

## A Study on the Body Proportion and Proportional Dimension Standards for Chinese Women

– Focusing on the analysis of the high-frequency group –

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### Abstract

This study aims at strengthening the national competitiveness of Korea's clothing industry as it provides substantial information on the human body proportion and proportional dimension standards for Chinese women and improves the fitness of clothing, considering human proportion in the production of clothing products for export to China. This study selected by simple random sampling Chinese women in Beijing and Shanghai, China, whose age is between 19–50 from June 23 to August 7, 2004.

The stature of the average Chinese woman belonging to the High Frequency group is 7.09 times as long as the length of the head.

We developed the body proportional dimension standards with the same proportion with High-Frequency group.

The basic size of proportional dimension standards for Chinese women has the stature of 159cm, (chest circumference)/2 of 42.8cm.

**Key Words** : Chinese women, Body proportion, proportional dimension standards

### I. Introduction

Chinese apparel industry has kept growing tremendously for the past 20 years and especially, China has positioned itself as the largest exporter of apparel in the world since 1994. In addition, foreign investment in China has expanded rapidly owing to the decrease of duty and various investment benefits for foreigners after China joined WTO in November,

2001. As a result of the improvement in economic power and the growth of the demand for apparel with the increase of the consumer goods, the apparel market is developing very quickly.<sup>1)2)</sup>

Nonetheless, most of the Korean apparel companies which tried to penetrate into Chinese domestic market from the early stage have failed despite of the geographical and cultural advantages.<sup>3)</sup> Though many Korean

clothing companies are now preparing the strategies for the 2nd market advancement on the basis of the past experience of failure, they are focusing on the design and marketing and are neglecting the body fitness of the apparel products which is the fundamental problem of the apparel products for the export to China.<sup>4)</sup>

Though there are differences in the physical fitness between Korean and Chinese women in each age and regional group, the products to be exported to China are still produced according to the size system of Korean domestic ready-made clothes thus not reflecting the different features. Therefore, it is necessary to understand the problem of physical fitness caused by the different physical figures. The people concerned with the brands that are operating in Chinese domestic market are also already recognizing this problem and feeling the necessity to change the size of clothing and patterns, but it is not reflected to the production of products due to the lack of systematic data. As the researches so far on the Chinese women are providing only the information about the size or dimensions of figures by direct measurement, as the next step a study of the Chinese women's physical characteristics or figure-related proposition are needed. The information on the proportion using index value will enable easier and more specific recognition of forms, and the patterns developed in consideration of the proportion of the customers at time of the production of the pattern of apparels will contribute to the better fitness of apparel products.

Thus, this study was designed to set the proportional dimension standards by analyzing the proportion of Chinese women with the

specific purpose to establish Chinese women's body proportion to help the improvement in the design, production and fitness of apparel products that will be exported to China.

## II. Research Method and Process

### 1. Research Sample

This study selected by simple random sampling 1,381 Chinese women in Beijing and Shanghai, China, whose age is between 19–50 from June 23 to August 7, 2004. The measurement method, measurement items and the average physical measurement value of Chinese women are the same as presented in the preceding study.<sup>5)</sup>

### 2. Data Processing and Analysis Method

The data processing and analysis is statistically processed by using SPSS WIN 10.0 program.

### 3. Research Process

- 1) Extraction of High-Frequency group and proportion analysis of Chinese women
  - (1) Select the High-Frequency group among Chinese women.
  - (2) Analyze the physical characteristics and proportion of the High-Frequency group.
- 2) Setting proportional dimension standards of High-Frequency group of Chinese women
  - (1) Choose the item that is important to the production of the pattern for clothing as the

standard for the physical proportion.

(2) Select the average stature and average chest circumference/2 of the High-Frequency group as the standard size and divide it by stature and select each size that is the same as the proportion of the stature of the standard size and the chest circumference/2.

(3) On the basis of the measure of the standard size, select the measure of each size that is equal to the proportion of chest circumference/2 and circumference and the proportion of stature and length to determine the final proportional dimension standards for Chinese women.

