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Features of individual cognitive style of qualified badminton players

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Abstract

Aim: to determine of peculiarities of personal cognitive styles in qualified badminton players.

Material and methods. The studies were carried out using the hardware-software computer complex "Multipsychometer-05". The modified Stroop test was selected. The indicators of the test "Field dependence" were determined: field independence, left hemispheric dominance, functional asymmetry, and the effectiveness of the test. The obtained results of the study were analyzed for the entire sample of badminton players, as well as separately for men and women.

Results. According to the results of scientific research on the field dependence of qualified badminton players, it was found that all athletes in our sample demonstrate a slight bias towards field dependence; dominated by right hemisphere dominance; in functional asymmetry and efficiency, qualified badminton players demonstrate an average level. The analysis of test indicators, taking into account gender dimorphism, showed that among men 72% demonstrate a predominance of right hemispheric dominance of varying degrees, 28% have left hemispheric dominance. As for women, 54% demonstrate a predominance of right hemispheric dominance of varying degrees, and 37% demonstrate left hemispheric dominance of varying degrees.

Conclusions. Men show a tendency towards better test performance and have more pronounced functional asymmetry. The cognitive style of skilled badminton players determines the strategy of selection and processing of information, problem solving, learning and other types of cognitive activities. Because human cognitive-activity styles are genetically determined and demonstrate a pronounced stability of cognitive-stylistic characteristics in ontogenesis, they can be used as prognostic and diagnostic criteria.

Key words: field dependence, left hemisphere dominance, functional asymmetry, badminton.



Анотація

Сюй Саньцян, Коробейников Г. В., Мищук Д. М., Коробейникова Л. Г. Особенности индивидуального когнитивного стиля квалифицированных бадминтонистов

Мета: визначення особливостей індивідуального когнітивного стилю кваліфікованих бадмінтоністів

Методи дослідження. Дослідження проводилися з використанням апаратно-програмного комп'ютерного комплексу «Мультіпсихометра-05». Було обрано модифікований тест Струпа. Визначалися показники тесту «Полезалежність»: полнезалежність, лівополушарне домінування, функціональна асиметрія, ефективність. Отримані результати дослідження були проаналізовані для всієї вибірки бадмінтоністів, а також окремо для чоловіків і жінок.

Результати. За результатами наукових досліджень полнезалежності кваліфікованих бадмінтоністів було виявлено, що всі спортсмени нашої вибірки демонструють незначне зміщення в сторону полнезалежності; переважає правокульве домінування; за показниками функціональної асиметрії та ефективності кваліфіковані бадмінтоністи демонструють середній рівень. Аналіз показників тесту з урахуванням статевого диморфізму показав, що серед чоловіків 72% демонструють переважання правопівкульового домінування різного ступеня, 28% мають лівопівкульове домінування. Щодо жінок, 54% демонструють переважання правопівкульового домінування різного ступеня, а у 37% спостерігається лівопівкульове домінування різного ступеня.

Висновки. Чоловіки демонструють тенденцію до кращої ефективності виконання тесту та мають більш виражену функціональну асиметрію. Когнітивний стиль кваліфікованих бадмінтоністів визначає стратегію селекції і переробки інформації, вирішення завдань, навчання і інших видів пізнавальної діяльності. Оскільки когнітивно-діяльнісні стилі людини генетично обумовлені та демонструють виражену стійкість когнітивно-стильових характеристик в онтогенезі, вони можуть бути використані як прогностичні та діагностичні критерії.

Ключові слова: полнезалежність, лівокульве домінування, функціональна асиметрія, бадмінтон.

Аннотация

Сюй Саньцян, Коробейников Г. В., Мищук Д. Н., Коробейникова Л. Г. Особенности индивидуального когнитивного стиля квалифицированных бадминтонистов

Цель: определение особенностей индивидуального когнитивного стиля квалифицированных бадминтонистов.

Материал и методы. Исследования проводились с использованием аппаратно-программного компьютерного комплекса «Мультіпсихометра-05». Был выбран модифицированный тест Струпа. Определялись показатели теста «Полезависимость»: полнезависимость, левополушарное доминирование, функциональная ассиметрия, эффективность выполнения теста. Полученные результаты исследования были проанализированы для всей выборки бадминтонистов, а также отдельно для мужчин и женщин.

Результаты. Выявлено, что все спортсмены нашей выборки демонстрируют незначительное смещение в сторону полнезависимости; преобладает правополушарное доминирование; по функциональной ассиметрии и эффективности квалифицированные бадминтонисты демонстрируют средний уровень. Анализ показателей теста с учетом полового диморфизма показал, что среди мужчин 72% демонстрируют преобладание правополушарного доминирования разной степени, 28% имеют левополушарное доминирования. Что касается женщин, 54% демонстрируют преобладание правополушарного доминирования разной степени, а у 37% наблюдается левополушарное доминирование разной степени.

