

MANIFESTATION OF SUBJECT'S PSYCHOMOTOR QUALITIES IN EXTREME ACTIVITY AND ITS FEATURES

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R. T. Simko. Manifestation of subject's psychomotor qualities in extreme activity and its features. The article contains general description of the activity approach as methodological basis for the psychomotor research of the subject, his psychomotor professionally important qualities and features of their manifestation in extreme conditions. The connection between the individual typological properties of the nervous system of extreme occupational workers (according to psychomotor manifestations) and the efficiency of their activities are revealed. The strength of the nervous system through its endurance with the help of the «tapping test» is investigated. The influence of the balance of human nerve processes on the performance of professional duties in extreme conditions is established. The influence of inertia-mobility of excitation and inhibition processes on the activity of a subject in extreme conditions with the help of the cinematometric method of Y. Ilyin is investigated.

The features of the psychomotor preparedness of the employees of the extreme profile and their personality traits and the effectiveness of their activities in extreme conditions are empirically investigated. The influence of different levels of psychomotor preparedness on the indicators of situational and personality anxiety is established.

It is proved that the level of psychomotor preparedness is related to the style of conflict behavior of the subject of extreme activity. It is stated that the level of psychomotor preparedness, reflected in the subject's consciousness, affects his behavior and, along with other factors, forms personality traits, in particular, important for effective activity in extreme conditions.

It is established that emotional stability in the conditions of competition, the ability to process information in a time deficit, accuracy of movements is closely interrelated with the performance of the subject in extreme conditions.

Key words: psychomotor quality, psychomotor preparedness, personality traits, conflict behavior, extreme conditions, patrol police.

Р. Т. Сімко. Особливості прояву психомоторних якостей суб'єктів екстремальної діяльності. У статті подано загальну характеристику діяльного підходу як методологічної основи дослідження психомоторики суб'єкта, його професійно значущих психомоторних якостей і особливостей їх прояву в екстремальних умовах. Розкрито зв'язки між індивідуально-типологічними властивостями нервової системи працівників екстремальних професій (за психомоторними виявами) та ефективністю їх діяльності. Досліджено силу нервової системи через її витривалість за допомогою «теппінг-тесту». Встановлено вплив балансу нервових процесів людини на ефективність виконання професійних обов'язків у екстремальних умовах. Досліджено вплив інертності-рухливості процесів збудження і гальмування на ефективність діяльності суб'єкта в екстремальних умовах за допомогою кінематометричної методики Є. Ільїна.

Емпірично досліджено особливості взаємозв'язків психомоторної підготовленості працівників екстремального профілю та їх особистісних рис на ефективність діяльності в екстремальних умовах. Установлено вплив різних рівнів психомоторної підготовленості на показники ситуативної й особистісної тривожності.

Доведено, що рівень психомоторної підготовленості пов'язаний зі стилем конфліктної поведінки суб'єкта екстремальної діяльності. Констатовано, що рівень психомоторної підготовленості, відображаючись у самосвідомості суб'єкта, впливає на його поведінку і разом з іншими чинниками формує особистісні риси, зокрема й важливі для ефективної діяльності в екстремальних умовах.

Зазначено, що емоційна стійкість в умовах змагань, здатність до опрацювання інформації в умовах дефіциту часу, точність рухів тісно взаємопов'язані з ефективністю діяльності суб'єкта в екстремальних умовах.

Ключові слова: психомоторні якості, психомоторна підготовленість, особистісні риси, конфліктна поведінка, екстремальні умови, патрульна поліція.

The problem formulation. The general psychological term is «psychomotor» and it is used by Y. Ilyin, V. Klymenko, S. Lazurenko, O. Malkhazov, V. Ozerov, N. Roze, A. Shynkariuk and others to define its influence on various types of activities. However, the research on the role of psychomotor qualities in ensuring the effectiveness of activities is practically absent, this phenomenon is considered in the context of other qualities of the subject, which have an impact on professional success.

Among the various types of human activities there are those that require significant nervous-psychic stress, since they are realized in extreme conditions. Such is, in particular, the professional activity of internal affairs officers characterized by constant struggle with offenders and criminals, significant physical and psychological stresses, lack of sufficient time for situation analysis and decision-making, high responsibility for the results and consequences of work, the need for special measures and reliable firearms, a health risk and life. According to the results of the research, native and foreign scholars (V. Barko, L. Kryvoruchko, V. Liefterov, O. Mateyuk, V. Medvediev, O. Okhremenko, Y. Potapchuk, O. Tymchenko and others) state that the professional activity of a policeman is struggling in the list of the most widespread risk-sensitive specialties.