To understand the body type of Chinese women who belongs to highly frequent group excluding less frequent group, the Rohrer's index that indicates level of fatness, breadth difference that indicates frontal silhouette, thickness difference that indicates side silhouette, height ratio that provides information on height, and head-to-stature ratio that is important in understanding proportion were analyzed. Even if 1% of total subjects 1,381 persons equals to 14 people, it is not an ignorable number. Thus, the section more than 1% was selected as the high frequency section and the group which all the indexes of Rohrer's index, breadth difference, thickness difference, height ratio, head-to-stature ratio belong to high frequency section was selected as High Frequency group.

The distribution chart of high frequency section and High Frequency group of Chinese women are as <table 1>. Subjects of High Frequency group were 1,095 (79.3%) and High Frequency group were 286 (20.7%).

### III. Results and Discussion

#### 1. Extraction and proportion analysis of High-Frequency group of Chinese women

- 1) Extraction of High-Frequency group of Chinese women

<Table 1> The distribution chart of high frequency section and High Frequency group of Chinese women

Item		High frequency section	High Frequency group	Non High Frequency group
Rohrer's index		1.0 ~ 2.0	1,095 women (79.3%)	286 women (20.7%)
Breadth difference	Shoulder Breadth - Waist Breadth	4cm ~ 15cm		
	Hip Breadth - Waist Breadth	2cm ~ 13cm		
Thickness difference	Bust Depth - Waist Depth	0cm ~ 7cm		
	Hip Depth - Waist Depth	-2cm ~ 6cm		
Height ratio	Ratio of Bust Height over stature	0.67 ~ 0.75		
	Ratio of Waist Height over stature	0.59 ~ 0.66		
	Ratio of Hip Height over stature	0.45 ~ 0.53		
Head-to-stature ratio		0.120 ~ 0.165		

2) Body Proportion Analysis of High-Frequency Group of Chinese women

(1) Analysis of Body Size of High-Frequency Group

<Table 2> shows the results of analysis on the 111 measurement and one index item of high-frequency group. The Chinese women that belongs to High Frequency group showed measures of stature of 158.9 cm, height of breast 113.3cm, height of waist 99.5cm, height of hips 78.2cm for height specifications, shoulder breadth of 34cm, breadth of breast

27.2cm, breadth of waist 24cm, breadth of hips 32.7cm in breadth specifications.

In thickness specifications, thickness of breast 22.8cm, thickness of waist 19.3cm, thickness of hips 21.4cm were measured and in girth specification, girth of breast 87.3cm, girth of chest 85.4cm, girth of waist 71.5cm, girth of hips 92cm were measured.

In length specification, front center length 32.5cm, horizontal length between nipples 17.6cm, arm length 52.7cm, hip side length 22.3cm, length of shoulder 39.4cm, length of back 37.7cm were each measured and for other specifications, the weight was 55.6kg.

<Table 2> Analysis of Body Size of High-Frequency Group

(unit: cm, n=1,095)

Item	Statistics						
	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range	
H E I G H T	stature	158.9	5.4	140.5	178.7	3.4	38.2
	chin height	136.5	5.1	118.2	153.7	3.7	35.5
	front cervical height	130.2	5.1	111.9	148.1	3.9	36.2
	chest height	121.8	4.9	102.4	144.0	4.0	41.6
	bust height	113.3	4.9	95.3	131.2	4.3	35.9
	bust-below height	108.2	5.0	72.7	126.3	4.6	53.6
	waist height	99.5	4.2	83.9	115.1	4.2	31.2
	waist height(Omphalion)	92.9	4.4	60.1	107.0	4.7	46.9
	abdomen height	88.6	4.2	72.8	106.4	4.7	33.6
	iliac spine height	92.5	4.6	69.4	110.0	5.0	40.6
	crotch height	71.4	4.1	29.7	99.9	5.7	70.2
	knee height	42.7	2.5	31.1	51.4	5.9	20.3
	minimum calf height	10.5	1.0	6.5	19.8	9.5	13.3
	outside malleolus height	6.4	.8	4.5	10.8	12.5	6.3
	inside malleolus height	7.6	.6	4.2	9.7	7.9	5.5
	side cervical height	134.6	5.2	104.1	155.0	3.9	50.9
	shoulder height	129.5	5.0	113.5	147.0	3.9	33.5
	axilla height	118.1	5.5	100.8	166.8	4.7	66.0
	elbow height	100.6	4.3	82.8	130.5	4.3	47.7
	wrist height	78.3	3.7	51.6	91.0	4.7	39.4
	fingertip height	62.4	3.8	37.7	94.8	6.1	57.1
	back cervical height	135.4	5.2	117.0	155.8	3.8	38.8
	hip height	78.2	3.8	65.5	90.0	4.9	24.5
	gluteal height	69.5	4.8	29.9	99.9	6.9	70.0
	thigh height	72.1	4.9	59.6	99.9	6.8	40.3
	calf height	31.4	2.3	16.6	54.6	7.3	38.0

