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## A study of the height and weight of Chinese school children in some northern Californian cities

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A  
STUDY OF THE HEIGHT  
AND WEIGHT  
OF CHINESE SCHOOL CHILDREN  
IN SOME  
NORTHERN CALIFORNIAN CITIES

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By  
Lillian Wai-chuen Chow

Stockton

1944

A Thesis  
Submitted to the Department of Education  
College of the Pacific

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In partial fulfillment  
of the  
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Degree of Master of Arts

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APPROVED:

Chairman of the Thesis Committee

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## INTRODUCTION

In any study of physical fitness or of nutritional well being of a group of people, a knowledge of the normal height and weight of that group serves as a valuable guide. Thus, Height-Weight-Age tables have been prepared and are being used in schools, gymnasiums, camps, etc., as a gauge of physical development in children. However, for the group of Chinese school children in the United States very little work has been done to determine the normal height range and weight range at the different ages and the normal height-weight-age relationships.

Because of the lack of data on the normal weights and heights of Chinese school children, the writer, who had previously attempted a survey and study of malnutrition among Chinese school children in Stockton, California, found that she has no means to gauge her measurements.

The tables prepared for Caucasian children are always available and can be referred to, of course; but can height-weight-age standards which are based on measurements of Caucasian children serve as standards by which Chinese children could be judged? This study was undertaken in order to throw light on that question and to serve as accurate and contemporaneous material for preparing height-weight-age tables for Chinese school children in Northern California, should the final analysis prove that tables prepared for Caucasian children cannot be adapted for their use.

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CHAPTER I  
SURVEY OF PREVIOUS WORK

During the past ten years much work has been done to determine the normal height-weight-age relationship of school children in California. Two notables among these investigators are Dr. H. K. Faber and Dr. Orren Lloyd-Jones.

Dr. Faber measured more than sixty thousand children in California<sup>1</sup> and from these measurements made up his "Weight-Height-Age Tables for California School Children." Dr. Faber's tables are shown in the appendix.

In an interview with Dr. Faber it was learned that he grouped his data according to sex, age, and height, and from the normal weight variations as found among each group established his weight range for that group.

An inspection of Dr. Faber's tables will show that they give the range of weight of a given age group at a given height and are distinct improvements over those tables which state an exact weight for a given age and height.

Dr. Lloyd-Jones worked out the average height for age and average weight for age of Caucasian, Mexican, Negro, and Japanese

<sup>1</sup> Personal communication.

school children in Los Angeles.<sup>2</sup> The data from which he established the average height per age and average weight per age of Caucasian children were massive, his measurements being taken from 121,820 individuals. However, his measurements on Japanese children included only 3,692 individuals.

In his study Dr. Lloyd-Jones found a clear-cut gradation of the races in regard to both height for age and weight for age. The sequence, downward, is Caucasian, Negro, Mexican, and Japanese. He also found that the general form of the growth curve was very similar for the four races.

In his discussion Dr. Lloyd-Jones says: "If we make an average weight per height comparison of white children and children of another race and find that the values are comparable and if we make a study of the range in height of white children and children of that other race and find them comparable, then the standard values given in height-weight-age tables for white races will be adequate for that other race, with this modification: that the modal heights of the two are different. This is of some significance because less weight range is normally allowed those individuals at the modal height, and wider range is allowed those individuals which are farther away from the modal height for that age."

<sup>2</sup> O. Lloyd-Jones, "Race and Stature: a Study of Los Angeles School Children," Research Quarterly of the American Association for Health, Physical Education, and Recreation, XII, 83-97, (March, 1941.)

O'Brien, Girshick, and Hunt, in a comprehensive report of measuring procedures and statistical analysis of data on 147,000 American children, devoted a part of their study to comparing the height and weight of children in different states. Their data show that in regard to body measurements, which include height and weight, Californian children on the whole rank highest and Tennessee and Alabama children lowest - "not only for all of the measurements but what is more significant, for all age groups and each sex."

They state that "the consistency of these results for each age and sex precludes a chance occurrence explanation."

In their study, also, O'Brien and associates showed that weight is highly correlated with height, while age is very little correlated with either height or weight.<sup>3</sup>

<sup>3</sup> R. O'Brien, M. A. Girshick, and E. P. Hunt, "Body Measurements of American Boys and Girls for Garment and Pattern Construction," U.S.D.A. Miscellaneous Publication No. 366. (July, 1941.)

CHAPTER II  
SCOPE OF THE DATA

The study, made specifically for the preparation of a height-weight-age table for use on Californian school children of Chinese ancestry, comprises height and weight measurements on Chinese school children. The samples were drawn principally from the schools of the two cities of San Francisco and Stockton, although one school in Tracy was also visited.

In all, fifteen schools were visited and all Chinese students between the ages of five and fifteen years inclusive were measured.

The schools visited are listed below:

Stockton Schools

Lafayette

Hazelton

Weber

Monroe

Jackson

Franklin

Stockton High

Edison High

Chinese School (Private)

San Francisco Schools

Hip Wo Chinese School

St. Mary's

Commodore Stockton

Washington Irving

Francisco Junior High

Tracy School

West Park

### CHAPTER III

#### SOURCE OF THE DATA

##### Number of Cases

The study comprises altogether a total of 1,892 Chinese children. Of these 1,892 children, 1,049 were boys and the remaining 843 girls.

