COMPARATIVE GROWTH OF MALAY, CHINESE AND INDIAN SCHOOL CHILDREN IN MALAYSIA

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INTRODUCTION

The growth of children is influenced by a number of factors. For example, in Hongkong (Chang *et al.*, 1963), Malaysia (McKay *et al.*, 1971) India, (Banik *et al.*, 1970), Jamaica (Ashcroft and Lovell, 1964), South Africa (Abramson, 1959), U.S.A. (Abraham *et al.*, 1975) and England (Acheson *et al.*, 1954), children of richer parentage have been shown to be bigger than those of the poor. Genetic factors may also be important and children of different ethnic groups often do not possess the same growth potential.

In Peninsular Malaysia, the three main ethnic groups are Malays (53%), Chinese (36%) and Indians (11%) (Malaysia, 1974a). The Chinese are mainly of southern Chinese origin while the Indians are of southern India origin. Millis (1958) found that the growth achievement of the Malay, Chinese and Indian preschool children from low income families in Singapore, were rather similar during the preschool age period, although the Indians were taller and lighter at 5 years of age. However, very little is known regarding the comparative growth achievement of the three ethnic groups in Malaysia.

The objective of this study was to compare the growth achievement of the Malay, Chinese and Indian school children in an urban area in Malaysia.

MATERIALS AND METHODS

From February to April, 1972, five primary schools (two Malay medium, one Chinese medium, one Tamil medium and one English medium school) in and around Kuala Lumpur were surveyed. Altogether 3,312 children, aged 6 to 11 years, were examined.

The dates of birth of the children were obtained from birth certificates and the age of each child was calculated therefrom. The household incomes and occupations of the parents and the number of living siblings were obtained by interviewing parents or obtained from returns of questionaires and the school registers. Weight, height, left triceps skinfold thickness, left arm circumference and head circumference were all measured. However, only the results of weights and heights will be presented in this paper.

In general, the methods of measurements used were those suggested by Jelliffe (1966). Children were weighed on an Avery beam balance accurate to an ounce. They were lightly clad with standard thin cotton school uniform. Measurements were read to the last complete ounce. The height was measured by means of the Microtoise which is manufactured in France. The child without shoes was positioned in the standard manner (Jelliffe, 1966) below the Microtoise. The head piece was then brought to rest on top of the head and the reading taken direct at the visor hairline and to the last complete 0.1 cm.

Means and standard deviations of weights and heights at the various age groups for boys and girls of the 3 ethnic groups were obtained with the aid of a computer.

These means are plotted at the mid point of the yearly age intervals as shown in Figs 1, 2, 3

and 4. In Fig. 1 and Fig. 2 are shown the mean weight and height curves of Hong Kong Chinese (Chang, 1965) for comparison. Presented with Fig. 3 and Fig. 4 are mean weight and height curves of Boston children (Nelson, 1966) for comparison. Growth curves were drawn with minimal smoothing.

RESULTS

The frequency distribution of children according to ethnic group, sex and income is shown in Table 1.

Socio-economic background of the study children

Income : Of the three ethnic groups, the Indians were the poorest, the Malays were better off, while the Chinese had the highest income. The majority of the Indian children (75%) came from families with a total monthly household income of less than M$200/-per month (US$1 = M$2.5). For purposes of comparison two groups of income levels are presented: monthly income M$300 and above and less than M$300 (the average monthly household income in Malaysia being M$275) (Malaysia, 1974b).

The mean monthly household incomes of the lower income children (less than M$300 per month) are as follows : Chinese M$211, Malays M$163 and Indians M$130. This difference is statistically significant ($p < 0.01$). The mean household income of the lower income Indian is below the poverty level which is $140 per month (Malaysia, 1974b). The parents of the children with household incomes of less than M$300 were mainly unskilled and semiskilled workers while those with M$300 or more were skilled workers, clerks, professionals and businessmen.

