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Influence of the Educational Factor on the Level of Intellectual Abilities of Police Officers

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Abstract.

The article is devoted to the analysis of the diagnostics of the educational factor influence on the level of intelligence and general intellectual abilities in police officers. In the article, it was also aimed to describe theoretical and practical studies on the diagnosing of the intelligence level and general intellectual capacities in police officers, and to assess the influence of educational factors on the level of intelligence.

The instruments used in the study during the professional-psychological selection included the Brief Qualifying Selection Test, the Intelligence Structure Test developed by Rudolf Amthauer et al., and Raven's Progressive Matrices. Based on the empirical data analysis, it was proved that the police officers' educational level had a significant impact on their integral index value, level and structure of intelligence, and general intellectual abilities.

Keywords: Level of intelligence, Structure of intelligence, General intellectual abilities, Police officer, Police educational institutions.

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Introduction

Professional psychological selection of the most suitable candidates for work is always an actual issue; police service and training at police educational institutions are no exception.

In connection with the ongoing socio-economic changes, the reforms in law enforcement bodies and in the society, as well as the technical progress, a police officer, in addition to his/her physical abilities and general capacity to logical thinking, needs to have a high level of general knowledge, erudition, and stability of mental activities in the situations of emotional tension during professional law enforcement actions. That is, at present, one of the criteria for professional selection of candidates for police service and police training is not only the general psychological suitability of the candidate, but also his/her intellectual abilities.

Practical psychologists of the Human Resources Department use several tests aimed at measuring intellectual abilities, among them Wechsler Adult Intelligence Scale (WAIS), R. Cattell's test, Eysenck's IQ test, Raven's Progressive Matrices (RPM) and some others. The widespread use of intellectual tests in world practice for predicting professional success is due to their high predictive reliability, especially as regards the success of learning (the intellect and the constructs associated with it have a high degree of validity). However, despite the large number of tests developed as diagnostic tools, the situation in the field of professional psychological selection of candidates for police service and training at police educational institutions can't be effective.

Therefore, it is interesting to identify the best tests that help to assess the intellectual capacities of a candidate for service or training in police.

It is worth noting that at present in Ukraine the procedure and diagnostic tools for professional psychological selection of police officers are only being formed, and therefore careful attention should be given to the methods that render the best results in the shortest term under the existing circumstances. The issue of comparing the testing results with the effectiveness of training and professional activities is also significant. In addition, during the ongoing police reform, it is important to determine whether higher education is necessary for a police officer, or the training program can be shortened.

The purpose of the article is to describe theoretical and practical studies on the diagnosing of the intelligence level and general intellectual capacities in police officers, and to assess the influence of educational factors on the level of intelligence.

Literature Review

Science studies existing relationships and general patterns that inevitably manifest in each case. In the psychological science, intelligence serves as the criterion for personality performance, explains individual differences in the academic performance, literacy, income, life expectancy, etc. (Linn, 2008).

The main reason for problems in the field of professional psychological selection of candidates for police service or training at police educational institutions is the lack of unity in the understanding of intelligence (Latin *Intellectus* – knowledge, understanding, or reason); that is, of what is actually being studied. Every psychologist understands what exactly is measured by tests, and how their results should be interpreted, in his/her own way.

It should be noted that today quite polar positions in understanding intelligence peacefully coexist in people who use the same methods of studying it. For instance, intelligence is understood as a one-level model with two blocks of indices of verbal (operative-logical – left hemisphere) and non-verbal (emotional-figurative – right hemisphere) nature (D. Wechsler) (Psyadlo, 2015); or as a set of mental abilities that provide success in cognitive activity, which includes acquired knowledge,

experience, ability to further accumulation of knowledge and its use in mental activity (E.M. Psyadlo, 2015).

On the basis of theoretical positions of W. Stern, D. Wechsler and J. Piaget, many research workers understand intelligence as people's natural (that is, it genetically determined) capacity which allows them to successfully adapt to changing conditions by making internal decisions (Gurevich, Borisova, 2001).

