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Professionally Important Psychophysiological Qualities of Patrol Police Officers

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Abstract

The influence of the authors' teaching method on the dynamics of the professionally important psychophysiological qualities of patrol police officers at the stage of professional development is investigated in the article. The essence of the authors' method is to apply specially developed situational tasks mastering the subjects of vocational practical training in the courses of the primary professional training of police officers. An experimental (EG, n=30) and control (CG, n=31) groups were formed from the listeners of the course of primary police training of the Center for Primary Professional Training of the National Academy of Internal Affairs, called the Police Academy. In order to achieve the goal of the research, a set of modern general scientific methods was used, including theoretical (the method of conceptual comparative analysis, structural and system analysis, synthesis, generalization); empirical (testing, pedagogical observation, pedagogical experiment); the methods of mathematical statistics.

According to the results of the experiment, significantly higher indicators of the attention capacity and distribution of the EG police officers, in comparison to the CG ones, were found; a significant improvement in the attention span and concentration in the EG was defined in comparison to the initial data; the increase of the indicators of neuropsychiatric stability and visual and involuntary memory of the EG police officers was determined. It indicates the positive impact of the authors' method on the dynamics of the professionally important psychophysiological qualities of patrol police officers at the stage of professional formation.
Keywords: psychophysiological qualities, professional training, patrol police, police officer.

Introduction

The mental cognitive processes of a person are one of the factors that determine the success of mastering the knowledge, acquiring special professional skills, the effectiveness of performing a certain activity, and they are a peculiar criterion of mental capacity [4, 5, 9, 10, 24]. The pattern of perception and mastering the information mostly depends on the adaptation of a future police officer to vocational training and specificity of professional activity [1, 3, 6, 17, 19].

An analysis of the characteristics of the patrol police professional activity shows that a police officer stays in the car performing the duties during a significant part of the work time. The qualitative performance of tasks in such conditions requires constant concentration and puts high demands on the neuropsychic stability and mental cognitive processes including attention, the ability to switch it quickly, high sensitivity of visual and auditory analyzers, speed of thinking, memory, etc. The proper functioning of these mental processes helps to keep the necessary service information in the memory, to process the data obtained more quickly that generally contributes to a more efficient performance of the duties.

The analysis of recent research shows that a considerable amount of psychological and pedagogical research is devoted to the study of the improvement of professionally important qualities of police officers [1, 7, 11, 18, 23]. The scientists proved a positive correlation between the development of basic physical and psychological qualities [8, 9, 12, 16, 20, 21], a positive impact of training on the development of professionally important characteristics [14, 17, 22].

2. Literature Review

The scientists in the field of legal psychology emphasize the importance of the development of the police officers' neuropsychic (emotional) stability because official activities are connected with the constant conflict situations that arise during the duties performance. Emotional stability is one of the most important determinants of the success of human life in general, a component of "emotional intelligence" that ensures the maintenance of friendly relationships. This characteristic is considered a manifestation of will. It determines the ability of a worker to regulate one's own emotions and overcome the state of increased emotional arousal during the performance of complex activities. Emotional stability is also interpreted as a feature of a person's temperament which allows performing the tasks reliably due to the optimal use of the reserves of the neuropsychic emotional energy. According to the results of modern research, emotional stability is formed in the process of human adaptation to extreme conditions of activity [2, 4, 9, 11].

One of the qualities that do not have own content but affect the course of a number of mental processes (perception, imagination, thinking, memorizing) is attention. The researchers [14, 15, 22] consider the attention to be the selective orientation of the process of perception on a particular object that is a signal to a worker to reflect it adequately during the time required to perform a particular activity. The attention is a specific psychophysiological phenomenon of a person, it can be considered as a process, state and characteristic of an individual [10, 25]. The scientists determined that attention is closely connected with the individual typological characteristics of the nervous system and is the result of complex integrative activity of the brain [1, 11, 13].

