

## SOMATOTYPE AND SELECTED ANTHROPOMETRIC COMPARISONS OF CANADIAN AND GUYANESE CHILDREN

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**Abstract.** As part of a larger World University Services of Canada project dealing with problems of development in Third World countries, this study compared the somatotypes and other selected anthropometric measurements of 10-year-old Canadian and Guyanese male children.

The Canadian sample consisted of 174 ten-year-old males from the Saskatchewan Growth Study while the Guyanese sample consisted of 35 ten-year-old males representative of the population from Georgetown, Guyana. All anthropometric measurements taken followed the procedures of the Heath—Carter Somatotype Method.

The somatotype distribution of the Canadian males displayed an average somatotype rating of 2.5—4.0—3.6, a *mesomorph-ectomorph*, with the largest identified category, at 30 per cent, being *mesomorph-ectomorph*.

The somatotype distribution of the Guyanese males displayed an average somatotype rating of 2.9—3.5—3.8, a *mesomorph-ectomorph*, with the largest identified category, at 27 per cent, being *balanced ectomorph*.

Comparison of the average somatotype ratings indicated the Canadian males to be significantly higher in the mesomorphic component whereas the Guyanese males were significantly higher in the endomorphic component ( $p \leq .05$ ).

Comparison of selected anthropometric measures indicated the Canadian males to have significantly larger calf girths whereas the Guyanese males were significantly larger in the skinfolds of the triceps and subscapula.

Various factors were speculated to have influenced the growth patterns of these children.

**Key words:** somatotypes, anthropometric, children, Canada, Guyana.

### Introduction

The physical growth and developments of children from industrialized countries of the western world has been well documented (MALINA 1971, TANNER et al. 1966, JOHNSTON et al. 1970, BAILEY 1972). There is however, a very limited number of anthropometric studies from developing countries (FIRSANCHO et al. 1975, MALINA et al. 1974, JOHNSTON et al. 1975, GLANVILLE and GEERDINK 1970).

As part of a World University Services of Canada project to expose and familiarize Canadians to development of Third World countries, this study was undertaken to (a) describe the somatotypes of a representative group of 10-year-old Guyanese males, and (b) compare the somatotypes and selected anthropometric measures of Guyanese and Canadian 10-year-old males.



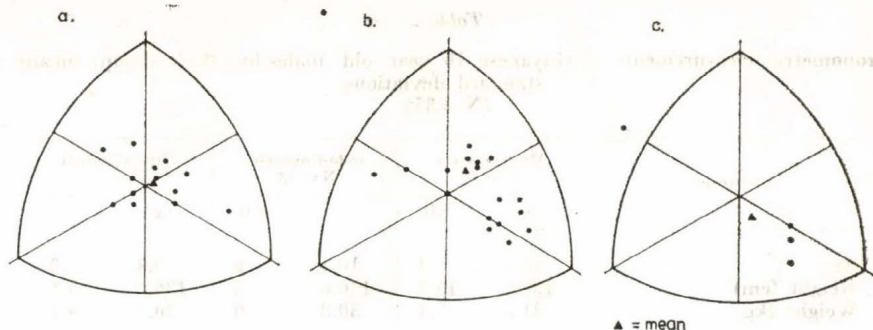


Fig. 2: A comparison of somatotype distributions of 10 year old Guyanese males by ethnic sample. — A: Mixed Guyanese males, N = 13; B: Afro-Guyanese males, N = 18; C: Indo-Guyanese males, N = 4

morph-ectomorph (second and third components do not differ by more than one-half unit and the first component is lower) was the second largest classification at 13.5 per cent, followed by balanced endomorphs at 10.8 per cent.

Figure 1B displays the somatotype distribution of 10-year-old Canadian males indicating an average somatotype rating of 2.5—4.0—3.6, a *mesomorph-ectomorph*. The largest identified category was the mesomorph-ectomorph at 29.3 per cent, followed by mesomorphic-ectomorph at 21.8 per cent, balanced mesomorphs at 18.4 per cent and ectomorphic-mesomorphs at 13.8 per cent.

Table 1

Anthropometric comparisons of Canadian and Guyanese 10 year old males: means and standard deviations

	Canadian N = 174		Guyanese N = 35	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Age	10.0	.3	10.1	.4
Height (cm)	138.5	6.5	136.7	11.8
Weight (kg)	31.9	5.2	30.9	5.5
<i>Skinfolds</i> (mm)				
Triceps	8.9	3.0	10.1*	3.6
Subscapula	6.1	2.7	7.6*	3.6
Suprailiac	5.6	3.1	5.9	4.4
Medial calf	—	—	12.7	3.8
<i>Bone diameters</i> (cm)				
Humerus	5.6	.3	5.4	.7
Femur	8.4	.5	8.2	.4
<i>Girths</i> (cm)				
Biceps	19.8	1.9	20.2	2.3
Calf	27.1*	2.0	25.9	4.8

\* Significant at .05



Table 2

Anthropometric measurements of Guyanese 10 year old males by ethnic group; means and standard deviations  
(N = 35)

Items	Afro-Guyanese N = 18		Indo-Guyanese N = 13		Others (mixed) N = 4	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Age	10.1	.4	10.1	.6	9.8	.3
Height (cm)	136.0	15.8	136.6	6.5	136.0	5.1
Weight (kg)	31.5	5.4	30.3	3.9	30.2	9.4
<i>Skinfolds (mm)</i>						
Triceps	8.9	3.2	11.7	3.6	8.7	2.1
Subscapular	7.3	3.9	7.7	2.1	9.9	6.1
Suprailiac	5.3	3.3	4.9	1.9	9.2	9.3
Medial calf	11.9	4.1	14.6	3.2	11.8	4.0
<i>Bone Diameters (cm)</i>						
Humerus	5.36	.27	5.54	1.09	4.98	.38
Femur	8.27	.36	8.07	.39	8.13	.81
<i>Girths (cm)</i>						
Biceps	20.7	1.9	19.9	2.1	19.5	3.9
Calf	25.7	6.6	26.4	1.7	25.5	3.4
<i>Somatotype Components</i>						
1st (endomorph)	2.7	1.3	3.1	.9	3.5	2.1
2nd (mesomorphy)	3.8	2.1	3.5	.7	3.0	2.0
3rd (ectomorphy)	3.7	1.4	3.5	1.1	4.0	2.3

Comparing the average somatotype ratings of the two samples indicated that the Canadian males were significantly higher ( $p \leq .05$ ) in the mesomorphic component while the Guyanese were significantly higher ( $p \leq .05$ ) in the endomorphic components. No differences were indicated in the ectomorphic component.

Since the Guyanese sample was composed of three ethnic subgroups, Figure 2 displays the somatotype distributions of 10-year-old Mixed Guyanese, Afro-Guyanese and Indo Guyanese males, respectively.

Figure 2A indicates that the average somatotype of Mixed-Guyanese 10-year-old males was 3.1—3.5—3.5, a *mesomorph-ectomorph*. The largest identified categories were mesomorph-ectomorph and central (no component differs by more than one unit from the other two and consists of ratings of 3 and 4) at 23.1 per cent each.

In Figure 2B the average somatotype for Afro-Guyanese 10-year-old males was 2.7—4.1—3.7, a *mesomorph-ectomorph*. The largest identified category was balanced ectomorph at 27.8 per cent, followed by mesomorph-ectomorph and mesomorphic-ectomorphs at 16.7 per cent each.

Figure 2C indicates the average somatotype of Indo-Guyanese 10-year-old males to be 3.5—3.0—4.0 although the sample size is quite small. The dominant category was *balanced ectomorphs*.

## *Anthropometric comparison*

For a more specific anthropometric comparison between Canadian and Guyanese 10-year-old males, the two groups were compared on 9 body measurements. Table 1 indicates significant differences ( $p \leq .05$ ) in favour of the Guyanese in the tricep and subscapula skinfolds and the Canadians in the calf girth.

Although it appears the Guyanese children may have more body fat, this conclusion could be misleading, due to the small number of fat sites employed and the confounding of racial fat pattern depositions.

Table 2 compared the three Guyanese ethnic groups on 10 anthropometric measurements. No significant differences were identified. Although there are obvious racial differences, a common diet may hide any real differences.

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