Выводы. Мужчины демонстрируют тенденцию к лучшей эффективности выполнения теста и имеют более выраженную функциональную ассиметрию. Когнитивный стиль квалифицированных бадминтонистов определяет стратегию селекции и переработки информации, решение задач, обучение и других видов познавательной деятельности. Поскольку когнитивно-деятельностной стиле человека генетически обусловленные и демонстрируют выраженную устойчивость когнитивно-стилевых характеристик в онтогенезе, они могут быть использованы как прогностические и диагностические критерии.

Ключевые слова: полнезависимость, левополушарное доминирование, функциональная ассиметрия, бадминтон.



Introduction

Badminton is in great demand among the population and has gained popularity due to its democracy. It can be played by everyone, regardless of gender and age [1, 2]. At the initial level, athletes have access to the simplest elements of the game, which do not require a rich technical arsenal. At a higher level, badminton is much more dynamic and requires players to have a high level of athletic training [3, 4]. The main issue of the control and planning system is the prediction of potentially high results in a particular sport based on a complex combination of motor and mental abilities and anatomical and physiological traits [5, 6]. High results in high-achievement sports are demonstrated by athletes who have a set of outstanding features, among which are high indicators of cognitive activity and individually stable features that determine the uniqueness of information processing strategy.

Given that the effectiveness of highly qualified badminton players depends on the athlete's ability to perceive, analyze and process information, the study of psychophysiological functions in order to control the functional state of the athlete and correct the training process is very important [6, 7, 8].

The analysis of literature sources shows that today a large enough theoretical and experimental-practical material on the selection, modeling, forecasting and control of high-achievement sports has been accumulated. The problems of modeling and control at different stages of long-term training of highly qualified athletes are studied. Works on the study of selection, modeling and control in various sports are widely presented. The works devoted to separate methods of selection arouse interest. This diversity and variety of work is further evidence that the use of a continuous control and planning system in the process of a continuous cycle of selection-forecasting-modeling-training accompanies the athlete throughout life, from the first steps in sports to the last stage of long-term training. sports career [5, 11, 12, 13].

However, there is virtually no work on the study of the functionality of athletes in badminton. In addition, no objective criteria have been developed to assess the functional status of a badminton athlete at different stages of training.

Aim: to determine the features of the individual cognitive style of qualified badminton players.

Materials and methods

Participants

The study involved 34 qualified badminton players, 12 men and 22 women, aged 18-19 years.

Procedure

The test, which examines the degree of autonomy of the subject from the outside world, is included by the authors of "Multipsychometer-05" in the block of methods "Activity styles". Among the various versions of the test for the study of qualified badminton players, the original version was chosen: a modified Strupa test. This technique studies various psycho-emotional states, determines the individual, stable features and characteristics of the subject, which determine the uniqueness of the strategies he uses for the selection and processing of information, problem solving, learning and other cognitive activities. The test was used to determine the indicators of the "Field Dependence" test: field independence, left hemisphere dominance, functional asymmetry, efficiency. The results of the study were analyzed for the entire sample of badminton players, as well as separately for men and women.

Statistical analysis

Statistical analysis was performed using the software package Statistica 6.0 and Excel. Due to the fact that the research results do not fall under the law of normal distribution, methods of nonparametric descriptive statistics were used.

Results

Pollen independence covers a wide range of phenomena, from the degree of stability and adequacy of perception to the manifestations of personality autonomy under external pressure. In the table. 1 shows the results of field independence testing in qualified badminton players. According to the field independence index, which is the inverse of the field dependence, all athletes in our sample show a slight shift in the values of field dependence $Me = 0.77$ um. units, a homogeneous group.



Table 1

Indicators of individual cognitive style (field independence) of qualified badminton players (n = 34)

Test	Indexes	The value of indicators			
		median	lower quartile	upper quartile	CV, %
Pollen independence	Field independence, c.u.	0.77	0.74	0.87	18.46
	Left hemispheric dominance, c.u.	0.92	0.85	1.08	26.89
	Functional asymmetry, c.u.	13.47	7.96	30.43	97.72
	Efficiency, ms	1723.10	1434.60	1991.60	21.02

Analysis of the functional asymmetry index showed that all badminton players in our sample have an average level of asymmetry $Me = 13.47$ um. units, the scatter of indicators varies from low to high, the

group is heterogeneous. Analysis of the effectiveness of the test shows that qualified badminton players show an average level of $Me = 1723.10$ ms, the group is homogeneous (Table 2).

