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Original Research

The role of psycho-physiological characteristics in the realization and sports selection of athletes

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Abstract
Our article mentions the problem of selection in sports. The psycho-physiological approach proposed by us is based on the method of assessing the inclination to a particular sports specialization, which takes into account the following algorithm of actions: psycho-social characteristics and genetic and typological characteristics of athletes.: psycho-social characteristics of sportsmen, and genetic and typological characteristics. EP Ilyin's motor skills technique; Determination of individual neurodynamic characteristics of a subject and their comparison with known, experimentally identified "model" neurodynamic characteristics that dominate, in terms of frequency of occurrence, among representatives of high-level sports. In modern conditions, when digital technologies are developing rapidly, the methods of evaluating and identifying talented athletes, saving health, and improving the quality of sports selection, which ensure a successful career and self-realization of all participants in sports activities, are of particular importance. We offer a psycho-physiological program, the obtained results provide important information in the form of practical recommendations to specialists, and coaches and help to determine the model characteristics, correctly plan the forecast, increase the selection efficiency, and improve the organization process.

Keywords: Selection in sports, typological characteristic, psycho-social characteristic, genetic indicator.

Introduction

The article mentions that the problem of selection of highly qualified athletes and paredictionof results cannot be solved only by measuring anthropometric indicators, or only by studying and observing typological indicators, which are prevalent in sports science today.

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The methodology for determining the individual neurodynamic characteristics of the subject developed by E.P. Ilyin's motor technique, determination of individual psychosomatic characteristics of the subject and their comparison with the known, "model" characteristics of successful athletes, who dominate among the representatives of the mentioned high-level sports Many authors point to the fact that the changes in the growth process in adolescent athletes are numerous and, in relation to the selection in sports, are essential. Typological data are also important, which confirm the results that with many possible combinations of psycho-somatic indicators measurement and evaluation, the share of typological characteristics decreases sharply and mainly dominates among athletes who have reached a high level of training.

The article mentions that the knowledge of the psycho-social and somatic characteristics of athletes, which are important in professional sports, is the basis that makes possible the early selection of potentially talented athletes according to sports specialization. Studies show that this is quite possible if the main psycho-somatic characteristics of the athlete are known. This article also mentions that it is impossible to plan and effectively manage the training process in the selected sport without in-depth knowledge of the psycho-social abilities and typological features of the athlete, and it is also impossible to predict the success and high results of these athletes.

Material and methods

The problem of human giftedness has been sufficiently developed in Russian psychology thanks to the research of representatives of the scientific school of D. B. Bogoyavlenskaya [1, 2]. At the same time, the issues of "giftedness" in sports have not yet received due development in academic science. Thus, in the reports of the All-Russian Scientific and Practical Conference "Psychology of Creativity and Giftedness" [3], with a very significant number of them, there are no reports at all that would reflect the study of the problem of giftedness in sports. It seems to us that today this problem cannot be solved only by tests-questionnaires, conversations, interviews, observations, which today dominate in the arsenal of sports psychologists [4, 5]. At the same time, attention is not paid to the psycho-physiological approaches to the problem of selection in sports, which are available in the arsenal of sports science, in particular, the psycho-physiology of sports and, to be more specific, the psychology of mood.

Statement of the problem

One of the features of this approach is the measurement of neurodynamic characteristics, or, in other words, the properties of the human nervous system. For example, in the books of Serova, L. K. "Professional selection in sports" [6] and "Psychology of selection in sports games" [7], there is no mention of instrumental methods for measuring SNS and there are no instructions on how to take them into account in sports selection. In the book by T. S. Timakova "Factors of Sports Selection or

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Who Becomes an Olympic Champion" [8], the researcher, considering methods for determining anthropometric indicators, does not focus on an unfavorable trend - the lack of instrumental methods for measuring NDC in the arsenal of sports psychologists.

In the monograph by N. L. Vysochina "Psychological Support for the Training of Athletes in Olympic Sports" [9], the topic of sports selection is completely absent. From our point of view, the psychological support for the training of athletes should begin with high-quality sports selection, with the solution of the problem of "giftedness" in sports, in other words, with the implementation in practice of the pedagogical principle - an individual approach to the trainee. In the book by Vysochina, N. L. "Sports Talent: Forecast and Implementation", the issues of athletes' predisposition to different sports are considered solely on the basis of the results of a survey of Olympic champions and outstanding coaches [9].

