

## **Research of the Motivational Mental States of Future Bachelors of the Faculty of Physical Education and Sports in the Educational Process**

### **Investigación de los estados mentales motivacionales de futuros licenciados de la Facultad de Educación Física y Deportes en el proceso educativo**

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### **Abstract**

The purpose of the article is to research the motivational mental states of future bachelors of the Faculty of Physical Education and Sports, majoring in “Secondary Education (Physical Education)” and “Physical Education and Sports”. Motivational mental states are important regulators of educational, professional, sports, competitive activity of bachelors. Educators’ understanding of motivational mental states makes it possible to operationalize the tasks of educational and professional training of future Physical Education teachers and professional athletes. The research represents tests with standardized

questionnaires and factor analysis of bachelor's motivational mental states (n=232). The structure of motivational mental states is determined by factor analysis. Factor 1 "Cognitive ego-motivation" (24.28%) and Factor 3 "Analytical and synthetic" (9.99%) were found to be the main ones. The results obtained may be of interest to the heads of sports educational establishments that organize the educational process of bachelors, coaching staff, athletic directors, anyone involved in the education and training of bachelors-teachers of Physical Education, bachelors-athletes, as well as researchers of psychology and physical education.

### **Resumen**

El objetivo del artículo es estudiar los estados mentales motivacionales de futuros licenciados de la Facultad de Educación Física y Deportes, que estudian en las especialidades "Educación Secundaria (Cultura Física)" y "Cultura Física y Deportes". Los estados mentales motivacionales son los reguladores importantes de la actividad educativa, profesional, deportiva y competitiva de los licenciados. La comprensión del profesorado de los estados mentales motivacionales les permite operacionalizar la solución de los objetivos de la preparación educativa profesional de futuros profesores de educación física y deportistas profesionales. El estudio presenta los tests con cuestionarios estandarizados y el análisis factorial de los estados mentales motivacionales de licenciados (n=232). El análisis factorial determinó la estructura de los estados mentales motivacionales. Se estableció que el principal es el Factor 1 "Ego-motivación cognitiva" (24.28%) y el Factor 3 "Motivación analítica de síntesis" (9.99%). Los resultados obtenidos pueden ser interesantes para los jefes de instituciones educativas deportivas que organizan el proceso educativo de licenciados, el equipo de entrenadores, los directores deportivos y para todos los que están relacionados con la formación y el entrenamiento de licenciados-profesores de educación física, licenciados-deportistas, así que para los investigadores de la psicología de educación física y deportes.

### **Key words**

*Mental State* – Bachelor – Teacher of Physical Education – Educational Process

### **Palabras clave**

*Estado mental* – Licenciado – Profesor de cultura física – Proceso educativo

### **Introduction**

The educational process of bachelor of Physical Education and Sports is an intellectual, creative activity aimed at getting a degree in higher education – a bachelor's degree organized in a higher education establishment. Educational activity involves a system of scientific, methodological, psychological and pedagogical, sports events aimed at the transfer, assimilation, multiplication and

use of knowledge, skills, competences, the formation of a harmoniously developed personality of a bachelor-teacher of Physical Education and bachelor-athlete. The leading type of activity of bachelors, which influences their mental development – is educational and professional activity. Educational and professional activity requires a future specialist of high educational, scientific, sports activity, assimilation of new psychological norms and criteria of socio-cultural development. Accordingly, in the process of educational and professional activity, the main goal of development of competence of the bachelors of Physical Education and Sports is achieved. The development of the competence of a bachelor, the acquisition of professionally important knowledge, skills and competences is carried out in a well-organized educational and professional activity of the educators. At the same time, the educational and professional activity of the bachelors of the Faculty of Physical Education and Sports is sporty and competitive, which influences its substantive and procedural features. The personal growth of a bachelor, as a specialist, is accompanied by the completion of professional self-determination, transformation of the structure of self-consciousness, the formation and meaningfulness of the social and professional dimension of the “Self-concept”. Mental processes and mental states are filled with professional content<sup>1</sup>.

The basis of educational and professional activity of the bachelor is their motivational sphere. The core of the motivational sphere consists of needs – the dynamically active mental states of the individual, which express their dependence on specific conditions of existence and encourage activities aimed at the removal of this dependence. Accordingly, the needs mediated by complex psychological processes of motivation are realized in the form of a motif of behaviour<sup>2</sup>. It is theoretically substantiated and empirically confirmed that mental states are in line with the needs and aspirations of an individual with his or her capabilities and resources, ensuring his or her development in specific environmental conditions<sup>3</sup>. Obviously, the research of dynamically active mental states, or as we have defined them – the motivational mental states of bachelors, will allow us to find the psychological determinants that influence development in specific sociocultural conditions.

The motivational *mental state* reflects the general functional level of mental activity of a person, which depends on the substantive-procedural features of professional activity, in particular conditions, dynamics, tempo-rhythm, as well as on the individual-psychological characteristics of a person. Motivational mental states can have a number of classification features, be short, situational, persistent, and personal and have many more dimensions<sup>4</sup>.

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<sup>1</sup> I. Halian, “Motivational and value determinants of future physical culture teachers’ professional becoming”. Science and education, num 3 (2018): 36-42 y I. S. Popovychy; O. Y. Blynova, “Research on the Correlation between Psychological Content Parameters of Social Expectations and the Indexes of Study Progress of Future Physical Education Teachers”. Journal of Physical Education and Sport, Vol: 19 num 3 (2019): 847-853.

<sup>2</sup> H. Hekhauzen, “Motivation and activity”. (SPb: Piter. 2003).

<sup>3</sup> A. Prokhorov; A. Chernov y M. Yusupov, “Cognitive states in educational activity of students: Structural-functional aspect”. Asian Social Science, Vol: 11 num 1 (2015): 213-218.

<sup>4</sup> E. P. Ilin, “Motivation and motives”. (SPb: Piter. 2008).

All mental states can be grouped into four groups. The first group includes motivational mental states that are desires, aspirations, interests, striving, passions, etc. The second group consists of emotional mental states – emotional tone of feelings, emotional response to the phenomena of reality, mood, conflicting emotional states, ie stress, affect, frustration, etc. The third group unites strong-willed mental states – initiative, determination, resoluteness, and perseverance. These states are largely related to the structure of complex volitional action. The fourth group is represented by mental states of different levels of organization of consciousness, which can be reflected in different levels of mindfulness<sup>5</sup>. In particular, mental states of expectations in professional activity belong to the fourth group.