##### Age Distribution

Children between the ages of five and fifteen years inclusive were measured and weighed. The number of samples from each group varied, more samples being obtained for the eleven-, twelve-, thirteen-, and fourteen-year-old groups, while the five- and the fifteen-year-old group included comparatively few samples.

##### Weight Distribution

The fundamental data for the study are displayed in Tables 1 to 22, drawn up to show the actual measurements taken. As may be seen, the weights show wide variations. For the five-year-old groups the variance between the lightest and the heaviest individuals was in the order of twenty pounds, the lightest boy weighing thirty-three and a half pounds while the heaviest boy tipped the scales at fifty-two pounds. The variance between the lightest and the heaviest individuals in the fifteen-year-old

groups was much more marked, being in the neighborhood of seventy pounds - the lightest fifteen-year-old boy weighed eighty-seven pounds, and the heaviest one hundred thirty-nine pounds.

#### Height Distribution

In growing children heights and weights are shifting values, and therefore one would expect to find variations in height of children within the different age groups. However, weight variations among the different age groups are greater than the height variations, the shorter and the taller children within any one age group seldom varying by more than fourteen inches. Furthermore, whereas the weight variance tends to separate out fanwise with increasing age from five to fifteen years, the height variance of the different age groups tends to maintain an approximately constant value. Thus the short ten-year-old boy is forty-seven inches in height and the tall ten-year-old boy fifty-nine inches - a difference of twelve inches. Against this, the short fifteen-year-old boy is fifty-seven inches in height and the tall fifteen-year-old boy sixty-nine - also a difference of twelve inches.



CHAPTER IV  
THE MEASUREMENTS

Age

All ages were computed from date of birth to date of measurement, the age being taken as that of the nearest birthday.

Almost all measurements were taken between March 25, 1944, and April 25, 1944.

Height

Standing height was measured with the shoes removed, with the heels together, and with the chin neither unduly raised nor lowered. The inch unit of measurement was used.

Weight

The weights of all children were taken in indoor clothing, with shoes, coat, and sweater removed. The pound was adopted as the unit of measurement.

CHAPTER V  
A COMPARISON OF THE DATA OBTAINED  
WITH THOSE ESTABLISHED FOR CAUCASIAN CHILDREN

Following Dr. Lloyd-Jones' example, average weight per age and average height per age of Chinese school children were computed from the collected data. The figures are shown in Tables I and II for height, and in Tables III and IV for weight. In addition, these tables show the amounts by which the Chinese children deviate in measurement from the white. It may be noted that all the deviations from the values for Caucasian children as established by Dr. Lloyd-Jones, as shown in Tables I to IV, are minus.

Charts I and II display the same data graphically. A glance at them reveals that the Chinese child is a shorter and a lighter individual than his Caucasian school-mate. A striking fact about the charts is the great similarity as displayed by comparable pairs of curves. Thus the lines showing average height per age and average weight per age for Caucasian boys are approximately parallel to similar lines for Chinese boys. An indeed striking fact, and one which shows that the data collected are sufficient to be representative, is the similar relative positions maintained by both races in regard to the measurements for boys and girls.

Following the average height per age lines for Caucasian boys and girls, it is seen that the five- to nine-year-old girls are approximately a half inch shorter than the boys. A little after the tenth year the positions are reversed so that the eleven-, the twelve-, and the thirteen-year-old girl is taller than a boy of like age. After the thirteenth year the momentum of height growth in the girls is lessened, while with the boys it is undiminished. Consequently, the lines intersect again.

The "average height per age" lines for Chinese boys and girls show similar trends and intersections.

Mean measurements of children at different age levels are shown in Chart II. It will be noticed from this chart that, up to about age eleven, boys are on the average heavier than girls. Both Caucasian and Chinese children show this tendency. From age twelve to about age fourteen, the situation is reversed. From fourteen to fifteen the rate of growth in weight decreases much more rapidly for girls than for the boys, so that the fifteen-year-old boy is heavier than the fifteen-year-old girl.

The charts and the tables also bring out the fact that the Chinese boy is approximately ten per cent lighter in weight and two inches shorter than a Caucasian boy of comparable age.

Whereas Charts I and II show definite and constant racial differences in average height per age and average weight per age, it does not preclude entirely the possibility that any height-weight-age standards which are based on measurements of Caucasian children could serve as standards by which Chinese children could be judged.

As Dr. Lloyd-Jones points out, "So long as the weight of a child of any given age bears the same relation to its own height as does the weight of the 'white' child to its own height, then the standard values given in height-weight-age tables for 'white' races will be adequate for children of that race."<sup>4</sup> That is to say, if the weight-height ratio of Chinese children is the same as the weight-height ratio of Caucasian children of comparable age, then the height-weight-age tables such as those prepared by Dr. Faber can be used for Chinese children.

