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A SOMATIC MODEL VERSUS SPORT MASTERY OF THE BEST EUROPEAN FOOTBALLERS

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Introduction. Out of personal qualities underlying effective and efficient sports competition morphological parameters come to the fore. Opinions on the role of body build or particular somatic qualities in the formation of a sport result with footballers have evolved considerably: from a period where sport results were wholly conditioned on the body build to an almost complete negation of any such dependence [5].

Presently, coaches have been more and more into an idea that the body build is one of the most important factors conditioning the achievement of sports results by those footballers who are at the highest level of sport proficiency. According to Drozdowski [1], somatic qualities might be an important selector in sport, found especially useful on account of the easiness to measure them.

Specialist training of a long duration, and selection inherently taking part over that time make those individuals that are of topmost sport professionalism look much alike with respect to their body build. Therefore, it can be assumed that there must be a "body build template" displayed by footballers playing in specific formations: attack or defence or halfback.

According to Ważny [8] the footballer is characterised by a considerable short body height as compared to other team gamers. Upper body parts and the shoulder girdle are not well developed in their widths. The width of the basis of upper arms is least developed; on the other hand the lower members are much more massive at their bases. Waist, hip, thigh and shank circumferences indicate significant musculature in those body parts, especially in the lower limbs.

The volume of fatty tissue is average, while the figure described in terms of a chest to hip circumference ratio places the footballer in the region of those players whose body build proportions are close to the "feminine extreme". A majority of the width qualities displays high significant correlations with body height, which confirms a proportional body build at relatively smaller overall dimensions of the whole body.

It seems that changes that football has undergone recently have also affected the new look at the role of the basic somatic indices, such as height and body weight. Present day tendencies in the intake and training of footballers require that earlier knowledge be verified as far as that problem is concerned [2, 4, 5, 7].

The objective of this research paper was to determine the age, somatic type, body weight and height of the footballers that took part in Champions' League in the 2004-2005 season.

Material and Method. 399 footballers, taking part in Champions' League in the 2004-2005 season, were studied. data on age, body weight and height were obtained from the Encyklopedia Piłkarska Fuji, the Internet and studies by certain authors [2].

To determine the types of somatic build of the footballers the Rohrer index was applied; depending on its value the footballers were classified after Kretchmer as:

1. Leptosomatic   x – 1.27;
2. Athletic   1.28 – 1.46;
3. Pyknic   1.47 – x.

Results. On analysis the gathered material showed that the players were on the average 26 years and 1 month old, with the age spread between 17 and 39. The oldest team was AC Milan – 28 years and 9 months, the youngest one was FC Barcelona – 23 years and 6 months.

The average goalkeepers' age was 27 years and 2 months, defenders: 26 years and 4 months, halfbacks 25 years and 6 months, and attackers 24 years and 11 months. These data disclose a certain regularity: the oldest, more experienced footballers play on defensive positions: goalkeepers, defenders, while the youngest take the lead as attackers and halfbacks.

The average body height of all the players was 181.1 cm, the tallest of all proved to be the goalies 188.4 cm, then defenders 182.2 cm, followed by attackers 181.0 cm and last came the halfbacks 179.0 cm.

The average body weight of all the players 76.1 kg, and this shows a certain regularity: the heaviest are in defence lines, followed by halfbacks. The average body weight of the goalkeepers was 82.2 kg, the defenders 77.7 kg, the halfbacks 73.1 kg and finally came the attackers with their 70.0 kg.

On analysis of body build types the leptosomatic type outnumbered noticeably, namely 233 out of 399 of all the subjects, 163 were of an athletic type and three players were pyknic. The average values of the Rohrer index for all the subjects was 1.266, while in 12 teams the index was between 1.20 and 1.27 indicating a leptosomatic type, in five others it was between 1.28 and 1.30 (an athletic type).

On analysis of the types of body build with account given for the players' position during a play (Table 1) it was found out that the goalkeepers were predominantly leptosomatic – 67 %, while in six teams, that is Arsenal London, Juventus Turin, FC Barcelona, Inter Milan, FC Porto and Chelsea all the goalies had this very type of body build.

In the case of other players, that is defenders, halfbacks and attackers, the leptosomatic type showed a slight majority. Thus, in defence there were 59 %, as halfbacks 57 % and in attack there were 55 % of such.

