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*Volodymyr Davydov, **

v-davydov55@list.ru

*Anna Mankevych, **

Mankevich@rambler.ru

*Iryna Lushchik ***

academy@vgafk.ru

Concentration and Distribution of Attention in Sports Swimming, Competitive and Rhythmic Gymnastics

*Poles state university (Republic of Belarus)**

*Volhograd state academy of physical culture (Russia) ***

Abstract:

Swimming in conditions of training and competition is considered as a specific sports activity that creates conditions for the appearance and development of diverse mental features of a person, including for such property as attention. In our work attention is considered as one of the properties of an individual athlete which ensures the implementation of its sports activity, it is one of the mechanisms of its control and regulation. Tasks of the work are to assess the level of concentration and distribution of attention among swimmers and gymnasts, and to compare the obtained data from athletes with different levels of mastery and the same level of mastery. It is shown that with the growth of sports mastery of swimmers there is the tendency of growth of quantitative indicators of concentration and distribution of attention. It was found out that the role of attention as a mechanism of control and regulation of activity varies in different kinds of sports activities. In gymnastics (competitive and rhythmic) concentration of attention and especially its stability play a more prominent role than in swimming.

Key words:

attention, swimmers, gymnasts, indicators, level of sports mastery

Description of the problem under consideration and its significance. Attention is the most studied mental function. Attention studies began at the stage of scientific psychology formation, and in a way even preceded it and was its main contents.

At the same time, both in native and foreign psychology attention content and its role in human mental activity are regarded ambiguously. The main problem, which is sharply debated, is the following: is attention an independent process, or is it the party, the aspect of any mental activity. In native psychology this dilemma is presented by two concepts of attention «attention is the direction and focus of any activity» and «attention is a special control activity» [2, p. 543].

However, supporters of a wide variety of views on the nature of attention recognize the fact that the result of the attention is to improve all activities to which it is attached. The famous psychologist P. Ya. Halperin has developed the concept attention in which this mental function acts as an activity of mental control based on this provision [1]. The improving of the results, when the attention joins, Halperin explains that mental control is carried out using the criterion, the measures, the sample, «in psychology it has been known for a long time that the presence of the sample «prevenient image», creating the possibility of clearer comparison and distinction, leading to a better recognition of events (and therefore to other positive changes, peculiar to attention)» [1, p. 538]. Based on the concept of attention, proposed by P. Ya. Halperin, we consider this mental function as the physiological mechanism that provides control of sporting activity and, consequently, and provides the quality of the activity, its success.

Person's behaviour in sports is governed by the same laws as in any other activity (work, study, play, creative). The level of athletes' performance of sports activities, their acquisition speed depends on a range of mental functions, which in this case act as personal qualities that are important for a particular athletic activity. Attention is no exception. R. M. Naydiffer analyzed the features of the attention in the sport, and said that «many of highly skilled athletes have the ability to an arbitrary attention concentration, which most of us can only dream about» [3, p. 761]. However, the display of attention in various kinds of sports activities is a problem that has been intensively studied in sports psychology and is important for such applications issues as improving efficiency of athletes and organization of the training process.

The relevance of the study is that it considers properties of attention (concentration and distribution) as regulators of the behaviour of swimmers, observed the dynamics of these properties in the process of sports skills formation, compares the role of these properties in various types of sports activities.

Objects of the research are the concentration and distribution of attention of athletes, swimmers and gymnasts.

Subject of the research is the identification of the attention concentration and distribution relationship to the level of swimmers sportsmanship, as well as a comparison the concentration and distribution of attention among athletes in different kinds of sports activities.

Hypotheses of the study:

- if the concentration and distribution of attention is professionally important qualities of a swimmer, so their quantitative indicators should increase of sportsmanship under investigation;
- Display of concentration and distribution of attention in various sports should have its own specifics.

Research objectives:

1. to diagnose the level of concentration and distribution of attention of swimmers and athletes involved in other kinds of sports;
2. to compare the concentration and distribution of attention of swimmers and athletes of different level of sportsmanship;
3. to compare the concentration and distribution of attention of swimmers and athletes at the same level of sportsmanship.

The organization and methods. As the base of research were taken the Volhograd Academy of Physical Culture and Sports (VAPCS) and swimming center «Volha», Russian national swimming team.

The volume of people under investigation was 118. The study involved 18 swimmers (VSAPC students), 18 representatives of gymnastics (VSAPC students), 15 representatives of artistic gymnastics (students VSAPC), 24 young swimmers in the experimental group, 23 swimmer of the swimming center «Volga», 20 swimmers, members of the Russian national swimming team. Swimmers were represented by 4 groups, which differ in the level of sports skills (level of sports skill of young swimmers is low; students-swimmers, mostly stroke swimmers and rarely CMS; swimmers of the center «Volha» and members of the Russian national swimming team, mainly CMS and MS).

