

## THE DIFFERENCES IN RESULTS OF PRELIMINARY SELECTION IN TEAM SPORTS AS THE PREMISE TO DEFINE A PROFILE OF A “YOUNG FOOTBALL PLAYER”

Jožef Štihec,<sup>1, A, B, C, D, E</sup> Radosław Sroka<sup>2, A, D</sup>

<sup>1</sup> Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia

<sup>2</sup> Faculty of Physical Culture and Health Promotion, Szczecin University, Poland

<sup>A</sup> Study Design, <sup>B</sup> Data Collection, <sup>C</sup> Statistical Analysis, <sup>D</sup> Manuscript Preparation, <sup>E</sup> Funds Collection

**Address for correspondence:**

Jožef Štihec

Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia

Gortanova 22, 1000 Ljubljana, Slovenija

E-mail: Jozef.Stihec@fsp.uni-lj.si

**Abstract.** The aim of the work was to define the differences between boys selected for football training and their peers at the beginning stage of different team sports training, as well as those that do not practice any sports discipline. The research material consisted of 97 schoolboys at the age of 10 selected to practice team sports, including football, and 39 non-training boys. All boys attended Szczecin primary schools. Apart from the basic anthropometric characteristics, the following motor skills were analyzed: kinesthetic differentiation, reaction speed, movement frequency, spatial orientation, static balance, maximal lactic anaerobic power, maximal non-lactic anaerobic power, fast muscle activation, aerobic endurance and absolute muscle strength. Not all test results are expressed in SI units. Data obtained through the applied method served as the grounds for defining a profile of a “young football player” as the premise to improve the process of preliminary selection for football. Candidates selected for soccer training presented higher level of kinesthetic differentiation than all other examined boys. They also presented higher level of movement frequency than volleyball players and higher level of space orientation than the not-trained boys. Soccer players nevertheless presented lower level of time of reaction than the candidates selected for basketball training. Results of all condition abilities tests obtained by soccer players were statistically significant better than the one obtained by the untrained boys ( $p \leq 0.001$ ) and the candidates for volleyball training ( $p \leq 0.05$ ,  $p \leq 0.001$ ). The greatest differences were noticed in tests of aerobic endurance and maximal non-lactic and lactic anaerobic power.

**Key words:** youth training, soccer, selection process, motor abilities

### Introduction

Primary selection is one of the most important factors determining the efficiency of sportsmen training (Malina 1997; Naglak 1989; Peltola 1992). One of the main problems is a great amount of factors that may determine

success in sport (Reilly et al. 2000). Additional difficulties are caused by the great dynamics of changes in training process along with its individual character.

Selection process in many sport arts is still based on the early detection of the children that match so-called „model of master” (Naglak 1989; Ziemainz et al. 2004) in spite of the fact that the efficiency of such a procedure has been found controversial.

Improving the selection process for sport training still seems to be very actual and unclear research subject for sport scientists. The analysis of the primary selection process in many cases showed a number of errors that might be affected by the unclear principles (Bompa 1985; Naglak 1989; Ozimek and Jurczak 2007; Piechaczek et al. 1995; Raczek et al. 1998; Rushton 2003; Szopa and Śrutowski 1990; Woodman 1985). Usually the same, practically insignificant factors are considered. What is more, any important attempts to change or update the criteria and principles are very rare (Spieszny 2005; Szopa 1984; Woodman 1985; Ziemainz et al. 2004). The consequence of such a status quo is the decrease of efficiency of training process and large risk of losing hidden sport talents.

The aim of this study was an attempt to answer the following question. What differ boys selected for soccer training from equals selected for other sport arts and the untrained ones?

## Methods

The research material consisted of 10-year-old boys selected for training in different sport arts including soccer (n = 97) and untrained equals – students of Szczecin’s primary schools (n = 39).

The research methods were the indirect tests of motor abilities with proved reliability and validity that can be used in field conditions. This is based on the fact that there is no synthetic way to measure the vast field of motor abilities. This forces the use of number of indirect tests of individual abilities that determine the quality of performed tasks (Szopa et al. 1996).