Weight-height ratios for children of the two races are given in Tables V and VI. The ratio is computed by the following formula:

$$\text{Weight-height ratio} = \frac{\text{Weight in Pounds}}{\text{Height in Inches}} \times 100 \quad ^5$$

#### Boys

Comparing the ratios for boys of the two races, it will be noted that the weight-height ratio for the six-year-old Caucasian boy is identical to that for the seven-year-old Chinese boy; and, with the exception of the eight-year-old group of Chinese boys, all the weight-height ratios of Chinese boys from seven to fifteen are strikingly similar to the weight-height ratios of Caucasian boys of

<sup>4</sup> Lloyd-Jones, Op. Cit.

<sup>5</sup> M. Smith, "Weight-Height Ratio and Personal Ascendency," The Pedagogical Seminary and Journal of Genetic Psychology, XLIX, 267-271 (September, 1936.)

six to fourteen respectively. This, coupled with the fact that the Chinese boy is two inches shorter, which represents one year's difference in height from that of the Caucasian boy of comparable age, indicates a point of great practical significance. That is, by shifting the 'age' complement of height-weight-age tables for Caucasian boys backward one year, those tables can be adapted for use on Chinese boys. Thus the values given for six-year-old Caucasian boys are applicable to seven-year-old Chinese boys, the values for seven-year-old Caucasian boys applicable to eight-year-old Chinese boys, and so on.

However, an application of Dr. Faber's table to the group of Chinese boys measured in this study, using his five-year-old figures for six-year-old Chinese boys, and so on, reveals that if his standards were used many Chinese boys would be classified as underweight. Therefore, Table VII was prepared to show height-weight-age relationships as actually found in the group of Chinese boys measured.

In order to bring out how the Chinese boy deviates in weight from a Caucasian boy of like height and age, Table VII also shows Dr. Faber's standards for Caucasian boys. Dr. Faber's figures appear in small type, while the standards established for Chinese boys appear in large type in the corresponding blocks.

#### Girls

Examination of the weight-height ratios for girls (Table

VI) reveals that the average weight per height of Chinese girls has a lesser value than that for Caucasian girls and demonstrates a well-marked tendency for a more slender build than is seen among the Caucasians. From the table also it is seen that, whereas Caucasian girls display a gradual and regular increase in average weight per height with increasing years from five to fifteen, Chinese girls display much less of this tendency.

For Chinese girls the weight-height ratio at nine years is somewhat lower than would have been expected from the trend of the preceding and following ratios. There is no way to determine the cause of this fluctuation.

Another point about the weight-height ratios of five- to fifteen-year-old Chinese girls is that the ratios level off at fourteen years. This would seem to imply that there is much less tendency for Chinese girls to show much increase in weight as they mature in years.

With these definite racial differences in mind, it would seem unlikely that any height-weight-age tables set up for Caucasian girls could serve for Chinese girls.

Therefore, Table VIII was prepared to show the normal weights of Chinese girls at different ages and for different heights. Dr. Faber's standards for Caucasian girls are also shown in the table. Here also his figures appear in small type, while the standards established for Chinese girls appear in large type in the corresponding blocks.

CHAPTER VI  
HEIGHT-WEIGHT-AGE TABLES

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TABLE I

HEIGHT FOR AGE OF CAUCASIAN AND CHINESE BOYS  
 WITH DEVIATIONS FROM WHITE VALUES  
 (All Figures in Inches)

Age	Caucasian	Chinese	Deviation
	Height	Height	
5	44.17	42.32	-1.85
6	46.01	44.06	-1.95
7	48.20	45.59	-2.61
8	50.40	49.01	-1.39
9	52.52	50.40	-2.12
10	54.42	52.40	-2.02
11	56.30	53.90	-2.40
12	58.33	55.50	-2.83
13	60.56	58.70	-1.86
14	63.25	60.82	-2.43
15	65.54	62.62	-2.92



TABLE II  
 HEIGHT FOR AGE OF CAUCASIAN AND CHINESE GIRLS  
 WITH DEVIATIONS FROM WHITE VALUES  
 (All Figures in Inches)

Age	Caucasian	Chinese	Deviation
	Height	Height	
5	43.78	41.21	-2.57
6	45.66	43.48	-2.18
7	47.97	45.10	-2.87
8	50.15	47.90	-2.35
9	52.14	49.86	-2.26
10	54.34	52.15	-2.19
11	56.62	54.45	-2.17
12	59.15	56.77	-2.38
13	61.28	58.48	-2.80
14	62.61	59.10	-3.51
15	63.35	59.75	-3.56