The main organizational method of attention studying of swimmers with different skills ranks and representatives of different sports activities was the comparative study. Peculiarities of attention of swimmers with different levels of sportsmanship, the representatives of artistic gymnastics and free calisthenics were investigated. Moreover, in order to observe the development of attention of swimmers, we studied its indexes among young swimmers, swimmers-students, masters-swimmers and swimmers of the Russian national team.

Psychodiagnostic method of correction task was used as the empirical research method. [7, p. 4–7]. The reliability of the results of the research was provided by a representation of people under test, using standardized diagnostic methods of concentration and distribution of attention, as well as the use of statistical processing methods of empirical material.

The testing occurred in the individual form across two stages. On the first stage the concentration of sportsmen's attention was studied. To conduct the research we used a standard test form «correction task» and a stopwatch. On the form letters of the Russian alphabet were typed randomly, altogether 2000 signs, 50 letters in each line. The people under testing were proposed to cross out required letters for 5 minutes. They started to work due to experimentator's command. At the end of each minute of work people under testing put vertical line into the test form due to experimentator's command, and after 5 minutes they noted the last seen letter.

On the second research stage the distribution of sportsmen's attention was studied. They received the standard test form «correction task», but they were proposed to cross out the required letters in odd and even lines of the correction table in variety of ways.

In test form of the «correction task» processing number of indicators was calculated: the total number of letters scanned for 5 minutes and each minute of work; the number of letters correctly crossed for 5 minutes and each minute of work; the number of letters that was necessary to cross out.

Then, due to the corresponding formulas quantitative indicators of concentration and distribution of attention for the whole time and every minute of the work were calculated. These indicators allow to quantify the level of concentration and distribution of attention of sportsmen and to observe the dynamics of these attention features in the process of testing.

Statistical analysis of these data included the computation of the standard (root mean square) deviation. Standard deviation (St. dev.) is one of the variance (dispersion, scatter) characteristic of experimental variable significance around the mean value. It is equal to the square root of the sum of all deviations from the arithmetic average variant raised to the square and divided into the number of all variants minus one. We consider the indexes of the standard deviation as a stability characteristic of the concentration and distribution.

Basic materials and argumentation of investigation. For ease of analysis of the data all results for each group of swimmers were add to the Table 1, which shows the average values of concentration (C) and distribution (D) of attention, the standard deviation (St. dev.) of these values.

Table 1

**Quantitative indicators of attention concentration, distribution and their stability
of sportsmen-swimmers with different levels of sportsmanship**

№	Groups of people under testing	Indicators of attention concentration (C) and distribution (D)							Indicators of stability (St. dev.)
		C/D	Gen.	1 min.	2 min.	3 min.	4 min.	5 min.	
1.	Experimental group	C	85,7	83,4	83,1	85,8	88,8	87,6	2,18
		D	74,7	76,9	73,6	74,4	75,7	73,1	1,52
2.	Swimmers (students of VSAPC)	C	90	93,3	90,3	88,2	89,4	89	1,97
		D	83,8	82,2	83,9	85,2	87	80,5	2,53
3.	Swimmers of the center «Volha»	C	83,4	84,2	85,6	87	82	78	3,57
		D	73,2	76,2	84,6	68	69	68	4,16
4.	Swimmers of the Russian national team	C	93	96	93	93	89	94	2,3
		D	82,6	81	84	79	83	86	2,8

Comparing the general indexes of attention concentration of swimmers from four groups that differ in their qualifications, indicate the increasing tendency with the growth of sports skill of swimmers (the exception is a general index of attention concentration of swimmers from the swimming center «Volha»).

So, the swimmers-beginners (experimental group) have the lowest general index of attention concentration ($C_{gen}=85,7$). The skilled swimmers have much higher general attention concentration ($C_{gen}=90$). And the swimmers from Russian national team showed the highest index ($C_{gen}=93$).

Comparing the general indexes of attention distribution of swimmers in four groups suggests that there is a evident difference between the level of attention distribution of sportsmen who are at the stage of initial specialization and athletes with higher qualifications. There has been no significant differences overall performance of the distribution of attention in swimmers of primary level and those who are at a stage of sports perfection ($D_{gen}=83,8$) and masters athletes ($D_{gen}=82,6$). At the same time, general index of attention distribution of swimmers from the swimming center «Volha» ($D_{gen}=73,2$) is lower than the one of young swimmers from the experimental group ($D_{gen}=74,7$).

