# METHOD OF COMPLEX DEVELOPMENT OF PSYCHOMOTOR QUALITIES IN PRECISELY-TARGETED SPORTS

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**Abstract:** *The purpose of the study: the determination of the effect of special precision-target exercises on the level and structure of psychophysiological indicators, physical and technical preparedness of players at the initial stage of training. Material and methods. The study was attended by 22 young footballers 10-12 years old. The subjects were divided into two groups (control and experimental) for 11 people in each. The control and experimental group trained the same amount of time for the same progips, but in the experimental group, in the main part of the class, used the technique of complex development of precision-target movements. Measured the level of physical and technical preparedness, as well as the level of psychophysiological functions of athletes. Results It is shown that the experimental group experienced significant improvements in the techniques of football due to the development of precision-oriented skills. Really improved results of physical and technical preparedness of athletes of the experimental group were revealed. The control group is also characterized by a significant improvement in testing results by level of technical and physical fitness, but not reliable or at a lower level of significance. The positive influence of the method of complex development of precision-target movements on the psychophysiological indices of athletes is shown. It was shown that after the experiment, the number of reliable interrelationships between the indicators of psychophysiological functions and the indicators of technical and physical fitness in the experimental group increased, and in the control remained unchanged. Conclusions. The application of the experimental methodology for the development of precision-target movements positively influenced the level of technical and physical preparedness, psycho-physiological indicators, as well as the structure of the complex preparedness of athletes.*

**Keywords:** *football, athlete, accuracy, strike, psycho-physiological indicators, technical readiness*

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*Мета дослідження: визначення впливу спеціальних точностно-цільових вправ на рівень та структуру психофізіологічних показників, фізичної та*

*технічної підготовленості футболістів на початковому етапі підготовки. Матеріал і методи. У дослідженні прийняли участь 22 юних футболіста 10-12 років. Випробувані були розділені на дві групи (контрольну і експериментальну) по 11 осіб в кожній. Контрольна та експериментальна група тренувалися за однаковими прогпамами однакову кількість часу, але в експериментальній групі в основній частині заняття застосовувала методика комплексного розвитку точнісно-цільових рухів. Вимірювався рівень фізичної та технічної підготовленості, а також рівень психофізіологічних функцій спортсменів. Результати. Показано, шо у випробуваних експериментальної групи достовірно поліпшились показники техніки футболу за рахунок розвитку точнісно-цільових навичок. Виявлено достовірне поліпшення результатів фізичної та технічної підготовленості спортсменів експермиентальної групи. Для контрольної групи також характерно достовірне поліпшення результатів тестування за рівнем технічної та фізичної підготовленості, але не достовірне або при меншому рівні значущості. Показано позитивний вплив застосування методики комплексного розвитку точнісно-цільових рухів на психофізіологічні показники спортсменів. Показано, що після проведення експерименту кількість достовірних взаємозв'язків між показниками психофізіологічних функцій та показниками технічної та фізичної підготовленості в експериментальній групі підвищилась, а в контрольній залишилась без змін. Висновки. Застосування експериментальної методики розвитку точнісно-цільових рухів позитивно вплинуло на рівень технічної та фізичної підготовленості, психофізіологічні показники, а також на структуру комплексної підготовленості спортсменів.*

**Ключові слова:** *футбол, спортсмен, точність, удар, психофізіологічні показники, технічна підготовленість*

**Аннотация:** *Козина Ж.Л., Серый А.В., Гринченко И.Б., Бочаров Е.А., Курят А., Глядя С.А., Васильев Ю.К. Методика комплексного развития психомоторных качеств в точностные-целевых видах спорта*

*Цель исследования: определение влияния специальных точностных-целевых упражнений на уровень и структуру психофизиологических показателей, физической и технической подготовленности футболистов на начальном этапе подготовки. Материал и методы. В исследовании приняли участие 22 юных футболиста 10-12 лет. Испытуемые были разделены на две группы (контрольную и экспериментальную) по 11 человек в каждой. Контрольная и экспериментальная группа тренировались по одинаковым*