Discussion

The research results show a very interesting profile if compared to the results obtained from players from other continents [4]. In the case of South American teams and Latin America which took part in the World Cup France '98, the athletic type was found to be predominant. The average value of the Rohrer index for players from Argentina, Brazil, Chile, Paraguay, Colombia, Mexico and the USA was between 1.29 and 1.36.

The next World Cup played in Korea and in Japan in 2002 revealed that again the largest number of athletic-type footballers came from American countries and Africa. The leptosomatic type prevailed, however, in the European and Asian teams. Similar regularities were observed during last World Cup played in Germany in 2006.

What then influences the state of affairs? It seems that especially in the South American countries emphasis is focused primarily on coordination skills and the performance of individual elements of the football game. Less significant as regards recruitment and on later stages during selection are somatic qualities. Therefore, attention is not much paid to body height as rather to technical skills. Moreover, available coaching reports inform that training, also training junior American footballers, is to a large extent based on performance and endurance. Hence, most likely, the prevalence of the athletic type among American players.

Training junior footballers in European countries such as Italy, Spain, Holland, France is based on the development of typical technical skills based on coordinative motor skills. As an example one can mention the famous Ajax School, where until sexual maturity training is focused chiefly on attaining technical skills of the trainees [7]. The recruitment and selection of junior footballers is dominated by coordination and speed criteria, and these are most common with slim trainees as a rule.

To recap, sport effectiveness of outstanding footballers, e.g. the Brazilian Ronaldo (athletic body build), does not derive only from their body posture, but is most and first of all a derivative of extraordinary level of coordinative and technical skills.

Things being so it stands out that European footballers represent the intermediate somatic type somewhere between leptosomatic and athletic ones. The Rohrer indices are within 1.20 to 1.30, yielding an arithmetic mean of 1.26.

Table 1.

Types of somatic body build in the Champions' League footballers – a general characteristic accounted for play position

Researched team	Body build types per play position												Rohrer index
	Goalkeepers			Defenders			Halfbacks			Attackers			
	L	A	P	L	A	P	L	A	P	L	A	P	
FC Liverpool	2	1	—	5	2	—	9	2	—	2	2	—	1.27
AS Monaco	1	2	—	4	4	—	4	4	—	3	3	—	1.28
Real Madrid	2	1	—	4	4	1	6	2	—	2	3	—	1.20
Bayern Leverkusen	2	1	—	4	3	—	6	4	—	2	3	—	1.25
Bayern Munich	1	1	—	3	4	—	4	6	—	5	1	—	1.27
Juventus Torino	2	—	—	5	5	—	5	3	1	3	2	—	1.20
Manchester United	1	2	—	5	3	—	4	3	—	5	1	—	1.25
Olimpique Lyon	1	2	—	4	4	—	4	4	1	1	5	—	1.30
Arsenal London	3	—	—	6	2	—	7	1	—	4	1	—	1.22
PSV Eindhoven	1	2	—	5	3	—	4	5	—	4	1	—	1.26
FC Barcelona	3	—	—	7	3	—	2	4	—	—	5	—	1.28
AC Milan	2	1	—	6	3	—	6	2	—	4	1	—	1.25
CF Valencia	1	2	—	6	3	—	6	2	—	4	1	—	1.25
Inter Milan	3	—	—	4	3	—	2	7	—	2	4	—	1.29
FC Porto	3	—	—	3	4	—	4	5	—	2	4	—	1.27
Chelsea London	3	—	—	5	3	—	5	4	—	4	1	—	1.26
Total	31	15	0	76	53	1	78	58	2	47	38	0	1.26

L – leptosomatic
A – athletic
P – pyknic

Conclusions

1.   Figures referring to somatic types among footballers of the best European teams show that in a majority of cases the footballers are leptosomatic, and then athletic in their body builds. The pyknic type is rare.

2.   The analysis of the statistical data suggest that a high degree of sports mastery of the footballers taking part in the Champions' League is conditioned by specific types of their somatic structure among which the prevailing ones are leptosomatic and athletics of low Rorher indices.

3.   The obtained arithmetical means of body weight and height of the best European footballers allow to determine the somatic model of the footballer who is characterised by: body height of 181.1 cm, body weight 76.1 kg and Rohrer index of 1.26.

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Abstract. In order to define the somatic type of footballers taking part in the Champions' League games in the season 2004-2005, based on anthropometric data: body weight and height such a model was defined and then it was referred to footballers from other continents.

Key words: somatic body build, a model of footballer, body weight and height.