We believe that motivational mental states are types of mental states that integrate mental processes and properties, and are important regulators of successful educational, sports and competitive activity of bachelors of the Faculty of Physical Education and Sports. The effective organization of the educational process of bachelors requires the administration of the higher education establishment to know the structure and psychological substantive features of the motivational mental states of future specialists. Understanding by leaders, educators, and coaches of motivational mental states of bachelors allow operationalizing solving problems of educational, professional, sports, competitive training. Motivational mental states influence actual activity and can be recorded as internality, externality, activity, passivity, openness, closeness, etc. According to C. Izard, mental states are closely linked to a person's mental activity, and sometimes the need to act becomes a form of mental stress<sup>6</sup>. It has been established that mental states of expectations influence the course of mental processes and, often, repeating, become stable and become a personality trait<sup>7</sup>.

Scientifically interesting is the research that shows that it is important for the coach to work on the transformation of mental states of fluctuations and uncertainty into positive ones, to allow the athlete to focus on the effective use of his or her mental and physical abilities during official competitions<sup>8</sup>. The individually-typological characteristics of athletes that contribute to the efficiency and reliability of sports activities have been examined. Motivation, self-regulation, self-control and emotional stability have been found to be key to achieving results<sup>9</sup>. There are researches in the field of sports psychology on the

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<sup>5</sup> H. Hekhauzen, "Motivation and ..."

<sup>6</sup> C. Izard, "The Psychology of Emotions". New York, NY: Plenum Press. 1991.

<sup>7</sup> I. S. Popovych, "Psychology of social expectations of personality". Extended abstract of Doctor's thesis. (Severodonetsk: Volodymyr Dahl East-Ukrainian National University. 2017).

<sup>8</sup> E. Nagla, "Impact of using some of mental strategies on the psychological hesitation and effectiveness of tactical activity of juniors' kumite". Journal of Physical Education and Sport, Vol: 15 num1 (2015): 32-39.

<sup>9</sup> M. Polishkis; O. Dashkevich y I. Klesov. "Lichnostnyye faktory effektivnosti i nadezhnosti sorevnovatelnoy deyatel'nosti yunykh futbolistov. Teoriya i praktika fizicheskoy kultury", num 2 (1998): 19-20.

connection of instability of performance of athletes as a direct consequence of emotional states during competitions<sup>10</sup>.

The motivational mental states of the bachelors of the Faculty Physical Education and Sports are understood as an integral complex of available characteristics which influence the educational and professional result of their activity. Our scientific views are confirmed in the research of cognitive mental states in the process of students' intellectual activity through the structure of the state of interest / mental stress<sup>11</sup>, in the research of the structure, variables and interdependence of factors of mental states of expectations in educational and professional activity of the students, in the research of the *mental state* of a long-term fatigue that impairs a person's physical performance<sup>12</sup>, in the positive direction of flow psychology as a *mental state* of optimal human experience, has merged completely with its activities<sup>13</sup>, etc.

A review of a contemporary scientific literature shows that the place and role of motivational mental states in educational professional, sports, competitive training of the bachelors of the Faculty of Physical Education and Sports is not taken into account, so research on the motivational mental states of bachelors-teachers and bachelors-athletes is relevant, since this age (17-22 years) is characterized by high intellectual potential<sup>14</sup>, physical and mental resources for the personal growth and professional development. Therefore, the research of motivational mental states of future bachelors of Physical Education and Sports in the educational process is considered relevant, timely and in need of empirical confirmation.

Hypothesis. The authors assume that: 1. The structure, variables and interdependence of the factors of motivational mental states of future bachelors of the Faculty of Physical Education and Sports are important components of their educational, professional, sports and competitive activities. 2. The application of the results of the research will contribute to the effective organization of the educational process of future bachelors-teachers and bachelors-athletes.

Purpose. To examine the structure, variables and interdependence of factors of motivational mental states of future bachelors of the Faculty of Physical Education and Sports.

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<sup>10</sup> E. S. Bulyanko, "Features of the emotional state of athletes playing sports in the competitive period". Applied sports science, Vol: 1 num 3 (2016): 4-9.

<sup>11</sup> A. O. Prokhorov; M. G. Yusupov y V. V. Plokhikh, "Cognitive States in the Process of Students' Intellectual Activity". The New Educational Review, Vol: 41 num 3 (2015): 263-274.

<sup>12</sup> S. M. Marcora; W. Staiano y V. Manning, "Mental fatigue impairs physical performance in humans". Journal of Applied Physiology, Vol: 106 num 3 (2009): 857-864.

<sup>13</sup> M. Csikszentmihalyi y J. Nakamura, "Positive psychology: Where did it come from, where is it going?" In: K. M. Sheldon; T. B. Kashdan y M. F. Steger (Eds.), Designing positive psychology (pp. 2-9). (New York, NY: Oxford University Press. 2011).

<sup>14</sup> M. L. Smulson, Psychology of intelligence development in the early youth age. Extended abstract of Doctor's thesis. (Kyiv: G. S. Kostiuk Institute of Psychology, Academy of Pedagogical Sciences of Ukraine. 2002).

## 1. Methodology and methods

Fundamental methodological positions of the empirical research of the motivational mental states of future bachelors of the faculty of physical education and sports in the educational process are a number of successive measures with the use of psycho-diagnostic instruments. The methodology suggested by the scientists was tested when examining mental states of expectations in different activities<sup>15</sup>. All the experimental and empirical studies mentioned here concern the research problem<sup>16</sup>.

### 1.1. Participants

It was examined of the first-fourth year students (n=232, age of 17-22 years) of Kherson State University and Vasyl Stefanyk Precarpathian National University. All the students study at the Faculty of Physical Education and Sports and pursue a degree in the areas of study "Secondary education (Physical education)" and "Physical Education and Sports". Participation in research does not violate rights and does not endanger students' wellbeing.

Based on Hollingshead four factor index<sup>17</sup> the participants' families corresponded to the following categories: 10.7% low Familiar Socioeconomic-Status (FSS), 20.4% FSS low-medium, 20.4% FSS medium, 25.2% FSS medium-high, 21.4% FSS high, and the 1.9% did not provide information.