A significant number of scientists now accept J. Carroll's definition of intelligence as a general cognitive ability that manifests itself in the ability to reason, solve verbal, mathematical and spatial problems, to learn quickly and absorb a significant amount of knowledge (Carroll, 1993). In our opinion, this definition has certain disadvantages – the implicit status of socio-cognitive knowledge and social adaptation, and consequently, rendering social and emotional intelligence out of brackets.

At present, intelligence is often defined as a general mental capacity that is present in any kind of mental activity and is potentially inherent in different individuals in varying degrees from their birth (Voloshchuk, 2003).

Psychological concepts (Ch. E. Spearman (1904); L. L. Thurstone (1924); A. Bine (1898); R. Cattell; J. Carroll and J. Horney (Schneider, McGrew, 2012); V.M Druzhinin (2007); H. Yu. Eysenck (2005) etc.), which claim the status of scientific theories, alternately change each other and are superseded by the next ones, seem more like partial philosophical systems, than theoretical generalizations of scientific facts.

At the present stage of development of the psychological science and the development of the law enforcement agencies, the priority direction of research in the field of psychology of intelligence is "the interest in the processes of transformation of capacities into competence" (Ushakov, 2011, p. 102), the phenomenon of expert abilities in the context of the general erudition factor in the specific area of knowledge, the interrelations of cognition and metacognition, the principle of dynamic typicality in the development of individual intelligence.

Some candidates for service at the National Police and training at the police educational institutions are more gifted with this capacity than others. The task is to measure it and thereby determine the capacities of each individual. This approach originates from experimental works of Ch.E. Spearman (1904) and R.B. Cattell (1958) and consists in the calculation of the IQ coefficient, which is understood as the reflection of the natural intelligence power.

If intelligence manifests itself as an ability to solve difficult problems, it is easy to understand why the research into the intelligence of candidates for police service is so important. To overcome challenges which police officers face in extreme situations, they need capacities to learn quickly, adjust to new circumstances, solve problems, and abstract thinking. Therefore, the level of intellectual abilities is a good predictor of success in police service and training. Hence, it is appropriate to study the relations between the general level of intelligence, the levels of intellectual abilities and thinking with the presence of higher education.

Research methodology and empirical research base

To study the level and structure of intelligence, the relationship between the results of activities and intellectual abilities, and the expanded characteristics of adaptation in the candidates for service in the police forces or training at the police educational institutions the following parameters of intelligence were measured: the Integral Index of General Mental Abilities (hereinafter – I.I.), the ability to generalize and analyze, flexibility of thinking, speed and accuracy of the material perception, literacy, choice of optimal strategy, etc. The instruments used included Raven's Progressive Matrices (hereinafter – Raven's Test), Intelligence Structure Test developed by R.

Amthauer et al. (hereinafter referred to as Amthauer's Test), and the Brief Qualifying Selection Test developed by V.N. Buzin (hereinafter – the BQS Test).

The BQS Test is intended to select persons with high ability to learn, who quickly develop special skills and efficiency and can restructure their stereotype of actions plastically in changing and complicating situations of activity.

The BQS Test is used for preliminary selection and distribution of personnel in industry, army, police, education system, vocational guidance work, and psycho-diagnostics of the applicants' training and business qualities. The test is based on the model of general abilities structure (Buzin, 1992). The BQS Test consists of 50 items that contain tasks on solving arithmetic problems, establishing analogies, understanding proverbs and sayings, syllogistic operations, as well as tasks for the sustainability of attention and spatial thinking. The test makes it possible to find:

– the Integral Index of General Abilities (the I.I.);

– subscale indices to assess individual values, reflecting the respondent's intellectual development, in particular: the level of voluntariness; concentration and distribution of attention (1); general level of knowledge and development of linguistic abilities (quality of humanitarian education) (2); level of education in the field of exact sciences (3); level of spatial orientation and abstract-logical thinking (4); erudition (5); verbal intelligence (6); inferences (7); flexibility of thinking (8); semantic generalizations (9); technical intelligence (10); numerical operations (11); numerical regularities (12); spatial operations (spatial imagination) (13); the ability to synthesize and analyze the material (14); emotional components of thinking (15); speed and accuracy of perception (16); the use of language (literacy) (17); mathematical abilities (18).