Siblings: Table 2 shows the mean number of living siblings (excluding the studied child) by ethnic group and income level. It can be seen that the family size of the Indians was the largest, followed by the Malays while the Chinese was the smallest. This difference is

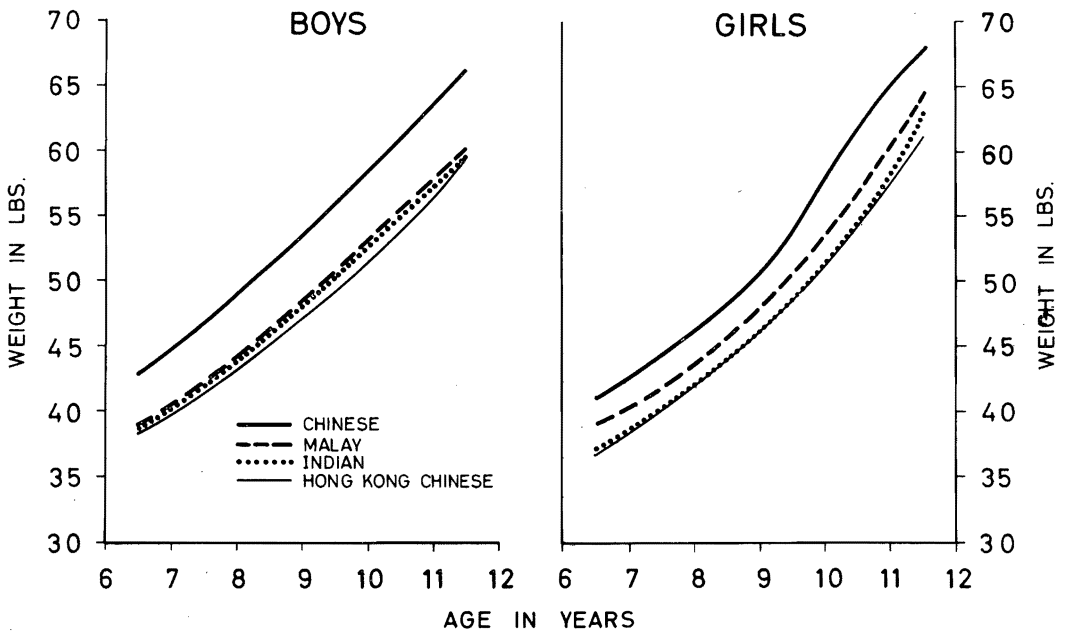

Fig. 1—Mean weights of Malaysian children of various ethnic groups and of Hongkong Chinese.

