage 3 - polygraph testing (question-answer procedure with connected sensors with simultaneous registration of several physiological parameters by the device);

stage 4 - post-test conversation.

Amongst of the 306 respondents who took part in the study, 35 were excluded from the calculation due to: recorded attempts to use counteraction methods during the research in a mental way (8 people - 2.6%) and in a physical way (21 people - 6.8%). In addition, due to technical failures, 6 respondents (1.9%) did not have pronounced psychophysiological reactions on the reactogram during the polygraph examination. For the remaining 271 respondents, verification measures were carried out, which are shown in table 4.

Table 4 - Statistical data of the interviewed respondents on the polygraph

Types of tests	Number of persons interviewed	Significant reactions have been identified	No significant reactions were detected
Questionnaire No. 1 Multi-topic screening (ART) Do you maintain any relationship with representatives of any religious organization?	271	32 (According to the norms of the table, points are received over 80%)	239 (According to the norms of the table, scores were received below 70%)
Questionnaire No. 2 Multi-topic screening (ART) Have you carried out any instructions from a representative of a religious organization?	271	26* (According to the norms of the table, points are received over 83%)	245 (According to the norms of the table, scores were received below 70%)
Questionnaire No. 3 Single-issue DLST screening - Are you connected with any radical religious organization? - Are you a supporter of any non-traditional religious movements?	32	8 (According to the decision-making thresholds, more than 3 points were obtained)	24 (According to the decision-making thresholds, more than + 3 points were obtained)
Note: * - these individuals also had significant reactions according to questionnaire No. 1			

In the research, special attention was paid to conducting a pre-test conversation, during which lecturers who directly conducted the research had to convince students of the safety and painlessness of the testing procedure itself. Each pre-test conversation was conducted at a calm pace, the principles and rules of the polygraph, the purpose of the main sensors and methods of information processing were explained to each student.

Special attention was paid in the pre-test conversation to the discussion of the following topics:

- the expressed interest of the subject in deep knowledge of radicalistic ideas, including religious issues;
- the desire to replenish your baggage with knowledge in the field of religion and fill in the gaps;
- communication with people who are deeply versed in religious issues;
- the presence of a spiritual mentor;
- the candidate's study of extremist materials;
- discussing extremist views with people who are deeply knowledgeable about religion;
- knowledge and approval of appeals for help to fellow religious;
- the facts of the candidate receiving an offer to participate in the holy war against the infidels (from the point of view of the polygraph examiner, it is a pronounced risk factor);
- the desire or willingness to sacrifice oneself for the sake of religion.

Before each study, in order to increase the effectiveness of polygraph tests, a final assessment of the emotional state of the subject was carried out in the process, as well as provocative questions were asked to identify the nature of the emotional response and adjust the amplification of the polygraph channels.

Stimulating and basic testing. The main purpose of the stimulating test in our research was to demonstrate to the subject that the polygraph "can detect a lie." In all the stimulating tests, we used similar sets of questions, where we asked the respondents to give a false answer. In particular, these were the card test, the familiarization test of known numbers, the blind numerical test, the control test and the loyalty control test. Along with this, the stimulating test allowed us to adjust the sensors correctly, check their attachment points and functioning, as well as introduce the respondent to the testing procedure. Next, the main test was conducted, consisting of two stages.

The first stage was conducted in the format of a screening research (in order to narrow the circle). According to the previously developed procedure for the actions of a polygraph examiner, in case of significant psychophysiological reactions to the stimulus we are interested in, respondents are asked to answer several questions at the beginning of the polygraph survey (questionnaire 1, 2).

During the expert processing and analysis of the received polygrams, the main attention was directed to studying the degree of significance for the "suspicious student" of the stimulus – the question of his possible membership in destructive religious organizations and the presence of a radical religious view. After calculating the total points for all the test topics, the probability of their significance was determined individually using the data shown in the table below (Table 5).

Table 5 - Probability of significant stimulus allocation (%) depending on the number of points scored in the experimental analysis based on the universal 3-point assessment method

Вероятность того, что стимул является значимым, %																					
Пр.	Суммарное количество набранных баллов																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20
1	4	15	37	63	85																
2	1	4	11	23	40	60	77	89	96												
3	0	1	3	8	16	27	42	58	73	84	92	97	99								
4	0	0	1	2	6	11	19	30	43	57	70	81	89	94	98	99	100				
5	0	0	0	1	2	4	8	14	22	32	44	56	68	78	86	92	96	98	99	100	100
6	0	0	0	0	1	1	3	6	10	16	24	33	44	56	67	76	84	90	94	97	100

**First.** A model of a universal questionnaire for conducting psychophysiological research has been developed and tested, as well as the procedure for the actions of a polygraph examiner in case of significant psychophysiological reactions to the stimulus of interest to us from the person being examined.

**Second.** During the analysis of polygrams, there were no obvious signs of the presence of radicalist sentiments and susceptibility to radicalism among the respondents. At the same time, the analysis showed that a small number of people had depression (17 people), a low level of social activity (23 people), and a reduced emotional background of reactions (6 people).

**The third.** Verification measures were carried out for the remaining respondents:

According to questionnaire 1 Multi-topic screening (ART), in 10 cases it was confirmed that the subjects maintained any kind of relationship with representatives of any religious organization

- according to questionnaire 2 Multi-topic screening (ART), in 9 cases it was revealed that the respondents carried out any assignments by representatives of a religious organization;
- according to the questionnaire 3 Single-volume DLST screening, in 3 cases, according to the decision-making thresholds, data were obtained that the respondents are associated with some radical religious organization and are supporters of any non-traditional religious movements.

**Fourth.** At the stage of the post-test conversation with students, the polygraph examiner became aware that some of them have a pronounced interest in deep knowledge of religious issues; a desire to replenish their baggage with knowledge in the field of religion and fill in existing gaps; they seek to communicate with people who are deeply versed in religious issues.

## CONCLUSION

Taking into account the above, we believe that psychophysiological research using a polygraph is one of the most effective tools for early diagnosis of the susceptibility of students to destructive religious ideas and views. Regular conducting of polygraphological screening studies among students would make it possible to identify potential supporters of destructive religious movements. Timely identification of such individuals and providing educational influence on them, including with the involvement of specialists in theology, is the most effective preventive measure in preventing and combating the manifestation of ideas of religious extremism among students.

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