The tests featured the measurements of:

- basic anthropometric parameters and it’s proportions,
- flexibility – *forward trunk bend* (Eurofit 1988),
- kinesthetic differentiation – *standing board jump on 50% of maximal power* (Mynarski 2000),
- time of reaction – *catch of the Dietrich’s stick* (Mekota and Blahus 1983),
- movement frequency – *hand plate tapping* (Eurofit 1988),
- space orientation – *walk to the target* (Raczek et al. 1998),
- balance – *flamingo balance* (Eurofit 1988),
- maximal non-lactic anaerobic power – *standing board jump* (Szopa and Śrutowski 1990),
- quick mobilization of the muscle – *10 × 5 m shuttle run* (Szopa and Śrutowski 1990),
- maximal lactic anaerobic power – *300 m run* (Szopa and Śrutowski 1990),
- aerobic endurance – *1000 m run* (Szopa and Śrutowski 1990),
- absolute muscle strength – *medicine ball throw* (Szopa and Śrutowski 1990).

Due to the fact that the indirect field tests were used in the research, not all results are represented with the SI units. Collected data was statistically elaborated. Average values ( $\bar{x}$ ), standard deviation (SD) along with t-Student test values were calculated. Normalised differences values were also elaborated (Stanisz 2000).

It should be mentioned that the selection criteria according to which young boys were selected for sports training were elaborated by the coaches themselves. The main selection criterion was a subjective evaluation of

players' behaviors during the small games and scrimmages. The results of the observation were confronted with the results of fitness tests of selected motor abilities, specific skills, and somatic features.

## Results

The first part of the results presents the comparison of the average body mass and body height of the examined soccer players, as well as the other sportsmen and untrained individuals. Mentioned somatic features were used to calculate the Rohrer's coefficient.

The analysis of the obtained results proved that candidates for soccer training were statistically significantly smaller than basketball candidates. Comparison of all other obtained results of somatic features including Rohrer's coefficient did not prove any statistically significant relations between soccer players and the other examined boys. Discussed data is presented in Figure 1.

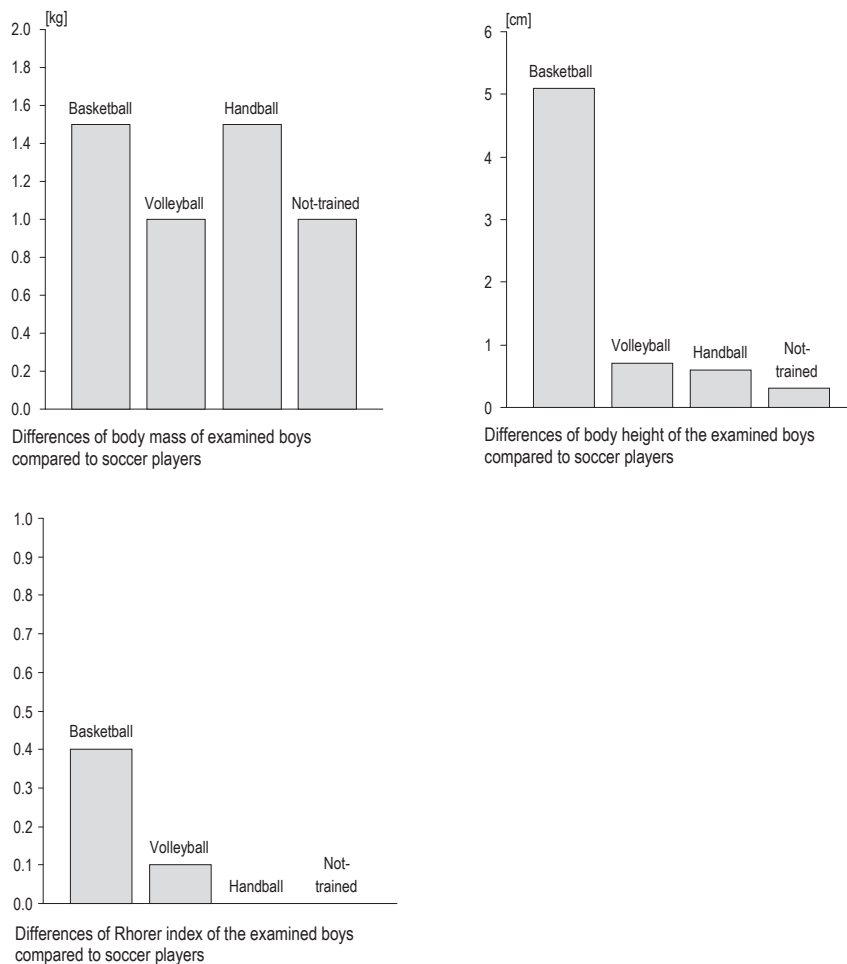
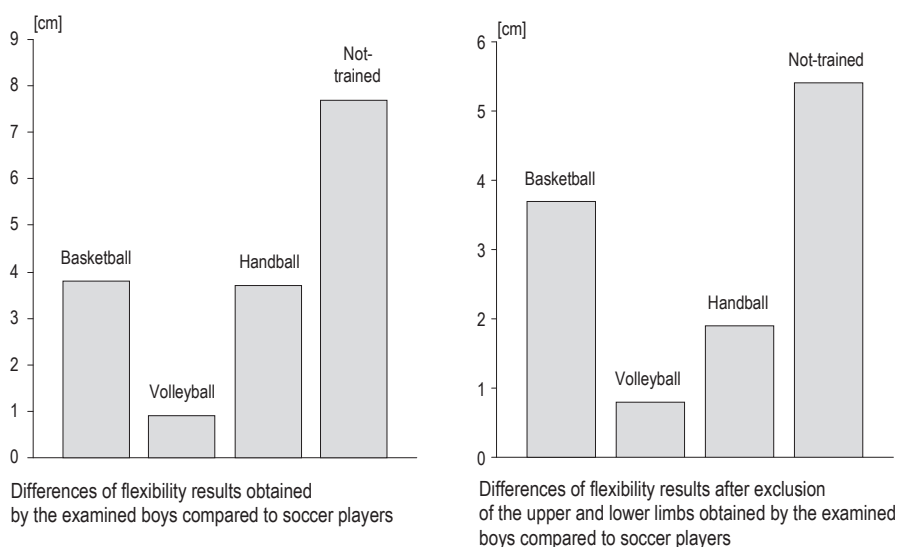


