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## Specific training for improving the skill and speed in junior football players

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### Abstract

*Background.* The purpose of the study was to realize the priorities in physical, technical and tactical training for junior football players. Moreover, preparing of the content was intended to optimize the use of the most efficient methods and means for increasing the efficiency of speed and skill during the training and games.

*Objectives.* Data were collected from 18 junior football players, with ages ranging from 14-15 years, members of the ACS Unirea (C) Tritenii de Jos team. The subjects were tested three times during the whole training stage, pre, middle and post-training examinations being performed. The three examinations consisted of 5 tests each: 50-meter sprint, standing long jump, 2000 meter running, maintaining the ball in the air and leading the ball through markers.

*Methods.* Specific methods for developing the speed used in the study are based on repetitions (specific efforts at maximum or submaximal speed, under usual, relieved, severe conditions), on various efforts and intervals. Skill development methods took into account the complexity of coordinating action movements and the spatial, temporal, and motion force precision. For developing motor skills, the authors used the interval and circuit training.

*Results.* All the participants attained higher levels of performance, both at the second and third examination, on each of the 5 tests. Data collected were analyzed using the One -Way ANOVA statistical procedure, which compares the results obtained by one single group of subjects. This procedure revealed, at a significant level of confidence, that the mean of the performance enhancement reached 50 percents along the one-year training stage.

*Conclusions.* The research has shown that, by giving a more significant share of the best methods and means for developing the speed and skill in the physical training of junior footballers, the increase in the performance of these motor skills is significant.

**Keywords:** training methods, junior football players, speed, skill

### Rezumat

*Scop:* Cercetarea și-a propus determinarea nivelului de pregătire fizică generală și a nivelului de pregătire specifică a tinerilor implicați în studiul experimental și identificarea mijloacelor care facilitează dezvoltarea capacităților motrice necesare obținerii performanței.

*Obiective:* Îmbunătățirea pregătirii fizice a fotbalistilor juniori, prin utilizarea eficientă a mijloacelor fizice și tehnico-tactice de antrenament, va determina o ameliorare a evoluției, atât în procesul de pregătire cât și în jocurile oficiale.

*Material și metode:* Cercetarea a fost realizată de-a lungul unui an competițional pe un grup de 18 subiecți, băieți cu vârsta cuprinsă între 14-15 ani, care fac parte din cadrul unei grupe de juniori legitimați la ACS Unirea (C) Tritenii de Jos. Grupului i s-a aplicat un program care a constat în testarea în trei stadii (inițial, intermediar, final) prevăzute în protocolul conceput în cadrul studiului. Între două stadii succesive participanții au efectuat programul săptămânal stabilit prin protocol. Fiecare test a cuprins cinci probe: alergare de viteză 50 metri, alergare de rezistență 2000 de metri, săritură de pe loc, menținerea mingii în aer, conducerea mingii printre jaloane 20 metri dus-întors. Metodele specifice utilizate în studiu pentru dezvoltarea vitezei

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sunt bazate pe repetări, eforturi variate și sprinturi pe intervale. Metodele de dezvoltare a îndemânării au avut în vedere complexitatea de coordonare a acțiunilor motrice și precizia spațială, temporală și de forță a mișcărilor. Metodele de antrenament utilizate pentru dezvoltarea calităților motrice au fost: antrenamentul cu intervale și antrenamentul în circuit.

*Rezultate și concluzii:* Toți participanții au atins niveluri mai ridicate de performanță, atât la testul al doilea, cât și la cel de-al treilea, pentru fiecare dintre cele 5 teste. Datele colectate au fost analizate utilizând procedura statistică ANOVA simplă care a relevat, la un nivel semnificativ de încredere, că media creșterii performanței a atins 50 de procente de-a lungul etapei de formare de un an.

**Cuvinte cheie:** metode de antrenament, fotbal, îndemânare, viteză, rezistență aerobă

## Introduction

Soccer, in its global evolution, has, in its current stage, as a standard feature in all high-performance teams, the increasing effort throughout the game to win. The game has become perfectly balanced, with very offensive, very collective, with a full rhythm, with complete athletic training with total physical commitment [1, 2].