Psychological peculiarities of extreme types of activity are studied by such branches of psychological science as legal, military psychology, psychology of work, psychology of sport, psychology of activity in special conditions, and others. That is the personality-based and professional development of specialists of risky occupations, in particular the development of professionally significant psychomotor qualities of specialists in the extreme profile of activity, is a general psychological problem. The high level of psychomotorism allows the subject of extreme activity to counteract the exhaustion of protective functions of the body and the psyche, the destruction of social and psychological well-being.

Modern society increasingly sets out strict requirements for a high level of psychomotor preparedness of specialists operating in extreme conditions. Therefore, the development of their psychomotor qualities, necessary for professional activity in extreme conditions, should be directed purposefully.

Psychomotor qualities and their components are widely studied according to different age categories and types of activities, but the manifestation of professionally significant psychomotor qualities for extreme activity is paid relatively little attention: researchers study the psychomotor qualities of athletes the most frequently, less studied is psychomotor in types of work that require fine coordination of movements, psychomotor in extreme conditions of activity is occasionally studied.

Social and practical significance, as well as insufficient scientific development of this problem, determined the choice of the topic of our study.

The purpose of the article is to identify psychological peculiarities of manifestation of psychomotor qualities of a person experimentally in extreme conditions.

The conducted analysis of scientific literature revealed that there is still no terminology in the description of the results of psychomotor studies. For example, one and the same phenomenon is called «physical qualities», «motor quality», «psychomotor quality» and there is no fundamental difference between them. They are close to their content the concept of «psychophysical qualities», «motor abilities» and others. At the same time, some scholars still differentiate the concept of «physical qualities» and «motor qualities», or «abilities» and «quality» [1].

On the basis of existing approaches in the literature the scientists [2; 3; 4; 5] disclosed that psychomotor qualities of a person are professionally significant factors of labor activity, and their manifestations are closely related to the properties of the subject's nervous system [6; 1; 7; 8 and others] and his personality traits [9; 10; 11 and others].

First of all, we will uncover the connections between the individual typological properties of the nervous system of extreme occupations (by psychomotor expressions) and the effectiveness of their activities. We will empirically examine the features of the psychomotor readiness of the employees of the extreme profile and their personality traits and the effectiveness of their activities in extreme conditions.

The fixing experiment was conducted on the basis of the units of the patrol police. At the various stages of the study, 178 patrol police officers aged 23–29 were involved.

In the first sub-stage of the first stage of empirical research, the effectiveness of each patrol police officer in extreme conditions was assessed on a 12-point scale by three experts.

In the second step in all of the subjects, the strength of the nervous system was determined through its endurance through the «tapping test» (Y. Ilyin's technique).

All surveyed subjects were divided into four groups by this indicator. In the group of persons with a weak nervous system, the indicator of the effectiveness of the activity was $6,81 \pm 0,15$ points, with the average weak nervous system – $7,24 \pm 0,13$ points, for those with a central nervous system – $9,17 \pm 0,15$ points, and for those with a strong nervous system – $9,33 \pm 0,20$ points.

Consequently, a strong nervous system allows a subject of psychomotor activity to perform more in volume and intensity of work in conditions of increasing psycho-emotional stress than weakness.

At the third step it was studied how the performance of professional duties in extreme conditions affected the balance of human nervous processes, which we determined by the indirect effects of excitation and inhibition reactions in the psychomotor actions of the subject. In particular, we used Y. Ilyin's cinematometric method to reproduce the standard of amplitude of motion without visual control on the basis of proprioceptive sensations. By this indicator all the subjects were divided into three groups. In the group of people with predominance of inhibition, the indicator of activity efficiency was $6,67 \pm 0,18$ points; subjects with a balance of processes of excitation and inhibition in the nervous system have $8,63 \pm 0,16$ points, and persons with a predominance of excitation strength have $9,12 \pm 0,17$ points.

Consequently, individuals with a transition of amplitude have dominant excitement at the emotional and motivational level and the typical for them is the emergence of the excitation reaction during the formation of the motive for achieving the goal, which improves the effectiveness of activities under extreme conditions.

At the fourth stage, the influence of inertia-mobility of excitation and inhibition processes on the efficiency of the subject's activity under extreme conditions was studied with the help of the cinematometric method of Y. Ilyin. According to this indicator, groups of persons with inert and mobile braking and excitement were identified (Table 1), which also affects the efficiency of the work of extreme profile workers.

In the group of persons with inert excitation, the indicator of activity efficiency was $7,96 \pm 0,17$ points, subjects with moving excitation – $8,32 \pm 0,15$ points, persons with mobile braking – $7,27 \pm 0,16$ points, and for subjects with inert braking – $9,01 \pm 0,20$ points.

At the same time, we note that the effectiveness of the subject's activities in extreme conditions is determined by not only one property of the nervous system, but their totality and the presence of those or other personality traits.