The Amthauer's Test permits to study the structural-level characteristics of intelligence deeply; helps to assess a respondent's abilities for natural, social, mathematical, and technical sciences, foreign languages, entrepreneurship, as well as for a number of specific fields of activity and to predict his/her success in training and further professional activities.

The Amthauer's Test provides a possibility to interpret the obtained results at three levels:

1. The general level of intelligence (IQ) – is found as the overall test result translated into a standard index.

2. The type of intelligence is revealed on the basis of the profile interpretation; it qualitatively characterizes the group of subtest with the highest results: verbal intelligence (VI) – the ability to operate with words as signals and symbols; mathematical talent (MT) – abilities in the field of practical mathematics and programming; visual imagery thinking (VIT); and constructive abilities of the theoretical (TL) and practical plan (PP).

3. The levels of development of individual abilities (or intellectual operations) – are found by interpreting the results obtained in individual subtests: 1. logical selection (LS) – inductive thinking, language skills ("feeling of language"); 2. determination of common characteristics (GE) – ability to conceptual abstraction, the use of verbal concepts; 3. analogies (AN) – combinatorial abilities; 4. classification (KL) – ability to judge, to form a certain point of view; 5. calculation (RA) – the level of arithmetic thinking development; 6. rows of numbers (ZR) – inductive thinking, ability to operate with mathematical regularities; 7. spatial imagination (FS) – spatial imagination, combinatorial abilities; 8. spatial generalization (WH) – ability to operate volumetric bodies in space mentally, spatial thinking; 9. memory, mnemonic ability (ME) – memory and focusing of attention.

The results of Amthauer's Test help psychologists to predict the success of the respondents' training activity; choose their profession and specialized training; predict their success in professional activities that require special intellectual skills.

The Progressive Matrices Scale was developed in 1936 by John Raven (jointly with L. Penrose). The Raven's Progressive Matrices Test (RPM) is intended to diagnose the respondents' level of intellectual development and assess their ability to systematized, planned and methodological intellectual activity (logical thinking). The author of the instrument managed to create a test, which is theoretically substantiated, can be uniquely interpreted, and the results of which are minimally dependent on differences in education, origin and life experience of the respondents. The test consists of 60 tables (5 series). Each series of tables contains tasks of growing difficulty. At the same time, the complexity of the types of tasks also grows from series to series.

The empirical basis of this study consisted of the results of psycho-diagnostics of 1434 persons (1076 men [75.0%] and 358 women [25.0%]) in the age from 19 to 45 years. Their term of service was from 3 to 15 years. The test subjects were represented by officers of the following units: criminal police (hereinafter referred to as the CP (n=323; 22.5%), agencies of pre-trial investigation (hereinafter – API (n=412; 28.7%), district police officers (n=530; 37.0%), patrol police (hereinafter referred to as PP (n=109; 7.6%), and special police (hereinafter – SP (n=60; 4.2%). Among them 578 respondents (40.3%) had higher education, the rest had secondary and special education (59.7%).

Results and Discussions

The analysis of the empirical data leads us to the conclusion that the level of intelligence, intellectual abilities, thinking and creativity depend on the educational factors. For instance, the analysis of the BQS Test results shows that the educational level of the candidates makes the most significant impact on the value of the I. I. (the total number of correct answers).

The I.I. values (Fig. 1) show statistically significant differences between groups. The empirical research data obtained with the BQS Test show that police officers with higher education, as compared to the officers with secondary and special education, have a higher level of intellectual development and better abilities for further education and cognitive activity; in other words, their cognitive activity is higher, and their capacities for acquiring new knowledge and mastering new skills in similar forms of activity is better ($p \leq 0.001$).