The degree of completeness and quality of reality perception depends on the level of performance of the central nervous system. That is, attention is a dynamic characteristic of any mental activity which influences the distribution of resources of the person's system of processing information and ensures the effectiveness of activity (both educational and professional). The essence of attention is to select significant influences and to extinguish insignificant and indirect ones. This makes the image clearer and the activity is

carried out accurately until the planned act is completed or the goal is reached. The most important functions of attention are the regulation and control of activity. The clarity and completeness of feelings, perceptions, and thoughts depend on what and how a worker focuses. The decrease in the attention intensity leads to a decrease in quality indicators of the work [9, 11, 13].

The special literature [14, 22, 25] mentions that the qualities of attention do not exist in isolation. They are closely interconnected and are the aspects of a single act of attention that does not remain constant but is refined due to human development. If a worker developed the habit of being attentive constantly, then the attention becomes a trait of one's character that is connected with persistent and focus attention, the ability to notice important for understanding characteristics in objects and phenomena. The attentiveness is the basis of sensitivity and tactfulness towards people and should be an integral feature of a patrol officer. The attention characteristics include span, concentration, distribution, switch, and volume. The attention span is a temporal characteristic of attention that is determined by the duration of focused attention on a particular object or activity. This characteristic of attention depends on the activity of the subject which is manifested in one's actions with the object. It is increased when performing practical or mental tasks that require a fuller display of objects [10, 14]. The attention switch is refocusing from one object or activity on another. According to scientists, this kind of attention is conditioned by the mobility of nervous processes. It is possible to improve the indicators of attention switch through training. The focus on the object has a certain intensity that is manifested at the concentration level. That is, the attention concentration is a measure of the person's immersion in a certain type of activity. The more attention is concentrated on the object, the less noticeable third-party influences are, and the more productive the activity is. Accordingly, the volume of attention is the number of objects that a person can simultaneously perceive in a short period of time. An important feature of the attention on which patrol efficiency depends is its distribution. The distribution of attention is the ability of a police officer to hold several objects in the attention, to perform two or even three activities at the same time. While performing the duties, a patrol officer must perform several activities at the same time. A police officer has to distribute attention, that is, to focus it simultaneously on different processes and objects, mostly with varying degrees of expressiveness. While patrolling by car, a worker must simultaneously monitor the traffic situation (state of own car, movement of other vehicles, behavior of pedestrians, road signs, condition of road laneway, etc.), monitor the instrument readings, control the maneuvers of movement of the car, as well as abidance by traffic regulations of other drivers and pedestrians, focusing on suspects, state car license plates, etc.

Concerning the investigations of a number of scientists [9, 13], the expression of attention depends to some extent on the development of the police officers' memory. The memory is the process of memorizing, keeping, reproducing and forgetting the past experience by an individual. The important memory processes for patrol police officers are remembering, keeping and reproducing essential service information. The assessment of neuropsychic stability, attention features, and memory of future patrol police officers will help determine the effectiveness of training methods aimed at the formation of professionally important psychophysiological qualities.

The aim of the study is to investigate the influence of the authors' teaching method on the dynamics of professionally important psychophysiological qualities of patrol police officers at the stage of professional development.

The tasks:

1) to determine the initial level of indicators of neuropsychic stability, attention, and memory of the listeners of the course of primary police training;

2) to investigate the dynamics of the studied indicators mastering the course of primary police training.

3. Method

3.1. Participants

In order to check the impact of the authors' teaching method on the development of professionally important psychophysiological qualities of the listeners of the course of primary professional training of police officers, a pedagogical experiment was conducted during the mastering of the course of primary

professional police officers training and it provided a statement and formative stages. During the statement stage of the experiment, the level of development of the studied indicators was determined to influence the personalities of the listeners of the experimental groups purposefully. The formation phase of the pedagogical experiment involved the creation of experimental (EG, n=30) and control groups (CG, n=31) from the listeners of the course of primary police training of the Center for Primary Professional Training of the National Academy of Internal Affairs, called the Police Academy. The study was conducted among the listeners in 2019 and it lasted for six months (from February to August in 2019).