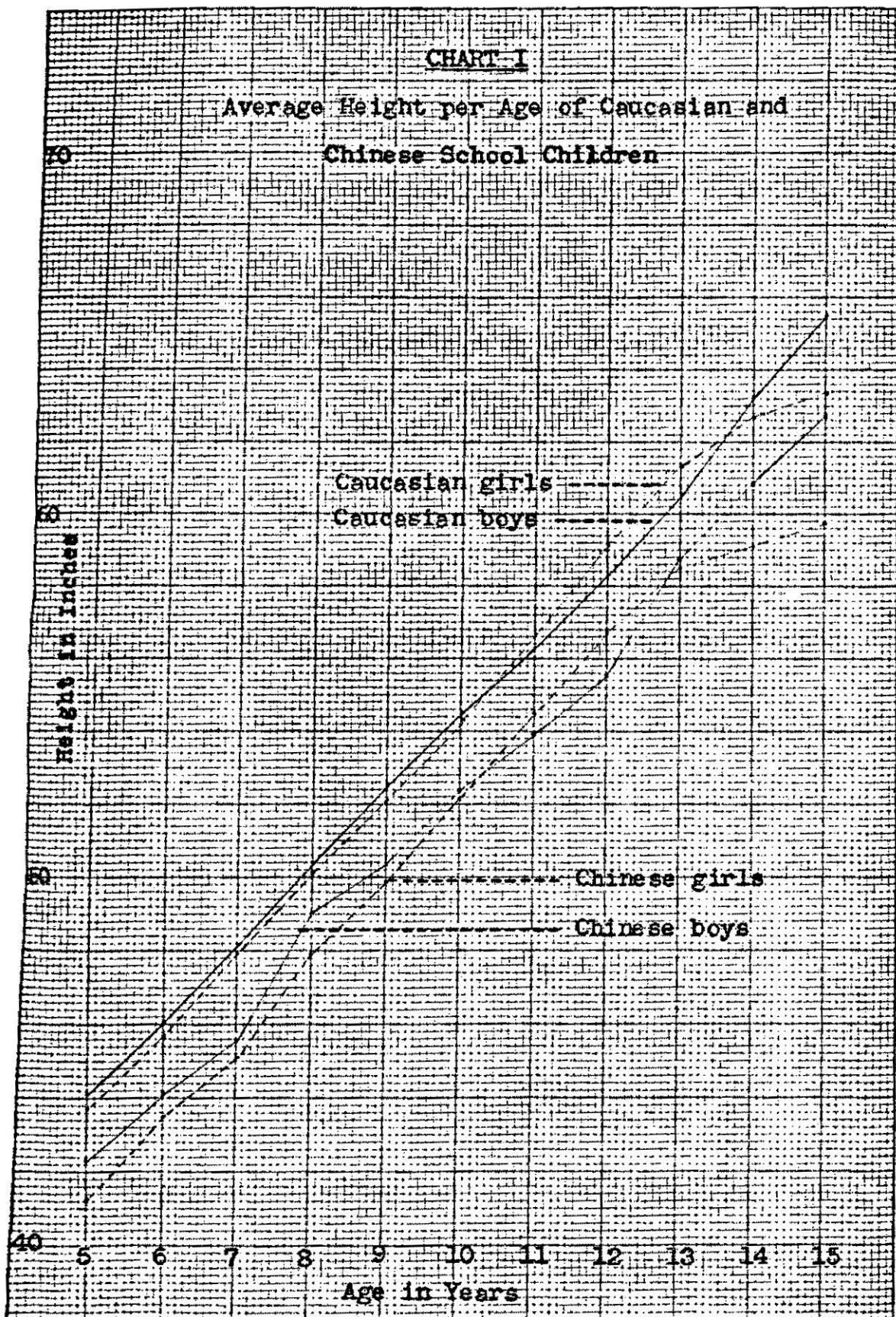


TABLE III

## WEIGHT FOR AGE OF CAUCASIAN AND CHINESE BOYS

WITH DEVIATIONS FROM WHITE VALUES

(All Weight Figures in Pounds)

Age	Caucasian	Chinese	Deviation
	Weight	Weight	
5	44.18	39.83	-4.35
6	47.93	42.85	-5.08
7	52.99	47.38	-5.61
8	58.92	50.26	-8.66
9	65.64	55.18	-10.46
10	72.27	64.44	-7.83
11	79.40	70.12	-9.28
12	87.32	78.80	-8.52
13	96.84	85.21	-11.63
14	109.78	99.66	-10.12
15	122.07	108.95	-13.12

TABLE IV

## WEIGHT FOR AGE OF CAUCASIAN AND CHINESE GIRLS

WITH DEVIATIONS FROM WHITE VALUES

(All Weight Figures in Pounds)

Age	Caucasian	Chinese	Deviation
	Weight	Weight	
5	42.59	35.94	-6.65
6	46.61	41.31	-5.30
7	51.74	43.95	-7.79
8	57.81	49.81	-8.00
9	64.12	50.59	-13.53
10	71.73	60.20	-11.53
11	80.26	69.47	-10.79
12	92.27	79.53	-12.74
13	102.23	89.67	-12.56
14	110.31	99.39	-10.92
15	115.75	100.45	-15.30

TABLE V  
WEIGHT-HEIGHT RATIOS

## BOYS

Age	Caucasian	Chinese
5	100	94
6	104	97
7	110	104
8	111	103
9	125	110
10	133	123
11	141	130
12	150	142
13	160	145
14	174	164
15	186	174