This game dramatically demands the manifestation of the physical factor determined by the content of the effort. Increasing the driving density in every unit of time is explained by a high number of gaming actions. A player of the world's elite football teams performs in 1-2 minutes or even 3, speeds, a jump, an air duel or an individual technical action. In general, all the minutes of the game are active, and even if some effort can stagnate, it is done with the intent of amplifying it in the next stages.

As for the motoring qualities, there is a predominance of velocity manifested in its forms of movement, execution, reaction; as well as the placement, movement, and handling of the ball. Speed is correlated with other driving qualities and is carried out in a resistance and force regime with the decisive role of skill in achieving technical-tactical combinations [3].

Effort increment is represented primarily by the large number of official or preparatory meetings, their peculiarities, and stake. Physical demands made in the running at a total distance of 6-9 km from the majority of players in 80-140 speed actions maximum on a distance ranging from 700 - 2500 - 3000 m, in 40-80 direct physical contact with opponents, 80-120 jumping and other physical actions - turns, changes in direction, falls, jumping.

In this paper, the issue of developing motor skills with the help of the specific means of football was pursued. The paper aims to bring the experts a methodical material, with scientific and systematized content, which is the basis of the training process, especially during the precompetitive and competitive period. The proposed means of action are accessible to the age and level of training and do not require extra effort. The requirement to model the development of motor skills, in addition to correlation with technical and tactical training, is also achieved with

regard to the content, structure, and dynamics of the specific effort.

Speed, skill, and specific strength are the most critical driving qualities in the football game. Their specific means of development, as well as technical and tactical training, require dosing and management of training appropriate to age and competitive level.

This scientific approach led to the organization of an experimental study.

The results show that specific training, conducted during a competitive season with appropriate methods and means, improves the performance of the footballers.

## Purpose and Objectives

We intend to study to what extent the performance of junior football players differs according to the type and characteristics of the training methods used.

Research has proposed the following goals:

- determining the level of general physical training and the specific training level of the players involved in the experimental study;
- identification of the means to facilitate the development of the motor skills necessary to achieve performance in training and during the games.

## Materials and Methods

**Participants:** The research was conducted on a group of 18 subjects, boys aged 14-15 years, characterized by homogeneity in age and physical and mental development.

The subjects are part of a group of junior qualified ACS Unirea (C) Tritenii de Jos, headed by coach Andrei-Petru Pintilie, with the written consent of the parents of minors.

**Venue and time:** The research was conducted at ACS Unirea (C) Tritenii de Jos throughout the 2015-2016 football year.

The specific methods for developing the speed used in the study are based on repetitions (specific efforts at maximum speed or submaximum, under normal, relieved, difficult conditions)[4], on varied efforts [5, 6, 7, 8, 9].

Methods of skill development have taken into account the complexity of coordination of motor

actions and spatial, temporal and movement accuracy [10, 11, 12].

Methods of training for the development of motor skills: Interval training [13] and circuit training [14, 15, 16, 17].

The research methods used in the study are the direct and indirect observation method, the measurement and evaluation method, the statistical-mathematical method.

The data obtained from the measurement and evaluation tests used were recorded in individual and collective records for centralizing, processing, comparing and establishing the relationships between them.

The Protocol: The experimental group was assigned a program consisting of the three-stage (initial, intermediate, final) testing set out in the protocol of this study. During the period between two successive stages, the participants performed the weekly schedule established in the protocol developed in the study.

Each test comprised five control samples.

Initial testing was performed on 21.09.2015 by applying test 1. Between 22.09.2015 - 10.01.2016, the protocol for improving the parameters of speed, skill, strength was applied. On 11 January 2016, test 2 was applied. Between 12.01. - April 17, 2016, the protocol for improving the parameters of maximum speed, increased skill, and specific resistance was applied. On 18.04.2016, test 3 was applied.

#### *Protocol for the period between tests 1 and 2*

##### *Technical description*

##### **Speed 1**

- running on the spot, in natural tempo; at a signal, running at a maximum of 5-6 ", followed by light running;
- accelerated runs at different distances (20-50 m);
- face running, signal - turning 180 degrees, then running backward;
- running at the hill, running down the valley;
- running with the traction of a rubber;
- running in ham;
- jumping from different positions to the signal, continued with 20-30 m distances; 5-6."