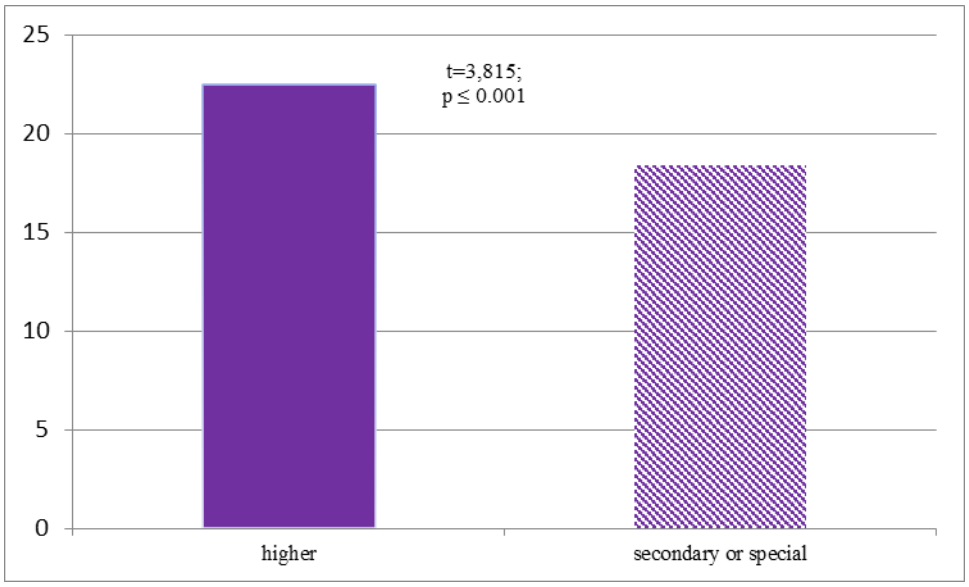


Fig. 1 Comparative characteristics of the level of the I.I. of the personality of the police officers according to the BQS Test considering the educational factor (x_{av}, points)

The diagnostics of the critical points of intelligence also proves that compared to police officers who have secondary or special education, officers with higher education have a greater overall level of knowledge, linguistic skills, and humanitarian education ($p \leq 0.014$); perform numerical tasks for the establishment of regularities with geometric figures more successfully ($p \leq 0.001$); are more informed ($p \leq 0.001$); have a deeper connection between the functioning of intelligence and different linguistic skills ($p \leq 0.002$); have higher abilities for semantic generalizations ($p \leq 0.003$); have a higher level of technical intelligence, that is, are more skilled with computer technologies, the Internet, etc. ($p \leq 0.001$); are much better at numerical operations ($p \leq 0.001$) and numerical regularities ($p \leq 0.002$); have better capacities for synthesis and analysis of material, which gives them ability to abstract from specific phrases and switch to the sphere of interpretation of meanings, find the intersection of meanings, and then return to specific phrases again ($p \leq 0.002$); have a much lower level of emotional destruction of mental processes ($p \leq 0.002$); are able to use the language correctly, are more literate, know foreign languages better ($p \leq 0.001$); and have a higher level of mathematical abilities ($p \leq 0.001$).

The analysis of empirical data obtained with Raven's Progressive Matrices (Fig. 2) also proves the existence of statistically significant differences between police officers who have higher education in comparison to those who have secondary or special education ($p \leq 0.05$).