TABLE VI

## WEIGHT-HEIGHT RATIOS

## GIRLS

Age	Caucasian	Chinese
5	97	87
6	102	95
7	108	98
8	116	104
9	123	101
10	132	116
11	142	128
12	156	140
13	167	153
14	176	168
15	183	168



TABLE VII

## HEIGHT-WEIGHT-AGE TABLE FOR CALIFORNIA SCHOOL CHILDREN - BOYS

Inches \ Age	5	6	7	8	9	10	11	12	13	14	15
39	32 - 38 34 - 40	34 - 40									
40	33 - 39 35 - 41	33 - 39 35 - 41									
41	34 - 40 36 - 42	34 - 40 36 - 43	37 - 44								
42	36 - 45 37 - 44	36 - 45 38 - 45	36 - 45 38 - 45	39 - 46							
43	37 - 47 38 - 45	38 - 47 39 - 46	38 - 47 39 - 46	39 - 47 40 - 47							
44	38 - 48 40 - 47	40 - 49 41 - 48	40 - 50 41 - 48	40 - 50 41 - 49	40 - 50 42 - 51						
45	40 - 50 42 - 49	41 - 50 43 - 50	41 - 53 43 - 50	41 - 53 43 - 52	41 - 53 44 - 53						
46	41 - 52 44 - 51	43 - 52 45 - 52	44 - 54 45 - 52	44 - 55 45 - 54	44 - 55 46 - 55	45 - 55					
47	46 - 53	44 - 53 47 - 54	46 - 55 47 - 55	46 - 57 47 - 56	46 - 57 48 - 57	48 - 58 48 - 58					
48		45 - 55 49 - 58	48 - 57 49 - 58	48 - 59 49 - 58	48 - 59 50 - 59	50 - 61 50 - 60	51 - 61 50 - 62				
49		51 - 60	49 - 58 51 - 60	50 - 61 62 - 62	50 - 64 62 - 62	51 - 65 52 - 63	53 - 65 52 - 64				
50		54 - 63	50 - 60 54 - 63	51 - 64 54 - 65	52 - 67 54 - 65	52 - 67 55 - 66	55 - 69 55 - 67	55 - 68			
51			57 - 66	52 - 66 57 - 68	54 - 70 57 - 68	54 - 72 57 - 69	57 - 72 57 - 69	57 - 72 57 - 71			
52			60 - 70	54 - 68 60 - 71	55 - 72 60 - 71	55 - 73 60 - 72	58 - 73 60 - 74	58 - 73 60 - 74	60 - 75		
53			62 - 73	62 - 74	57 - 74 63 - 75	58 - 75 63 - 75	60 - 75 63 - 76	61 - 76 63 - 77	63 - 79 63 - 78		
54				65 - 76	59 - 76 64 - 77	60 - 77 64 - 78	63 - 79 65 - 80	63 - 79 66 - 81	64 - 81 66 - 81	66 - 82	
55				65 - 78	61 - 78 67 - 80	62 - 79 67 - 81	64 - 81 67 - 83	64 - 84 68 - 84	66 - 85 68 - 85	66 - 85 69 - 86	
56					70 - 84	63 - 82 71 - 85	66 - 86 71 - 87	66 - 90 71 - 87	68 - 90 71 - 88	68 - 90 73 - 90	74 - 92
57					73 - 87	64 - 84 74 - 89	68 - 90 74 - 91	68 - 92 74 - 91	70 - 92 75 - 93	72 - 94 76 - 95	77 - 96 77 - 96
58					76 - 91	70 - 92 77 - 95	68 - 90 74 - 91	70 - 92 77 - 95	72 - 96 78 - 97	74 - 98 80 - 99	81 - 100 81 - 101
59						80 - 98	72 - 95 80 - 99	72 - 98 81 - 101	73 - 100 82 - 102	80 - 102 83 - 103	84 - 104 84 - 104
60						84 - 101	74 - 98 84 - 103	75 - 100 85 - 104	75 - 105 86 - 106	83 - 105 86 - 107	87 - 108 87 - 108
61							87 - 107	78 - 104 88 - 109	80 - 108 89 - 111	85 - 110 90 - 112	91 - 113 91 - 113
62							91 - 112	80 - 108 92 - 113	84 - 112 94 - 116	90 - 115 95 - 118	96 - 117 96 - 119
63							95 - 117	95 - 117	88 - 115 97 - 121	95 - 118 99 - 123	97 - 120 101 - 125
64								99 - 122	94 - 118 101 - 125	100 - 123 104 - 129	100 - 125 108 - 131
65								104 - 128	100 - 120 106 - 131	105 - 126 107 - 133	105 - 128 110 - 137
66									110 - 137	110 - 128 112 - 139	110 - 130 116 - 142
67									115 - 142	114 - 130 117 - 146	115 - 135 119 - 148

Large figures: normal weight ranges for Chinese children (findings of Lillian W. Chow).