3.2. Materials

The professionally important psychophysiological qualities of listeners in the process of vocational training were determined using the following methods: the multilevel personal questionnaire "Adaptability" (MPQ-AM), developed by A. G. Maklakov and S. V. Chermianin (to evaluate the indicator "Neuropsychic stability"), the test "Finding numbers" (the indicator "The distribution and volume of attention"), the method of numbers operation (the indicator "Visual and involuntary memory"), Burdon-Anfimov corrective test (the indicator "Attention span and concentration").

Multilevel personality questionnaire "Adaptability" (MPQ-AM) is designed to evaluate the adaptive capacity of an individual taking into account the socio-psychological and some psychophysiological characteristics, reflecting generalized features of neuropsychic and social development [13]. The methodology is based on the interpretation of adaptation as a process of continuous active adaptation of a person to constantly changing conditions of the social environment and professional activity. The questionnaire, designed to assess this indicator, contains 165 questions and the following scales: reliability (R); neuropsychological stability (NPS); communicative abilities (CA); moral normativity (MN); personal adaptive capacity (PAC). Determining the degree of development of the examined indicator, we used the NPS scale, the level of development of which ensures the workers` stress tolerance. The survey was conducted using a special form. Concerning the scale of this method, the growth of the NPS is determined by the decrease in its score. According to the points obtained, the following distribution of developmental levels is provided: a high level – from 0 to 5 points (9-10 sthenes); a sufficient level – 6-21 points (6-8 sthenes); a satisfactory level – 22-37 points (3-5 sthenes); a low level – 38 and more points (1-2 sthenes).

According to the "Finding Numbers" test, one should find the missing numbers on the checklist as soon as possible and cross them out [11, 13]. The level of development of the studied indicator was evaluated by the number of correctly crossed out numbers on the checklist by a 9-point scale. According to the points received, the following distribution of levels is provided: a high level – 8, 9 points; sufficient – 6, 7 points; satisfactory – 5, 4, 3 points; low – 1 and 2 points. The assessment of the indicator "Attention span and concentration" predicted the use of a Burdon-Anfimov corrective test. The levels of development of this indicator were defined in the following way: people with low attention span and concentration had a low and below the middle (up to 84%); people with moderate level of attention span and concentration (85-89%) had a satisfactory level; higher than the middle (90-94%) – a sufficient level; a high level – 95% and more.

The estimation of the indicator "Operational and involuntary memory" was carried out by the method of "Operation with numbers", the essence of which is to manage certain amounts of information in the form of single digits. A poster containing two numbers in each of the seven rows was presented to the listeners for 1 min. They had to summarize the numbers in each row, to compare the amount received with the number 10 and to remember the resulting difference. They also had to memorize the location of this difference on the poster (where the free cell is in this row) and then write it down in the checklist. According to the methodology, the tasks are performed twice using posters with different numbers. The evaluation of this indicator was carried out in points. The correct answer equaled 2 points. If the number was written correctly, but the place in the row was mixed up (or vice versa), it equaled 1 point.

3.3. Procedure

The organization of the pedagogical experiment did not violate the educational regime of the center of primary professional training of police officers and the educational process, the classes were held in accordance with the usual rules. In the EG and CG, the same amount of time was devoted to master certain material – 1102 hours. The standard curriculum provides normative (702 hours), variational (378 hours)

parts of the training program and control measures (24 hours). The normative part of the program consists of subjects of general vocational training (126 hours), professional theoretical (172 hours), and professional practical training (404 hours). The variation part contains training subjects related to the specifics of patrol activity (the organization of patrol police activity; the patrol activity for road safety; the patrol actions during mass events, etc.).

The authors' teaching method provided the introduction of innovations in the subjects of vocational training, including physical, tactical, weapons, first aid training, and externship. The classes of the EG differed from the CG because they provided the implementation of a number of innovations, including the use of advanced situational tasks (while working over the cases); the performance of situational tasks mastering the subjects "Tactical training", "Weapons training", "Physical training"; purposeful development of the necessary physical qualities.