At the second stage of the recording experiment, the features of the relationship between psychomotor preparedness, personality traits and the effectiveness of the subjects in extreme conditions were studied.

Table 1

Influence of properties of the nervous system of subjects on the efficiency of their professional activity in extreme conditions

Groups are surveyed with different properties of the nervous system	n	%	Efficiency of activity, points $M \pm m$
strength of the nervous system			
A group of people with a strong nervous system	32	17,98	9,33±0,20
A group of people with average strength nervous system	49	27,53	9,17±0,15
A group of people with moderate to weak nervous system	52	29,21	7,24±0,13
A group of people with a weak nervous system	45	25,28	6,81±0,15
external balance of nervous processes			
A group of people with a predominance of excitement	52	29,21	9,12±0,17
A group of people with a balance of processes of excitation and inhibition	43	24,16	8,63±0,16
A group of people with predominance of inhibition	83	46,63	6,67±0,18
mobility-inertia of the nervous processes			
A group of people with a mobile excitement	74	41,57	8,32±0,15
A group of persons with inert excitation	104	58,43	7,96±0,17
A group of persons with motor braking	66	37,08	7,27±0,16
A group of persons with inert braking	112	62,92	9,01±0,20

To do this, all 178 subjects were recorded for speed indicators (running 100 m), strength (tightening), endurance (running 1000 m), and dexterity (techniques of self-defense without weapons). All surveyed subjects by the results of each test and in accordance with the definitions in the internal affairs bodies received norms estimates for a four-point system. Then the average score of each of the subjects was studied for the four psychomotor qualities, which represented his level of psychomotor preparedness. Then all the subjects were divided into three groups. Representatives of the first group had a satisfactory (low) level of psychomotor preparedness, the second – a good (average) level, and the third – excellent (high) one.

At the same stage of the study, with the help of C. Spielberger's test, adapted by Y. Khanin, the self-esteem of situational (before interrogation) and personal anxiety was studied; using the semantic differential, developed by C. Osgood (co-authored) and adapted by the staff of the psycho-neurological institute named after V. Bekhteriev, three classical factors were studied: evaluation (E), strength (S), activity (A); with the help of A. Assinger's study the level of aggressiveness tested; the style of conflict behavior was tested by K. Thomas's test, adapted by N. Hrishyna. The empirical data and performance indicators obtained in these extreme conditions (obtained in the first stage) obtained from these methods in subjects with different levels of psychomotor preparedness are presented in Table 2.

Table 2

**The relationship between psychomotor preparedness,
personality traits and the effectiveness of the subject's
activities in extreme conditions**

Indicators studied	Level of psychomotor preparedness		
	high M±m	average M±m	low M±m
Situational anxiety	32,51±0,59	37,03±0,72	46,28±0,67
Personal anxiety	28,63±0,48	32,92±0,61	38,44±0,71
Factor of evaluation (e)	10,24±0,41	9,91±0,37	6,82±0,29
Force factor (f)	13,84±0,32	10,54±0,35	8,39±0,26
Activity Factor (a)	5,18±0,33	4,80±0,31	4,68±0,24
Aggressiveness	43,73±0,96	42,56±0,98	37,82±1,23
Competition as a style of conflict behavior	11,34±0,18	10,32±0,17	9,72±0,15
Adaptation as a style of conflict behavior	1,34±0,11	1,99±0,12	2,29±0,14
Compromise as a style of conflict behavior	7,62±0,15	7,38±0,13	7,05±0,14
Avoidance as a style of conflict behavior	4,42±0,12	5,28±0,10	6,35±0,11
Collaboration as a style of conflict behavior	5,28±0,15	5,03±0,13	4,59±0,14
Efficiency in extreme conditions	10,17±0,39	8,94±0,36	6,79±0,31

It turned out that subjects with a high level of psychomotor's preparedness, the indicators of situational and personal anxiety are statistically significantly lower than those of subjects with an average level of $p < 0,001$, the performance indicators in extreme conditions are statistically significantly higher than $p < 0,05$. The subjects with high and average psychomotor readiness have statistically significantly higher self-esteem than that of those with a low level of $p < 0,001$. The manifestation of volitional personality traits of subjects with a high level of psychomotor preparedness is statistically significantly higher than that of the subjects with an average level of $p < 0,001$. Indicators of activity factor (A) of individuals with a high level of psychomotor preparedness are somewhat higher than subjects with a mean and low one, but the difference between arithmetic meanings is not statistically reliable $p > 0,05$. The difference between the indicators of aggressiveness of the subjects with high and average levels of psychomotor preparedness is statistically not reliable $p > 0,05$, and between the indicators of the surveyed with the middle and low levels – statistically significant $p < 0,01$.