### 1.2. Organization of research

During the academic term, tests were conducted with standardized questionnaires, factor analysis of data of future bachelors of the Faculty of Physical Education and Sports. The educational and professional activity of the bachelors of the Faculty of Physical Education and Sports is accompanied by a considerable number of planned and independent tasks, complex tests, in which the level of parameters of verbal and non-verbal intelligence matters:

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<sup>15</sup> P. Nosov; I. Palamarchuk; S. Zinchenko; I. Popovych; Y. Nahrybelnyi y H. Nosova, "Development of means for experimental identification of navigator attention in ergatic systems of maritime transport". Bulletin of University of Karaganda. Technical Physics", Vol: 1 num 97 (2020): 58-69; I. Popovych; L. Lymarenko; N. Tereshenko; T. Kornisheva; O. Yevdokimova; A. Koverznieva y M. Aleksieieva, "Research on the Effectiveness of Training Technologies' Implementation in Student Theater", Revista Inclusiones, Vol: 7 num 2 (2020): 104-121 y S. Zinchenko; P. Nosov; V. Mateichuk; P. Mamenko; I. Popovych y O. Grosheva. "Automatic collision avoidance system with many targets, including maneuvering ones". Bulletin of university of Karaganda, Vol: 96 num 4 (2019): 69-79.

<sup>16</sup> I. Popovych; O. Blynova; A. Zhuravlova; M. Toba; T. Tkach y N. Zavatska, "Optimization of development and psycho-correction of social expectations of students of foreign philology", Revista Inclusiones. Vol: 7 num Especial, (2020): 82-94; I. Popovych; A. Borysiuk; L. Zahrai; O. Fedoruk; P. Nosov; S. Zinchenko y V. Mateichuk, "Constructing a Structural-Functional Model of Social Expectations of the Personality", Revista Inclusiones, Vol: 7 num Especial (2020): 154-167 y I. Popovych; O. Kononenko; A. Kononenko; A. Stynska; N. Kravets; L. Piletska y O. Blynova, "Research of the Relationship between Existential Anxiety and the Sense of Personality's Existence", Revista Inclusiones, Vol: 7 num Especial (2020): 41-59.

<sup>17</sup> A. Hollingshead, "Four factor index of social status. Unpublished manuscript". (New Haven; Yale University, CT, 1975).

vocabulary, general awareness, ability to abstract, ability to generalize, mathematical ability, combinatorial thinking, spatial awareness, ability to store information for short periods of time. In order to evaluate the parameters of the educational and professional activity of bachelors, we consider it expedient to apply the test of the structure of intelligence of R. Amthauer. We settled on a modification of the IST-70 form A ("IST-70-A") test<sup>18</sup>, which consists of nine subtests (subscales), which are combined into three blocks: verbal intelligence, mathematical intelligence, spatial intelligence. Verbal intelligence is composed of five subscales: sentence supplementation (SS), word exclusion (WE), analogy (A), generalization (G), mnemonic abilities (AM). Mathematical intelligence was made up of two subscales: arithmetic problems (AP), numerical series (NS). Spatial intelligence was made up of two subscales: spatial imagination (SI) and spatial generalization (SG).

The research of motivational mental states requires us to use psychodiagnostic methods that will allow us to measure a number of parameters of the motivational sphere. The "Level of Aspirations of Personality" ("LAP") questionnaire<sup>19</sup> is used, which consists of fifteen scales that are combined into four blocks: the core of the motivational structure; achievement of big goals; predictive evaluation of the subject's activity; compliance with the activities performed. The core of the motivational structure was made up of six parameters: internal motif (IM), cognitive motif (CM), avoidance motif (AM), the motif of competition (MC), the motif of changing activity (MCA), the motif of self-respect (MS). The achieving big goals was made up of five parameters: the significance of results (SR), task complexity (TC), volitional effort (VE), estimation of the level of the achieved results (ELAR), estimation of personal potential (EPP). The predictive valuation of a subject's activity was made up of two parameters: the projected level of mobilizing efforts (PLME) and the expected level of results (ELR). The compliance of the activities performed was made up of two parameters: regularity of results (RR), initiative (I).

To determine the degree of sensory-life parameters of the bachelors of the Faculty of Physical Education and Sports: the presence of a life goal, vocation in life, intentions, interest in life and emotional saturation of life, satisfaction with self-realization, a sense of ability to influence the course of one's life – Test "Purpose in Life" "PIL"<sup>20</sup>: goals of life (GL), process (P), result (R), locus of control – Self (LCS), locus of control – life (LCL). The questionnaire allows you to identify features of the subject's intrinsic motivation – the desire to learn something new, the acquisition of positive emotions, self-improvement of skills; external motivation – goal setting, heightened feeling of guilt, social approval.

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<sup>18</sup> R. Amthauer, "Intelligenz-Struktur-Test. I-S-T 70". (Göttingen: Hogrefe. 1970).

<sup>19</sup> V. Herbachevskiy, Test of level of aspirations of personality ("LAP"). Psychodiagnostic series. (Moscow: Smysl.1990).

<sup>20</sup> D. A. Leontyev, Test of life-meaningful orientations ("LMO"). Psychodiagnostic series. (Moscow: Smysl. 2006).

The most important criterion for self-determination of personality in any activity is subjective control, that is, the ability of a person to take responsibility for his or her own behaviour, for the result of the activity<sup>21</sup> (Rotter, 1982). In educational, sports and competitive activities, subject control is an important component of overall control, which determines the regulatory capacity of the subject, and it is based on the nature of comparison of planned and demonstrated actions, and is aimed at self-improvement. Subject level control parameters are defined by the questionnaire "Level of subjective control" ("LSC")<sup>22</sup>. The following empirical values are taken into account: internality in the area of achievements (IA), internality in the area of failures (IF), internality in relationships (IR), internality in the area of labor relations (ILR), internality concerning health and illness (IH). The responses were evaluated by means of the bipolar semantic differential scale, its value was within the range of -3 (absolutely disagree) and +3 (absolutely agree). The indexes of reliability, obtained by means of Cronbach's alpha, were:  $\alpha_{IST} = .734$ ,  $\alpha_{LPC} = .821$ ;  $\alpha_{PIL} = .837$ ;  $\alpha_{LSC} = .791$ . The indexes of reliability of the methods used and the tests of Cronbach's alpha were within sufficient (.7) and high levels (.9).

