DIAGNOSING MOTOR COORDINATION ABILITIES IN TRAINING JUNIORS IN FOOTBALL

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Introduction

The contemporary football meets many requirements, ranging from those physiological to psychological which determine motor, fitness, technical and tactical actions. Undoubtedly, the development of physical, technical, tactical and mental fitness are necessary to rise sports level. Motor coordination abilities are one of the most common issues explored by theoreticians of physical education. Nevertheless, they still constitute one of the least known field of research.

Recently it has been found that higher level of development of motor coordination abilities increases the level of sports championship. A key to success is a proper choice and usage of motor-sports tests that evaluate particular coordination abilities of players with different level of physical and somatic development (Ljach 1995, Ljach, Witkowski 2004, Raczek, Mynarski, Ljach 2002, Starosta 2003).

Objectives

The aim of this paper is to evaluate the level of motor coordination abilities among young football players aged 14-15 and 16-17. The undertaken issue is unusually current, interesting and of great importance as regards the effectiveness of the process of training young football players (Cicirko i in. 2000, 2004, 2005, 2007).

Taking this into consideration one formulated the following research questions:

1. What is the level of development of motor coordination abilities of young football players aged 14-15 and 16-17?

2. What are the differences between the indices characterising the area of motor coordination sphere among players after a two - year training period?

Materials and methods

1. The research material constitute the results of measurements conducted among 20 football players whose calendar age was 14-15 and 16-17. Young football players trained regularly ca. 4-5 times per week in their own clubs. Their average training experience was 7 years. Players began to participate in tests after 15- minute general warm-up. In order to improve the course of measuring and increase the level of motivation and concentration of the subjects, the authors of that work explained in details and demonstrated the proper way of performing all tests. Before performing the main test the subjects were allowed to do several, trial repetitions to get accustomed to the test. In evaluation of motor coordination abilities the following tests were used (Lijach, Waśkiewicz 1998):

1. **Test assessing motor adjustment** – race with circling the poles

Accessories: a tape measure, 3 poles, a ball, a stopwatch.

The course of test: 3 poles placed on 10 m section, the first one is situated 2,5 m from the start line, the next poles at the same distance from each other. At a given signal, a player runs circling the poles from the right side, then repeats it twice with a ball. While circling poles from the left side he dribbles the ball with the right leg, and vice versa.

Result: the difference between race without and with a ball.

2. **Space orientation** – race to the colour balls

Accessories: 6 balls, a stopwatch, a tape measure, boards.

The course of test: a player stands next to the ball placed 3m from other balls on the circumference of a circle with a 3-meter radius, at a distance of 1,5 m from each other. At a given signal he turns around and runs to the ball which has the same colour as shown on the board. After touching this ball with a leg he returns, touches the starting ball and runs to the next one which is indicated by the examining person. The situation repeats 5 times. About 20 min earlier a player performs a swing race 5x3m.

Result: the difference between the time of swing race and race with balls.

3.   **Kinaesthetic differentiation of movements** – long shot

Accessories: a tape measure, a basketball, a football.

The course of test: a player kicks 10 times a basketball and a football (alternately); a ball should stop itself as close as possible to the indicated line which is at a distance of 10 m from the examined person.

Result: the arithmetic mean of 10 kicks.

4.   **Balance** – standing on one leg and keeping a ball on a foot

Accessories: a ball, a stopwatch.

The course of test: a player stands on one leg, hands on hips, the second leg outstretched forwards; he tries to keep a ball on his foot. Moving hands from hips, dropping the ball or moving the first leg ends an attempt.

Result: better time out of two repetitions.

5.   **Speed of reaction** – trapping with the foot

Accessories: a ball, two gym benches, a tape measure.

The course of test: benches are fastened from one side at a height of 1 m, at a distance of 5 cm from one another. A player stands 4 m away from the benches. At a given signal an examining person says "hop" and lets a ball go down the benches, the player turns around and tries to trap the rolling ball with his foot as fast as possible.

Result: the mean distance covered by the rolling ball in two attempts.

6.   **Movement combining** – slalom with dribbling two balls

Accessories: a tape measure, 3 poles, 2 balls, a stopwatch.

The course of test: 3 poles placed on 10 m section, the first one placed 2,5 m from the start, the rest at the same distance from one another. At a given signal a player dribbles two balls between the poles.

Result: the mean time out of two attempts.

7.   **Rhythmization** – lifting a ball with the foot

Accessories: a stopwatch, a ball.

The course of test: at a given signal a player lifts a ball in order to roll it on the instep.

Result: the mean of two attempts performed with the right and left leg.

Results

Table 1 presents statistical indices characterizing motor coordination abilities of young football players aged 14-15 and the comparison of their results after a period of two years' training. It must be noted that in two cases tests were carried out in identical conditions in order to make the comparison objective and reliable. In this way one can also evaluate reliably a coach's work. The analysis of data in Table 1 shows the progress of results in all tests. Players aged 16-17 gained much better results. I can be explained by the fact that players were older but also by bigger experience and above all the improvement of physical and special fitness as well as technical skills.

