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# SIZE, SHAPE AND BODY PROPORTION OF YOUNG BASKETBALL PLAYERS

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A b s t r a c t. The study deals with somatometric, somatotypologic and proportional characteristics of young Czechoslovakian basketball players. The examined groups consisted of boys and girls belonging to three age groups (from 13 to 18 years) who were divided according to specialization into guards, forwards and centres. The results suggest that even in young basketball players specialized in the posts mentioned above the size of the body and of the extremities differ considerably. According to the somatotypologic analysis, the guards display the highest mesomorphy and the centres the highest ectomorphy. There are small differences in body proportionality between guards, forwards and centres.

*Key words:* physique, body measurements, body proportion, somatotype, basketball players.

## Introduction

It is for the most part studies dealing with the observation of the body build of the best basketball players, representative of different countries that appear in the literature. The anthropometric, functional and motor indices of young basketball players were observed by Vank et al. (1974), Sekkin and Krotov (1975), Dobry (1967) and Haley (1974).

Our contribution is concerned with the characteristics of some body parameters, with the somatotypologic analysis and proportional characteristics of young basketball players.

## Material and Methods

The examined group consisted of the best Czechoslovak teams of different age-groups, which played in the final matches of the Championship of Czechoslovakia in the season 1977|78. In the age-group of 13—14 year-old players 27 girls and 29 boys, in that of 15—16 year-old players 47 girls and 54 boys and in that of 17—18 year-old players 32 girls and 37 boys were examined. The players of each group were divided into guards (A), forwards (B) and centres (C).

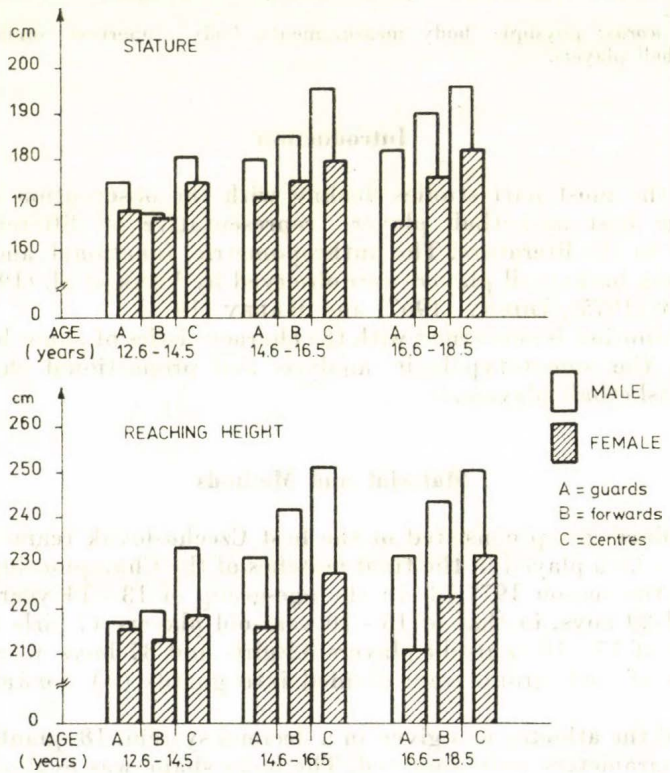
The age of the athletes was given in a decimal system. 18 quantitative morphological parameters were observed. The body shape was evaluated somatotypologically, according to Heath—Carter's method (Carter 1975), and

the results were elaborated statistically according to Ross et al. (1974). The proportionality of the body parameters of the observed groups was evaluated according to EIBEN et al. (1976).

## Results

### *Body size*

From the results of the observed length measurements of the body and extremities (standing height, sitting height, reaching height, length of the arms and legs) and body weight of young basketball players it appears that in all mentioned parameters, in boys and girls of each age-group the guards display the lowest values. The values of the forwards are higher, and the highest values are to be found among the centres. In girth measurements of the extremities the results were the same, except for the 15—16 and 17—18 year-old girls, where the highest values were presented by the forwards. The significance of the differences in average numbers of the mentioned parameters is demonstrated in the Table 1. The greatest differences can be found between guards and centres (A:C), smaller ones between forwards and centres (B:C), especially in standing height, weight, reaching height and length of the lower extremities (the differences in standing and reaching height are presented in the Fig. 1).