##### **Skill 1**

- individually, from the speed jump, throw the ball with his hand, hit the foot forward, then catch and hit again; the running speed is kept constant, and the ball must not fall on the ground;
- keeping the ball in the air by repeated kicks with the foot, thigh, and head, moving in speed, in a straight line;
- individually along the field, hitting the ball with the low trajectory, forwarding it to 5-6 m, then running in speed and kicking directly with the foot at the same distance and the same trajectory after deflected from the ground;
- throwing the ball with her hand in the ground, hitting her in the jump, with her head, sending her with high trajectory before, then catching and throwing again;
- running the ball, alternately with the left and right legs, speeding with the back;
- a player is running in speed, with directional changes, another player runs with the same ball.

##### **Resistance 1**

- Two players, A and B:
  - player A passes the ball at 8-10 m to player B so that the latter is forced to run 4-6 m to reach it;
  - B reshapes A's ball;
  - passing B on the other side, forcing him to run to resume the ball (30 "); - roles are reversed;
  - after 30 "request follows 30" active pause with simple passes.
  - This exercise requires a strong demand if the player A launches the ball directly and, as far as possible, in an unobstructed direction. These results in the running at 10-12 x 4-6 m distances, bringing the pulse to 168-188 beats per minute.
- With two players, 18-20 meters away, each with a ball:
  - each player directs the ball with his right foot, at high speed, towards each other;
  - before they meet, each passes the ball with his left foot on the right side, then returns and runs after the partner's ball;
  - each reaches the ball and stops the ball, returns, resumes the initial distance and repeats the exercise in the same way - 30 "duration;
  - after an active 1-2 minute break, repeat using the other foot - 30 "duration;

- usually runs 5 x 10-15 m running with the ball management;

The request depends on the running speed, the pulse increases to 180.

On a half-field, the 11-meter line is extended, parallel to the median line. In the prolongation of the small bow, a few balls are placed, from 3 to 3 m.

The following cycles are executed:

- effort 15 "- starts up to the 11 m line and backward;
- rest 60 "- walking and maintaining the ball;
- effort 20 "- starts with 6-meter directional changes, bypassing the ball back and forth in the 11m space;
- rest 90 "- relax, walk, pass in two;
- effort 15 "- starts up to 11 m and back, with 2 jumps after each start;
- resting 60 "- walking, walking in two;
- effort 20 "- starts up to 11 m, running face and back;
- rest 180 "- walking, relaxing, walking in two.

### **Protocol for the period between tests 2 and 3**

#### **Speed - 2**

- Running at different speeds: Once progressive acceleration has achieved the maximum speed, the player continues running for another 10-20 m at maximum speed, then slows down the effort gradually;
- 10-15-20 m displacements, from different positions: squatting, jumping on the spot, on both legs, and so on;
- repeated jump with turns; the players in support of the squat, on the starting line, start at the signal on a 15 m route; the first 30 m (15 rounds, 15 turns) will run in mild running, then 15 m again at maximum speed;
- slalom running competitions and bypassing the obstacles (hoops), all in the form of a relay: start at the signal, avoid the obstacle placed at 15-20 m, return with the ball of the ball; jogg - shuttle without stopping, bring the ball: run back 10 m, then return 20 m, total 60 m (or variant 20 + 20, 30 + 30, total 100 m);
- Running the ball with difficulty: Run 20 m with a medicinal or other weight, put the weight down, then run another 20 m, avoid an obstacle and

come back to pick up the weight, come back with her to the group and be surrendered to the next performer;

#### **Skill - 2**

- Two players, face-to-face, 10-15 m apart: one player guiding the ball, halfway through a 180-degree turn, overstepping the other player, returning to the original position, and pass the ball;
- Inside one half of the field, at equal distances, eight players are placed, each with the ball (four at the corners and four at the sides of the sides). Another player runs in front of them, at 10-12 m, receives the ball from each and, by direct blows, tries to put them in the net;
- from the formation on a string, 30 m from the gate, the players run in a row and, after 8-10 m, they receive the ball thrown by the hand of a partner who sends it forward, strikes it at will and puts it in the gate;
- overtaking the speed of a defender, kicking the ball or throwing the ball with the tip of the foot over it, then finishing with a shot at the goal;
- keeping the ball with seat exchange; one player (A) throws the ball diagonally to another player (B), the latter holds it and, juggling it, runs to A, which then lies behind B; now B passes to A with his head, after which the exercise resumes;
- two players face to face at 18-20 m: A player leads the ball in speed, while B runs without the ball; on the new positions they reached, to pass B's ball and continue the exercise;

#### **Resistance- 2**

The complex of exercises specific in 5 series:

Work on half the field. From the 16 m line, the 10, 20 and 30 m distances are measured at the center of the field. 4 players (preferably the 4 forerunners), each with his ball, help the other four to return the balls to useful time.