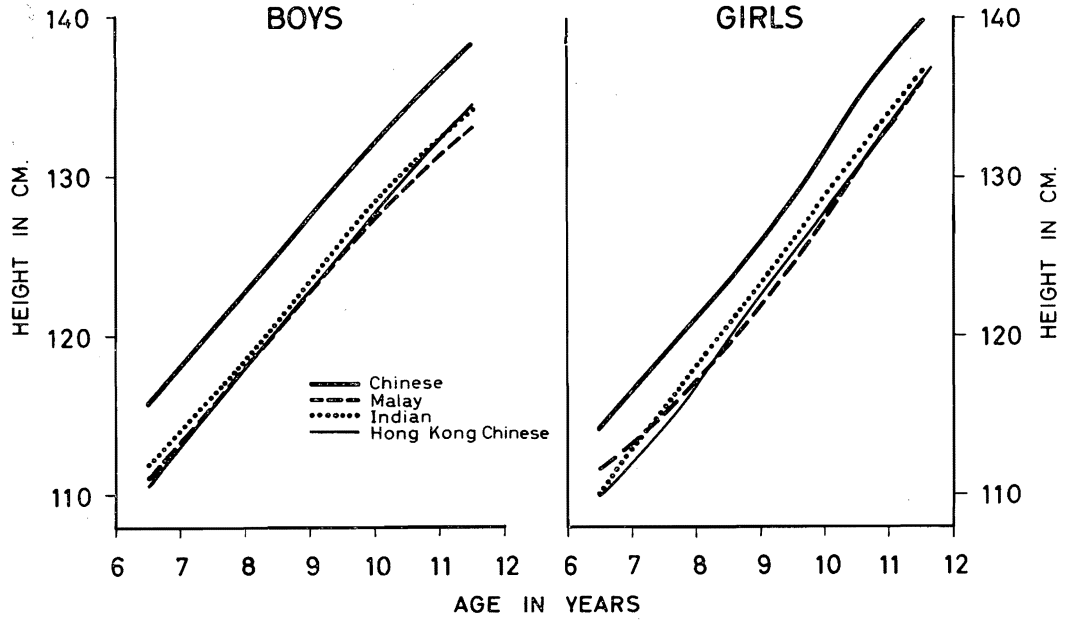

Fig. 2—Mean heights of Malaysian children of various ethnic groups and of Hongkong Chinese.

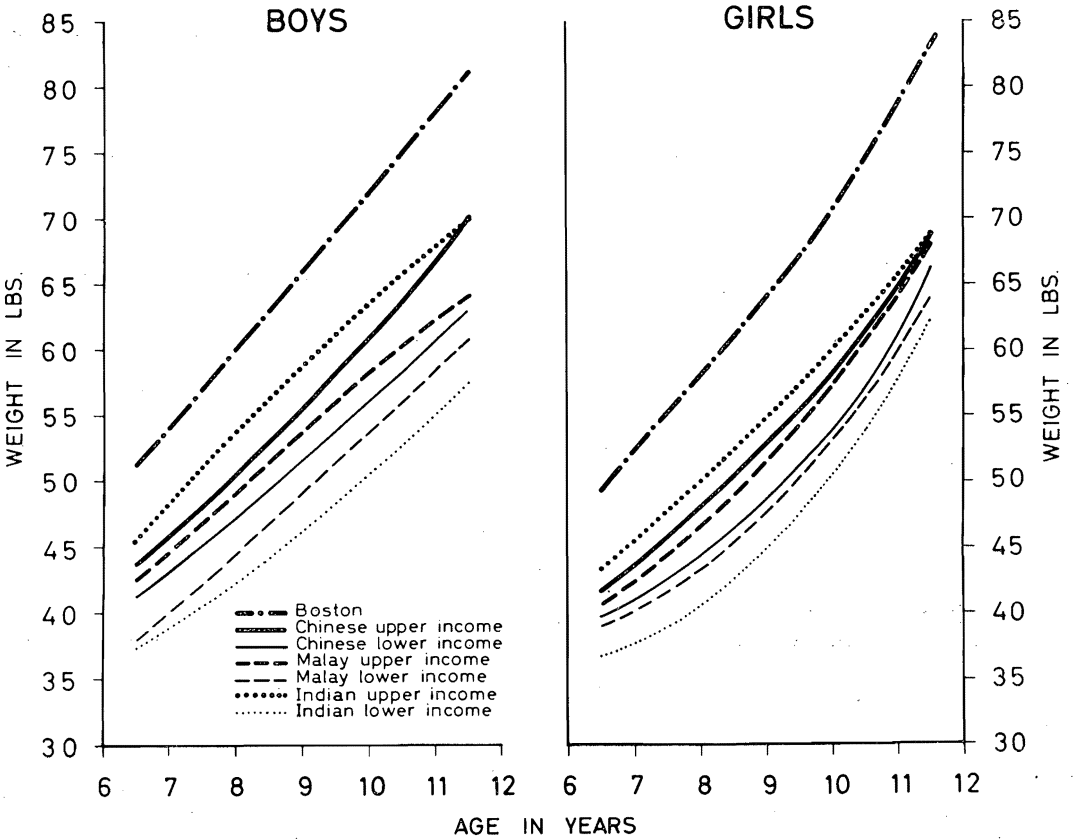

Fig. 3—Mean weights of Malaysian children of various ethnic groups and income levels and of Boston children.