The interviewed specialists expressed the opinion that it takes from 1 to 2 years to reveal sports talent. It should be noted that the terms for revealing sports talents were determined by experienced specialists, but in practice, in most cases, young coaches work with novice athletes, who will certainly face objective difficulties in early assessment of a novice athlete's predisposition to a particular sports specialization. Such diagnostics, based on objective data obtained on the basis of instrumental measurement of psychophysiological indicators, is one of the main tasks of modern sports. Mistakes in the choice of sports specialization can neutralize, or even nullify, all subsequent efforts of specialists in the implementation of programs for preparing athletes for important competitions, which can significantly reduce the ability of athletes for successful self-realization in sports [1,2,3]. Here it would be appropriate to refer to the collective monograph "Psychological factors of success in sports activities", dedicated to the problems of elite sports, where the authors ask a reasonable question: "Why does an athlete who has been training for about 10 years in sports never achieve high results. There are several reasons. But one of them is the inconsistency of the athlete's psychocomplex with the chosen type of sports activity" [4].

It seems that the psychophysiological approach to the problem of giftedness and sports selection most of all correspond to the following definitions of the concepts of giftedness, abilities, inclinations, formulated in the encyclopedic dictionary "Man: anatomy, physiology, psychology". "Giftedness is a combination of a number of abilities that ensure the success (level and originality) of performing any activity ... the concept of giftedness can include the psychological (mental) stability of a person if his activity is associated with extreme conditions" [5]. "Abilities are ... innate, but developed in the process of activity: however, it is not unlimited, therefore, differences between people in abilities still remain. The latter are not due to the presence or absence of a particular function ... but the number of innate inclinations that

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affect the manifestation of this function: the more inclinations a person has, ... the higher his ability (memory, concentration of attention, quick response to a signal, etc.) [5]. “The makings of abilities are the innate anatomical and physiological characteristics of a person, which determine a high level of manifestation of mental functions. The inclinations include typological features of the manifestation of the properties of the nervous system: strength or weakness, mobility or inertia, balance or the predominance of one of the nervous processes - excitation or inhibition" [9]. From the above definitions, it follows that the solution of issues of giftedness and selection in sports should begin precisely with the inclinations, which include the properties of the nervous system (hereinafter, abbreviated - NDC). In all our studies, in the aspect of the development of a psychophysiological approach to the problem of giftedness and sports selection, SNS was measured by motor methods of E.P. Ilyin [6]. To implement the techniques, the author's software and hardware complex was used [7]. It is appropriate to note here the well-known scientific fact that the human SNS is very conservative to changes in the process of growing up [8, 9].The noted seems to be essential for the substantiation of the proposed psychophysiological approach to the problem of giftedness and selection in sports. In conclusion of the section, we will refer to the statement of the New Zealand athlete Peter Snell, three-time Olympic champion, Doctor of Physiology, quoted by Serova, L: “We cannot get a complete picture of an athlete based only on the level of oxygen consumption, glycogen stores and biomechanical measurements ... The main thing what needs to be taken into account is psychology, an understanding of those personal qualities that determine the highest achievements in sports” [5].

Evaluation of predisposition to certain sports specializations

There is a known method for assessing the natural predisposition to certain specializations in sports, which allows, on the basis of knowledge, on the one hand, of individual psycho-social measured by E. P. Ilyin’s motor methods, on the other hand, model psycho-somatic characteristics, optimal choices and predict the ability of an athlete to achieve high results in the chosen specialization [9]. For example, in table 1, in digital format, model neurodynamic characteristics of successful representatives of several sports are presented. It also reflects the indicators (in points) of similarity / dissimilarity of the compared neurodynamic characteristics, model and individual, where the latter are given for three randomly selected subjects for whom it is required to determine the sports specialization. Based on the indicator of similarity/dissimilarity (respectively, 0–2 points/8–10 points) of the compared characteristics, represented by digital neurodynamic codes, the level of the subject's predisposition to certain sports specializations is determined. Note that in Table 1, in digital neurodynamic codes, the properties of the nervous system are presented in the following order: 1) the strength of the nervous system: 1 - strong, 2

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- medium, 3 - weak; 2) processes of excitation and 3) inhibition: 1 - mobile, 2 - average mobility, 3 - inert; 4) "external" balance and 5) "internal" balance: 1 - excitation prevails, 2 - balance, 3 - inhibition prevails

Table 1. Measuring the indicator of similarity / dissimilarity of the neurodynamic characteristics of the subject and the "model" characteristics of a typical representative, successful in sports specialization