- 1<sup>st</sup>Series
  - 5 x 10 m driving the ball in the speed, with firing at a gate of 16 m;
  - rest 15 "after each lead, bringing the ball and return 30";
- 2<sup>nd</sup>Series
  - 5 x 20 m moderate direction of the ball, shooting at a gate of 16 m, with the base leg (force in speed);

- rest 20 "after each driving (60" at the end of the series, with two passes);
- 3<sup>rd</sup> Series
- 5 x 20 m sprint with chick at the gate from 16 m, static ball;
- rest 30 "after each sprint (80" at the end of the series);
- 4<sup>th</sup> Series
- 5 x 20 m (at medium speed driving) sprint at 16 m, with the clumsy foot;
- rest 20 "after each driving (60" at the end of the series);
- 5<sup>th</sup> Series
- 5 x 30 m sprint with chick at the gate from 16 m, static ball;
- 40 "rest after each sprint (180" at the end of the series).

The complex of 4 specific exercises in one series:

It is used for individualization and works on the entire playing surface.

#### Exercise 1

- 2 x 16 m, pass, and sprint - on the goal line, the player with the ball passes with the coach on the side; midway sprints up to 1 m of the coach, rejects the ball, passes directly with the coach and sprints to the goal line;
- rest 30 "- keeping the ball;

#### Exercise 2

- 2 x 35-40 m, driving through the ramps - from the 16 m line, driving at 5 speeds at equal distances up to the center line (35-40 m);
- rest 50 "- easy to hold and keep the ball;

#### Exercise 3

- 2 x 35-40 m, two inches, simple and with the exchange of seats;
- 1 x 35-40 m, at a distance of 10 m from the 16 m line, passes in two at maximum speed to the center;
- rest 40 "- walks in two further, up to 16 m, in mild running and passes in two until the end of the intervals;
- 1 x 35-40 m, at a distance of 10 m from the 16 m line, passes in two at maximum speed, to the center, with the exchange of seats;
- resting 80 "- walking in two with seat change, up to 16 m in mild running and continuing the steps until the end of the interval;

#### Exercise 4

- 2 x 20 m, driving and shooting at the gate, in return;
- at the intersection of the 16-meter line with the bottom one, at each corner is a ball; the player drives at a speed of 16 m, makes a shift to the 4 m junction, shoots at the gate and continues the easy run to the opposite corner, where he repeats the exercise by shooting at the gate with the other foot.

### Results

The overall average of all five samples, performed on each of the tests, is the evolution of players' performance on driving capabilities.

The control samples applied in the three tests were selected to cover a wide range of general motricity, different forms of manifestation of necessary motor skills and, implicitly, technical-tactical training, but also to provide information necessary to demonstrate the hypothesis.

A particular score was associated with the control samples to unify the measurement units used to quantify the data collected in each sample (distance, time, frequency), respectively to facilitate their statistical processing and to interpret the results.

The compilation of the score grids for each sample was based on the following considerations:

- the minimum limit reflects an average level of subject performance at the beginning of the research but also allows for any regressions that might occur in the next stage;
- the scoring of points between two consecutive stages will indeed reflect a steady and significant quality growth;
- the upper limit also represents the average level of performance achieved at the end of the last stage of the research, with the possibility of one step being exceeded by the best participants.

Since the design of the research is one with repeated measurements, it is strictly necessary to analyze the condition of sphericity of the data (the homogeneity of the variants in the experimental conditions as well as in any two comparison conditions) using the Mauchly W test:

**Table I.**Mauchly W test

Within Subjects Effect	Mauchly's W	Aprox. Chi Square	df	Sig.	Epsilon <sup>b</sup>		
					Greenhouse - Geisser	Huynh -Feldt	Lower - bound
Performance	0.87	2.2	2	0.33	0.88	0.98	0.5

The value of Mauchly's W = 0.872 is statistically insignificant for the threshold  $p = 0.333 > 0.05$  (in the table p is denoted by Sig.) Moreover,consequently, the sphericity condition is met. In this situation, the Epsilon coefficients in the table are not of interest; they are used to make specific corrections when the spherificationis not fulfilled. Column df stands for degrees of freedom (df = number of steps - 1).