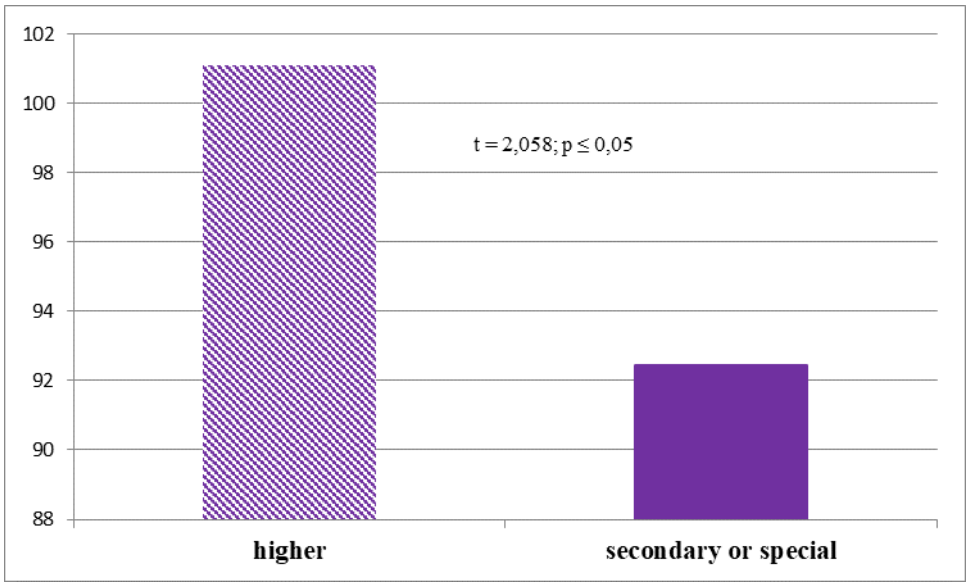
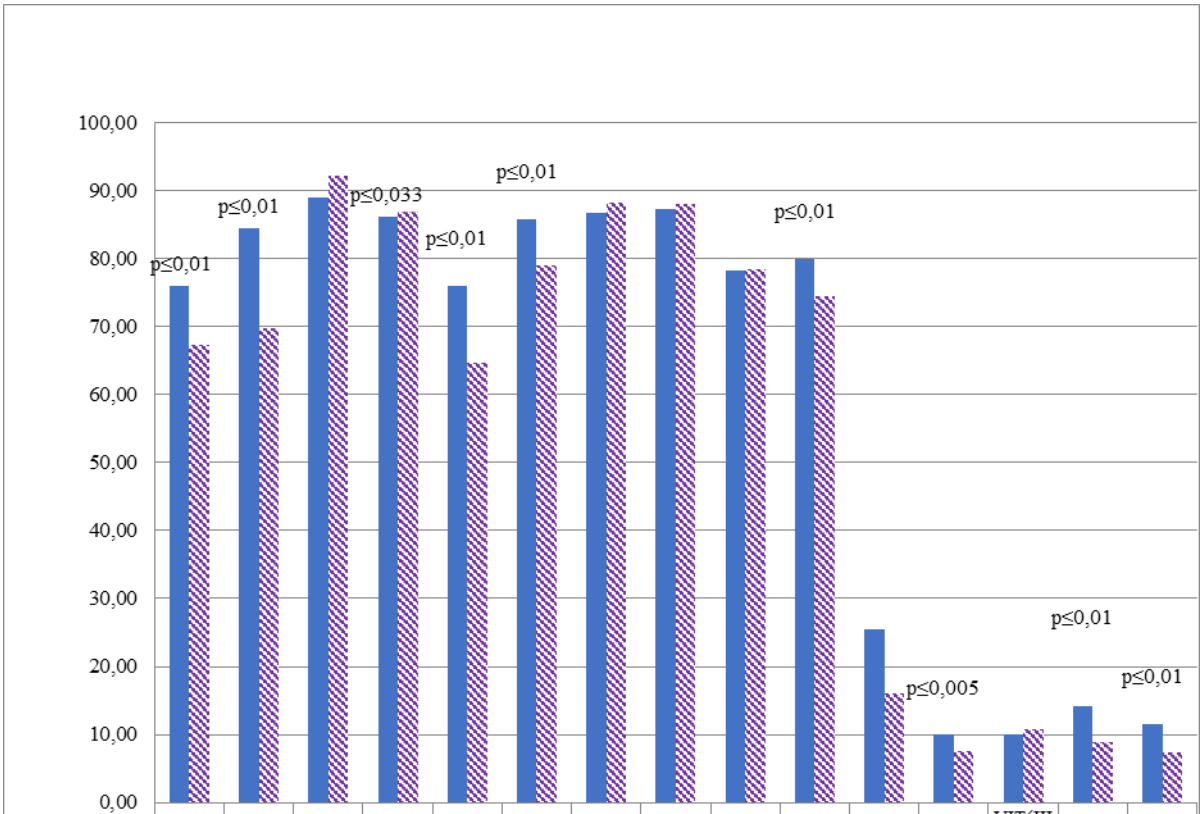