The level of psychomotor preparedness is also associated with the style of conflict behavior of the subject of extreme activity. The finding of competition as a style of conflict behavior of subjects with a high level of psychomotor preparedness is statistically significantly higher than that of the subjects with an average level of $p < 0,001$, and the manifestation of adaptation as a style of conflict behavior is statistically significantly lower than $p < 0,001$. The difference between the indicators of compromise as a style of conflict behavior in the subjects with high and average levels of psychomotor preparedness is statistically not reliable $p > 0,05$, and between the indicators of the subjects with high and low levels – statistically significant $p < 0,01$. Subjects with a high level of psychomotor preparedness, the indicators of avoidance as a style of conflict behavior are statistically significant lower than in individuals with an average level of $p < 0,001$, and between the indicators of cooperation in these groups the difference is not reliable $p > 0,05$.

Thus, the level of psychomotor preparedness, reflected in the subject's consciousness, affects his behavior and, along with other factors, forms personality traits, in particular, important for effective activity in extreme conditions.

In the first sub-stage of the third stage of the survey, all 178 surveyed subjects according to the expert evaluation of the effectiveness of activities in extreme conditions (obtained in the first

stage) were divided into three groups. Representatives of the first group (4–6 points) had a low level of efficiency in extreme conditions, the second (7–9 points) – the average one, and the third (10–12 points) – a high one.

At the same sub-stage, the study on indicators of the adjustment of the motor's stereotype of the writing (K. Platonov's method, modification), we studied the emotional stability of employees of the extreme profile. Stress-factor was the conditions of competition between subjects of psychomotor activity and teams created by them.

Comparison of the manifestation of emotional stability of subjects with high and average levels of activity in extreme conditions showed that the former have statistically significantly better coordination time $p < 0,001$ and errors of coordination of movements $p < 0,05$ than the second ones. The difference is statistically significant between the average arithmetic mean of the surveyed second and third groups.

In the second sub-stage in all of the studied focal points (the method of «confused lines») the ability to process information in a time deficit was studied. We have found that subjects with high and average performance levels under extreme conditions are statistically significant different by the number of correctly tracked lines $p < 0,05$ and the number of errors in the tracking of lines $p < 0,05$. It is true that there is a difference between the indicators in the studied second and third groups.

At the third sub-stage there was studied the accuracy of reproduction of spatial characteristics of movements and the accuracy of the reaction to the moving object (according to V. Klymenko), subjects with different levels of efficiency in extreme conditions. The empirical results of the third stage of the test experiment are presented in Table 3.

It turned out that the difference between the arithmetic mean accuracy of walking reproduction at 7 meters in the examined groups 1 and 2 is not statistically significant at $p > 0,05$, while the second and third ones are statistically significant $p < 0,001$. The difference between the mean arithmetic accuracy of the response to the moving object in the investigated first and second groups is statistically significant $p < 0,05$. Also, the difference between these indices in the second and third groups $p < 0,01$ is significant.

Consequently, emotional stability in the conditions of competition, the ability to process information in a time deficit, accuracy of

movements is closely interrelated with the performance of the subject in extreme conditions.

Table 3

Interrelation between the performance of subjects in extreme conditions and the development of their psychomotor

Indicators studied	Performance level		
	high M±m	average M±m	low M±m
emotional stability			
Coordination time, c	288,75±1,52	349,08±1,27	411,28±1,47
Coordination error, n	87,51±2,41	96,39±2,56	132,65±2,68
processing of information			
Correctly tracked lines, n	18,04±0,32	17,01±0,31	15,92±0,28
Errors in tracking lines, n	1,87±0,16	2,45±0,17	2,96±0,15
precision movements			
Reproduction of spatial characteristics, cm	12,34±1,08	15,25±1,29	27,48±1,82
Reaction to moving object, c	0,011±0,001	0,014±0,001	0,018±0,001

Conclusions. The effectiveness of the expression of psychomotor qualities of subjects in conditions of significant psycho-emotional stresses significantly affects the properties of their nervous system. The inertia of excitation in the nervous system positively affects the effectiveness of the work of employees of risky occupations in conditions of neuropsychiatric overstrain, and the mobility of excitation is negative.

The psychomotor preparedness of employees of risky occupations is interrelated with their personal and situational anxiety. There is a certain relationship between the aggressiveness of the subject of activity and the level of his psychomotor preparedness. The level of psychomotor preparedness of patrol police officers affects the choice of their way of responding to a conflict situation.

The correlation between the psychomotor qualities of employees of risky occupations and the efficiency of their activities in extreme conditions are established.

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Особливості прояву та корекції агресивності у молодших школярів

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V. I. Spivak. The peculiarities of the manifestation and correction of aggression among junior pupils. The article highlights the results of the correction of aggressive behavior of children of elementary school age who are studying at boarding schools.

Economic instability and social tension in the country are noted to be influenced by the increase in the manifestation of aggression and the