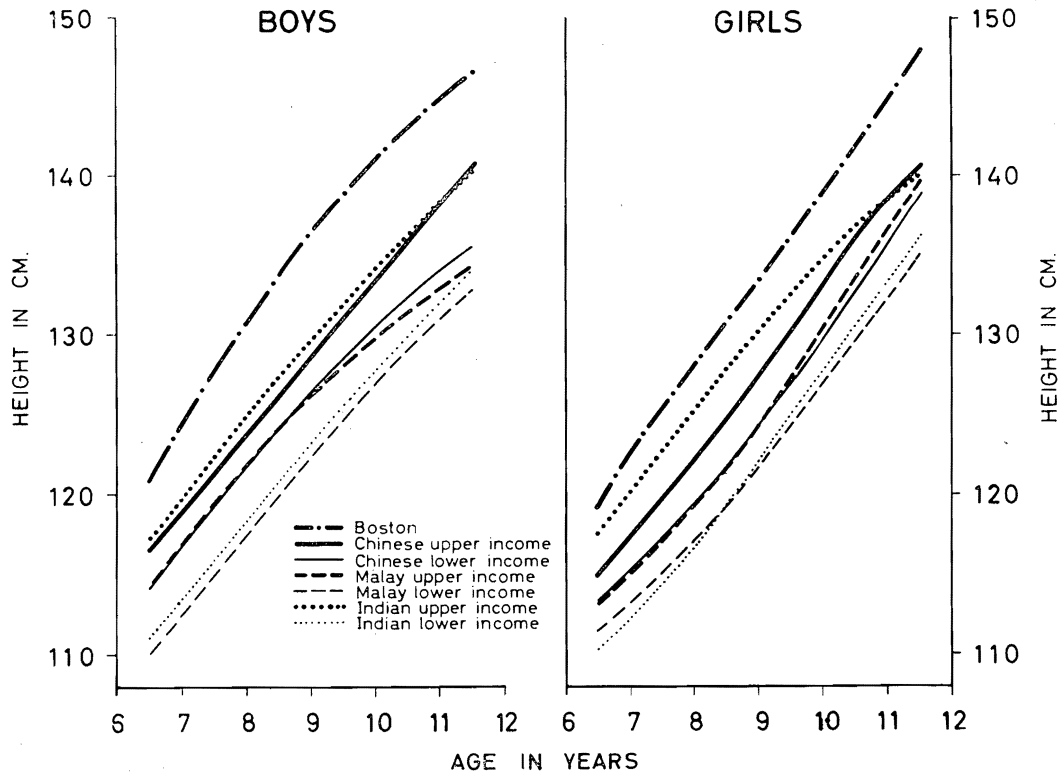

Fig. 4—Mean heights of Malaysian children of various ethnic groups and income levels and of Boston children.

Table 1

Frequency distribution of school children according to ethnic group, sex and income.

Monthly household income (M$)	Malay		Chinese		Indian		Total		Grand Total
	Male	Female	Male	Female	Male	Female	Male	Female	
Less than 300	415	550	308	306	312	372	1,035	1,228	2,263
300 and above	78	77	429	370	42	53	549	500	1,049
Total	493	627	737	676	354	425	1,584	1,728	3,312

Table 2

Mean number of living siblings of school children by ethnic group and income.

Monthly household income (M$)	Mean no. of living siblings		
	Malay	Chinese	Indian
300 and above	4.1	3.7	3.3
Less than 300	4.8	4.1	5.3
All income groups	4.7	3.9	5.1

statistically significant ($p < 0.05$). The results also show that the family size of the poorer children was bigger than that of the higher income children ($p < 0.05$).

Weights and heights

The means and standard deviations for weights and heights at yearly age intervals for boys and girls of the three ethnic groups are listed in Table 3.

For both boys and girls, the Malaysian Chinese were heavier and taller than the Malays, Indians and the Hongkong Chinese. The mean weights and heights of the Malays, Indians and the Hongkong Chinese were rather similar except that the Malays were slightly heavier (Figs. 1 and 2).

Fig. 3 and Fig. 4 show that the higher income children were heavier then the lower income children irrespective of ethnic groups. They were also taller than the lower income children except for the Malays who did not differ consistently from the lower income Chinese. The higher income Chinese and Indian children were rather similar in their growth achievement and were heavier and taller than the higher income Malays. However, for the lower income children, the growth achievement of the Chinese was better than the Malays and the Indians who were the least heavy among the three ethnic groups.