Fig. 2 Comparative characteristics of indicators of the level of intellectual development of police officers according to Raven's Test (x_{av}, points)

The results of the intelligence structure diagnostics with Amthauer's Test (Fig. 3) indicate that there are statistically significant differences between groups, and prove that as compared to officers with secondary or special education, police officers with higher education have a greater level of intellectual development ($p \leq 0.001$). The diagnostics of the intelligence structure proves that officers with higher education have greater abilities to formulate concepts, to identify specific phenomena within more generalized categories, to systematize knowledge, to generalize, to structure descriptive empirical material through the creation of objective classifications ($p \leq 0.001$). In addition, the data analysis suggests that police in officers with higher education verbal intelligence prevails; they have a more general orientation at social sciences and learning foreign languages, their practical thinking is verbal ($p \leq 0.001$); and they have better academic performance ($p \leq 0.002$).



	IQ	LS(1)	GE(2)	AN(3)	KL(4)	ME(9)	RA(5)	ZR(6)	FS(7)	WH(8)	VI(I)	MT(II)	VIT(III)	TL(IV)	PP(V)
Higner	75,95	84,45	89,13	86,20	76,05	85,82	86,77	87,33	78,23	80,06	25,47	9,94	9,97	14,14	11,59
Secondary	67,37	69,75	92,19	86,90	64,61	79,13	88,19	88,11	78,39	74,59	15,99	7,47	10,69	8,81	7,30

Fig. 3 Comparative Characteristics of the Intelligence Structure of National Police officers with Higher and Seerent Education by Amthauer's Test (x_{av}, points)

With the purpose of increasing the police officers' level of intellectual operations (individual abilities), and raising their level of performance in professional police activities, the program for improvement of psychological support (hereinafter – IPS) of professional activities was implemented in the police units in the form of practical classes.

The comparative characteristic of the intelligence structure indices obtained with R. Amthauer's test before and after the IPS training (Fig. 4) proved that the use of complex and efficient psychological methods improved the police officers' capacities, such as the ability to distinguish the main things visually, to select most significant and important things among the descriptive, non-structured material, to understand the internal meaning of utterances and messages, to separate essential, constant characteristics in objects and phenomena from their "external", secondary properties ($p \leq 0.008$).Training sessions also improved the participants' ability to form concepts, to identify specific phenomena within more general categories, systematize knowledge, generalize and structure the descriptive, empirical material by creating objective classifications ($p \leq 0.002$); the sessions improved their operational logical memory ($p \leq 0.018$), ability to operate with relationships regardless of the qualitative content of the information, and to carry out various logical transformations of thinking operations ($p \leq 0.017$).