Sports	Specializations in sports	TC NDC in the group, neurocode	Index of similarity/dissimilarity of compared neurodynamic codes: high level of predisposition –0–2; medium - 3-4; satisfactory - 5–7; low level of predisposition to specialization – 8-10 points					
			1		2	3		
			psychosomatic codes of subjects					
			13333		13311	31111		
Wrestling	freestyle	31122	8	low	8	low	2	high
	Greco-Roman	13322	2	high	2	high	8	low
	Judo	33322	4		4		8	low
Rugby								
	Defender	13311	4		0	high	6	
	striker	31133	6		10	low	4	

From the data presented in Table 1, it is clearly seen that an athlete with certain neurodynamic characteristics can be predisposed to several sports specializations at once, and if it is necessary to choose one, the selection specialist can use additional criteria. For example, it would be appropriate to take into account the results of a number of experimental studies [4, 3,], where statistically significant trends in the severity of balances were revealed, in their combinations. The trends point to the natural predisposition of subjects to more or less successfully "interact" with the vector of gravity, as one of the fundamental characteristics of the external environment. These trends are presented by us in paragraphs 1–4, where the severity of the external and internal balance of the processes of excitation and inhibition is reflected in digital format. Based on the trends presented in paragraphs 1–4, it can be noted that for athletes of the first group (paragraph 1, combination of balances - 31), characteristic, in the process of activity, are jumping actions directed vertically upwards, that is, against

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the vector of gravity. Hypothetically, this group can also include: high jump, pole vault; volleyball (playing on a net), etc. A group of athletes with a combination of balances 13 (item 3) differs from group 1 in the opposite nature of "interaction" with the vector of gravity. Sports are also represented here, where often difficult to predict "forces" of nature (currents, wind, etc.) are present.

Hypothetically, the second group can be categorized: wrestling. The identified tendencies need experimental studies for additional verification in the listed sports (points 1–4), as well as in those specializations for which model neurodynamic characteristics have yet to be identified. Note that in Table 1, the severity of external and internal balances is shown, respectively, by the last two digits in five-digit neurodynamic codes, reflecting individual and model neurodynamic characteristics. Optimizing training programs in the chosen sport is impossible without knowing the psycho-somatic abilities and characteristics of athletes [6, 8]. Such a prediction is needed for athletes who have different playing roles to learn. For example, Table 2 presents data for basketball, rugby, and wrestling.

Table 2. Prediction of psychological abilities and characteristics of athletes with different playing roles based on model neurodynamic characteristics

Natural psychological abilities manifested in four aspects of sports activity	Forecast of the severity (in points) of psychological abilities and athletes with different game roles: low - 1 point, medium - 2, high - 3 points		
	wrestler	forward	Defender
psycho-social and somatic characteristics of roles in the form of digital codes	12221	31231	23321
Features of psychomotor			
Movement coordination	2	3	1
Sprint makings	3	2	2
Reaction speed in play activity	2	3	1
The speed of recovery processes	3	3	3
Stayer makings	2	3	2
motor memory	1	1	1
Individual style of activity			

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The dominant part of the activity: executive (exec.), indicative (orient.)	exec.	balance	orient.
Learnability (high pace - 3 points)	3	2	2
Tendency to leadership	3	1	3
Adapting to changing, crisis situations	3	3	1
Duration of preparation for the competition (3 points)	1	2	1
Peculiarities of intellectual activity			
Type of thinking: thinking (think); artistic (art)	art.	art.	thinking
The speed of associative and mental processes	3	3	1
Switching attention	3	3	1
Concentration of attention	2	2	3
memory involuntary	3	3	1
Psychonomic characteristics in the form of numerical codes	12221	31333	23322
Memory is arbitrary	2	2	2
Creativity of thinking	1	3	1
Speed of visual image formation	2	3	1
The pace of the beginning of activity (fast - 3 points)	3	3	1
Resistance to crisis conditions, endurance feature (endurance to fatigue)			
Endurance (before fatigue)	3	3	3
Endurance (in the face of fatigue)	2	1	3
Adaptation to crisis environmental factors	1	2	3
Resistance to static postures	1	3	1
Courage	3	2	3
Determination	3	2	3
Tolerance for ambiguity	1	2	2
Emotional and physical resilience	3	3	3

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It should be noted that the psycho-social and somatic characteristics of the model for athletes with different playing roles are presented in Table 2, by A. A. Banayan in a study conducted by Banayan on basketball and rugby teams [5]. They are, according to the results of their performances at the World Championships and Olympic Games One of the world leaders. These characteristics, according to our approach, can be taken as "model", which does not exclude the need for additional experimental studies to verify them for the considered game roles. In the study of A. A. Banayan, the task of forming individualized training programs for athletes, taking into account their roles, was also set and solved.