<Table 2> Continue

(unit: cm, n=1,095)

Item	Statistics	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
B R E A D T H	head breadth	15.6	.6	13.5	19.7	3.8	6.2
	cervical breadth	12.1	1.0	9.8	19.7	8.3	9.9
	shoulder breadth	34.0	1.5	29.2	39.5	4.4	10.3
	breadth between the upper arms	40.9	2.8	28.2	49.0	6.8	20.8
	chest breadth	28.6	2.2	20.2	40.8	7.7	20.6
	bust breadth	27.2	2.2	17.3	57.8	8.1	40.5
	bust-below breadth	25.9	1.8	20.5	32.0	6.9	11.5
	waist breadth	24.0	2.3	18.8	32.7	9.6	13.9
	abdomen breadth	30.9	2.4	20.7	39.9	7.8	19.2
	hip breadth	32.7	1.7	24.9	39.7	5.2	14.8
	thigh breadth	32.9	1.8	24.7	40.5	5.5	15.8
	thigh breadth	15.7	1.3	9.8	21.9	8.3	12.1
	knee breadth	10.4	.9	5.2	19.9	8.7	14.7
	minimum ankle breadth	5.2	.4	3.3	6.8	7.7	3.5
	maximum ankle breadth	6.1	.4	3.1	7.3	6.6	4.2
	foot breadth	9.2	.6	5.9	10.8	6.5	4.9
	elbow breadth	7.8	.8	4.8	10.8	10.3	6.0
	wrist breadth	4.9	.5	2.9	9.2	10.2	6.3
	hand breadth	8.9	.7	5.8	12.7	7.9	6.9
	calf breadth	10.2	.9	6.1	16.9	8.8	10.8
T H I C K N E S S	head depth	18.0	.9	10.3	27.6	5.0	17.3
	chest depth	18.8	1.6	10.0	25.7	8.5	15.7
	bust depth	22.8	2.3	16.6	29.9	10.1	13.3
	bust-below depth	20.3	2.2	15.0	29.9	10.8	14.9
	waist depth	19.3	2.7	13.6	29.0	14.0	15.4
	abdomen depth	21.8	2.9	11.7	34.0	13.3	22.3
	lap depth	10.7	.8	8.3	18.0	7.5	9.7
	axilla depth	10.4	1.3	6.8	17.3	12.5	10.5
	elbow depth	5.6	.5	3.6	9.7	8.9	6.1
	wrist depth	3.4	.3	2.0	4.7	8.8	2.7
	hip depth	21.4	2.3	15.3	32.1	10.7	16.8
	hip-below depth	16.3	1.6	10.0	27.4	9.8	17.4
	calf depth	10.5	3.0	8.1	106.0	28.6	97.9
C I R C U M F E R E N C E	head circumference	55.5	1.6	48.4	60.8	2.9	12.4
	neck base circumference	37.4	2.0	31.2	44.5	5.3	13.3
	chest circumference	85.4	5.7	70.6	106.0	6.7	35.4
	bust circumference	87.3	7.0	70.7	112.0	8.0	41.3
	bust-below circumference	76.8	6.3	56.3	103.5	8.2	47.2
	waist circumference	71.5	8.1	51.5	110.0	11.3	58.5
	abdomen circumference	87.0	8.2	69.5	115.1	9.4	45.6
	hip circumference	92.0	5.6	63.2	119.4	6.1	56.2
	thigh circumference	52.8	4.5	35.8	96.0	8.5	60.2
	lap circumference	35.0	2.4	24.0	55.8	6.9	31.8
	calf circumference	34.6	2.3	26.9	42.9	6.6	16.0
	calf minimum circumference	21.0	1.5	10.8	37.3	7.1	26.5
	ankle maximum circumference	23.4	1.3	19.7	29.8	5.6	10.1
	axilla circumference	38.2	3.0	27.3	48.6	7.9	21.3
	upper arm circumference	28.0	2.9	20.5	42.3	10.4	21.8
	elbow circumference	23.0	1.8	17.1	32.2	7.8	15.1
	wrist circumference	15.3	1.1	12.6	24.3	7.2	11.7
	hand circumference	21.4	1.2	12.3	26.9	5.6	14.6
back neck circumference	16.0	1.2	13.0	21.6	7.5	8.6	

