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**SPACE PERCEPTION PECULIARITIES OF YOUNG ATHLETES****A. A. Chatinyan,****M. G. Avetisyan**

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**The Relevance of the Research:**

Perceptions related to the reflection of space, time and movements play an important role in sports. The special nature of the sports activity contributes to the formation of a certain structure of the processes of time and space perception.

Due to the process of perceiving moving objects and a moving competitor during the trainings, an active eye is formed. With such an eye ruler, an athlete can fairly accurately estimate the space from a moving object in a short period of time and respond by one action or another.

A number of specialists state that doing sports regularly effects the ability of athletes to control the characteristics of movements, as well as influences the effective performance of motor actions in general [2].:

Undoubtedly, the indicators of both the sense of space and the control of small movements among athletes are higher than

in an average person or an amateur athlete [3].

It should be mentioned that many scientific researches have been carried out both in chess [4,5, and more] and in boxing [6,8,9, and more ]. They mainly refer to the improvement of chess players' sports skills, intellectual trainings, tactics of playing the game, technical, physical, psychological trainings of qualified boxers of different sexes, determinants for conducting successful tactics in competitions and other important issues.

In the literature available, we have not come across researches that studied and compared the indicators of understanding space and controlling the accuracy of movements of athletes of different sports that differ significantly from each other, chess players (intellectual sport) and boxers (classical sport) in particular.

The relevance of this research is due to this fact.

**The purpose of the research:**To identify indicators of the sense of space and



control of small movements of young chess players and boxers.

**The research problems are:**

1. To clarify the features of space perception among chess players and boxers

**Methods and organization of the research**

**The research methods are:** scientific methodical, study and analysis of educational literature, F. Galton's method of eye ruler, dynamic tremometry, mathematical statistics. The study of the understanding of the boundaries of the visual field and the accuracy of small movements was carried out according to the methodology proposed in the literature [1,7]. The accuracy of the eye ruler is 0.25 cm.

The following characteristics of the studied indicators were calculated: the average of the data, the standard deviation of the average, the error of the average, as well as the reliability of the difference of the average data by the coefficient of the Student. In the case of the eye ruler, the accuracy of the task was also calculated with percentages.

15 chess players and 23 boxers aged 17-20 were involved in the research, and their average sports experience was 9 and 5 years.

The research was carried out in the research laboratory of "the Department of Sports Pedagogy and Psychology" and "the

2. To reveal the control indicators of small movements of the athletes under study

3. To compare the comparative analysis of the studied indicators of athletes of two sports.

Department of Weightlifting, Boxing and Fencing" in 2020.

**Analysis of the results of the research.** By using Galton's ruler, it became possible to clarify the influence of professional training and competitions on the peculiarities of the perception of space (reproduction) (table 1). The research was carried out in the right and left directions, in small (5cm), medium (15cm) and large (30cm) spaces.

Comparing the test results in the right and left directions, it becomes clear that in comparison with the movement of bows in the left direction, the task is more accurately performed in the right direction, except for long distance data. It is interesting to mention the fact, that the comparison of the test indicators in right and left directions in all cases showed almost the same result, and the difference is not accurate ( $p \geq 0.05$ ).

It can be mentioned that in all cases chess players performed the task more accurately on a small space, while the indicators for medium and large spaces depend on the direction of bowmovement. Examining the indicators of space reproduction of boxers in relation to the movement of the bow to the right, it is clearly seen that, in the



data of both chess players and boxers, as the proposed space increases, the magnitude of

deviations (errors) increases, the sense of space becomes worse.

Table 1

**Comparative indicators of space reproduction of 17-20-year-old chess players and boxers (errors,  $X \pm m$ ), cm**

Direction of the Movement	Chess Players					
	Space(cm)					
	Short (5)		Average (15)		Long (30)	
Right	$0,43 \pm 0,12$		$0,97 \pm 0,19$		$1,51 \pm 0,25$	
Left	$0,87 \pm 0,18$		$1,32 \pm 0,28$		$1,09 \pm 0,22$	
Accuracy of Difference	t	P	t	P	t	P
	2,03	>0.05	1,03	>0.05	1,26	>0.05
Direction of the Movement	Boxers					
	$0,88 \pm 0,14$		$1,58 \pm 0,23$		$1,77 \pm 0,23$	
	$0,76 \pm 0,11$		$1,16 \pm 0,18$		$1,17 \pm 0,20$	
Accuracy of Difference	t	P	t	P	t	P
	0,67	>0.05	1,44	>0.05	1,97	>0.05

The image of the indicators of space reproduction of the bow moving to the left is slightly different. In particular, he revealed that the boxers did the task in the given direction more accurately.