As shown above (see Table 1), we take a high predisposition as a subject's potential talent for certain specializations. However, before the successful self-realization of an athlete in the chosen specialization [1, 2], even if the optimal choice was made, the subject has a long sports path to the heights of mastery. And here it is advisable to touch on a topic that can be designated by the “coach – method – athlete” scheme, which implies the psychophysiological and psychological compatibility of participants in joint activities [7], when the coach applies such methods of working with a gifted athlete that do not contradict the natural individual style of sports activity of both.

Conclusion

Based on the data obtained as a result of the research presented in the article, we can assume that the use of the anthropometric methods we have found will be especially interesting for coaches focused on high sports results. At the same time, the use of somatotype in the process of sports selection is significant.

The selection of athletes and prediction of results should not be done on an intuitive level, but using evidence-based methods (testing, observation, survey, etc.). The main characteristics, which are based on the realization and socialization of athletes in sports, are typological and psychosocial characteristics (motivation, temperament, character). Considering the typology of the athlete's personality, his individual features, allows us to plan the full development of the athlete's abilities, and to effectively use them in predicting the results and realizing the athlete. A special place in the psychological support of sports activities is motivation, which helps a person to engage in sports and achieve success. A successful combination of temperament, motives, and character contributes to the development of capabilities, and their effective implementation. Typological and based on typological and psychosocial characteristics, the coach will be able to individualize the training process, select, and determine the attitude of athletes to responsible games, and make the right choice of motivation. Also, considering psycho-somatic characteristics, plan the career of a sportsman and the process of resocialization in society after the end of a successful sportsman's career.

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ფსიქო-ფიზიოლოგიური მახასიათებლების მნიშვნელობა სპორტსმენთა რეალიზაციასა და შერჩევაში

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აბსტრაქტი

სტატიაში აღნიშნულია, რომ ნიჭიერი სპორტსმენებისა და ზოგადად, სპორტული შერჩევის პრობლემა ვერ გადაიჭრება მხოლოდ ანთროპომეტრიული მაჩვენებლების გაზომვით, ან მხოლოდ ტესტ-კითხვარებით, გასაუბრებით, ინტერვიუებითა და დაკვირვებებით, რაც დღეს სპორტის ფსიქოლოგთა არსენალში დომინირებს. ასევე, მეცნიერების მხრიდან, იგნორირებულია დიფერენციალური ფსიქოფიზიოლოგიის მეცნიერული საკითხები, რომლებიც აფართოებენ სტატიაში მითითებული პრობლემების გადაჭრის შესაძლებლობებს.

ჩვენს მიერ შემოთავაზებული ფსიქო-ფიზიოლოგიური მიდგომა ეფუძნება სუბიექტის მიდრეკილების შეფასების მეთოდს კონკრეტულ სპორტულ სპეციალიზაციაზე, რომელიც ითვალისწინებს მოქმედებების ალგორითმს: ფსიქო-სომატური სისტემის თვისებების ინსტრუმენტული გაზომვას, ე.პ. ილინის მოძრაობითი უნარების ტექნიკას, სუბიექტის ინდივიდუალური ნეიროდინამიკური მახასიათებლების დადგენასა და ცნობილ, ექსპერიმენტულად იდენტიფიცირებულ „მოდელურ“ ნეიროდინამიკურ მახასიათებლებთან, რომლებიც დომინირებს მაღალი დონის სპორტსმენებს შორის, მათ შედარებას. დღეს, სპორტული ტექნოლოგიების განვითარების ეპოქაში, განსაკუთრებული მნიშვნელობა აქვს ნიჭიერი სპორტსმენების შეფასებისა და გამოვლენის, ჯანმრთელობის დაზოგვის მეთოდებს, სპორტის შერჩევის ხარისხის გაუმჯობესებას, რაც უზრუნველყოფს სპორტულ აქტივობებში ჩართული ყველა მონაწილის წარმატებულ კარიერასა და თვითრეალიზებას.

შემოთავაზებული ფსიქო-ფიზიოლოგიური პროგრამა მნიშვნელოვან ინფორმაციას აძლევს, პრაქტიკული რეკომენდაციების სახით, სპეციალისტებს, მწვრთნელებს და ეხმარება სწორად დაგეგმოს პროგნოზირება, აამაღლოს შერჩევის ეფექტურობა და გააუმჯობესოს სპორტული წვრთნის ორგანიზების პროცესი.

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