According to the authors' method, working over the cases occurs after mastering the basics of training subjects in tactical and weapons training. In the process of performing the cases, future officers solve new tasks and non-standard professional situations. The use of variational situational tasks in the educational process contributes to the consolidation of the acquired theoretical knowledge, the formation of practical skills and abilities to quickly assess the situation predict the possible consequences, compare the level of threat and type of influence, according to legal grounds while applying the police enforcement measures. The development of professionally important physical qualities was carried out during the classroom (training) and extracurricular activities (morning physical training, classes in sports groups, self-training) according to the developed program which provided the use of a set of exercises aimed at increasing the level of general physical fitness, improving the static endurance of body muscles. The training was carried out taking into account a number of pedagogical conditions and principles.

4. Results and discussion

The study of the specifics of vocational training of patrol police officers provides reasons for a number of interrelated key stages, including the stage of professional self-determination, professional development, and professional growing. The stage of professional self-determination continues till professional education is acquired, it is professionally oriented and designed to encourage individuals to improve themselves that will help to develop the professionally important traits necessary for listeners to adapt to training and further professional activity quickly. The stage of professional development is the main one, during which professional training of future police officers takes place. This stage covers the period of the primary training of police officers and involves the formation of professional readiness for the effective performance of duties as a patrol police inspector. The training system at the stage of professional growing is aimed at updating knowledge and maintaining the achieved level of professional readiness and it provides the strengthening of the role of general physical training and the maximum practical orientation of tactical and weapons training.

As the stage of professional development is crucial in the training of patrol officers, the authors' method was developed for this stage of training and approbated during the primary training of police officers.

The analysis of the "Neuropsychic stability" states its improvement (decrease of indicators) for the EG and CG listeners at the formative stage of the experiment (Table 1).

Table 1. The dynamics of the professionally important psychophysiological qualities of the EG and CG patrol police officers during the pedagogical experiment, points

The statement stage of the experiment				The formative stage of the experiment			
EG (n=31)	CG (n=30)	Significance value		EG (n=31)	CG (n=30)	Significance value	
X±m	X±m	t	p	X±m	X±m	t	p
"Neuropsychic stability"							
19.1±1.62	18.6±1.31	0.240	>0.05	18.0±1.41	17.8±1.14	0.110	>0.05
pEGst–pEGf				p>0.05			
pCGst–pCGf				p>0.05			
"The distribution and volume of attention"							

5.90±0.24	5.57±0.31	0.842	>0.05	6.87±0.21	6.13±0.28	2.114	<0.05
pEGst–pEGf				p<0.05			
pCGst–pCGf				p>0.05			
"Attention span and concentration"							
87.48±0.82	88.63±0.81	0.998	>0.05	90.84±0.66	89.63±0.64	1.316	>0.05
pEGst–pEGf				p<0.05			
pCGst–pCGf				p>0.05			
"Visual and involuntary memory"							
5.48±0.26	5.30±0.28	0.314	>0.05	6.06±0.26	5.67±0.27	1.040	>0.05
pEGst–pEGf				p>0.05			
pCGst–pCGf				p>0.05			

Legend: pEGst–pEGf – significance of difference of EG police officers' indicators at the statement and the formative stages of the pedagogical experiment due to the t-test, pCGst–pCGf – significance of difference of CG police officers' indicators at the statement and the formative stages of the pedagogical experiment due to the t-test

The indicator of the EG listeners was decreased by 1.1 points and accounted for 18.0±1.41 (p>0.05). The indicator of neuropsychic stability of the CG listeners was also decreased: from 18.6±1.31 to 17.8±1.14 points. The analysis of the data from Table 2 indicated a slight change in the levels of development of the studied indicator. The number of listeners with a satisfactory level was 9.6% decreased in the EG. No EG listeners who had a low level at the formative stages of the pedagogical experiment were identified. The number of EG listeners with a sufficient level was increased: 54.8% at the statement stage, 71% at the forming stage. The number of listeners with a high level did not change – 9.7%. The results were similar in the CG: the listeners with a low level were not identified. The number of listeners with a satisfactory level was increased by 3.4% to 26.7%. The number of listeners with a sufficient level of development of this indicator was decreased by 3.4%: it was 66.7% at the statement stage, 63.3% at the formative stage. The number of listeners with a high level of development was increased by 3.3% to 10% (Table 2). Such results show that the neuropsychic stability of the listeners at the stage of professional development is not significantly improved. This problem requires extensive scientific research.