### 1.3. Statistical analysis

Statistical processing of the empirical data was performed by means of the statistical program "SPSS" v. 23.0 and "MS Excel". Spearman's correlation coefficients (rs) were used to find and determine the correlation between the indexes obtained. Arithmetic mean value of minimum (min), maximum (max), parameters (M) and mean-square deviation (SD) were calculated. Evaluation of differences reliability of distinctions of average values of independent sample was carried out by parametrical methods with the help of Student's t-test on the basis of normal Gaussian distribution of the studied quantitative characteristic. The differences between the values of the variables at the level  $p \leq .05$  are considered statistically significant.

## 2. Results

The obtained results of the research psychological parameters of motivational mental states of future bachelors using the scales of minimum (min), maximum (max), the arithmetic mean (M) and the mean square deviation (SD), given in Table 1.

Scale	Minimum, min	Maximum, max	Arithmetic mean, M	Mean square deviation, SD
<b>"IST-70-A" (verbal intelligence, IQ)</b>				
<b>SS</b>	65.00	121.00	97.73	10.34
<b>WE</b>	65.00	120.00	94.63	9.33

<sup>21</sup> J. B. Rotter, "The development and applications of social leaning theory: Selected papers". (New York: Praeger. 1982).

<sup>22</sup> J. B. Rotter, "Generalized expectancies for internal versus external control of reinforcement: Psychological Monographs". General and Applied, Vol: 80 num 1 (1966): 1-28.



<b>A</b>	55.00	115.00	88.60	10.11
<b>G</b>	56.00	108.00	84.75	9.88
<b>AM</b>	54.00	105.00	81.02	8.94
<b>“IST-70-A” (mathematical intelligence, IQ)</b>				
<b>AP</b>	65.00	120.00	93.96	9.25
<b>NS</b>	66.00	117.00	89.91	9.86
<b>“IST-70-A” (spatial intelligence, IQ)</b>				
<b>SI</b>	56.00	108.00	84.59	9.93
<b>SG</b>	54.00	105.00	81.33	9.52
<b>“LPC” (the core of the motivational structure)</b>				
<b>IM</b>	5.00	20.00	12.77	3.06
<b>CM</b>	8.00	21.00	15.49	2.92
<b>MA</b>	3.00	20.00	11.67	3.75
<b>MC</b>	4.00	19.00	12.18	3.45
<b>MCA</b>	4.00	21.00	12.96	3.68
<b>MS</b>	8.00	21.00	14.13	3.17
<b>“LPC” (achieving big goals)</b>				
<b>SR</b>	3.00	17.00	8.73	.19
<b>TC</b>	2.00	18.00	5.65	.19
<b>VE</b>	5.00	19.00	12.72	.20
<b>ELAR</b>	4.00	14.00	10.04	.14
<b>EPP</b>	8.00	20.00	14.00	.20
<b>“LPC” (the predictive valuation of a subject’s activity)</b>				
<b>PLME</b>	9.00	21.00	14.14	2.66
<b>ELR</b>	3.00	14.00	9.75	2.16
<b>“LPC” (compliance of the activities performed)</b>				
<b>RR</b>	5.00	21.00	13.54	2.73
<b>I</b>	9.00	21.00	12.94	2.74
<b>“PIL”</b>				
<b>GL</b>	12.00	42.00	31.86	7.51
<b>P</b>	13.00	42.00	30.08	5.28
<b>R</b>	8.00	35.00	25.40	4.87
<b>LCS</b>	7.00	30.00	21.31	4.58

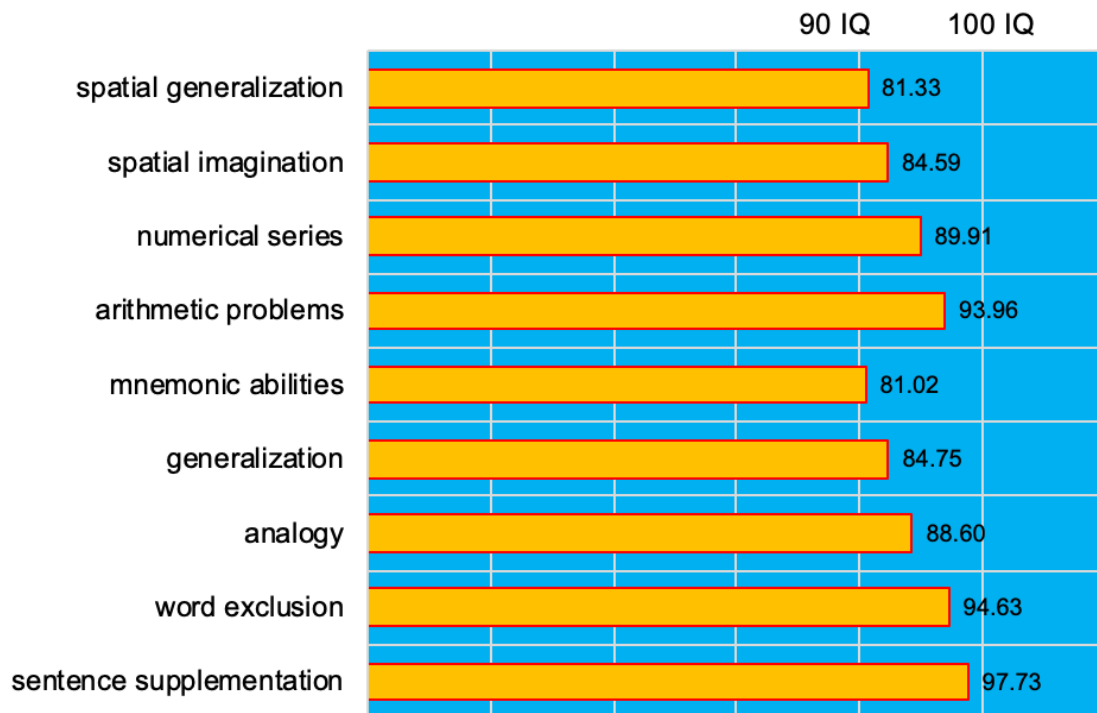
<b>LCL</b>	14.00	42.00	29.86	4.62
<b>“LSC”</b>				
<b>IA</b>	28.00	71.00	55.02	7.46
<b>IF</b>	20.00	73.00	50.98	8.19
<b>IFR</b>	19.00	56.00	40.31	6.68
<b>ILR</b>	26.00	51.00	36.83	5.08
<b>IHI</b>	5.00	26.00	18.75	4.32

Note: min – minimum; max – maximum; M – arithmetic mean; SD – mean square deviation.