Figure 1. Differences of the average body mass and body height values obtained by the examined boys compared to soccer players

**Flexibility was the next analyzed feature.** The analysis of the results obtained by the candidates for soccer training in comparison with the other examined boys proved that the soccer players presented statistically significant higher level of flexibility than untrained boys ( $p \leq 0.05$ ). Compared with the other sportsmen no statistical significant differences were noticed. Even after the exclusion of the upper and lower limbs, the results did not change significantly. Discussed data was presented in Figure 2.



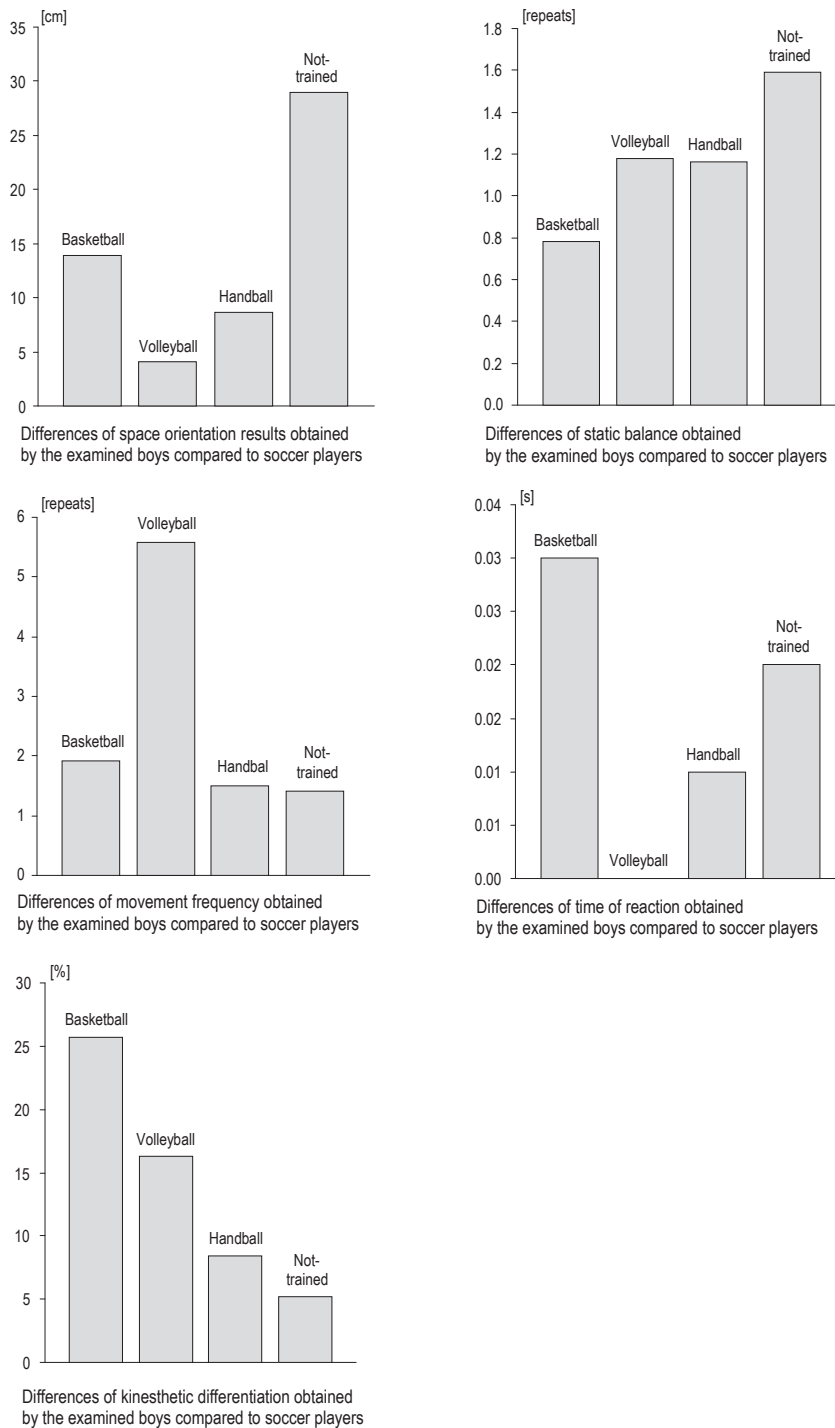
**Figure 2.** Differences of the flexibility' results obtained by the examined boys compared to soccer players

