

INDIVIDUAL-AND-TYOLOGICAL PECULIARITIES OF ATHLETES AS A RESOURCE FOR ENHANCING THE COMPETITIVE ACTIVITY EFFICIENCY

*Vysochina Nadiia,¹
Petrachkov Oleksandr,²
Biloshytskyi Vasyl,³
Konovalov Denis⁴*

^{1,2,3,4}*National defence university of Ukraine named after Ivan Cherniakhovskyi, Kiev, Ukraine*

Abstract. *The peculiarities of the nervous system functioning in athletes specialized in different sports events are considered. Indices of simple and complex visuomotor response and functional mobility of nervous processes were determined. The interrelation of individual-and-typological peculiarities of athletes with the competitive activity specifics is shown. The priority individual-and-typological characteristics influencing the competitive activity efficiency in different sports events were revealed.*

Keywords: *individual-and-typological features, competitive activity, athletes.*

Introduction. As is well known, improvements in the field of sports practice are achieved through the introduction of various technologies into the training of athletes and conducting scientific studies to increase the efficiency of their performances. Due to the change in the competitive activity conditions - the development of the facilities and equipment, the complication of the technique of movements, the emergence of new extra-training means of impact, as well as the alteration of the competition rules, there has been a constant increase in loads of athletes in recent decades. Pride of place in the formation of a proper psychophysiological state under conditions of intensive physical and psychoemotional loads goes to the nervous system and, in particular, its higher parts. Scientific knowledge about the formation of individual-and-typological properties of higher nervous activity can be aimed at predicting and improving the performance of athletes.

The objective of the study: examining individual-and-typological indices of athletes of different physical activity types and determining their differences to increase the competitive activity efficiency.

Methods of study: analysis of scientific and methodological literature, pedagogical observation, psychological testing using psychodiagnostic methods: measuring the latent period of a simple visuomotor response (SVMR), measuring the latent period of a complex visuomotor response of choosing one irritant of three (RC1-3) and the response of choosing two irritants of three (RC2-3), measuring the level of functional mobility of nervous processes according to the method of N.V. Makarenko.

The study involved 73 highly skilled athletes specialized in different sports events: members of the national teams of Ukraine in freestyle, diving, football, basketball, rhythmic gymnastics, track and field, and cross-country skiing.

Parameters of higher nervous activity were recorded in all subjects according to the results of sensorimotor activity of different complexity degrees.

Results of the study and their discussion. The study of approaches to the issue of examining individual-and-typological peculiarities of athletes indicates that in modern scientific literature, the authors tend to address them through the lens of functioning of the personality psychophysiological features that have a significant impact on the competitive activity efficiency [2, 4, 7, 9].

Meanwhile, there is no consensus today among experts on the definition of the “individual-and-typological peculiarities” term used to characterize individual differences [3, 6]. In the scientific literature, the “individual-and-typological peculiarities” are associated with such notions as “individual peculiarities”, “individual-psychological peculiarities”, “typological peculiarities”, etc. The listed notions reflect a single phenomenon and the forms of manifesting personality characteristics. Therefore, we will focus on the most commonly used definition of the notion of individual-and-typological peculiarities – the basic individuality characteristics that are formed on the basis of natural properties, reflect in a person both the general and the individual and have different degree of expression determining the uniqueness and inimitability of each person.

Most researchers incorporate various mentality characteristics in individual-and-typological peculiarities [1, 5, 8]: properties of the nervous system, temperament type, psychodynamic features, features of interhemispheric functional asymmetry of the brain, etc. The quantitative composition of human individual properties is the same, as a rule. People differ only in the degree of their expressiveness, which may change in the course of life. Relatively stable individual psychophysiological characteristics of athletes associated with features of their nervous system were subjected to analysis as individual-and-typological peculiarities: reactivity and functional mobility of nervous processes, as well as bilateral features (interhemispheric functional asymmetry of the brain). The psychodynamic characteristics of athletes – extraversion-introversion and emotional resilience-emotional non-resilience have remained out of our focus and may be of interest for further studies in this area.