**Table 1**

The results of psychological parameters of motivational mental states of the research sample set (n=232)

The complex of 34 research parameters is methodologically substantiated, that reflects the research subject of the motivational mental states of future bachelors of the faculty of Physical Education and Sports. Most of the subjects have indicators of intelligence within the test standards (95-105 IQ), in particular verbal intelligence (n=123; 53, 02%), mathematical intelligence (n = 113; 48, 71%), spatial intelligence (n = 97 41.81%). In general, the average group values of intelligence for the age group (17-22 years) are below the average, since the limit of 100 IQ does not cross any indicator (see Fig. 1), and the limit 95 IQ – only subscale SS, which rather performs a motivational function and implemented by R. Amthauer, for the interest of the subjects, has the effect of encouragement and at the same time allows to determine the general outlook. Critically low levels (54-65 IQ) were recorded in a small portion of the sample population (n = 30; 12.93%). We observe a tendency of decrease of indicators in three blocks of intelligence: verbal – SS (sentence supplementation) → WE (word exclusion) → A (analogy) → G (generalization) → AM (mnemonic abilities); mathematical – AP (arithmetic problems) → NS (numerical series); spatial – SI (spatial imagination) → SG (spatial generalization). Of course, each of the subscales is unique and allows measuring the psychological content of the intelligence of the subject. In Fig. 1 presents the intelligence structure of future bachelors of the Faculty of Physical Education and Sports.

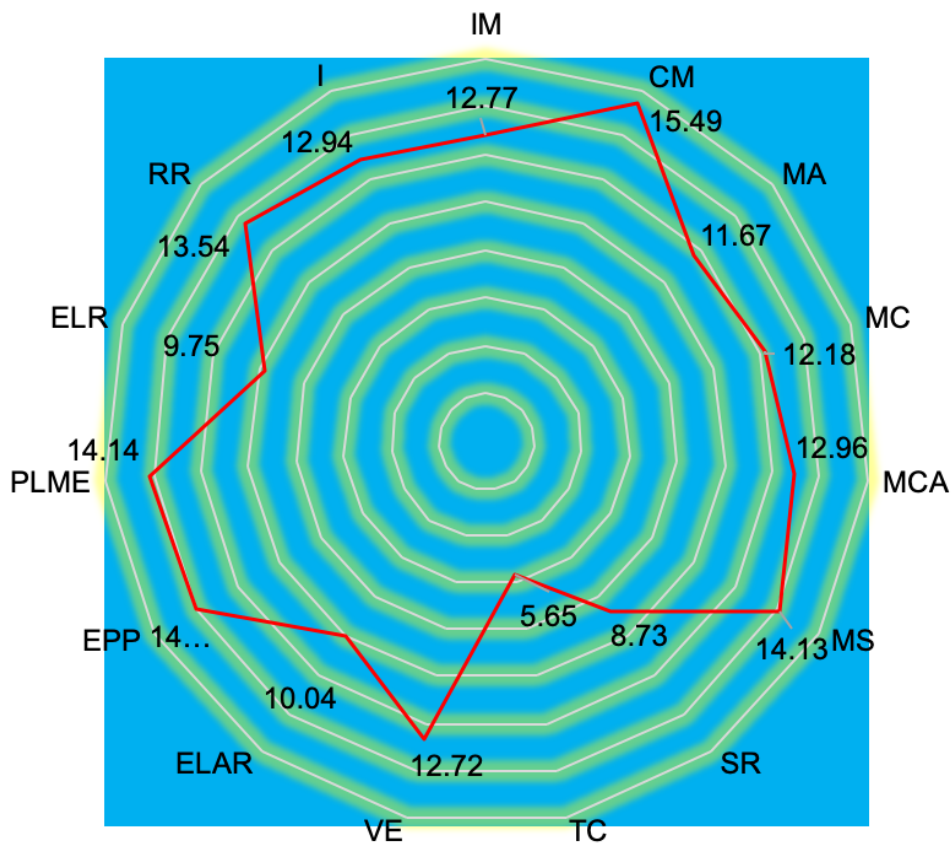


**Figure 1**

The intelligence structure of future bachelors of the Faculty of Physical Education and Sports

All sub-scales of intelligence arithmetic mean (M) are in the range of 90-100 IQ. The highest and lowest mean values were recorded in the sub-scales of verbal intelligence: SS (Sentence supplementation) (M = 97.73; SD = 10.34) and MA (mnemonic abilities) (M = 81.02; SD = 8.94).

The psychological content parameters of the subjects are presented in the form of motivation structure of future bachelors of the Faculty of Physical Education and Sports (see Fig. 2).



**Figure 2**

Structure of motivation of future bachelors of the Faculty of Physical Education and Sports

The diagram type used (see Fig. 2) makes it possible to clearly visualize the area formed by the connected points of the measured fifteen motivation parameters. The area of the diagram shows the motivational resources of the bachelors of Physical Education and Sports. The TC points ( $M = 97.73$ ;  $SD = 10.34$ ), ELAR ( $M = 97.73$ ;  $SD = 10.34$ ) and ELR ( $M = 97.73$ ;  $SD = 10.34$ ) have relatively low values, respectively, refract the diagram, i.e., conditionally reduce its area. It can be assumed that in critical stressful situations (exam, sports, etc.) the subject may lack the motivational resource (small diagram area) to achieve the goal. Of course, the newly born hypothesis should be examined empirically in subsequent scientific studies. Note that the parameters of the TC ( $M = 5.65$ ;  $SD = .19$ ), ELAR ( $M = 10.04$ ;  $SD = .14$ ) and ELR ( $M = 9.75$ ;  $SD = 2.16$ ) have a negligible factor load (see table. 2) and have no significant effect on any of the following motivational mental states. This is all too important because these refractive points can be exactly the resource of a bachelor-teacher and bachelor-athlete who can determine his or her future achievements. It is important to note that the parameters of the TC and ELAR relate to the block of methodology "LPC" (achievement of big goals) and ELR – block "LPC" (predictive evaluation of the subject's activity), that is extremely important for the structure of motivation of the subjects. To influence it, in order

to form the necessary level of meaningful parameters of motivation, it is necessary to create a complex of training sessions, which is the next step after our empirical research.