<Table 2> Continue

(unit: cm, n=1,095)

Item	Statistics	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
L E N G T H	waist front length	32.5	1.9	21.9	42.6	5.8	20.7
	cervical to breast point length	26.3	2.2	20.7	37.7	8.4	17.0
	cervical to waist length	40.0	2.2	26.5	48.4	5.5	21.9
	bishoulder to breast point length	23.2	2.1	17.7	37.0	9.1	19.3
	bishoulder, breast point to waist length	39.4	2.1	29.6	46.3	5.3	16.7
	front interscye, length	32.3	2.0	22.3	44.3	6.2	22.0
	front interscye fold, length	33.1	2.2	23.5	40.3	6.6	16.8
	bust point-bust point	17.6	1.8	13.3	25.0	10.2	11.7
	crotch length	73.5	4.4	51.2	89.5	6.0	38.3
	bishoulder, upperarm, to axilla length	12.3	1.2	8.0	19.6	9.8	11.6
	upperarm length	29.9	1.8	18.7	39.5	6.0	20.8
	arm length	52.7	2.7	15.4	60.6	5.1	45.2
	straight hand length	17.1	.8	10.7	19.9	4.7	9.2
	waist to hip length	22.3	2.1	11.8	33.3	9.4	21.5
	outside waist malleous length	95.1	4.3	73.3	109.8	4.5	36.5
	outside leg length	101.1	4.5	81.6	118.7	4.5	37.1
	straight foot length	23.1	1.2	15.2	28.9	5.2	13.7
	back cervical to outside shoulder length	19.2	1.1	16.0	23.1	5.7	7.1
	side cervical to outside shoulder length	12.6	1.0	9.8	19.3	7.9	9.5
	bishoulder length	39.4	2.4	29.2	49.2	6.1	20.0
	back interscye, length	35.9	2.5	29.0	49.3	7.0	20.3
	back interscye fold, length	34.7	2.8	26.3	43.8	8.1	17.5
	scye depth	18.4	1.7	13.3	38.4	9.2	25.1
	waist back length	37.7	2.0	30.5	48.5	5.3	18.0
	total length	137.7	5.2	113.2	159.0	3.8	45.8
	bishoulder to scye, length	25.6	1.7	20.1	42.2	6.6	22.1
	cervical to waist length	40.5	2.1	30.3	47.9	5.2	17.6
	bishoulder, scapular, to back waist length	40.7	2.2	28.5	52.2	5.4	23.7
	back waist to gluteal fold, length	31.7	2.1	20.3	43.5	6.6	23.2
	thigh vertical length	27.5	2.0	18.3	33.8	7.3	15.5
ANGLE	right shoulder slope(°)	21.7	3.8	10.0	38.0	17.5	28.0
	left shoulder slope(°)	21.7	3.8	8.0	32.0	17.5	24.0
OTHER	weight(kg)	55.6	7.9	37.6	88.4	14.2	50.8
	Rohrer's index	1.4	.2	1.0	2.0	14.3	1.0