Table 2

Indicators of individual cognitive style of qualified badminton players taking into account sexual dimorphism

Test	Indicators	The value of indicators			
		men (n=12)		women (n=22)	
		median	lower quartile	upper quartile	median
Field independence	Field independence, c.u.	0.77	(0.72; 0.87)	0.80	(0.74; 0.88)
	Left hemispheric dominance, c.u.	0.92	(0.73; 1.02)	0.96	(0.87; 1.13)
	Functional asymmetry, c.u.	15.82	(7.77; 37.28)	13.25	(9.97; 28.23)
	Efficiency, ms	1717,60	(1554,40; 1863,70)	1736,75	(1414,50; 2054,10)

Functional asymmetry is more pronounced in men: $Me = 15.82$ um. from with a larger scatter of indicators, from low to above average. Instead, women show a statistically insignificantly lower level of functional asymmetry $Me = 13.25$ um. from with less scatter of the lower and upper quarters.

The analysis of efficiency in groups taking into account sexual dimorphism showed that men $Me = 1717.60$ ms show insignificantly better efficiency of performance of the task at smaller scatter of indicators, the group is homogeneous. Women have

a lower efficiency of the task $Me = 1736.75$ ms on the background of a greater scatter of indicators, the group is heterogeneous.

In general, men in the "Polyanezalezhnosti" test show a tendency to shift the indicators towards right-hemispheric asymmetry against the background of better performance of the task compared to women.



Discussion

The study showed that cognitive style is leading in shaping the style of play of skilled badminton players. This confirmed the theories about the leading role of psychophysiological functions in the formation of individual style of activity [16, 17, 18]. This is evidenced by the results obtained. Analysis of the values that determine the predominance of the physical (iconic) form of coding over the semantic (semantic) form and characterize the left hemispherical dominance, showed that qualified badminton players show values below one, $Me = 0.97$ um. from which means the dominance of the right hemisphere. The range of indicators ranges from 0.85 um. from (presence of dominance of the right hemisphere) to 1,08 um. from (presence of dominance of the left hemisphere), the group is heterogeneous. If we consider the percentage, then 60% of badminton players show dominance of the right hemisphere, 6% have a balance between the hemispheres and 34% of athletes show left hemisphere dominance.

Analysis of the indicators of the degree of autonomy of the subject from the outside world, which are determined in the test "Field Independence", taking into account sexual dimorphism, showed that men show a statistically insignificant shift towards field dependence. This is indicated by both the medians and the scatter of the lower and upper quarters.

In male badminton players, there is a shift in the direction towards the right hemispherical dominance ($Me = 0.92$ units). Instead, women show a greater balance between the hemispheres, as evidenced by the median ($Me = 0.96$ d. Units), as well as the scatter of the lower and upper quarters. If we consider these values as a percentage, then 72% of men show a predominance of right hemispheric dominance of varying degrees, and 28% have a rate higher than one, ie the presence of left hemisphere dominance. In the group of women, the indicators were distributed as follows: 54% of women show a predominance of right hemispheric dominance of varying degrees, 9% show hemispheric symmetry, and 37% show left hemispheric dominance of varying degrees.

High results in sports of the highest achievements are shown by athletes who have a complex of outstanding features: motor qualities; high psychophysiological characteristics; mental (personal) character traits (purposefulness, determination, perseverance, courage, perseverance, endurance, independence, initiative, patience, reliability, ambition, initiative) [5, 6, 14].

Pomitkin V. [5] points out that in the process of sports selection a very significant role is played by the inclinations and abilities of the individual. Each athlete in accordance with the law of heredity and under the influence of the external environment develops individually. It is proved that the more parameters are controlled, the more accurate can be the forecast of suitability of a particular athlete to engage in the chosen sport [12, 14, 15]. Different content of activity requires the development of certain intellectual abilities of the individual. The development of certain qualities of general cognitive abilities is determined both by the genotype of the individual and the breadth of his life experience [19-21].

According to the special literature, a period of higher achievements in the development of physical capabilities among badminton players has been established: up to 19-22 years for women and up to 21-24 years for men. In the future, high results are achieved without improving speed and strength, and are based on the development of moral and mental improvement, strengthening the nervous system and expanding the strategic understanding of the game [1, 5, 8].

Conclusion

1. It is determined that all athletes in our sample show a slight shift towards field dependence; 60% of badminton players show dominance of the right hemisphere of the brain, 6% have a balance between the hemispheres of the brain and 34% of athletes show left hemisphere dominance; in terms of functional asymmetry and efficiency, qualified badminton players show an average level.
2. It is determined that 72% of men show a predominance of right-hemispheric dominance of varying degrees, 28% have left-hemispheric dominance. 54% of women show a predominance of right-hemispheric dominance of varying degrees, 9% hemispheric symmetry, and 37% have left-hemispheric dominance of varying degrees; functional asymmetry is more pronounced in men; men show a tendency for better test performance.

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Conflict of interest

The authors declare that there is no conflict of interest.

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