The 34-variable correlation matrix is determined by the principal component method. The 10 factors have their own values greater than one and explain 77.30% of the variance of the variables (Table 2).

Scale	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
SS	.865		.168			-.082				
WE	.933		.060						-.084	
A	.836		.202						-.106	
G	.162		.883	-.012						
AM	.217		.816				-.061			
AP	.854		.097			-.093				
NS	.853					.276		-.059		
SI	.136	-.020	.885							
SG	.221		.837				-.060			
IM	.682			.310	-.075					
CM	.002			.853						-.206
MA			.264			.588			-.303	
MC						.831	.250			-.196
MCA		.138				.502	-.497			
MS			-.242	.498						
SR				.153			-.970	-.237		
TC					-.275					.364
VE							.140	.951		-.380
ELAR	-.449							.382		
EPP				.422						-.261
PLME		-.184		.719				.222		
ELR	-.251						.428			
RR			-.191	.302			.675			
I				.403	-.234	-.568				
GL		.952						-.116	.192	

P	.361	.799	-.241							
R		.565	-.217		.381					
LCS		.925			-.108		.104			
LCL		.814					-.282		.266	
IA			-.109		.432					
IF					.931		-.268		.074	
IFR					.937		-.156		.130	
ILR							.169		-.440	
ILR									.942	
IHI	-.218		.234		.913					
D, %	24.28	12.09	9.99	6.17	5.63	5.33	3.89	3.78	3.11	3.04
$\Sigma D, \%$	24.28	36.37	46.36	52.53	58.16	63.49	67.38	71.15	74.26	77.30
Value	8.254	4.111	3.396	2.098	1.913	1.813	1.322	1.284	1.056	1.034

Note: The loadings of the significant variables are given in bold type; D – dispersion;  $\Sigma D$  –  $\Sigma$  dispersion.

**Table 2**

The matrix of factor loadings of the motivational mental states of the subjects (n=232)

Characteristics of the factors that determine the structure of the motivational mental states of future bachelors of the Faculty of Physical Education and Sports

Factor 1 “Cognitive ego-motivation” combined the important parameters of verbal, mathematical intelligence and intrinsic motive. Such subjects rely on their cognitive abilities and internal motivational resources to achieve success. Success in the educational and professional activities of such bachelors is directly dependent on the level of their IQ.

Factor 2 “Meaningful motivation” combines all the parameters of the “PIL” methodology and is a motivational *mental state* that characterizes the degree of meaningfulness of the bachelors activity, namely: existence of life goals, vocation, intentions, interest in life and emotional saturation of life, contentment, self-satisfaction, self-satisfaction a sense of ability to influence the course of one’s life. Such a motivational *mental state* is characterized by the ability to seek meaning and value reinforcement in everything related to the educational and professional activity and educational process of the subjects.

Factor 3 “Analytical and synthetic motivation” can to some extent be considered as a pragmatic motivational mental state, which is related to the subject’s desire for analysis, synthesis and generalization, for operationalization. Such subjects seek to create algorithms, instructions, and calculate the opponent’s actions.

Factor 4 “Problem-search motivation” combines the parameters “cognitive motive” and “intended effort mobilization level” and to some extent underlines the cognitive self-regulation of the subject, the ability to calculate his or her efforts to achieve the result based on cognitive resources. This motivational *mental state* has a high search-ability.

Factor 5 “Internal motivation” is made up of variables whose psychological content reflects the subject's desire to take responsibility for everything that happens in the realm of failures and family relationships. This heightened sense of responsibility focuses the bachelor on internal mental processes.

Factor 6 “Motivation of avoidance” consists of variables whose psychological content reflects the desire to avoid responsibility, to change activity. Initiative has a significant negative impact on results. Such subjects, under any circumstances, seek to avoid anything; they are dominated by the desire not to “stick out.”

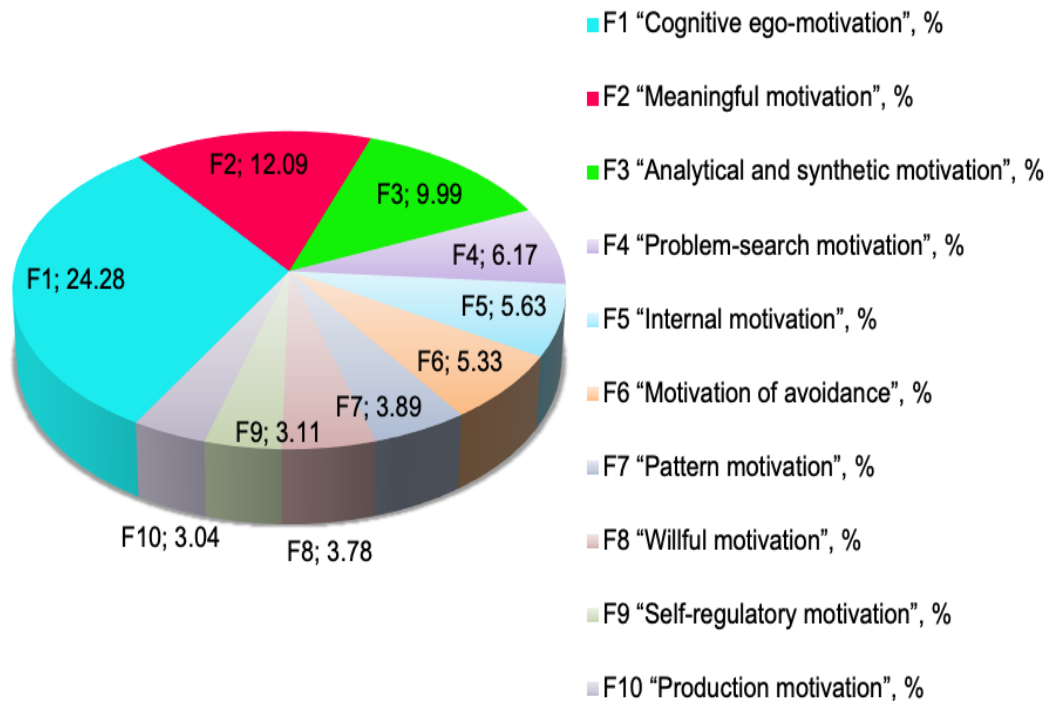
Factor 7 “Pattern motivation” shows the prevailing importance of the regularity of results and at the same time demonstrates a negative relationship with the “significance of results”, which indicates the subject's desire to comply with regulations, rules, laws, and at the same time neglect the essential meaningful features. There is a peculiar prevalence of attribution, formality over content and nature.