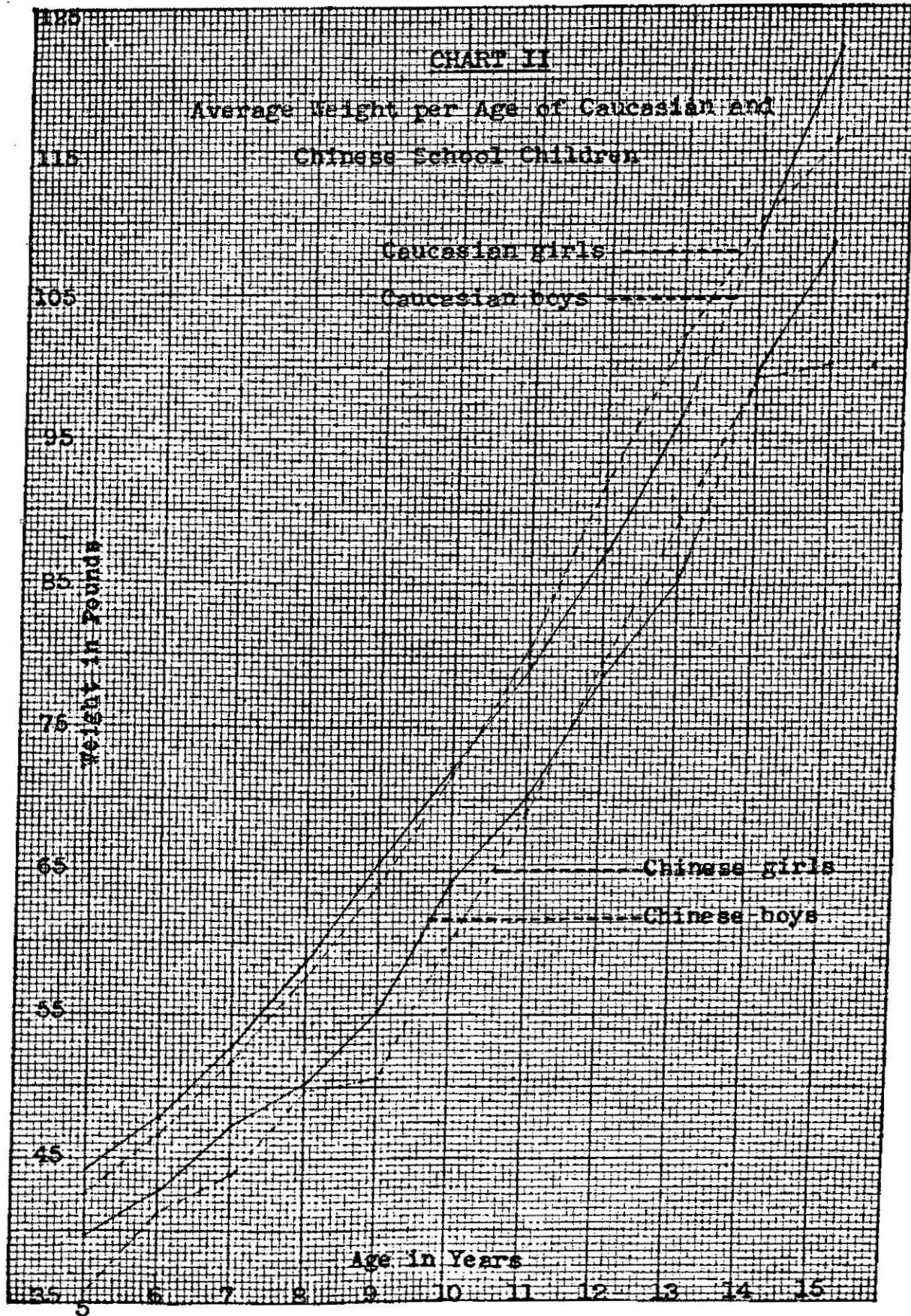
Small figures: normal weight ranges for Caucasian children (according to Dr. Harold K. Faber).