(2) Analysis of Body Index Value of High-Frequency Group

<Table 3> is the results of analysis on the index values of 99 items including the height item over stature, the breadth item over stature and waist breadth, the thickness item over stature and waist depth, the circumference item over stature and bust circumference, and the length item over stature for high-frequency

group. <Figure 1> is the front proportion view for High-Frequency group.

The stature of the average Chinese woman belonging to the high-frequency group is 7.09 times as long as the length of the head. The high-frequency group had proportion that the stature and waist height ration was 1.6 : 1, the ratio of the stature-waist height : waist height was shown to be 1 : 1.67. The ratio of

stature–chin height : stature–arm pit height : stature–breast height : stature–waist height : stature–hip height : stature–knee height had the ratio of 1 : 1.82 : 2.04 : 2.65 : 3.6 : 5.18, shoulder height–breast height : breast height–waist height : waist height–hip height had the ratio of 1 : 0.85 : 1.31, and stature–chin height : chin height–arm pit height : arm pit height–waist height : waist height–hip height had the ratio of 1 : 0.83 : 0.84 : 0.95.

The ratio of breast breadth: neck breadth was 2.25 : 1, the ratio of shoulder breadth : horizontal length between nipples : waist breadth : hip breadth was 1.42 : 0.72 : 1 : 1.36, the thickness ratio of breast : waist : hip was 1.19 : 1 : 1.12.

Lower neck size : breast size : waist size : hip size had the proportion of 1 : 2.33 : 1.91 : 2.45, respectively, and the ratio of front center length : back length was 1 : 1.16, and the length of armpit point length and armpit back point length was the proportion of 1 : 1.05.

<Table 3> Analysis of Body Index Value of High-Frequency Group (n=1,095)

Item		Statistics	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
H E I G H T	chin height/stature		85.9	.8	83.5	87.9	0.9	4.4
	front cervical height/stature		81.9	1.2	66.8	88.6	1.5	21.8
	chest height/stature		76.7	1.3	63.8	96.2	1.7	32.4
	bust height/stature		71.3	1.3	67.1	75.0	1.8	7.9
	bust–below height/stature		68.1	1.6	44.8	78.0	2.3	33.1
	waist height/stature		62.6	1.1	59.0	66.0	1.8	7.0
	waist height(Omphalion)/stature		58.5	1.5	38.3	64.7	2.6	26.4
	abdomen height/stature		55.7	1.4	47.7	62.8	2.5	15.0
	iliac spine height/stature		58.2	1.8	44.8	66.3	3.1	21.5
	crotch height/stature		44.9	1.7	19.3	63.1	3.8	43.8
	knee height/stature		26.9	1.2	19.5	30.2	4.5	10.6
	side cervical height/stature		84.7	1.3	64.9	91.8	1.5	26.8
	shoulder height/stature		81.5	1.1	69.5	88.8	1.3	19.3
	axilla height/stature		74.3	2.2	65.8	107.6	3.0	41.8
	back cervical height/stature		85.2	1.3	75.5	104.4	1.5	28.9
	hip height/stature		49.2	1.3	45.0	52.7	2.6	7.6
	gluteal height/stature		43.7	2.4	18.8	63.8	5.5	45.0
thigh height/stature		45.4	2.6	37.0	67.1	5.7	30.1	
calf height/stature		19.8	1.3	11.0	36.4	6.6	25.4	
(Stature minus chin height)/stature		14.1	.8	12.1	16.5	5.7	4.4	
B R E A S T H	cervical breadth/stature		7.6	.6	6.2	12.9	7.9	6.6
	cervical breadth/waist breadth		50.7	5.7	35.0	84.2	11.2	49.2
	shoulder breadth/stature		21.4	1.0	18.7	24.8	4.7	6.1
	shoulder breadth/waist breadth		142.5	12.1	113.2	176.0	8.5	62.8
	chest breadth/stature		18.0	1.4	13.0	24.9	7.8	11.9
	chest breadth/waist breadth		119.4	9.2	87.2	170.1	7.7	82.8
	bust breadth/stature		17.1	1.5	10.6	37.5	8.8	26.8
	bust breadth/waist breadth		113.6	7.4	71.8	241.8	6.5	170.1
	bust–below breadth/stature		16.3	1.2	12.4	20.2	7.4	7.8
	bust–below breadth/waist breadth		108.2	6.0	78.1	139.4	5.5	61.3
	waist breadth/stature		15.1	1.5	11.8	19.9	9.9	8.1
abdomen breadth/stature		19.4	1.5	12.8	26.1	7.7	13.2	