1 *Fig. 1:* Differences in height and reaching height of the young basketball players

*Table 1*

Results of the *t*-test between mean anthropometric parameters of young basketball players, according to specialization

| Male | 13—14 | | | 15—16 | | | 17—18 | | |
|---|---|---|---|---|---|---|---|---|---|
| | A:B | A:C | B:C | A:B | A:C | B:C | A:B | A:C | B:C |
| Stature | 2.64 | 3.73* | 3.90* | 2.36 | 7.47* | 5.54* | 4.47* | 5.22* | 2.72 |
| Weight | — | 3.54* | 2.53 | — | 6.47* | 5.97* | — | 3.29* | — |
| Reaching height | — | 3.34* | 2.87 | 3.46* | 6.47* | 3.05* | 4.77* | 5.42* | 2.44 |
| Upper extr. length | — | 3.25* | 3.06* | 2.16 | 4.22* | 3.29* | 3.03* | 3.12* | — |
| Sitting height | — | — | 2.46 | — | 4.10* | 4.01* | 2.27 | 2.46 | — |
| Lower extr. length | — | 3.79* | 3.16* | 2.18 | 6.06* | 3.55* | 2.09 | 2.54 | — |
| Arm girth | 2.98* | 3.00* | — | — | 2.28 | 2.40 | — | 2.22 | — |
| Calf girth | — | — | — | — | 2.97 | 3.48* | — | — | — |
| **Female** | **13—14** | | | **15—16** | | | **17—18** | | |
| | A:B | A:C | B:C | A:B | A:C | B:C | A:B | A:C | B:C |
| Stature | — | 3.07* | 3.59* | — | 4.30* | 2.30 | 3.97* | 7.13* | 2.39 |
| Weight | — | 2.43 | 3.33* | — | 2.97 | — | 2.65 | 4.18* | — |
| Reaching height | — | — | — | 2.11 | 4.34* | 2.12 | 3.65* | 7.18* | 3.03* |
| Upper extr. length | — | — | 2.71 | — | 3.88* | — | 3.36* | 6.53* | — |
| Sitting height | — | — | — | — | 2.70 | 2.79 | 3.45* | 4.22* | — |
| Lower extr. length | — | — | 2.65 | 3.01* | 3.06* | — | 3.10* | 7.93* | 3.64* |
| Arm girth | — | — | — | — | — | — | — | — | — |
| Calf girth | — | — | 2.54 | — | — | — | — | — | — |

* = t significant at 0.01 level of confidence; without * *t* significant at 0.05 level of confidence
A: guards, B: forwards, C: centres

### *Body shape*

Founded on the somatotypologic analysis of the boys and girls (Fig. 2) it can be said that it is mostly the guards who have the greatest mesomorphic component, i.e. they have the greatest amount of LBM. The greatest ectomorphic component appears among the centres, i.e. they display the longest body segments.

The somatotype of 13—14-year-old boy guards and forwards is in the central sector; centres are balanced ectomorphs. The girls are in the sector of endomorphic mesomorphs.

The somatotype of 15—16-year-old boy guards is in the sector of mesomorph–ectomorph, the forwards and centres are mesomorphic ectomorphs. The girls' somatotype is in the central sector, but the girls guards have the highest

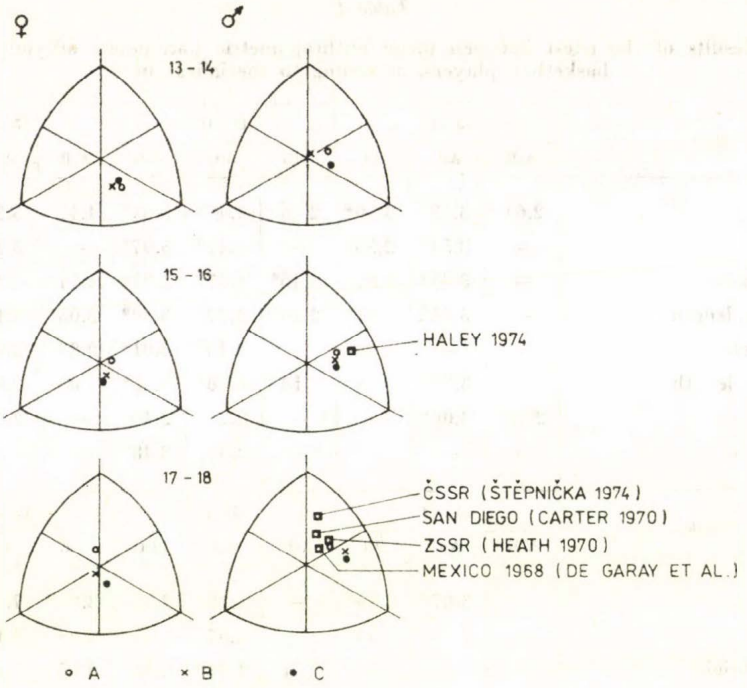



*Fig. 2:* Somatotypes of the young basketball players

mesomorphic components. The somatotype of 15-year-old basketball players of the Bonita Vista Junior High School which was observed by HALEY (1974) is placed in the same sector as that of authors' group, but the American boys have less subcutaneous fat.