Table 2. The levels of the professionally important psychophysiological qualities development of the EG and CG patrol police officers during the pedagogical experiment, %

The levels	The statement stage of the experiment		The formative stage of the experiment	
	EG (n=31)	CG (n=30)	EG (n=31)	CG (n=30)
"Neuropsychic stability"				
Low	6.5	6.7	0	0
Satisfactory	29.0	23.3	19.4	26.7
Sufficient	54.8	66.7	71.0	63.3
High	9.7	6.7	9.7	10.0
"The distribution and volume of attention"				
Low	3.2	6.7	0	3.3
Satisfactory	38.7	46.7	22.6	43.3
Sufficient	51.6	33.3	51.6	36.7
High	6.5	13.3	25.8	16.7
"Attention span and concentration"				
Low	12.9	10.0	3.2	3.3
Satisfactory	51.6	46.7	29.0	33.3
Sufficient	22.6	26.7	51.6	46.7
High	12.9	16.7	16.1	16.7
"Visual and involuntary memory"				

Low	3.2	6.7	3.2	3.3
Satisfactory	45.2	60.0	32.3	46.7
Sufficient	41.9	23.3	54.8	40.0
High	9.7	10.0	9.7	10.0

The analysis of the results of the study of the attention characteristics of listeners through the test "Finding numbers" showed that the level of the indicator "The distribution and volume of attention" did not differ significantly at the statement stage of the experiment ($p>0.05$). This indicator accounted for 5.90±0.24 points in the EG, and 5.57±0.31 in the CG (Table 1). The analysis of data from Table 2 states that the highest number of listeners with a sufficient level of development of this indicator is 51.6% in the EG, the number of such listeners was slightly lower in the CG – 33.3%. Listeners with a high level of development of the studied indicator accounted for 6.5% in the EG, and 13.3% in the CG. 3.2% listeners with a low level of readiness were found in the EG; and 6.7% in the CG; 38.7% listeners with a satisfactory level were found in the EG; and 46.7% in the CG. The analysis of the indicator "The distribution and volume of attention" states its improvement for the EG and CG listeners at the formative stage of the experiment (Table 1): 5.90±0.24 points at the statement stage in the EG, 6.87±0.21 points at the formative stage ($p<0.05$). This indicator was increased by 0.56 points ($p>0.05$) to 6.13±0.28 points in the CG. The analysis of the data from Table 2 gives reason to note the change in the levels of development of the indicator "The distribution and volume of attention". The number of listeners with a high level of development of this indicator was increased by 19.3% in the EG. The number of listeners with a satisfactory level was decreased by 16.1%. The number of listeners with a low level of readiness was decreased from 6.7% to 3.3% in the CG. The number of listeners with a satisfactory level was decreased by 3.4%; with a high level of professional readiness increased by 3.4% in the CG. In general, the level of the distribution and volume of attention in the EG and CG was rated as sufficient. The conducted analysis proves the positive impact of the proposed author method on improving the distribution and volume of attention of listeners of the primary police training course. The listeners of the EG were observed to have a significant improvement in this indicator.

The indicator "Attention span and concentration" of the EG and CG listeners also did not differ significantly at the statement stage of the experiment ($p>0.05$). This indicator was 87.48±0.82% in the EG, and 88.63±0.81% in the CG (Table 1). The analysis of the levels of development of this indicator states the following distribution: the largest number of listeners in the EG are recorded to have a satisfactory level of professional readiness – 51.6%, in the CG – 46.7%. There were found 12.9% listeners with a low level of professional readiness in the EG, 10% in the CG; with a sufficient level in the EG – 22.6%, in the CG – 26.7% (Table 2). Received results indicate a satisfactory level of attention span concentration that does not contribute to the complete acquisition of the material by the listeners during the course of primary professional training.

