

SOMATOTYPE OF MALE AND FEMALE VENEZUELAN SWIMMERS

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ABSTRACT

A study has been done about the somatotypes of 34 Venezuelan male and female swimmers belonging to the Francisco de Miranda Swimming Team. Somatotypes ratings were calculated for all performers based on the Heath-Carter Anthropometric - Method. Means, standard errors and standard deviations on the variables Endomorphy, Mesomorphy and Ectomorphy were calculated for both groups. Finally, the individual somatotypes were plotted on somatocharts.

INTRODUCTION

The basic principles of the science of constitution began to develop in the time of Hipocrates. In this period the connexion was established - between body build and behavior.

Of all the variables present in the constitution, physical appearance is the most obvious and for this reason in the last decade there is a renewed interest in the constitution. Recently, correlation has been found to exist between it and the performance of athletes. Morphological characteristics of athletes have been studied because competitive sports demands a great deal from the body and therefore one expects to find evidence of the structure - function relationship among athletes. This type of study offers basic information about the morphological characteristics necessary for - each type of sport and the physical differences among individuals who practice different sports.

Even though the concept of somatotype was introduced by Sheldon, - -

Stevens and Tucker in 1.940 (Sheldon, et. al, 1.940) and the consideration of structural and functional characteristics of championship athletes is - part of the base for selection in the sports programs of developed countries, there is an alarming scarcity of anthropometric and somatotipic data on Latin American athletes. The only valuable information on the anthropological structure using anthropometric techniques concerning Latin American athletes is that collected for the Olympic Games in Mexico (de Garay, and coworkers, 1.974) and that being collected on athletes in Cuba.

It should be pointed out nevertheless that an athlete's success can - not be explained only on the bases of anthropometric measurements. Both - genetic and environmental factors must be taken into account.

The purpose of this paper is to report data found on Venezuelan swimmers. This is a pilot study for a research program on the Biotipology of Venezuelan athletes in which other sports as well as swimming will be considered. The frame of reference for this study is the concept of somatotype - defined by Carter as " a description of present morphological conformation. It is expressed in a three-numeral rating, consisting of three sequential numerals, always recorded in the same order. Each numeral represents evaluation of one of the three primary components of physique which describe - individual variations in human morphology and composition. " (Carter,1.975).

REVIEW OF THE LITERATURE

Numerous studies of the biology of athletes have been done. The recent olympic games were a wonderful opportunity for gaining knowledge about the physical constitution of athletes as exemplified by study of Tanner (1.964) and de Garay, et al. (1.974). Especifically about swimming there are the studies by Cureton (1.951), Dupertuis (1.965) and Carter (1.966) among others.

MATERIALS AND METHOD

The sample used in this study consists of 34 swimmers, 22 males and 12 females whose ages vary from 10 to 21 years. The data was collected - during the months of October and November 1.975.

The athletes studied belong to the categories Infantile "A" and "B" and Juvenile "A" and "B" according to the especifications established by - the F.I.N.A. This team won the national championship in 1.974. Moreover, some of the team members hold national records and have performed well in international competitions.

The somatotype rating for each subject was determined using the Heath

Carter Anthropometric Method (Carter, 1.975). Age, height and weight were - obtained. Skin folds of the triceps, scapula and suprailiac were measured. The biépicondylar diameters of the femur and humerus, and the girths of the biceps and calf were taken. Mean, standard error and standard deviation - were calculated for each of these measurements. Finally, the individual - somatotypes were plotted in somatocharts.

RESULTS AND DISCUSSION

Minimum and Maximun values for the three primary components, their - means, standard errors, variances and standard deviations as well as the means of the age, weight and height variabiles are presented for males in Table N° 1 and for females in Table N° 2.

MEAN VALUES FOR MALE VENEZUELAN (Francisco de Miranda) SWIMMERS

T A B L E N° 1

	Mean	Error	Variance	Standard deviation	Min.	Max.
Endomorphy	1.8	0.102	0.581	0.762	1.0	4.0
Mesomorphy	4.3	0.184	0.742	0.862	3.0	5.5
Ectomorphy	3.7	0.213	0.994	0.997	2.0	6.0
Age (Years)	13.8					
Height (cm.)	158.24					
Weight (Kgs)	46.50					
Total Fat. (mm)	19.98					

MEAN VALUES FOR FEMALE VENEZUELAN (Francisco de Miranda) SWIMMERS

T A B L E N° 2

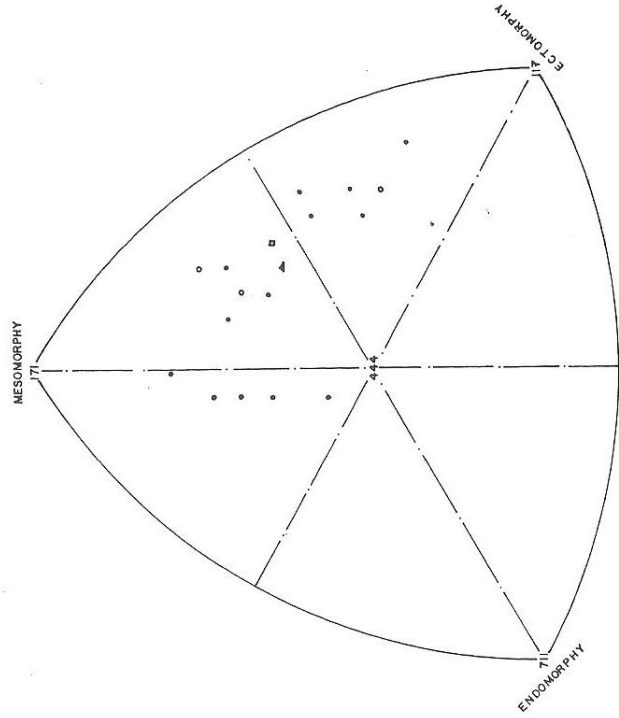
	Mean	Error	Variance	Standard deviation	Min.	Max.
Endomorphy	2.25	0.317	1.205	1.098	1.0	4.5
Mesomorphy	3.78	0.299	1.072	1.036	2.5	5.9
Ectomorphy	3.41	0.368	1.629	1.276	1.0	4.5
Age (Years)	11.11					
Height (cm.)	148.84					
Weight (Kgs.)	40.70					
Total Fat. (mm)	23.50					