The study of individual characteristics of SVMR, RC1-3, and RC2-3 demonstrated that the peculiarities of athletes’ higher nervous activity have pronounced group specific differences reflecting their individual psychophysiological adaptation to a specific type of motor activity.

The data of studying a simple visuomotor response indicate that the best results were demonstrated by basketball players (231,1 ms) and footballers (252,8 ms). This goes to prove that athletes of team sports have a high index of reactivity.

The analysis of RC1-3 and RC2-3 allows to claim that under complex conditions of sensorimotor activity the highest efficiency is demonstrated by basketball players (420,0 ms), footballers (405,5 ms), and track and field athletes (420,2 ms). The high indices were also observed in athletes specialized in diving (407,0 ms). At the same time, with an increase in the task complexity a significant deterioration of sensorimotor activity efficiency was noted in representatives of rhythmic gymnastics and cross-country skiing. These indices determine the association between motor actions and mental processes of perception, attention, and memory. The voluntary sensorimotor response of choice is more complex than a simple sensorimotor response and thus, is characterized by long time. An increase in the time of complex response of athletes is associated with the necessity for logical comprehension of a task to make a decision.

In the course of studies, it was revealed that the response rate of the left hand is higher than that of the right hand in almost all groups of athletes except for rhythmic gymnastics representatives, which is indicative of the dominance of their left hemisphere of the brain. The complexity of gymnasts' motor action structure necessitates memorizing numerous, relatively independent movements. This places demands on the memory of female gymnasts, as well as, such qualities as scrupulosity, clarity, and fullness of visual imageries, the accuracy of motion reproduction. The quality of exercise execution (expressiveness, artistry) determines the need for the formation of the ability to self-control and correction of muscular efforts, attention span, ability to concentrate and distribute attention, responsiveness, mental speed, quick wit, self-criticism, persistence.

To determine the level of nervous process functional ability, the feedback mode was used under conditions of which the duration of testing signal exposure changed automatically depending on the character of the subject's responses. The above allowed revealing the highest individual level of response time while performing the work by the athlete at a quick pace that envisages selection and differentiation of irritants.

The results of analyzing functional mobility of nervous processes by sports events demonstrate that the best indices were observed in athletes specialized in diving. Their minimum exposure time was at the level of 95,7 ms, whereas in basketball players and skiers it constituted 156,9 ms and 160 ms, respectively. These values indicate a low level of nervous process mobility, which is due to the contingent of the subjects. U-16 national basketball team

participated in the studies. Differences in skill level, experience, as well as age differences were the main reason for such a low value. Basketball players demonstrated a good result in a choice reaction, however, with task condition complication a decrease in the information processing efficiency was noted.

Notably, the best indices of the time to reach minimum exposure were observed in the representatives of freestyle – 33,5 s, which is much better than in other athletes. This is also confirmed by the data of test performance time. Such test results reflect the athletes' psychophysiological peculiarities underlying their successful execution of sports event typical motor actions.

Conclusions. The study allowed tracing the association between individual-and-typological peculiarities of athletes and competitive activity specifics. For instance, the highest mobility of nervous processes is observed in team sports characterized by constant change of situations, whereas the lowest – in cyclic sports events demanding endurance manifestation. It has been demonstrated that certain individual-and-typological features of the mentality are formed in athletes depending on motor activity specifics, which may be used as model characters and permit to predict and influence the competitive activity results. The reactivity and functional mobility of the nervous system, as well as, the peculiarities of interhemispheric asymmetry of the brain are the priority individual-and-typological psychophysiological and bilateral characteristics influencing the competitive activity efficiency in different sports events.

It is safe to conclude that intensive physical loads stimulate the development of those nervous system structures, which provide the implementation of complex sensorimotor acts corresponding to these loads.

The obtained indices allow objective diagnosing the peculiarities of psychophysiological functions of athletes that represent different sports events, which provide the information necessary for individual approach in sports preparation and is a source for enhancing competitive activity efficiency.

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