**Motor coordination abilities were analyzed in the following part of the results.** Indirectly, the level of following motor abilities was elaborated: balance, kinesthetic differentiation, time of reaction, movement frequency, and space orientation. The results of the coordination abilities tests obtained by the examined boys were presented in Table 1.

**Table 1.** Statistical characteristics of the results obtained by the examined boys in the tests of coordination motor abilities

Variable	Basketball		Volleyball		Handball		Soccer		Not-trained	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Static balance (repet.)	10.26	3.67	8.30	4.65	8.32	4.38	9.48	4.29	11.07	5.67
Kinesthetic differentiation (%)	68.94	11.98	78.36	25.04	86.25	24.20	94.63	22.13	89.41	24.48
Time of reaction (s)	0.22	0.14	0.25	0.11	0.24	0.12	0.25	0.12	0.23	0.15
Movement frequency (repet.)	49.26	5.78	45.61	4.81	52.70	5.87	51.19	6.63	49.78	6.85
Space orientation (cm)	42.18	19.23	51.98	30.28	64.76	22.14	56.10	26.45	85.05	59.09

The results obtained by the candidates for soccer training were compared with the ones obtained by the other sportsmen and untrained boys. Details are presented in Figure 3.



**Figure 3.** Differences of the coordination motor abilities' results obtained by the examined boys compared to soccer players.

Candidates for soccer training presented similar level of static balance to the other examined boys. The best results were obtained by the young soccer players in tests of kinesthetic differentiation. Comparing with the candidates engaged in basketball and volleyball training, the results were more statistically significant  $p \leq 0.05$  and  $p \leq 0.001$ . It means that candidates for soccer training present higher level of kinesthetic differentiation than basketball and volleyball players. Boys selected for soccer training also present higher level of movement frequency ( $p \leq 0.05$ ).

In the test of space orientation, young soccer players obtained more statistically significant results than the untrained boys ( $p \leq 0.05$ ) and less statistically significant results than young adepts of basketball ( $p \leq 0.05$ ).

Time of reaction was another examined motor ability. Soccer players present statistically significant lower level of time of reaction than young basketball players ( $p \leq 0.05$ ).

It is also worth to mention that although young soccer players presented higher level of most examined motor abilities than untrained boys, statistically significant differences were noticed only in the case of space orientation. The untrained boys also presented higher level of time of reaction than soccer players.

**The last examined groups of factors were the condition motor abilities.** The battery of used tests consisted of: maximal non-lactic and lactic anaerobic power, quick muscle mobilization, aerobic endurance and absolute muscle strength. Table 2 presents the results obtained by the examined boys in test of condition motor abilities.