However, even the higher income Malaysian children were lighter and shorter than the Boston children.

DISCUSSION

The Chinese children were on the whole, heavier and taller than the Malay and the Indian children, the Indians being the least heavy. This correlated well with the income levels of the three ethnic groups; the Chinese had the highest income while the Indians had the lowest. The fact that the Indian children from higher income families were as heavy and as tall as the higher income Chinese children shows that the growth potential of the Indian is similar to that of the Chinese. The growth retardation of the Malays and the Indians was most probably due to poverty.

The poor families had poor nutrition, bad living conditions, poor hygiene and health care and suffered from poor health. Chen and Dugdale (1972), in a survey of school children in three of the schools included in this study, found that the Indian children suffered from more ill health than the Malays while the Chinese were the healthiest of the three. Not only were the Indians poorest among the three ethnic groups, but they also had the largest family size which further compounds the problem of poverty. Guzman (1973) has shown that malnutrition and excessive family size are associated.

Malaysian children from higher income families were found to be lighter and shorter than the Boston children. (Figs. 3 and 4). Is this the result of genetic differences or is it due to environmental factors?

Ashcroft *et al.*, (1966) found that Chinese children in Jamaica were lighter and shorter compared with the Jamaican children of African, Afro-European and European origin of the same socioeconomic status. They also found that the Indian (Asian) children in Guyana had consistently lower weights for age than their African compatriots, although mortality rates for African children were higher (Ashcroft *et al.*, 1968). Whether such observed differences in growth achievement between ethnic groups are attributable to differences in genetic potentials, or is the result of cultural-environmental factors, or perhaps is the consequence of adaptive interaction between the two, is not clear.

The growth of upper income Hongkong Chinese (Chang, 1963) and Jamaican Chinese girls (Ashcroft and Lovell, 1964) is very simi-

Table 3

Weights (lbs) and heights (cm) of Malaysian children of various ethnic groups.

Sex	Age (years)	Malay					Chinese					Indian				
		No.	Weight		Height		No.	Weight		Height		No.	Weight		Height	
			Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.
Boys	6-	83	38.9	4.8	111.2	5.1	113	43.0	5.5	115.7	4.7	75	38.7	5.9	112.3	4.9
	7-	101	42.0	5.4	115.1	5.8	150	46.9	7.0	120.5	5.6	77	41.7	6.4	116.0	5.7
	8-	82	46.1	6.3	120.4	5.5	155	51.3	8.5	125.2	6.0	39	44.8	6.4	121.0	6.0
	9-	78	52.0	8.9	124.9	5.1	111	55.7	8.7	129.5	6.2	49	52.6	14.2	127.2	6.8
	10-	79	55.9	7.2	129.8	6.0	95	61.2	9.4	134.6	5.7	54	53.4	7.8	129.9	6.7
	11-12	70	60.2	9.2	133.0	6.9	113	67.7	16.0	138.2	7.4	60	60.5	13.8	135.1	6.8
Girls	6-	91	39.3	6.4	111.7	6.0	81	41.0	5.7	114.3	5.6	91	37.4	5.1	111.0	5.7
	7-	120	41.3	5.8	114.8	6.0	120	44.7	6.7	118.8	5.0	112	40.5	6.1	115.6	6.2
	8-	107	45.7	5.6	119.6	5.1	168	48.1	6.7	123.2	5.0	67	44.1	7.0	119.9	6.4
	9-	100	50.5	7.4	124.3	5.8	124	53.6	8.3	128.4	5.8	49	50.2	8.9	126.5	6.2
	10-	99	57.0	9.7	130.4	6.5	93	62.2	13.0	134.9	6.6	60	54.4	8.1	130.3	5.6
	11-12	110	64.5	12.1	136.0	6.8	90	68.0	13.0	139.9	7.4	46	62.9	11.1	136.8	6.9

lar to that of Malaysian upper lower income and middle income girls (Fig. 5) except that the Hongkong girls are taller. Whether the Malaysian Chinese children from the upper income group will achieve better growth than this present group of lower and middle income children remains unknown. It is interesting to note that McKay (1971), studying a small sample of children, found that the economically privileged Malay preschool children's growth closely approximates that of Boston children.