The 17—18-year-old boy guards are in the mesomorph–ectomorph sector, the forwards and centres are mesomorphic ectomorphs. The girl guards and forwards are in the central sector, and the girl centres are endomorphic ectomorphs.

The adult basketball players: representatives of the U.S.S.R., San Diego, Czechoslovakia and the participants of the Olympic Games in Mexico have higher and dominant mesomorphic components.

The differences in mean SDD between the guards, forwards and centres are not statistically important.

### *Body proportion*

According to the proportional z-scores (Fig. 3) the greatest differences are to be found in the age-group of the 13—14-years old with the boys and in that of the 17—18-years old with the girls.

We can state in general that except for the two mentioned groups there are small differences in body proportions of the young basketball players, if they are standardized on the same body height.

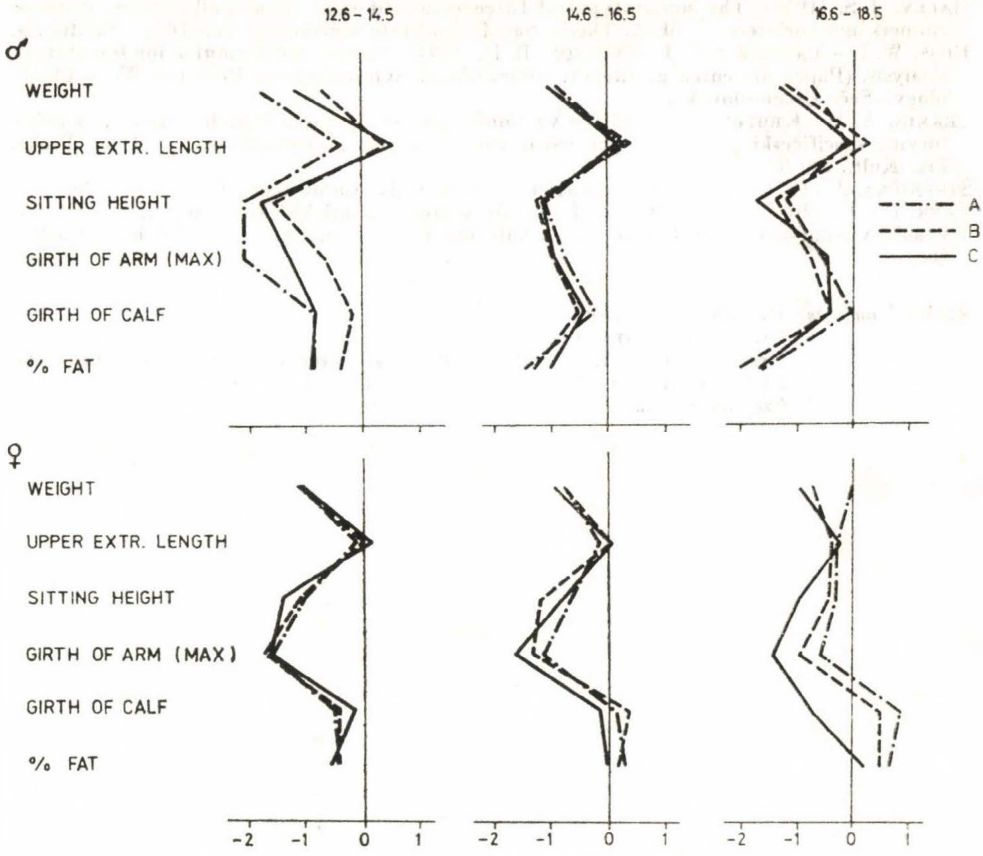



*Fig. 3:* **Proportional z-scores of the young basketball players**

## Conclusion

Results presented above suggest that even in young basketball players of any specialization, body end extremity sizes differ considerably. According to the somatotypologic analysis, the guards are more mesomorphic and the centres more ectomorphic.

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