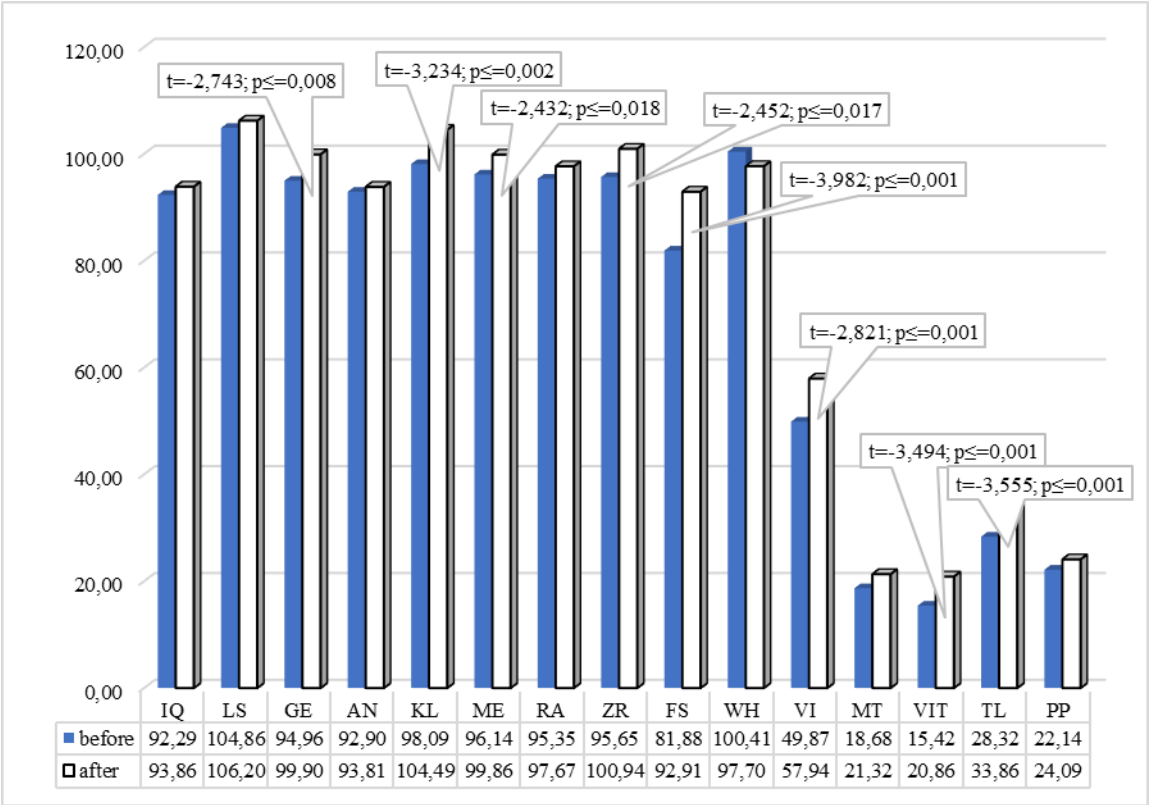


Fig. 4 Comparative Characteristics of the Intelligence Structure of National Police officers with Higher and Seerent Education by Amthauer's Test (x_{av}, points)

Conclusion

Our research determined that the level of intelligence and general intellectual abilities of police officers is influenced by the presence of the educational factor. It was found that persons with higher education have a higher level of intelligence ($p \le 0.05$) and better abilities for further education and cognitive activity; in other words, their cognitive activity is higher, and their capacities for acquiring new knowledge and mastering new skills in similar forms of activity is better than in others ($p \le 0.001$). Comparison of the components of general intellectual abilities showed that police officers with higher education had a greater level of general knowledge and linguistic abilities, their humanitarian education was better than in others ($p \le 0.014$); they were more efficient in completing numerical tasks ($p \le 0.001$); more informed ($p \le 0.001$); had a deeper connection between the functioning of intelligence and different linguistic skills ($p \le 0.002$); were better in semantic generalizations ($p \le 0.003$); had a higher level of technical intelligence, that is, they were more skilled with computer technologies, the Internet, etc. ($p \le 0.001$); were much better at numerical operations ($p \le 0.001$) and numerical regularities ($p \le 0.002$); were more skilled in generalizing and analyzing ($p \le 0.002$); had a much lower level of emotional destruction of mental processes ($p \le 0.002$); used the language correctly, were more literate and better with foreign languages ($p \le 0.001$); and had a higher level of mathematical abilities ($p \le 0.001$).

On the grounds of the above results, we one can conclude that educational factors have a strong impact on the level of intelligence and general intellectual abilities, which proves the expediency of obtaining higher education for the police officers.