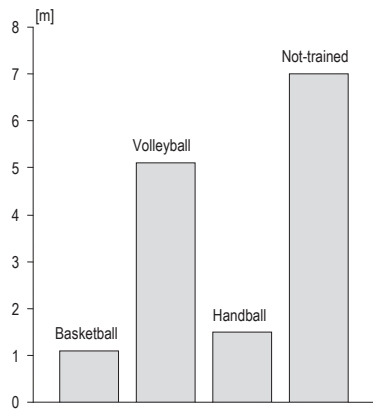
**Table 2.** Statistical characteristics of the results obtained by the examined boys in the test of condition motor abilities

Variable	Basketball		Volleyball		Handball		Soccer		Not-trained	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Maximal non-lactic anaerobic power (cm)	156.06	18.00	141.91	21.40	166.04	19.96	166.61	21.62	150.92	27.24
Quick mobilization of the muscle (s)	21.91	1.37	22.09	1.55	21.95	2.93	21.78	1.19	24.89	3.42
Maximal lactic anaerobic power (s)	41.20	3.40	45.20	4.80	41.60	5.20	40.10	2.60	47.10	5.20
Aerobic endurance (s)	297.40	42.80	318.20	68.10	287.60	37.40	283.10	48.70	321.50	57.70
Absolute muscle strength (m)	8.20	1.55	6.75	1.11	8.13	1.09	7.60	1.25	5.33	1.25

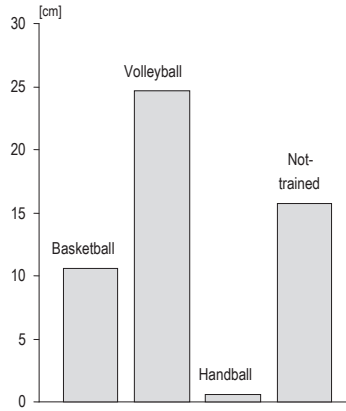
Candidates selected for soccer training presented higher level of maximal non-lactic and lactic anaerobic power comparing to all other examined boys including sportsmen. Statistically significant differences were noticed only when comparing soccer players to the untrained boys ( $p \leq 0.05$ ) and ( $p \leq 0.001$ ), as well as volleyball players ( $p \leq 0.001$ ) and ( $p \leq 0.05$ ).

The next analyzed abilities included quick muscle mobilization and aerobic endurance. Like in the case of maximal non-lactic and lactic anaerobic power, soccer players also presented the highest level among all examined boys. Statistically significant differences were noticed only when comparing soccer players to the untrained boys ( $p \leq 0.001$ ). Soccer players also presented higher level of aerobic endurance than boys selected for volleyball training ( $p \leq 0.001$ ).

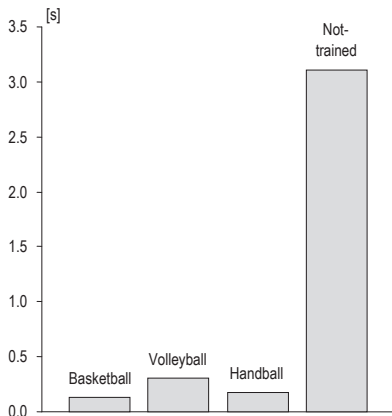
Candidates selected for soccer training presented lower level of absolute muscle strength than boys selected for basketball and handball training, and higher level than untrained boys and candidates for volleyball training ( $p \leq 0.05$ ) and ( $p \leq 0.001$ ).



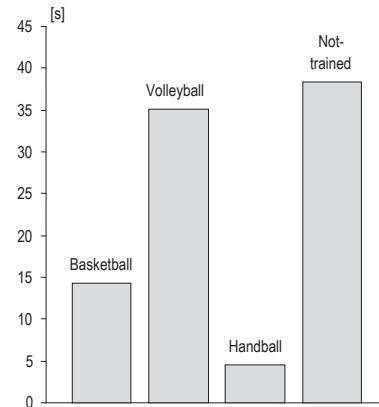
Differences of maximal lactic anaerobic power results obtained by the examined boys compared to soccer players



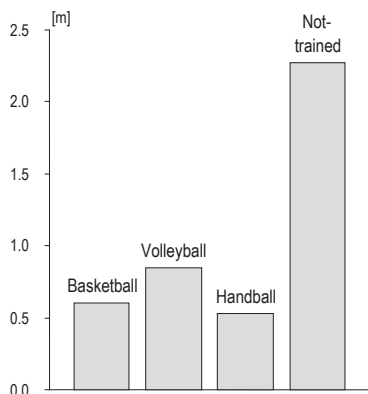
Differences of maximal non-lactic anaerobic power results obtained by the examined boys compared to soccer players



Differences of quick mobilization of the muscle results obtained by the examined boys compared to soccer players



Differences of quick mobilization of the muscle results obtained by the examined boys compared to soccer players



Differences of absolute muscle strength results obtained by the examined boys compared to soccer players

Figure 4. Differences of the condition motor abilities' results obtained by the examined boys compared to soccer players

Analyzing the results obtained by the soccer players in the tests of condition motor abilities with the ones obtained by the other examined boys one may notice that soccer players had more statistically significant results than untrained boys and some sportsmen.