*прогпамамы одинаковое количество времени, но в экспериментальной группе в основной части занятия применяла методика комплексного развития точностные-целевых движений. Измерялся уровень физической и технической подготовленности, а также уровень психофизиологических функций спортсменов. Результаты. Показано, шо у испытуемых экспериментальной группы достоверно улучшились показатели техники футбола за счет развития точностные-целевых навыков. Выявлено достоверное улучшение результатов физической и технической подготовленности спортсменов експермиентальнои группы. Для контрольной группы также характерно достоверное улучшение результатов тестирования по уровню технической и физической подготовленности, но не достоверное или при меньшем уровне значимости. Показано положительное влияние применения методики комплексного развития точностные-целевых движений на психофизиологические показатели спортсменов. Показано, что после проведения эксперимента количество достоверных взаимосвязей между показателями психофизиологических функций и показателями технической и физической подготовленности в экспериментальной группе повысилась, а в контрольной осталась без изменений. Выводы. Применение экспериментальной методики развития точностные-целевых движений положительно повлияло на уровень технической и физической подготовленности, психофизиологические показатели, а также на структуру комплексной подготовленности спортсменов.*

**Ключевые слова**: *футбол, спортсмен, точность, удар, психофизиологические показатели, техническая подготовленность*

## INTRODUCTION

Among the modern types of sports of particular popularity become precise-target species. These are sports where you need to perform actions that require hits for a specific goal. Among such sports - sports games, boxing, various types of shooting, etc. These sports appeared to be a necessary element of survival in the wild, and in human society they have become a mass phenomenon that attracts people with their tenderness, a complex manifestation of psychomotor functions.

Precision-target movements are manifested in many types of motor activity. For example, it's different types of shooting (Camus, 2017; Clark, 2016). The art of precision-oriented movements arose in the era of primary people (Arnade, 2018; Ditcham, 2017; Pontzer et al., 2017; Sensfelder, 2017; Silverman, 2016).

At the precise stage, precision-oriented sports are actively developing (Park, 2016; Park et al., 2016; Tarigan, et al., 2018). Together with the development of these kinds of sports, the technique of teaching precision-target movements techniques is developed (Choi, and Ok, 2016). For this purpose, in today's world sports science, research is conducted on the determination of biomechanical and physiological parameters (Ariffin et al., 2018; Reddy et al. 2016; Simsek, 2018; Suppiah, 2017; Taha et al., 2017); The simulation of precision-target movements technology (Richards, 2018), Factors of Fatigue (Lankford, and Higginson, 2016), examines time parameters for identifying factors that impair the achievement of a high athletic outcome (Callaway, et al., 2017, Furley, et. al., 2017), cognitive mechanisms are explored (Gonzalez, et al., 2017), the ability of athletes to self-examine technical actions and training processes su (Tan et.al., 2016), as well as opportunities for the use of precise sports as a means of stress (Aysan, 2016).

Precision-target movements technique is used as an example for the analysis of the laws of mechanics and biomechanics in various training programs (Broglio, et al., 2016,). Precision-target movements are also used as an analogy for psychoanalysis (Richards, 2018). Determine the risk from the point of view of traumaticity and suggest solutions to this problem (Prine, 2016). The technique of precision-target movements is also analyzed from the point of view of the training of athletes with disabilities (Shiiya et al., 2017; You, et al., 2016).

Thus, modern scientific research reveals the importance of the formation of the correct technique in precision-oriented movements (Grygorowicz et al., 2017; Hadlow et al., 2017; Hart et al., 2016; Kobayashi et al., 2017). But the question remains unclear about the development of special techniques for the development of precise actions. The exercises are mainly directly exercises specific to a particular sport without special exercises for the development of target precision as a complex psychomotor quality (Merrell et al., 2017; Prasetio, D. et al., 2016; Rosli et al. 2018; Ward et.al., 2018; Winchester et al., 2017; Woods et al., 2018). It should be noted that in game precision-target species there are methodological developments for the development of accuracy. Several studies have shown that target precision is a complex quality that requires the display of both physical indicators and indicators of functional preparedness, the development of psychophysiological functions, etc. (Kozina, 2016). A methodology for the development of accuracy in basketball in combination with the development of speed-strength qualities is proposed (Kozina et al., 2011, 2015, 2016, 2017). The development of target precision is an integral part of the athlete's development as a system that is self-regulating. It is logical to conclude that in other precision-oriented sports, in particular in football, the use of

special exercises, including - from other sports, for the development of target accuracy, will have a positive impact on the effectiveness of training accuracy of strikes and transmissions. Especially this question is relevant for athletes at the initial stage of preparation, when the versatile preparation is of great importance for the creation of the basis of technology.

The purpose of the study: the determination of the effect of special precision-target exercises on the level and structure of psychophysiological indicators, physical and technical preparedness of players at the initial stage of training.