Further study of the elite Chinese, Malay and Indian children of Malaysia is necessary if we are to ascertain the growth potential of these children.

SUMMARY

The weights and heights of 3,312 Malaysian primary school boys and girls, aged 6 to 11 years, belonging to various ethnic groups in Malaysia were measured.

On the whole, the Chinese children were taller and heavier than the Malay and the Indian children who were the least heavy among the three ethnic groups. Economically the Indians were the poorest among the three ethnic groups and they also had the largest family size. When the household incomes were taken into consideration it was found that the growth achievement of the higher income children was better than that of the poorer children, irrespective of their ethnic groups. It is interesting to note that,

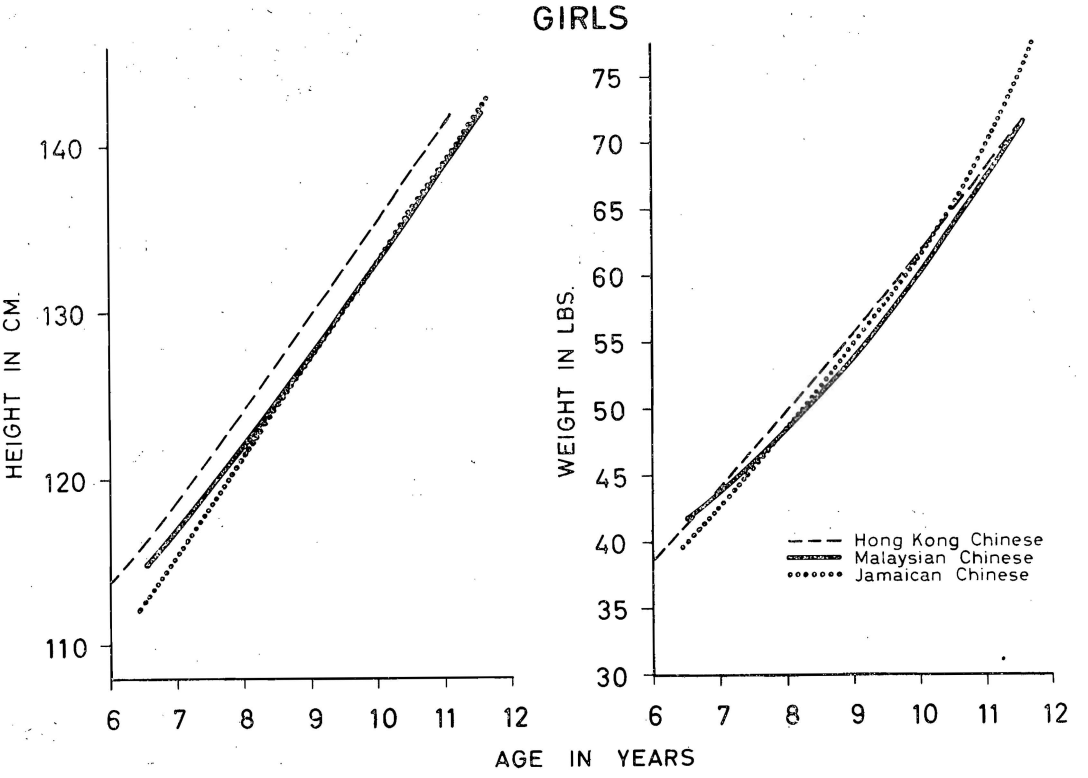

Fig. 5—Mean weights and heights of Hongkong, Malaysian and Jamaican Chinese children.

although the Indian children as a whole, were the least heavy of the three ethnic groups, yet the growth achievement of the higher income Indian children was similar to that of the higher income Chinese children.

The differences in growth achievement of the various ethnic groups are probably due to environmental differences, rather than genetic differences. It seems likely that Malaysian children of different ethnic groups (Malay, Chinese and Indian) can attain similar statures if environmental conditions are similar.

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