TABLE VIII  
HEIGHT-WEIGHT-AGE TABLE FOR CALIFORNIA SCHOOL CHILDREN - GIRLS

Inches \ Age	5	6	7	8	9	10	11	12	13	14	15
39	32 - 38 33 - 38	32 - 38 33 - 39									
40	33 - 40 34 - 41	33 - 42 34 - 41									
41	34 - 41 35 - 41	34 - 44 35 - 42	34 - 44 36 - 43.3								
42	35 - 42 37 - 44	35 - 45 37 - 44	35 - 45 37 - 44								
43	36 - 43 38 - 45	36 - 46 38 - 45	36 - 46 38 - 46	38 - 47 38 - 46							
44	37 - 45 40 - 47	37 - 48 40 - 47	38 - 48 40 - 48	39 - 49 40 - 48							
45	38 - 48 42 - 49	38 - 49 42 - 49	39 - 51 42 - 50	40 - 52 43 - 50	42 - 52 43 - 52						
46	44 - 51	39 - 50 45 - 53	40 - 52 45 - 53	42 - 54 45 - 54	43 - 54 45 - 54	45 - 56					
47	46 - 55	40 - 51 46 - 55	41 - 54 46 - 55	43 - 56 46 - 56	44 - 56 46 - 57	44 - 56 46 - 58					
48		41 - 53 47 - 57	42 - 57 48 - 58	44 - 58 48 - 58	46 - 60 48 - 59	46 - 60 48 - 60	49 - 62				
49		42 - 55 60 - 59	43 - 58 51 - 61	45 - 62 51 - 62	47 - 62 51 - 62	49 - 62 51 - 64	50 - 63 51 - 66				
50		53 - 63	44 - 60 53 - 63	46 - 64 53 - 64	49 - 64 53 - 66	50 - 65 54 - 67	52 - 66 54 - 69	55 - 72			
51			55 - 67	48 - 66 55 - 67	50 - 66 56 - 69	52 - 67 58 - 70	53 - 68 57 - 72	54 - 68 58 - 74			
52			58 - 71	50 - 68 58 - 72	52 - 70 58 - 72	54 - 70 58 - 75	55 - 70 59 - 75	56 - 71 59 - 76	58 - 74		
53			61 - 75	61 - 74	54 - 71 62 - 76	56 - 73 62 - 78	56 - 73 62 - 78	58 - 75 62 - 80	62 - 78 62 - 82		
54				63 - 77	56 - 73 64 - 79	58 - 75 64 - 81	58 - 76 64 - 82	60 - 78 65 - 83	64 - 82 66 - 85	68 - 85	
55				66 - 81	58 - 74 67 - 82	62 - 77 67 - 84	62 - 80 67 - 86	62 - 82 68 - 88	66 - 86 69 - 90	71 - 90 70 - 91	74 - 96
56					70 - 86	66 - 80 70 - 88	66 - 82 70 - 90	66 - 85 71 - 92	68 - 90 73 - 95	75 - 95 74 - 96	78 - 100
57					73 - 89	70 - 82 73 - 91	70 - 84 74 - 94	70 - 88 75 - 96	72 - 97.5 77 - 99	80 - 100 78 - 102	82 - 105 82 - 106
58						74 - 85 76 - 95	74 - 87 77 - 98	74 - 92 78 - 100	76 - 100 80 - 103	82 - 106 83 - 108	85 - 110 86 - 111
59						80 - 100	77 - 92 81 - 104	77 - 96 82 - 106	80 - 106 84 - 109	85 - 110 86 - 112	88 - 115 90 - 117
60						84 - 105	80 - 95 85 - 108	82 - 100 86 - 110	84 - 110 87 - 113	88 - 116 90 - 117	92 - 120 95 - 123
61							85 - 100 89 - 114	87 - 105 90 - 116	90 - 115 91 - 118	92 - 120 94 - 122	95 - 125 98 - 128
62							94 - 120	90 - 110 95 - 122	94 - 120 95 - 124	95 - 125 97 - 126	97 - 128 102 - 132
63								95 - 115	100 - 125 100 - 130	100 - 130 101 - 131	100 - 130 106 - 137
64								103 - 132	105 - 130 104 - 135	105 - 135 105 - 137	105 - 135 108 - 140
65								106 - 137	108 - 140	110 - 143	111 - 144
66									112 - 145	113 - 147	114 - 149
67									116 - 151	117 - 152	118 - 153

Large figures: normal weight ranges for Chinese children (findings of Lillian W. Chow).  
Small figures: normal weight ranges for Caucasian children (according to Dr. Harold K. Faber).





CHAPTER VII  
DISCUSSION OF THE TABLES

By the use of over-all averages and group data the conclusion was reached that the Chinese boy of from five to fifteen years old is physically smaller than a Caucasian boy of like age. The degree by which he is smaller is two inches in height and ten per cent in weight - these two values representing one year of growth in the normal boy. That is, the Chinese boy is physically smaller than the Caucasian boy by one year.

The Chinese girl was found to be a smaller individual than her Caucasian school-mate. The difference in average physical build between the Chinese and Caucasian girl was found to be of a larger magnitude than is the case with the boys.

These were the results obtained from a study of the average heights and weights of different groups of individuals.

Departing from the use of averages and concentrating attention on individuals, height-weight-age tables for Chinese boys and girls were prepared. These tables in essence bear out what has been said: that the Chinese are a physically smaller people than the Caucasian. In certain details, such as the fact that the fourteen-year-old Chinese girl is three and a half inches shorter

than a Caucasian girl of like age; or that the thirteen-year-old Chinese boy is eleven and a half pounds lighter than a like Caucasian boy, these tables do not tell the story. This is because in representative descriptions averages are used while height-weight-age tables are instruments for measuring individuals.

In discussing the tables it seems best to separate the table for boys from the table for girls and treat them as separate units.

### Boys

In order to compare the table prepared for Chinese boys with Dr. Faber's table for Caucasian boys, the general characteristics of the two tables must first be evaluated, then certain segments of the tables should be segregated and viewed in the proper perspective. Thus the tables can be compared for:

- (1) Weight and height ranges of boys from five to fifteen years;
- (2) Weights of lighter boys in the different age-height groups;
- (3) Weights of heavier boys in the different age-height groups;
- (4) Weight range of the shorter and taller boys in the different age groups.