Factor 8 “Willful motivation” is accompanied by considerable volitional efforts in achieving results in educational, professional, sports and competitive activities. In general, the educational activities of such subjects are reminiscent of a permanent competition in which the researcher prefers volitional components, although this is not always advisable.

Factor 9 “Self-regulatory motivation” is the dominance of the internal component of health and illness in educational and occupational activities. To a large extent, Factor 9 has something in common with Factor 5 “Internal Motivation”, only for another area of internalization. The place of this factor in the structure of motivational psychic processes suggests that Factor 9 is not the main motivational *mental state* of bachelors.

Factor 10 “Production motivation” is also the dominance of the internal component in industrial relations, in part subjects who are in such a motivational state, oriented on the substantive parameters and less on the productive ones, so the value (1.034) of this factor in the total variance is insignificant.

The following factors have a load beyond the total variance of the variables (less than .901). Thus, according to the results of the statistical processing, 10 main factors (77.30%) were presented, which determined the structure of the motivational mental states of the subjects (see Fig. 3).



**Figure 3**  
Structure of motivational mental states of future bachelors of the Faculty of Physical Education and Sports

Interdependence of factors determining the structure of motivational mental states of future bachelors of the Faculty of Physical Education and Sports

Let's analyze the most stable correlations between the selected factors (see Table 3). The most significant ( $p \leq .01$ ) is the correlation between F1 and F3 (.461), F8 and F10 (.452). F1 "cognitive ego-motivation" (24.28%) was found to be the most important. F3 has significant correlations with all factors. Thus, cognitive ego-motivation and analytical and synthetic are important components in the structural and functional organization of motivational mental states of bachelors in the educational process. The most dependent factors in the structure of expectation states are F1, F3, F4 and F5, F7 and F10. Note that the structure of motivational mental states has a high degree of homogeneity and interrelation.

F	1	2	3	4	5	6	7	8	9	10
1	1,000	,077	,461**	,160**	,067	-,112*	,133**	,141**	,144**	-,132**
2	,077	1,000	,223**	,117**	,384**	,114**	,240**	,033	-,054	,053
3	,461**	,223**	1,000	,092*	,140**	-,127**	,179**	-,091*	-,169**	-,099*
4	,160**	,117**	,092*	1,000	,212**	-,092*	,320**	,223**	-,030	,061



5	,067	,384**	,140**	,212**	1,000	-,032	,260**	,167**	,081*	,211**
6	-,112**	,114**	-,127**	-,092**	-,032	1,000	-,203**	-,014	-,055	,276**
7	,133**	,240**	,179**	,320**	,260**	-,203**	1,000	-,040	,024	-,151**
8	,141**	,033	-,091*	,223**	,167**	-,014	-,040	1,000	,169**	,452**
9	,144**	-,054	-,169**	-,030	,081*	-,055	,024	,169**	1,000	,138**
10	-,132**	,053	-,099*	,061	,211**	,276**	-,151**	,452**	,138**	1,000

Note: \* – statistical significance of  $p \leq .05$ ; \*\* – statistical significance of  $p \leq .01$ .

**Table 3**

Correlation matrix of components of the structure of motivational mental states of subjects (n=232)

We state that the proposed structure, variables and interdependence of the factors of the motivational mental states of the bachelors of the Faculty of Physical Education and Sports are important components of their educational, professional, sports and competitive activities, which confirms the proposed first hypothesis.

Based on the logic of empirical research, the relationship of psychological semantic parameters of motivation with the parameters of intelligence investigated by the Spearman correlation coefficient  $r_s$  is determined. The results of correlation analysis are presented in table. 4.

F	SS	WE	A	G	AM	AP	NS	SI	SG
IM	.805**	.742**	.776**	.552**	.561**	.664**	.546**	.525**	.572**
CM	.210	.162*	.198*	.091*	.112	.115	.011	.095	.114
MA	.245**	.249**	.256**	.376**	.289**	.262**	.249**	.384**	.274**
MC	-.054	-.067	-.061	.030	.044	-.104	.095	.022	-.007
MCA	-.301**	-.266**	-.302**	-.090	-.136*	-.220**	-.072	-.088	-.138*
MS	-.068	-.078	-.078	-.081	-.067	-.087	.116	-.085	-.145*
SR	-.008	.012	-.036	-.116	-.044	.023	-.021	-.098	-.014
TC	-.124	-.035	-.148*	-.169*	-.176**	-.052	.172**	-.171**	-.116
VE	.002	.015	-.011	-.147*	-.071	-.003	.054	-.173**	-.094
ELAR	-.210**	-.229**	-.174*	-.052	-.088	-.281**	-.118	-.044	-.138*
EPP	.198**	.214**	.167	-.019	.054	.143*	.147*	-.006	.027
PLME	.211**	.219**	.202**	.163*	.152*	.148*	.226**	.153*	.171**
ELR	-.118	-.163*	-.111	.058	.061	-.172**	.043	.062	.028
RR	.148*	.146*	.133*	.087	.019	.117	.153*	.075	.034
I	.141*	.136*	.136*	.076	.049	.114	-.089	.073	.063

Note: \* – statistical significance of  $p \leq .05$ ; \*\* – statistical significance of  $p \leq .01$ .