## MATERIAL AND METHODS

Participants

The study was attended by 22 young players 10-12 years old. All children and their parents have agreed to participate in the experiment. The research was conducted from 01.03.2018 to 01.07.2018 on the basis of "Arsenal" Youth Sports School. The subjects were divided into two groups (control and experimental) for 11 people in each. Distribution was made by accident.

The study was conducted in accordance with the requirements of the Helsinki Declaration Ethics.

## ORGANIZATION OF RESEARCH

The control and experimental group trained the same amount of time (4 times a week for 2 hours each training session) for the same progapam, but in the experimental group in the main part of the class, the technique of complex development of precision-target movements was used. In the control group at that time exercises were applied with the use of mobile games without the special focus on the development of precision-target movements. In the beginning and at the end of the experiment, athletes were tested. By the beginning of the experiment, the groups did not differ significantly from each other (Table 1) according to psychophysiological indices (according to Horbova and Schulte tests), according to indicators of physical preparedness (bending-extension of hands in the emphasis of lying and squatting) and indicators of technical readiness (accuracy of hits at the gate , an exact coordination test, a description of the tests are given below).

Methodology of complex development of precision-target movements

The technique with the use of special precision-purpose exercises was used in the experimental group. The experimental group was engaged in the standard program, but the time at the common practice was reduced, and in the training were included additional exercises, such as throwing basketball into the basket, throwing the tennis ball into the target with distances of 3-10 m, blows m ' Bags of different sizes and different weight with a foot to the target with distances of 5-12

m, juggling with legs and hands with balls of different sizes and different weights. Exercises were conducted using sequential and game techniques.

**THE TEST FOR THE ACCURACY OF HITS AT THE GATE**

Strike a foot on a stationary ball from a distance of 8 m in the gate. The ball must cross the gate line in the air and descend by 10 m, 12 beats (6 right, 6 left leg). Estimated number of hits.

**PRECISION COORDINATION TEST**

The footballer is in the center of the field (distance 50 m from the goal line). By the signal, without touching hands, juggles (at least 5 times) the ball, moving forward. Before the first stop, the ball stops the foot and successively circles 5 racks (distance to the first rack - 4 m, between the racks - 7 m). Having reached the last stand but does not reach the line of the penalty area, he takes a kick on the ball by the foot to the goal. The ball must intersect in the air through the gates between the racks and under the crossbar. Evaluated quality and time of exercise (2 attempts, rated best) (c).

Investigation of the level of attention in the method of Horbova "Red-black table" [11].

Goal.

Estimation of switching and distribution of attention. Can be used to survey people of all ages.

The study is conducted using special tables, in which randomly located 25 red and 24 black numbers. The tester must first find the black numbers in ascending order, then the red numbers in descending order. Immediately after the first task, the numbers in the table are mixed, and the subject begins to perform the second task. It consists in alternating the search for black numbers in the growing and red in descending order.

**DATA PROCESSING.**

The time taken for each series and the error are taken into account. The time of execution of the second task is not equal to the time of execution of the first task, because part of the time goes to switching the attention and operational content of the just mentioned numbers. The difference between two time indices will be the time of switching attention (ERV) from one row of numbers to another. The less this difference, the less the number of errors, the better the switching attention. Types of errors: skipping a number, repeating one number twice, choosing the wrong color number.

After completion, the results of the first and second tests, as well as ERW are displayed on the screen and automatically entered in the database.

Research of mental performance according to the method of "Table Schulte" [1, 8].

Goal.

Determination of stability of attention and dynamics of efficiency. Used to survey people of all ages. The tested in turn offers five tables, on which randomly numbers are from 1 to 25. The searcher looks for, shows and names the numbers in the order of their growth. The sample is repeated with five different tables.

The main indicator is the time of execution. According to the results of each table, a depletion curve (fatigue) can be constructed, which reflects the stability of attention and performance in dynamics.

With this test, you can also calculate indicators such as performance (EP), degree of exercise (BP), mental resistance (PU).

$$ER = \frac{T1 + T2 + T3 + T4 + T5}{5}$$

where T1 - time of work with the first table; T2 - from the second; TK - from the third; T4 - from the fourth; T5 - from the fifth.

The degree of development (BP) is calculated by the formula:

$$BP = \frac{T1}{ER}$$

The result is less than 1,0 - the indicator of good training, respectively, the higher the given figure, the more the subject needs time to prepare for the main work. Mental endurance (endurance) is calculated by the formula:

$$PU = \frac{T4}{ER}$$

Indicator of the result (PP) of less than 1,0 says good mental stability and, accordingly, the higher the given indicator, the worse the psychological stability of the researched before performing a given job. After completion, test results are automatically entered into the database.