Table 1.

Statistical parameters characterising the level of motor coordination abilities of young football players

Lp.	Test 1A (s)		Test 1B (s)		Test 2 (s)		Test 3A (cm)		Test 3B (cm)		Test 4 (s)		Test 5 (cm)		Test 6 (s)		Test 7 (s)	
age	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17	14/15	16/17
X	3,63	3,4	3,73	3,59	8,59	7,85	136,5	109,3	145	116,8	74,24	158,5	184,2	137,2	8,13	7,86	15,03	24,94
S	0,87	0,67	0,64	0,54	1,61	0,8	66,04	51,5	64,03	39,8	38,75	68	27,41	55,89	1,46	1,29	1,58	4,29
V	23,86	19,7	17,16	15,04	18,79	10,19	48,38	47,1	44,16	34,1	52,2	42,9	14,87	40,73	17,94	16,41	10,55	19,93

The most significant differences as regards motor coordination abilities were visible in test 5 evaluating the speed of reaction, which was proved by the value of variation indices. Average distance of stopping the ball with foot decreased by 47 cm among players aged 16-17. In other tests older players gained better results as well, however, the differences were not so visible.

The least significant differences were noted in tests evaluating kinaesthetic differentiation of movements and movement combining. It could result from the fact that during a two-year training too little emphasis was put on exercises developing this area of coordination sphere of young football players.

Table 2.

Matrix of correlation between indices characterising the area of coordination sphere of young football players (n=20)

	T1A	T1B	T2	T3A	T3B	T4	T5	T6	T7
T1A		-0,21	-0,85	-0,74	**-0,43**	-0,36	-0,15	-0,66	-0,95
T1B	-0,21		+0,51	+0,44	+0,26	+0,22	+0,90	+0,40	+0,57
T2	-0,83	+0,51		+0,17	+0,10	+0,86	+0,36	+0,16	+0,23
T3A	-0,74	+0,44			+0,88	-0,14	+0,31	+0,14	+0,20
T3B	**-0,43**	+0,26	+0,10	+0,88		**+0,43**	+0,18	-0,19	+0,11
T4	-0,36	+0,22	+0,86	-0,14	**+0,43**		+0,15	+0,66	+0,96
T5	-0,15	+0,90	+0,36	+0,31	0,18	+0,15		+0,28	+0,40
T6	-0,66	+0,40	+0,16	+0,14	+0,19	+0,66	+0,28		+0,17
T7	-0,93	+0,57	+0,23	+0,20	-0,11	+0,86	+0,40	+0,17	

Analysing data in Table 2 one can conclude that different motor coordination abilities are slightly connected with each other. Out of 36 determined correlations, only 2 turned out to be significant, which constitutes 5.5%. Statistical correlation significance was noted between the following tests: T3B (long shot) and T1A (race with circling the poles) as well as T4 (sense of balance) and T3B (long shot). Other indices of motor coordination abilities were connected weakly or not connected at all.

It should be added that in earlier research carried out with the same research method more correlations were found (Cicirko and others, 2004).

Discussion

In order to gain expected results in training, every person taking care of young sportsmen should get to know the possibilities of the charges as well as connections and relations among the level of development of coordination abilities, age or somatic built.

Received results are similar to those published by other authors (Cicirko and others 2000, 2004, Szyngiera and others 2000), which indicates that in order to control motor coordination preparation one should take advantage of wide range of tests evaluating these abilities. Analysed data can or even have to be used in choosing proper means, forms and methods of shaping particular characteristics among children and youth.

Conclusions

On the basis of research results one formulated the following conclusions:

1. Footballers made the biggest progress in speed of reaction test.

2. The most significant variations in the level of motor coordination abilities was noted in tests that evaluated Kinaesthetic differentiation of movements and Movement combining.

3. Analysed data regarding motor coordination abilities can be used in choosing proper means, materials and methods to mould particular characteristics of young football players.

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1. What is the level of development of motor coordination abilities of young football players aged 14-15 and 16-17?

2. What are the differences between the indices characterising the area of motor coordination sphere among players after a two - year training period?

Materials and methods. The research material constitute measurements carried out on 20 young football players, whose calendar age during the research was 14-15 and 16-17. Football players trained regularly in their clubs 4-5 times per week. Their average training experience was 7 years. For the evaluation of motor coordination abilities particular tests were used (Ljach, Waśkiewicz 1998).

Conclusions. Footballers made the biggest progress in speed of reaction test.

1. The most significant variations in the level of motor coordination abilities was noted in tests that evaluated kinaesthetic differentiation of movements and movement combining.

2. Analysed data regarding motor coordination abilities can be used in choosing proper means, materials and methods to mould particular characteristics of young football players.

Key words: football, motor coordination abilities, tests, training, analysis.