Comparing the data of the task performed in the right and left directions, it is obvious that in the case of the task in the left direction, the reproduction of space was performed more accurately than with the bow moving to the right. In the case of opposite directions, the difference between the indicators of small distances is not so

great, but there is a certain difference between medium and large distances.

In the left direction, the boxers rated the reproduction (feeling) of medium and long distance by 0.42 and 0.6 centimeters more accurately. Such a result was remarkable due to the fact that the majority of the athletes who were involved in the study were right handed, which we believe should have had a positive effect on the evaluation of the task performed on the right side.



However, performing a mathematical analysis, it becomes clear that the comparison of the data of the right and left directions showed the same result in all cases ( $p \geq 0.05$ ).

One of the objectives of the research was to study and compare the sense indicators of space of chess players and boxers. It can be noted that chess players performed tasks in the right direction more accurately, and in the left direction just on the contrary, boxers were more accurate here, that is, the latter had higher sense of space.

Examining the accuracy of the task in percentage, it becomes clear that chess players performed the task in the right direction with an average accuracy of 93.3%, and in the left direction with 90.06%

accuracy. Such a result, according to the data proposed in the literature, is estimated as a result below average. In the case of boxers, the result is almost the same. In particular, in the right direction, the accuracy of the task was 90.4% and in the left direction 91.06%, which is also estimated as a result below average.

Within the framework of the research, with the help of a tremometer, we identified the control level of the accuracy (sense of space) of complex, medium and simple movements (table 2). The studies were carried out at medium speed, with both right and left hands. The division of movements into 3 groups according to the degree of complexity has been grounded experimentally in the literature [10].

Table 2

***Comparative indicators of accuracy of small movements of right and left hands of 17-20-year-old chess players and boxers (errors,  $X \pm m$ ), touch***

Hand	Chess players					
	Group movements					
	I (complex)		II (medium difficulty)		III (simple)	
Right	$2,00 \pm 0,33$		$1,25 \pm 0,26$		$1,58 \pm 0,24$	
Left	$3,38 \pm 0,53$		$2,15 \pm 0,28$		$1,21 \pm 0,28$	
Reliability of the difference	t	P	t	P	t	P
	2,21	<b>&lt;0.05</b>	2,36	<b>&lt;0.05</b>	1,00	>0.05
Hand	Boxers					
	$2,10 \pm 0,26$		$1,52 \pm 0,31$		$1,27 \pm 0,26$	
	$3,02 \pm 0,38$		$1,98 \pm 0,33$		$0,64 \pm 0,18$	
Reliability of the difference	t	P	t	P	t	P
	2,00	>0.05	1,02	>0.05	1,99	>0.05



The results obtained from the research of chess players were predictable, as 70% of the participants were right-handed, and right-handed people find it easier to perform complex moves with the leading hand compared to left-handers for whom the left hand is the leading one. Analyzing the magnitude (accuracy) of the sense of space in the case of complex movements, in relation to the square and zigzag line and contour, it can be seen that the task was performed almost 1.38 times more accurately with the right hand ( $P \leq 0.05$ ). The analysis of the indicators of average complexity moves revealed that such moves were also performed more accurately by the chess players with the right hand, but here the difference is already 1.2 touch. This indicator reveals the following: the easier the exercise, the smaller the average error of touch accuracy. After the mathematical processing of the indicators of the right and left hands, it becomes clear that the chess players make more accurate outlines of rings and triangles with right hand ( $P \leq 0.05$ ).

A completely opposite picture was recorded in the data of simple movements. Here, the average index of movement touch done with the right hand was 1.58 and with the left hand - 1.21. There is something not clear with the fact that, when drawing straight and wavy lines with the right hand, simple movements were performed worse

by those chess players whose 70% are right-handed. However, in this case the difference is not reliable ( $P \geq 0.05$ ).

In the framework of our research, it was important to find out the features of the accuracy of the boxers' small movements.

Examining the results of the accuracy of complex movements of the right hand, we found that the average indicator was 2 touches. Observing all the data, it is obvious that along with simplifying of the task, the average number of touches also decreases, that is, the accuracy of the movements improves.

As a result of the study of the accuracy of average complexity movements, the average indicator was revealed, which was 1.52 touches.

In the case of simple motion control, the picture is as follows, the average number of touches here is 1.27. The mathematical analysis of the data revealed that the difference between the indicators of the 1st and 2nd, 1st and 3rd group movements is reliable.