**Table 4**

Correlation of the parameters of the structure of motivation with the parameters of the structure of intelligence of the subjects. (n=232)

Correlation analysis has shown the following results. The most significant are the correlations of “internal motif” (IM) with the indicators of verbal intelligence: “sentence supplementation” (DR) ( $r_s = .805$ ;  $p < .01$ ), “analogy” (A) ( $r_s = .776$ ;  $p < .01$ ) and “word exceptions” (WE) ( $r_s = .742$ ;  $p < .01$ ). A significant part of the subjects are future bachelors-teachers of Physical Education and Sports. Obviously, high indicators of verbal intelligence and the connection of these indicators with the specified parameters of motivation are determined by the content features of the leading activity. “Internal motif” (IM), “avoidance motif” (AM) and “the projected level of mobilizing efforts” (PLME) have significant correlations with all subscale of intellect, allows to make corrections in the organization of educational process of the Faculty of Physical Education and Sports. The researches strive to get the desired result at the expense: 1) internal motivational resource; 2) avoiding responsibility, without initiative and proper efforts; 3) mobilizing their efforts, demonstrating psychological readiness to perform, but this is not the most important task. Therefore, it is necessary to organize the educational process in such a way as to avoid false results, pseudo motivation, focusing on the content and expediency of efforts. The obtained results of empirical research, outlined some significant correlations allow us to state that operationalization of the research results will contribute to the effective organization of the educational process of future bachelor-teachers and bachelor-athletes, and confirms the second hypothesis.

### 3. Discussion

We have hardly encountered any researches of motivational mental states of future bachelors in the educational process, in scientific, educational and methodical literature on psychology and pedagogy of Physical Culture and Sports. There are scientific researches, which substantiate the essence of mental states, which often acquire stability and transform into personality properties<sup>23</sup>. The psychic state of expectations and its substantive features in educational and professional activities have been studied<sup>24</sup>. Cognitive mental states of students were also the subject of research<sup>25</sup>. Any dominant motivational *mental state* of the bachelors, which takes place in the studied structure (see Fig. 3), affects the content of the educational and professional, sports and competitive activities in the educational process of the Faculty of Physical Education and Sports. In particular, Factor 6 “Motivation of avoidance” and Factor 4 “Problem Search Motivation” are oppositely directed, as well as oppositely directed Factor 7 “Pattern Motivation” and Factor 3 “Analytical and synthetic Motivation”. It is important for acquisition of dyads, triads in

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<sup>23</sup> C. Izard, “The Psychology of Emotions”. (New York, NY: Plenum Press. 1991).

<sup>24</sup> I. S. Popovych, “Psychology of social ...

<sup>25</sup> A. O. Prokhorov; M. G. Yusupov y V. V Plokhikh. “Cognitive States ...

educational and professional activities, acquisition of sports teams in game sports, acquisition of pairs, in synchronous sports, in educational and methodical training, in all in sports and competitive activities. In particular, the presence of participants in one group, a team of F6 and F4, F7 and F3 weakens the organization of effective interpersonal interaction. It is important for the organizers of the educational process to understand the essence of the phenomenon of “motivational mental state”, its content features in order to effectively manage the educational process, to avoid unwanted mistakes.

The content of the subject matter disclosure depends on the applied set of methods. We note that the selected set of tests with standardized questionnaires and factor analysis allowed to disclose the subject of the research. This made it possible to separate one motivational *mental state* from another, to establish differences between motivational mental states of bachelors. Variables of motivational mental states and interrelation of factors reflect the levels of motivational resource of the subjects. The dominant motivation has a direct dependence on the type of the subject's motivational mental state. Our findings have been confirmed by other similar scientific advances in the regulatory role of mental conditions in the structure of a person's cognitive and mental resources<sup>26</sup>.

The empirical results confirm the hypothesis that the structure, variables and interdependence of the factors of motivational mental states of future bachelors of the faculty of physical education and sports are important components of their educational, professional, sports and competitive activities. The application of the results of the study will facilitate the effective professional development of specialists. The results of the research of the motivational mental states of the investigated operationalize the solution of problems for the effective organization of the educational process of future bachelors-teachers and bachelors-athletes. A number of questions remain open, including the relationship of a specific motivational *mental state* with the performance of bachelors, the impact of low values of motivation parameters on the motivational resource of the subject under critical stress situations.

#### **4. Conclusions**

1. Factor analysis determined the structure of motivational mental states of future bachelors, consisting of 10 major factors (77.30%). Factor 1 “Cognitive ego-motivation” (24.28%) and Factor 3 “Analytical and synthetic motivation” (9.99%) were found to be the main ones. F3 is significantly correlated with all factors ( $p \leq .05$ ;  $p \leq .01$ ).

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<sup>26</sup> I. M. Halian, “Personal determinants of responsibility of future educators”. *Insight: the psychological dimensions of society*, num 1 (2019): 15-21; O. Halian, “Responsibility and emotional burnout of teachers”. *Insight: the psychological dimensions of society*, num 2 (2019): 16-23; P. J. Silvia; A. H. Robert y J. L. Templin, “Are the sources of interest the same for everyone? Using multilevel mixture models to explore individual differences in appraisal structures. *Cognition and Emotion*, Vol: 23 num 7 (2009): 1389-1406 y D. Thoman; J. Smith y P. Silvia, “The resource replenishment function of interest”. *Social Psychological and Personality Science*, num 2 (2011); 592-599.

2. The structure of intelligence of future bachelors of Physical Education and Sports is constructed, which consists of nine subscales (according to R. Amthauer), the levels of verbal, mathematical and spatial intelligence are determined, the arithmetic mean IQ (M) is substantiated, the tendency of indicators of the subjects is described.

3. The diagram of the motivation structure of future bachelors of the Faculty of Physical Education and Sports is represented, it consists of 15 parameters (according to V. Herbachevskiy), four blocks of motivation are defined, the levels of parameters are determined, the nature of the motivational resource of the subjects is outlined. The assumption is made that the low values of motivation parameters in the form of points in the diagram (see Fig. 2) of the TC (M = 97.73; SD = 10.34), ELAR (M = 97.73; SD = 10.34) and ELR (M = 97.73; SD = 10.34) conditionally reduce its area, which is a graphic reproduction of a person's motivational resource. Such a reduction in resources can be important in critical stress situations.

4. It is substantiated that the structure, variables and interdependence of factors of motivational mental states are important components of educational, professional, sports and competitive activities; the empirical results of the research will contribute to the effective organization of the educational process of the bachelors of the Faculty of Physical Education and Sports.

5. The first and second hypotheses are confirmed. The results of the research may be of interest to the heads of sports schools that organize the educational process of bachelors, coaching staff, athletic directors, anyone involved in the education and training of bachelors-teachers of Physical Education, bachelors-athletes, as well as researchers of psychology and pedagogy sports.

Prospects of subsequent researches. Further scientific research will be focused on establishing the relationship of a particular motivational *mental state* with the success rates of future bachelors of the Faculty of Physical Education and Sports.

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