SOMATOCHART

SUBJECTS: FCC. MIRANDA SWIMMERS ♂

N = 22

▲ = MEAN



- One individual
- Two individuals
- ◻ Three individuals

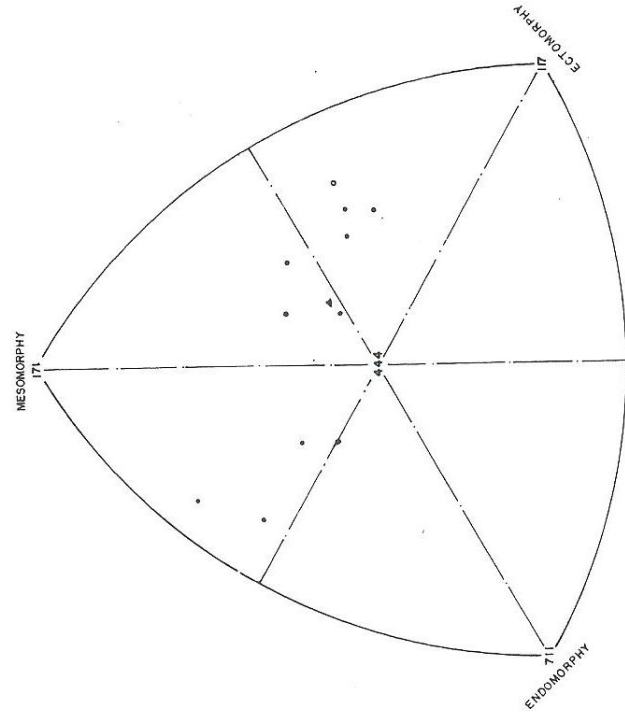
FIG. 1 SOMATOCHART DISTRIBUTION OF FRANCISCO DE MIRANDA MALE SWIMMERS

SOMATOCHART

SUBJECTS: FCC. MIRANDA SWIMMERS ♀

N = 12

▲ = MEAN



- One individual
- Two individuals

FIG. 2 SOMATOCHART DISTRIBUTION OF FRANCISCO DE MIRANDA FEMALE SWIMMERS

The sample means for males were 13 years 8 months for age, 158.24 cm. for height and 46.50 Kg. for weight; on the other hand females were 11 years 11 months old stood 148.84 cm. tall, and weighed 40.70 Kg.

The typical male somatotype was 1.8 4.3 3.7. The largest frequencies for endomorphy fell between 1.5 and 1.9, for mesomorphy between 4.5 and 4.9 and for ectomorphy between 3.5 and 3.9. As a group the males swimmers are mostly meso-ectomorphic (45%); with the next largest group being the ectomorphic mesomorphs, followed by mesomorph-endomorphs, with only one case of balanced mesomorph.

As shown in Figure 1, the somatotipic distribution is located within the mesomorphic and ectomorphic area, above the 551-444-117 line. The somatotipic mean of the group falls within the area delimited by the somatotypes 354, 244, 144 y 254. No cases of extreme somatotypes were found in the sample even among the best swimmers. Two of the individuals studied hold national records, one of them, a male is 1 4 4 1/2 somatotipically, the other a female has a somatotype of 3 1/2 4 2.

The typical female somatotype is 2.2 3.7 3.4. They are also mainly meso-ectomorphs (40%) with a 25% of endomorphic mesomorphs as the second largest group.

It can be observed in the somatochart (Figure N° 2) that the somatotypes are spread out within the mesomorphic and ectomorphic regions. Only one individual is located below the 551 - 444 line. The mean female somatotype 2.2 3.7 3.4 is delimited by the somatotypes 344, 354 and 244.

SUMMARY

This report is presented without detailed statistical analysis because the sample is small and no relationship with other population has been established. Our knowledge is far from complete; this is only a pilot study of the somatotypes of Venezuelan athletes. The proposed study takes into account athletes participating in other sports as well as more swimmers.

Within the limitations of this study we can conclude that:

1. The typical Francisco de Miranda swimmer is 13 years, 8 months old; 158.24 cm. tall; weighs 46.50 Kgs. and has a somatotype of 1.8 4.3 3.7. As a group these swimmers are ectomorphic mesomorph.
2. The swimmers are located in the area of the somatochart bounded

by the limits of endomorphic mesomorph, ectomorphic mesomorphs, and mesomorphic ectomorphs.

3. There are no cases of extremes of mesomorphy, the highest value found for the second component is 5 1/2.

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