Summarizing the data with the right hand, it can be noted that the boxers showed the best results when controlling simple movements.

When studying the data of the left hand, there is some deterioration in the results associated with the control of complex movements, where the average was 3.02 touches.



With movements of average difficulty, the average error was 1.98 touches. Comparing the data of average complexity and complex movements, we can conclude that the existing difference is reliable ( $P \leq 0.05$ ).

An interesting result was revealed in these simple movements. In particular, the boxers showed an average of 0.64 touches, which, in our opinion, is a pretty good result. However, the analysis of the indicators of complex and simple movements showed that the difference is again reliable with a probability of  $P \leq 0.001$ .

By comparing the indicators of the right and left hands, it is obvious that the control of complex and medium movements was performed more accurately with the right hand. However, it is noteworthy that the control of simple movements was performed better with the left hand. In contrast to the right hand, athletes with the opposite hand performed the task almost twice as accurate.

However, the reliability of the difference is not reliable in all cases.

As a result of analyzing the data of chess players and boxers, it was found out that boxers were more accurate in controlling small movements with their left hand, which, in our opinion, is explained by the fact that during sports activities chess players use mainly the leading hand.

Summing up the above, it can be noted that in all cases, boxers performed the task more accurately in a small space with the help of the Galton's eye ruler. At the same time, it becomes clear that along with the increase of the proposed space for evaluation, the magnitude of errors also increased.

A similar pattern can also be seen in the management of small movements, in particular, the easier the task, the better the indicators of boxers become.

**Conclusion.** Using Halton's eyemeter rule method, it was revealed that chess players have a better developed sense of small space perception when the bow moves in the right and left direction.

Boxers perceived distances in the right and left directions with smaller deviations in a small area.

Comparing the indicators of boxers and chess players, it was revealed that chess players were more accurate on the right direction, and boxers on the left.

The comparative analysis of the indicators of the accuracy of the small movements of the right and left hands revealed that the chess players control the movements more accurately with the leading (right) hand in the conditions of performing a task of both complex and medium complexity.

Two-hand micro-movement control data revealed that in complex and medium-



conditions, boxers performed the task more accurately with the right hand, and simple movements with the left hand.

In case of comparing the data of chess players and boxers, it became clear that

boxers controlled small movements more accurately with the use of the tremometer by an average of 1.04 touches with their left hand.

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### **ՊԱՏԱՆԻ ՄԱՐԶԻԿՆԵՐԻ ՏԱՐԱԾՈՒԹՅԱՆ ԶԳԱՑՈՂՈՒԹՅԱՆ ԱՌԱՆՁՆԱՀԱՏԿՈՒԹՅՈՒՆՆԵՐԸ**

**Մ.գ.դ., պրոֆեսոր Ա.Ա. Չափինյան,**

**մագիստրանտ Մ.Գ. Ավերիսյան**

Հայաստանի ֆիզիկական կուլտուրայի և սպորտի  
պետական ինստիտուտ, Երևան, Հայաստան

### **ԱՄՓՈՓԱԳԻՐ**

**Առանցքային բառեր:** Շախմատ, բռնցքամարտ, տեսադաշտի սահմանների ըմբռնում, մանր շարժումներ, տրեմոմետրիա, Ֆ. Գալտոնի աչքաչափի քանոն:

**Հետազոտության նպատակ:** Բացահայտել պատանի շախմատիստների և բռնցքամարտիկների տարածության զգացողության և մանր շարժումների կառավարման ցուցանիշները:

**Հետազոտության մեթոդներ և կազմակերպում:** Հետազոտության մեթոդներն են՝ գիտամեթոդական, ուսումնական գրականության ուսումնասիրում և վերլուծում, Ֆ.



Գալտոնի աչքաչափի քանոնի մեթոդ, դինամիկ տրեմոմետրիա, մաթեմատիկական վիճակագրություն:

Տեսադաշտի սահմանների ըմբռնման և մանր շարժումների ճշգրտության հետազոտությունն իրականացվել է՝ ըստ գրականությունում առաջարկվող մեթոդիկայի:

Հետազոտությունում ներգրավվել են 17-20 տարեկան 15 շախմատիստ և 23 բռնցքամարտիկ, որոնց միջին մարզական ստաժը կազմում էր 9 և 5 տարի:

Տարածության զգացողության առանձնահատկությունները ուսումնասիրվել են աջ և ձախ ուղղություններով՝ փոքր (5սմ), միջին (15սմ) և մեծ (30սմ) տարածությունների վրա: Ուսումնասիրվել է նաև աջ և ձախ ձեռքերի մանր շարժումների ճշգրտությունը:

**Ստացված արդյունքների վերլուծություն:** Բոլոր ուսումնասիրված դեպքերում Ֆ. Գալտոնի աչքաչափի քանոնով շախմատիստները և բռնցքամարտիկներն ավելի ճշգրիտ էին կատարում առաջադրանքը կարճ տարածության վրա: Միջին և մեծ տարածության պարագայում շախմատիստների ցուցանիշները կախված են աղեղիկի շարժման ուղղությունից: Շախմատիստներն ավելի ճշգրիտ էին կատարում առաջադրանքն աջ ուղղությամբ, իսկ ձախ ուղղության առումով պատկերը հակառակն էր՝ այստեղ ավելի ճշգրիտ էին բռնցքամարտիկները:

Տրեմոմետրի միջոցով մանր շարժումների կառավարման ճշգրտության ուսումնասիրությունը, կապված բարդ (քառակուսի և զիգագ), միջին բարդության (օղակ և եռանկյունի) և պարզ (ուղիղ և ալիքաձև գիծ) աջ և ձախ ձեռքերի շարժումների հետ, բացահայտեց, որ բռնցքամարտիկները, ի համեմատ շախմատիստների, ավելի ճշգրիտ էին կառավարում շարժումները, որոնք կատարվում էին ձախ ձեռքով:

**Համառոտ եզրակացություն:** Բացահայտվել է, որ շախմատիստների մոտ ավելի լավ է զարգացած տարածության զգացողությունը՝ կապված աչքաչափի քանոնի աղեղիկի դեպի աջ շարժվող ուղղության հետ, իսկ բռնցքամարտիկների մոտ հակառակ ուղղությամբ:

Բացահայտվել է նաև, որ բռնցքամարտիկները տրեմոմետրի կիրառմամբ ձախ ձեռքով միջինը 1,04 հայումով ավելի ճշգրիտ են կառավարել մանր շարժումները, քան շախմատիստները:



**ОСОБЕННОСТИ ВОСПРИЯТИЯ ПРОСТРАНСТВА У ЮНЫХ СПОРТСМЕНОВ****Д. п. н., профессор А.А Чатинян,****магистрант М.Г. Аветисян**Государственный институт физической  
культуры и спорта Армении Ереван, Армения**РЕЗЮМЕ**

**Ключевые слова:** шахматы, бокс, восприятие границ поля зрения, мелкие движения, тремометрия, глазомерная линейка Ф. Гальтона.

**Цель исследования** - выявить показатели восприятия пространства и управления мелкими движениями у юных шахматистов и боксеров.

**Методы и организация исследования:** В работе исследовались следующие **методы:** изучение и анализ научно-методической и учебной литературы, методика «линейный глазомер» по Ф. Гальтону, динамическая тремометрия, математическая статистика. Исследование восприятия границ поля зрения и точности мелких движений проводились по методике, предложенной в специальной литературе .

В исследовании приняли участие 15 квалифицированных шахматистов и 23 боксера 17-20-ти лет, средний спортивный стаж которых составил 9 и 5 лет.

Тестирование линейного глазомера проводилось в двух направлениях движения ползунка: вправо и влево на коротком (5 см), среднем (15 см) и большом (30 см) отрезках. Изучение точности выполнения мелких движений проводилось правой и левой рукой.

**Анализ полученных результатов:** Во всех исследованных случаях и шахматисты, и боксеры точнее выполнили задание на коротком отрезке глазомерной линейки Ф. Галтона, а показатели шахматистов на среднем и большом отрезках зависят от направления движения ползунка. Шахматисты точнее выполняли задания в правом направлении, а в отношении левого направления картина была обратной: здесь точнее были боксеры.

Изучение точности управления мелкими движениями на тремометре, связанная обведением сложных (квадрат и зигзаг), средних по сложности (кольцо и треугольник) и простых (прямой и волнообразной) движений правой и левой руками, показало, что боксеры более точно управляли мелкими движениями левой рукой, чем шахматисты.

**Краткие выводы:** Установлено, что у шахматистов лучше развито чувство пространства в отношении движения ползунка глазомерной линейки вправо, а боксёров



в противоположном направлении. Так же было выявлено, что по суммарным показателям треметрии правой и левой рук боксеры на 1,04 касания были точнее, чем шахматисты.

Հոդվածն ընդունվել է 27.03.2022-ին:

Ուղարկվել է գրախոսման՝ 27.03.2022-ին: