

SECULAR CHANGE OF BODY SIZE AND FORM OF BLACK AMERICAN CHILDREN AND YOUTHS LIVING IN THE UNITED STATES

by J. H. SPURGEON and H. V. MEREDITH

(College of Health and Physical Education, University of South Carolina,
Columbia, South Carolina, USA)

Abstract. During 1974—1977, 1,500 black children and youths of Richland County, South Carolina were measured for standing height, sitting height, hip width, arm girth, calf girth, and body weight. These data were obtained to (a) provide descriptive statistics on body size and body form of United States Southern blacks, and (b) allow comparison of Southern blacks with other groups studied about 1900 in the United States, and since 1960 in many parts of the world.

Compared with black youths measured in the United States at about the turn of the century, present-day youths are considerably larger: girls age 13 years are 10.9 cm taller and 9.9 kg heavier; boys age 15 years, taller by 14.5 cm and heavier by 12.3 kg. These increases closely approximate those of their white peers over the same period.

Richland County black youths have longer lower limbs relative to sitting height than their white peers. Undoubtedly, this relates to the success experienced by black youths in some athletic events.

Key words: Secular change, racial differences, skeletal index.

Introduction

Between 1974 and 1977, physical measurements were taken on nearly three thousand black and white children and youths in Richland County, South Carolina. Two of our objectives were (1) revision of American white height-weight school and clinic charts for the National Education Association and the American Medical Association, and (2) development of similar charts for American black children and youths. Additionally, we aimed to secure descriptive statistics on body size and body form of United States Southern blacks, and compare these with statistics of groups studied about 1900 in the United States and since 1960 in other parts of the world (MEREDITH 1976, MEREDITH and SPURGEON 1976, SPURGEON and MEREDITH 1979).

Methods and Materials

The materials used in this paper are measures of standing height, sitting height, and body weight obtained during 1974—1977 on South Carolina black and white female youths age 13 years, black and white male youths age 15 years, and black male youths age 19 years. The measures of standing height and sitting height were used to derive an index of body form, i.e. the *skelic*

index. In deriving this index (1) lower limb height was obtained as standing height minus sitting height, and (2) lower limb height \times 100/sitting height was computed for each subject.

The method is both descriptive and comparative. Means for standing height, body weight, and the skellic index are presented for South Carolina black and white females age 13 years and black and white males age 15 years. Comparison of means for standing height and body weight are made with means from studies reported near 1900. Skellic index comparisons are made for black and white groups.

Results and Discussion

A commonly heard observation is that adults have been getting taller and heavier during the last several generations. This is true to some extent, but the increases are much more dramatic in late childhood and early adolescence than in adulthood. Table 1 compares the black and white youths studied in South Carolina with black and white youths studied in the United States in the 1890's.

Table 1

Average height and weight of United States youths in two secular periods

Date	Height (cm)	Weight (kg)	Date	Height (cm)	Weight (kg)
<i>Black Females Age 13 Yrs.</i>			<i>White Females Age 13 Yrs.</i>		
1896-97	145.8	39.0	1875-80	145.3	36.7
1974-77	156.7	48.9	1974-77	156.4	47.3
Increase	10.9	9.9		11.1	10.6
<i>Black Males Age 15 Yrs.</i>			<i>White Males Age 15 Yrs.</i>		
1896-98	152.7	44.3	1892	154.9	45.4
1974-77	167.2	56.6	1974-77	169.4	57.1
Increase	14.5	12.3		14.5	11.7

Utilizing two age groups, the black girls measured in 1974-1977 are 10.9 cm taller and 9.9 kg heavier than those measured during 1896-1897. The white girls of 1974-77 are 11.1 cm taller and 10.6 kg heavier than those measured between 90 and 100 years earlier. The black boys measured in 1974-1977 are 14.5 cm taller and 12.3 kg heavier than those measured near the turn of the century and the white boys measured in 1974-1977 are 14.5 cm taller and 11.7 kg heavier than those measured 83 years earlier. Obviously the increases are quite similar over approximately the same period.

Of interest is what has caused these increases. The answers most often heard are better nutrition, vitamins, better prenatal and postnatal medical care, improved housing, adequate clothing, etc. However, these responses pose problems. Quantitatively it is not possible to determine where the effect of better nutrition leaves off and improved medical care begins. Also no disinterested observer would suggest that black children have had as good a "growth

environment" in Richland County during the last 75 years as have white children, yet their increases in height and weight are quite similar.

It has been suggested that these environmental influences have been cumulative. This sounds reasonable except that secular increases are now being observed in many of the developing nations of the world where living conditions are far from optimal. The fact is, as current authorities have stated, the reasons for secular increases are not well understood (CONE 1961, MEREDITH 1976, TANNER 1966, VLASTOVSKY 1966).

A phenomenon of the American sports world since World War II has been the emergence of the black athlete. Many reasons for his success have been suggested, among them social, cultural, economic, and even anthropometric differences. Unquestionably there are anthropometric differences that are advantageous in certain sports such as basketball and track and field, and one difference is the relation of lower limb length to sitting height i.e., the skelic index. If everything else is equal in two men of the same height the man with the highest skelic index will jump highest because his crotch is higher off the ground. We found this relationship to exist between the 13 year old girls and 15 year old boys.

The black girls have about a 5 percentage point advantage and the black boys a 6 to 7 percentage point advantage.

Among the white females one subject only had a skelic index above 100, 15 of the black females exceeded 100. Among the white males, 4 subjects had skelic indexes above 100, 74 of the black males exceeded 100 (Table 2).

Table 2

Skelic index statistics (%) for United States black and white youths measured 1974-1977

13 year old girls						
	N	Mean	P ₅	P ₂₅	P ₇₅	P ₉₅
Black	201	93.2	85.5	89.9	96.7	100.7
White	185	88.0	80.0	84.7	90.7	95.9
15 year old boys						
	N	Mean	P ₅	P ₂₅	P ₇₅	P ₉₅
Black	219	97.7	88.7	94.4	101.5	105.7
White	186	91.1	82.3	87.3	94.4	98.7

Some years ago, we measured 15 black members of the state 24-man all-star basketball team. These players had been rated by the coaches and considered to be the states' best.

As noted in Table 3, 8 of the 15 young men matriculated at two- or four-year colleges. Player number one became an outstanding member of one of the nation's best teams.

One of our finest professional basketball players is David Thompson who is 193 cm. and has a skelic index of 115. One can well understand why he has such great jumping ability. Some observers have suggested that the black

Table 3

Skelic indices of 15 black high school all-star basketball players

Subject	Skelic Index	Subject	Skelic Index
*1	114	9	99
*2	107	10	99
*3	105	11	98
*4	104	12	97
*5	101	13	95
*6	100	14	95
*7	100	15	95
*8	100		

Average for group = 101

* Matriculated at two and four year colleges

athlete's success in sports is based almost entirely upon desire. We would suggest that in addition to desire, ability and appropriate physique are also important.

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Author's address: Prof. Dr. JOHN H. SPURGEON
 Prof. Dr. HOWARD V. MEREDITH
 College of Health and Physical Education
 University of South Carolina
 Columbia,
 U.S.A. South Carolina 29208