## Discussion

The analysis of the research outcomes allowed a wide estimation of the selected morphological features and motor abilities of the 10-year-old boys selected for soccer training. Young soccer players presented similar level of the somatic features as the other examined boys. Only in the case of body height, soccer players were significantly smaller than young boys selected for basketball training, what confirms the role of this feature in basketball (Chudecka 2000). The importance of the morphological features, especially body height, in the selection process is still discussed. Some authors present model values for different age groups of future soccer players as a crucial selection factor (Reilly et al. 2000). Many results of the scientific research are referred to these values in order to estimate the selection process in soccer (Ozimek and Staszkiwicz 1999). Up-to-date research, however, indicate that there is a need to separate the biological age from the calendar one of the selected sportsman. Very often coaches select the candidates who present higher level of somatic features and reject the ones who are simply biologically younger (Fajfer 2003; Reilly et al. 2000; Spieszny 2011). In extreme cases, the difference between calendar and biological age can be up to even 7 years (Szopa et al. 1996). In individual research no differences in somatic features were noticed between soccer players and the untrained boys. It shows that morphological factor was not crucial in the selection process. Similar results were also observed by Stępiński et al. (2003) in the research of U-14 Polish soccer championships finalists.

The results of the research indicate that young soccer players present significantly higher level of flexibility than untrained boys ( $p \leq 0.05$ ) and similar level to the other examined sportsmen. The research done by Ozimek and Staszkiwicz (1999) also indicated statistically significant differences in the level of flexibility presented by a 12-year-old young soccer players and the untrained boys.

The analysis of the results obtained by all examined boys in tests of coordination abilities indicates very little differences. According to Reilly et al. (2000), the most important coordination abilities for soccer are: kinesthetic differentiation, time of reaction, and space orientation. In individual research among all three above-mentioned coordination abilities, statistically significant differences between soccer players and untrained boys were observed only in the test of space orientation. Soccer players presented higher level of kinesthetic differentiation than boys selected for basketball ( $p \leq 0.001$ ) and volleyball ( $p \leq 0.05$ ). The results obtained by the soccer players compared to the ones obtained by the untrained boys seem to be, according to Ljach's criteria, not enough.

Among the analyzed motor abilities, condition ones were the most significant. In all tests of condition abilities young soccer players presented significantly higher level than the untrained boys ( $p \leq 0.001$ ), as well as volleyball players ( $p \leq 0.05$  and  $p \leq 0.001$ ). Similar results were noticed by Stępiński et al. (2003). According to these research studies, 13-year-old soccer players after basic selection and few years of soccer training presented higher level of motor abilities than the untrained boys. The greatest differences were noticed in cases of movement frequency, quick muscle mobilization, and maximal non-lactic anaerobic power (differences between 2.5–4 SD).



On the other hand, Gołaszewski and Wieczorek (2001), who examined the body proportions and motor fitness of young soccer players, noticed that they presented higher level of static balance than the untrained boys. No statistically significant differences were although noticed in the test of maximal anaerobic power, local strength, and agility.

The results seem to confirm Fajfers' (2001; 2003) statement that in the age of 8 to 10 higher efficiency of prognosis is based upon the level of motor abilities - especially speed and endurance.

The analysis of the obtained results allowed to form the following conclusions:

1. Soccer training candidates present statistically significant lower body height than basketball candidates.
2. The analysis of the results obtained in the flexibility tests showed that candidates for soccer training present statistically significant higher level of this ability only in comparison with the untrained boys.
3. Candidates selected for soccer training presented higher level of kinesthetic differentiation than all other examined boys. They also presented higher level of movement frequency than volleyball players and higher level of space orientation than the untrained boys. Soccer players, nevertheless, presented lower level of reaction time than the candidates selected for basketball training.
4. Results of all condition abilities tests obtained by soccer players were more statistically significant than the one obtained by the untrained boys ( $p \leq 0.001$ ) and the candidates for volleyball training ( $p \leq 0.05$ ,  $p \leq 0.001$ ). The greatest differences were noticed in tests of aerobic endurance and maximal non-lactic and lactic anaerobic power.

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