#### 1. Weight and Height Range

Dr. Faber's table shows that weight and height differences between five-year-old boys are comparatively small, but with increasing years the differences among individuals of the same age group

gradually become wider. Thus a normal five-year-old boy may be 39 inches tall or he may be 47 inches; he may weigh 34 pounds (at 39 inches tall) or he may weigh 52 pounds (at 47 inches tall). On the other hand, the thirteen-year-old boy may measure anywhere in height from 52 to 67 inches and may weigh 60 pounds (at 52 inches tall) or 142 pounds (at 67 inches tall).

Weight and height ranges for Chinese boys show the same characteristics.

## 2. Weights of Lighter Boys

The tables show that for Chinese boys there is a smaller minimum allowed in the different age and height groups, thus indicating that the Chinese boy is a lighter individual than his Caucasian schoolmate. This difference in weight is especially apparent in the nine- to fourteen-year-old groups. For example, the minimum normal weight for a thirteen-year-old Caucasian boy of five feet in height is 86 pounds, while that for a Chinese boy of like age and height is 75 pounds.

This difference in minimum normal weight between Chinese and Caucasian boys of similar age and height is not uniform, however, though the trend is definite.

Another point brought out in the table for Chinese boys is that the minimum weight for taller individuals has a much lesser value than the minimum normal weight for Caucasian boys of like age and height. This indicates that there is a tendency for the taller Chinese boys to be slim.

### 3. Weight of Heavier Boys

The maximum normal weights for Chinese boys at the different ages and heights resemble closely the maximum normal weights for Caucasian boys. This statement is true when the maximum normal weight of the shorter boys and boys of medium height is compared. For the taller boys in the different age groups, the maximum normal weights for the Chinese group are smaller. Here again, the fact is brought out that the taller Chinese boys have a tendency toward a more slender build.

### 4. Weight Variances Among the Taller and Among the Shorter Boys

An examination of Dr. Faber's table will show that within any age group the weight range among the shorter individuals is narrower than is found among the taller individuals. With Chinese boys, this increase in weight difference among the taller boys of any given age group is much more marked, especially in the age groups of eight, nine, ten, eleven, twelve, and thirteen years.

As an example, the normal weight range for both Caucasian and Chinese boys of ten years of age and 47 inches in height is 48 to 58 pounds. For ten-year-old Caucasian boys of 57 inches in height, the normal weight range is 74 to 89 pounds, a range of 15 pounds, whereas with Chinese boys the range is 64 to 84 pounds, a difference of 20 pounds.

### Girls

A study of the average height and weight of Chinese girls of five to fifteen years and a study of their weight-height ratio



reveals that the Chinese girl is a markedly shorter and lighter individual than her Caucasian girl-friend.

The height-weight-age table for Chinese girls, prepared from a study of 843 individuals, indicates several points:

- (1) The minimum normal weights for Chinese girls are of a lesser value than the minimum normal weights for Caucasian girls of similar age and height. This is especially true in the case of girls from five to twelve years old.
- (2) The maximum normal weights for Chinese girls are comparable to the maximum normal weights for Caucasian girls except for the two age groups of eleven- and twelve-year-olds. In these two age groups the maximum normal weights of Chinese girls are distinctly lower than those for Caucasian girls.
- (3) The normal weight variations among the taller Chinese girls in the five-, six-, seven-, eight-, and nine-year-old age groups is much wider than the normal weight variations found among Caucasian girls. After the ninth year, the weight variations of the taller Chinese girls approximate the values for Caucasian girls.
- (4) The normal weight ranges for Chinese girls in the thirteen-, fourteen-, and fifteen-year-old groups are very similar to those established for Caucasian girls.

## CHAPTER VIII

## SUMMARY AND CONCLUSIONS

- I. A study was undertaken to determine the normal weight range and height range of Chinese school children in Northern California.
- II. One thousand eight hundred ninety-two Chinese school children, drawn principally from the two cities of San Francisco, and Stockton, California, were measured for height and weight.
- III. Average weights and heights of boys and girls at the different ages were computed and the figures thus obtained compared to those established for Caucasian school children by Dr. Lloyd-Jones.
- IV. The Chinese boy was found to be two inches shorter than a Caucasian boy of like age; he was also ten per cent lighter in weight. These two values represent one year of growth in the normal boy.
- V. The Chinese girl was found to be a shorter and a lighter individual than her Caucasian school-mate. The difference in physical build between girls of the two races was greater in magnitude than was the case with the boys.

- VI. There was a marked tendency for Chinese girls to be more slender in build than the Caucasian girls.
- VII. From the data obtained, height-weight-age tables for Chinese boys and girls of five to fifteen years of age were prepared.
- VIII. These tables compare closely with Dr. Faber's tables for Californian school children except for a few points:
- A. Lower minimum weights must be allowed for Chinese children in the different age-height groups;
  - B. Wider weight variations are to be expected among taller Chinese children in the
    - 1. Five- to ten-year-old groups for girls,
    - 2. Five- to twelve-year-old groups for boys;
  - C. Lower maximum weights are allowed for Chinese girls of eleven to fifteen years of age inclusive;
  - D. Lower maximum weights are allowed for the taller Chinese boys and girls.



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