Of course, we are not going to challenge numerous empirical studies which show that the level of abilities development found in testing may not correlate (or weakly correlate) with the

respondent's academic performance or success in professional activities. Prediction only on the basis of intelligence level can't be highly reliable. The efficiency of a National Police employee is an aggregate characteristic of all his/her personal capacities, and not just the intellectual ones.

However, the results of many studies including ours prove that the underdevelopment of certain intellectual operations prevents a person from mastering some relative kinds of activity or fields of knowledge, whatever efforts he/she makes. The connections between the results of activity and intellectual abilities are not necessarily expressed in simple linear correlations.

We shouldn't forget that the success of one's educational or professional activities depends not only on his/her abilities and personal potential, but also on the systematic nature of the learning process and on his/her possession of the necessary information.

If a cadet of a police school or a police officer at advanced training course misses a class and doesn't hear the teacher's explanation, or fails to read the relevant material, he/she may have gaps in knowledge. As a result, it can be difficult for him/her to understand the following sections and obtain the necessary knowledge for professional police activities. However, if the intelligence operations necessary for mastering this particular subject are formed, some gaps in knowledge may not interfere with understanding the following sections; moreover, the education gaps can be "filled in" as if spontaneously, not owing to the information contained in subsequent topics. Also, the absence of a specialist in professional police activities of the necessary information does not allow him to correctly assess the situation, make a decision. Abilities do not replace knowledge (experience), they simply greatly facilitate their acquisition, systematization, allow them to be used with maximum efficiency. However, the lack of abilities indicates the impossibility of mastering the relevant activities in general.

Of course, we are not going to challenge the numerous empirical studies that have shown that the level of development of abilities found during testing may not correlate (or weakly correlate) with current progress or the success of professional activity. Forecast only based on intelligence cannot be highly reliable. The effectiveness of an employee of the National Police is the aggregate characteristic of all personal capabilities, and not just intellectual ones.

However, many, including our research, have proved that precisely the underdevelopment of certain intellectual operations does not allow a person, whatever effort she has not applied, to master the relevant activity or field of knowledge. Linking the results of activity with intellectual abilities does not necessarily have to be expressed in the form of simple linear correlations.

Personality characteristics of a candidate for service or training in the police can act as additional forces that allow him to optimize and develop his intellectual potential, which limitations, which do not allow to realize even the capabilities available to him. High reliability of the forecast is possible only based on the information obtained as a result of complex psychological examination.

In making the projection, it should also be considered that the effectiveness of professional police activity depends to a large extent on the availability of police information necessary for its implementation. Therefore, the quality of the curriculum and the acquired knowledge can both expand and limit the professional or training potential of candidates for service and training in the police.

So the comparative characteristic of the indicators of the structure of intelligence by R. Amthauer's method before and after the VEP proves that when using complex and competent psychological methods, police officers are raising levels of intelligence type (in particular, the wibing intellect ($p \leq 0.006$), visual imagery ($p \leq 0.001$), the constructive ability of the theoretical plan ($p \leq 0.001$)) and the development of individual abilities (in particular: the ability to conceptual

abstraction, the use of verbal concepts ($p \leq 0.008$), the ability to judge, the formation of a certain point of view ($p \leq 0.002$), inductive thinking, ability to operate with mathematical regularities ($p \leq 0.017$), spatial imagination, combinatorial abilities ($p \leq 0.001$), concentration of attention and memory ($p \leq 0.018$)).

It should also be noted that the level of intelligence is just one of many factors that determine the success of a professional activity. Therefore, the final conclusion on the professional suitability of a candidate for service in police and training at police institutions should be made on the basis of the results of comprehensive psychological, psycho-physiological testing, taking into account the specifics of the service activity. To increase the reliability of the forecast, additional studies on the level of professional preparedness of the individual are necessary. In educational police establishments, this aspect is reflected in the success of the students, which should be considered in predicting their future potential.

Conflict of interest

The authors declares no conflict of interest.

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