Attention is drawn to the fact that the general indexes of attention concentration of the sportsmen from four groups are higher than the general index of attention distribution. This fact indicates that the simultaneous concentration of consciousness on several subjects is more difficult internal activity than keeping of consciousness at one subject.

The indexes of concentration's stability and attention concentration of the sportsmen with various level of classification do not significantly differ, except the indexes of swimmers from the swimming center «Volha». This fact may indicate that the ability of swimmers under testing to keep the concentration and attention distribution at the appropriate level.

Dynamics of attention concentration and distribution indexes during the testing also shows that swimmers of all four groups can cope well with the task of keeping attention concentration and distribution at the optimal level for five minutes.

The attention is also drawn to the fact that quantitative indexes of attention concentration and distribution and indexes of concentration stability and distribution of the swimmers from the swimming center «Volha» are lower than the young swimmers' from the experimental group. At first sight this fact contradicts our hypothesis. However, the results, on the contrary, can confirm it. Low results of attention concentration and distribution diagnostics of high-skilled sportsmen from the swimming center «Volha» may indicate that the age of the sportsmen is not a significant factor in determining the level of attention concentration and distribution. Rather, the results of attention diagnostics of swimmers from the center «Volha» have been affected by some unaccounted factor (current emotional or physical condition of sportsmen, psychological climate in the testing group, some previous events, etc.). Consequently, general dynamics of quantitative indexes of attention concentration and distribution in all four groups is not determined by age differences, but the role that attention plays in the regulation of their activities and, above all, sporting activity.

In order to identify the features of attention concentration and distribution in various kinds of sports activity, we compared the quantitative indexes of these attention features of swimmers and gymnasts.

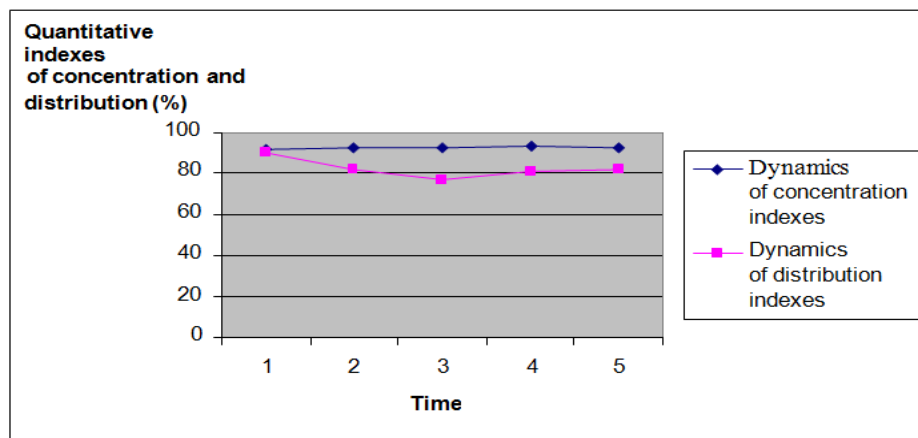
For comparative analysis we took a group of students-swimmers from VSAPC, as the members of this group are the closest in age and their level of sportsmanship to sportsmen-gymnasts. The statistics is presented in the Table 2.

Table 2

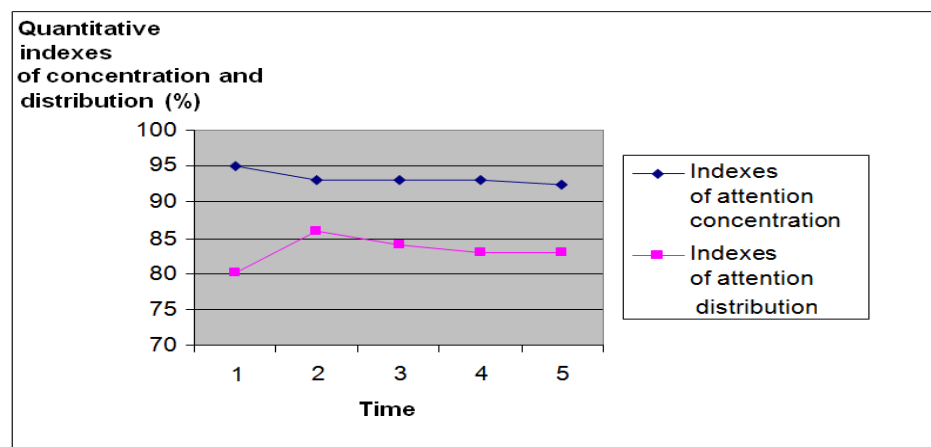
Indexes of attention concentration and distribution of sportsmen-swimmers and sportsmen-gymnasts