**Table II.**Intra-subject effects test

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Performance Sphericity Assumed	4126.77	2	2063.38	323.95	0.00
Greenhouse-Geisser	4126.77	1772	2328.51	323.95	0.00
Huynh-Feldt	4126.77	1.96	2101.65	323.95	0.00
Lower-bound	4126.77	1.00	4126.77	323.95	0.00
Error (Performance)	216.55	34	6.36		
Sphericity Assumed					
Greenhouse-Geisser	216.55	30.12	7.18		
Huynh-Feldt	216.55	33.38	6.48		
Lower-bound	216.55	17.00	12.73		

The table includes the results of the Levene tests (Test F), which check the homogeneity of the variants. The variants must be relatively equal for each of the three stages of the experiment. The condition of sphericity is met, only interest in the first row of the table.

The value obtained,  $F(2, 34) = 323,959$ , significant at a  $p = 0.000 < 0.05$ , indicates significant differences between the experimental stages in performance. In other words, it can be said that there is a significant effect of the independent variable (VI) - the

application of appropriate methods and methods of training - on the dependent variable (VD) - the performance - the level of the motoric capacities, the risk that this statement is wrong being zero. Consequently, the research hypothesis is validated. To support the above conclusion, the contrast test and the post-hoc test continue. The contrast test generates the table:

**Table III.**Contrast test

Source Performance	Type III Sum of Squares	df	Mean Square	F	Sig.
Performance Level 1 vs. Level 2	2913.38	1	2913.38	181.01	0.00
Performance Level 2 vs. Level 3	1317.55	1	1317.55	157.24	0.00
Error (Performance)					
Level 1 vs. Level 2	273.61	17	16.09		
Level 2 vs. Level 3	142.44	17	8.37		

The values in the table indicate:

- $F(1, 181.015)$ ,  $p = 0.000 < 0.05$  - there are significant differences between the "initial" and "intermediate" stages (in the table: "Level 1 vs. Level 2");
- $F(1, 157.243)$ ,  $p = 0.000 < 0.05$  - there are significant differences between the "intermediate" and "final" stages (in the table: "Level 2 vs. Level 3").

The post-hoc (unplanned) test is intended to detect significant differences when there is a probability of producing type I errors. The results presented in the table below are as follows:

**Table IV.** The post-hoc test (Bonferroni)

(I) Evaluation	Mean difference (I-J)	Standard error	p	95% confidence Interval for the mean difference	
				Lower limit	Upper limit
				pre (inițial) intermediar	-12.722
post (final)	-21.278	0.874	0.002	-23.598	-18.958
intermediary pre	12.722	0.946	0.001	10.212	15.233
post	-8.556	0.682	0.004	-10.367	-6.744
post pre	21.278	0.874	0.002	18.958	23.598
intermediar	8.556	0.682	0.003	6.744	10.537

The first column shows the elements of the comparison matrix (between stages), and in the second the differences between the compared pair averages. There are standard errors and significance thresholds for each media difference. The last two columns indicate the minimum and maximum limits for the confidence interval for a 95% confidence level.

### Discussions

The first analysis of the statistical series in the table also provides the first relevant observation: the comparison of the individual values in the three steps indicates a significant increase in performance for all subjects.

The overall average of all five test samples, performed on each test, is the evolution of player performance on motor capabilities, in the dependent variable of research.

The analysis of the results of the experiment led to the validation of the research hypothesis, according to which the use of the appropriate training methods and means presented and applied in this research determines the performance of the junior footballers on the level of driving capacities (speed and skill), on average by 50%.

It was found that at this age, in the training of juniors, it is advisable that physical training and

technical-tactical training should have equal weight. Using complex exercises that also provide technical and tactical objectives, one can work with optimal performance to increase the degree of development of different motor skills.

### Conclusion

The research has shown that, by giving a more significant share of the best methods and means for developing the speed and skill in the physical training of junior footballers, the increase in the performance of these motor skills is significant, manifesting itself shortly after the implementation of these types of training.

Taking into account the positive, statistically demonstrated influences on the motor quality complex, it can easily be deduced that the technical and tactical availability of the athletes will be positively influenced.

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