The analysis of the indicator "Attention span and concentration" at the formative stage of the experiment showed that the mean values of the EG and CG listeners did not differ significantly ($p>0.05$). On the other hand, the comparison of the indicator of the EG listeners at the formative stage with the results of the statement stage of the experiment showed it was significantly improved ($p<0.05$). The average value of this indicator was increased by 3.36 points to 90.84±0.86 points (Table 1) that indicates the positive impact of the proposed changes in the attention span and concentration of future patrol police officers. This indicator was increased inauthentically to 89.63±0.64 points in the CG during the primary professional training course ($p>0.05$). The improvement of the indicator "Attention span and concentration" during the course of mastering a police officers' primary training course is certainly a positive step toward improving the professional readiness of future patrol officers for effective service. The analysis of the data from Table 2 notes changes in the levels of development of the indicator "Attention span and concentration" at the formative stage of the pedagogical experiment. Both groups showed a decrease in the number of listeners with a low level of development of this indicator from 12.9% at the statement stage to 3.2% at the forming stage in the EG, and from 10% to 3.3% in the CG. The number of listeners with a satisfactory level of development was also decreased by 22.6% in the EG, and by 13.4% in the CG. The number of listeners with a

sufficient level of development of this indicator was increased significantly: they accounted for 51.6% in the EG that was 29% more than at the statement stage of the experiment; and 46.7% in the CG (20% more than at the statement stage). The number of listeners with a high level of development of this indicator in the CG did not change during the experiment and it accounted for 16.7%. The number of such listeners in the EG was increased by 3.2% to 16.1%.

The analysis of the results of the "Visual and involuntary memory" indicator of the EG and CG listeners at the formative stage of the experiment by the method of operation with numbers showed that the average values of the EG and CG listeners did not differ significantly ($p>0.05$). On the other hand, the comparison of the indicators characterizing memory functions of the EG listeners with the results of the statement stage showed that they were 0.58 points better ($p>0.05$) and they accounted for 6.06±0.26 points (Table 1) that indicated the positive impact of the authors' method on the memory functions of future patrol officers. This indicator was increased by 0.37 points ($p>0.05$) in the CG mastering the course of primary professional training and accounted for 5.67±0.27 points. The analysis of the data from Table 2 notes a slight change in the levels of development of the "Visual and involuntary memory" indicator of the listeners. The number of listeners with a sufficient level of development was increased by 12.9% in the EG at the formative stage. The number of listeners with a satisfactory level was decreased by 12.9% in the EG. The trend towards an increase in the number of listeners with a sufficient level of development of the studied indicator from 23.3% to 40% and towards a decrease in the number of listeners with a satisfactory level by 13.3% was defined in the CG. A decrease by 3.4% in listeners with a low level was determined in the CG. The number of listeners with a high level of development of the studied indicator remained unchanged (10%).

5. Conclusions

On the basis of the conducted researches, the efficiency of the influence of the authors/ method on the psychophysiological qualities of patrol police officers during their training at the stage of professional development was proved experimentally.

It is determined that the initial level of the studied attention indicators of the listeners of the primary police training course is evaluated as satisfactory. The positive dynamics of the attention indicators of the EG and CG listeners mastering the course of primary professional training of police officers were stated. The EG listeners were defined to have significantly higher indicators of the attention span and distribution, in comparison with CG listeners at the formative stage of the pedagogical experiment ($p<0.05$). The mean values of the indicator "Attention span and concentration" of the EG and CG listeners did not differ significantly ($p>0.05$). However, the investigated indicator of the EG listeners was significantly improved ($p<0.05$), in comparison with the results of the statement stage. An increase in the number of the EG listeners with high and sufficient levels of attention development and a decrease in the number of t listeners with low and satisfactory levels were noted.

The positive influence of the authors' method on the development of indicators of neuropsychic stability and visual and involuntary memory was determined. However, the results were not significantly improved ($p>0.05$).

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