№	Groups under testing	Indicators of attention concentration (C) and distribution (D)							Indicators of stability (St. dev.)
		C/D	Gen.	1 min.	2 min.	3 min.	4 min.	5 min.	
1.	Swimmers (students of VSAPC)	C	90	93,3	90,3	88,2	89,4	89	1,97
		D	83,8	82,2	83,9	85,2	87	80,5	2,53
2.	Representers of free calisthenics (students of VSAPC)	C	92,6	92,2	92,7	92,5	93,1	92,5	0,57
		D	82,2	90	82,1	76,8	81	81,8	4,78
3.	Representers of artistic gymnastics (students of VSAPC)	C	93,3	95	93	93	93	92,4	1,0
		D	83,2	80,1	86	84	83	83	2,1

For the convenience of monitoring the dynamics of the attention concentration and distribution in sportsmen-gymnasts we have presented them in pictures 1–2.



Pic. 1. Dynamics of attention features of free calisthenics' representatives.



Pic. 2. Dynamics of attention features of artistic gymnastics' representatives

As it is shown in the table 2, general indexes of attention distribution of the sportsmen-swimmers (Dgen.=83,8) and sportsmen-gymnasts (Dgen.= 82,2 (free calisthenics); Dgen. = 83,2 (artistic gymnastics)) are almost equal.

General index of attention concentration of the swimmers (Cgen.=90) is slightly lower, than of free calisthenics' (Cgen.=92,6) and artistic gymnastics' (Cgen.=93,3) representatives.

However, attention is drawn to the fact that the index of stability attention concentration of free calisthenics' (St. dev.=0,57) and artistic gymnastics' (St. dev.=1.0) representatives significantly higher than of swimmers (St. dev.=1,97).

The difference between the stability of attention distribution between the free calisthenics' (St. dev.=4,78) and artistic gymnastics' (St. dev.=2,1) representatives is explained by the fact that sporting activity takes place in the past more difficult and more hazardous conditions. To keep under control the various aspects of the complex and hazardous activity conditions in gymnastics the sportsman needs a high level of attention distribution.

Comparison of attention features indexes of swimmers and gymnasts indicates that the characteristics of such kinds of sports activities as swimming, free calisthenics and artistic gymnastics have different requirements to the attention concentration of athletes:

1. free calisthenics and artistic gymnastics require the highest level of attention concentration of sportsmen on their actions than on the swimming activity;
2. free calisthenics and artistic gymnastics require the higher level of attention concentration of the sportsmen than swimming.

Conclusions and perspectives for further investigation. These data received from the research confirm our hypothesis that the abilities to concentrate and distribute attention are professionally important qualities of sportsmen-swimmers, as a tendency of quantitative indicators of attention concentration and distribution with the development of swimmers' sportsmanship grows. Especially bright this tendency appears in the quantitative attention concentration indexes.

Operational and technical features of swimming demand the high level of attention concentration of sportsmen. Therefore, the ability to concentrate the attention can be regarded as the relative professional important feature of sportsman-swimmer, so it defines an opportunity to achieve a high index of sporting activity.

The ability to distribute attention by swimmer should be considered as absolute professionally important qualities that determines the ability to perform sporting activities in the given regulatory (middle) level, but does not affect the ability to achieve high results in swimming.

The role of attention concentration and distribution as the mechanisms of control and regulation of the activities differs in various kinds of sporting activities. The features of sports activities and the conditions of its realization determine the type of attention sportsman and the place of the specific attention features in the control and regulation of activity.

So, in gymnastics (artistic gymnastics and free calisthenics) attention concentration and especially its stability play a more prominent role in the control and regulation of sports activity than in swimming.

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Information about the Authors:

Davydov Volodymyr; orcid.org/0000-0002-4882-8064; v-davydov55@list.ru; Polessky State University; 23 Dnieper Flotiliya Street, Pinsk, 225710, Byelorussia.

Mankevych Anna; orcid.org/0000-0002-1205-9718; Mankevich@rambler.ru; Polessky State University; 23 Dnieper Flotiliya Street, Pinsk, 225710, Byelorussia.

Lushchyk Iryna; orcid.org/0000-0002-8693-2436; academy@vgafk.ru; Volgograd State Academy of Physical Culture; 78 V. I. Lenin Street, Volgograd, 400005, Russia.

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