Statistical analysis.

The digital material obtained during the study was processed using traditional methods of mathematical statistics. For each indicator, the arithmetic mean value X, the mean square deviation S (standard deviation), and the validity of the differences between the parameters of the initial and final results, as well as between the

control and experimental groups according to the t-student criterion with the corresponding level of significance (p) were determined.

A correlation analysis of the test parameters was also conducted for the experiment and after the experiment (the results of the control and experimental groups were processed separately for each group).

In mathematical treatment of the primary materials of this study, in addition to calculating primary statistics, a correlation analysis of the test indicators was conducted. Mathematical processing of data was carried out using Microsoft Excell's Data Analysis SPSS research programs. Differences were considered to be reliable at a significance level of $p < 0.05$.

## REFERENCES:

1. Ariffin, M. S., Rambely, A. S., & Ariff, N. M. (2018). Wrist Muscle Activity of Khatrah Approach in Mameluke Technique Using Traditional Bow Archery. In K. Ibrahim, M. M. Hanafiah, M. H. H. Jumali, N. Ibrahim, & S. A. Hasbullah (Eds.), 2017 Ukm Fst Postgraduate Colloquium (Vol. 1940).

2. Arnade, P. (2018). Archery and Crossbow Guilds in Medieval Flanders, 1300-1500. American Historical Review, 123(1), 308-309. doi:10.1093/ahr/123.1.308

3. Aysan, H. A. (2016). The Effects of Archery as a Sports Branch on Coping with Stress. Studies on Ethno-Medicine, 10(1), 39-43.

4. Broglio, S. P., Williams, R., Rettmann, A., Moore, B., Eckner, J. T., & Meehan, S. (2018). No Seasonal Changes in Cognitive Functioning Among High School Football Athletes: Implementation of a Novel Electrophysiological Measure and Standard Clinical Measures. Clinical Journal of Sport Medicine, 28(2), 130-138. doi:10.1097/jsm.0000000000000420

5. Callaway, A. J., Wiedlack, J., & Heller, M. (2017). Identification of temporal factors related to shot performance for indoor recurve archery. Journal of Sports Sciences, 35(12), 1142-1147. doi:10.1080/02640414.2016.1211730

6. Camus, R. M. (2017). Comparison by Metaphor: Archery in Confucius and Aristotle. Dao-a Journal of Comparative Philosophy, 16(2), 165-185. doi:10.1007/s11712-017-9545-y

7. Choi, S., & Ok, G. (2016). The Role of Gukgung in the Success of South Korean Archery. International Journal of the History of Sport, 33(9), 990-1007. doi:10.1080/09523367.2016.1237507

8. Clark, G. A. (2016). Philosophy as Practice Zen and Archery (Vol. 72).

9. Ditcham, B. G. H. (2017). Archery and Crossbow Guilds in Medieval Flanders, 1300-1500. Sixteenth Century Journal, 48(2), 485-487.

10. Furley, P., Noel, B., & Memmert, D. (2017). Attention towards the goalkeeper and distraction during penalty shootouts in association football: a retrospective analysis of penalty shootouts from 1984 to 2012. Journal of Sports Sciences, 35(9), 873-879. doi:10.1080/02640414.2016.1195912

11. Gonzalez, C. C., Causer, J., Grey, M. J., Humphreys, G. W., Miall, R. C., & Williams, A. M. (2017). Exploring the quiet eye in archery using field- and laboratory-based tasks. Experimental Brain Research, 235(9), 2843-2855. doi:10.1007/s00221-017-4988-2

12. Grygorowicz, M., Michalowska, M., Walczak, T., Owen, A., Grabski, J. K., Pyda, A., . . . Kotwicki, T. (2017). Discussion about different cut-off values of conventional hamstring-to-quadriceps ratio used in hamstring injury prediction among professional male football players. Plos One, 12(12). doi:10.1371/journal.pone.0188974

13. Hadlow, S. M., Pinder, R. A., & Sayers, M. G. L. (2017). Influence of football size on kicking performance in youth Australian rules footballers. Journal of Sports Sciences, 35(18), 1808-1816. doi:10.1080/02640414.2016.1239023

14. Hart, N. H., Cochrane, J. L., Spiteri, T., Nimphius, S., & Newton, R. U. (2016). Relationship between Leg Mass, Leg Composition and Foot Velocity on Kicking Accuracy in Australian Football. Journal of Sports Science and Medicine, 15(2), 344-351.