&lt;Table 3&gt; Continue

(n=1,095)

Item		Statistics	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
B R E A D T H	abdomen breadth/waist breadth		129.0	8.6	79.3	169.5	6.7	90.2
	hip breadth/stature		20.6	1.0	16.4	24.6	4.9	8.2
	hip breadth/waist breadth		137.0	10.3	109.9	161.6	7.5	51.7
	thigh breadth/stature		20.7	1.1	15.6	25.2	5.3	9.6
	thigh breadth/waist breadth		137.7	11.2	84.6	178.9	8.1	94.3
T H I C K N E S S	chest depth/stature		11.9	1.0	6.5	15.5	8.4	8.9
	chest depth/waist depth		98.5	9.9	45.1	136.8	10.1	91.7
	bust depth/stature		14.3	1.5	10.0	19.0	10.5	9.0
	bust depth/waist depth		118.8	8.9	96.7	143.6	7.5	46.9
	bust-below depth/stature		12.8	1.4	9.2	18.9	10.9	9.7
	bust-below depth/waist depth		105.9	7.7	84.2	179.0	7.3	94.8
	waist depth/stature		12.2	1.7	8.6	19.2	13.9	10.5
	abdomen depth/stature		13.7	1.9	7.3	22.1	13.9	14.8
	abdomen depth/waist depth		113.0	8.1	65.0	172.5	7.2	107.5
	axilla depth/stature		6.5	.8	4.2	10.4	12.3	6.2
S I Z E	axilla depth/waist depth		54.2	5.6	35.0	77.6	10.3	42.6
	hip depth/stature		13.5	1.5	9.7	19.6	11.1	9.9
	hip depth/waist depth		111.6	9.1	87.2	140.3	8.2	53.1
	hip-below depth/stature		10.3	1.0	6.2	17.3	9.7	11.2
	hip-below depth/waist depth		85.5	10.3	50.5	124.6	12.0	74.1
C I R C U M F E R E N C E	neck base circumference/stature		23.6	1.3	18.9	28.3	5.5	9.5
	neck base circumference/bust circumference		43.1	2.6	35.0	52.1	6.0	17.1
	chest circumference/stature		53.8	3.8	44.4	65.1	7.1	20.7
	chest circumference/bust circumference		98.0	3.3	80.9	125.3	3.4	44.4
	bust circumference/stature		55.0	4.6	44.2	71.5	8.4	27.4
	bust-below circumference/stature		48.4	4.1	35.3	64.4	8.5	29.1
	bust-below circumference/bust circumference		88.1	3.3	76.5	106.5	3.7	30.0
	waist circumference/stature		45.0	5.2	34.1	66.1	11.6	32.0
	waist circumference/bust circumference		81.9	5.0	64.5	134.1	6.1	69.6
	abdomen circumference/stature		54.8	5.3	42.6	70.3	9.7	27.7
	abdomen circumference/bust circumference		99.8	5.4	78.0	131.0	5.4	53.1
	hip circumference/stature		57.9	3.5	39.3	71.4	6.0	32.1
	hip circumference/bust circumference		105.7	5.6	69.6	17.9	5.3	68.3
C I R C U M F E R E N C E	axilla circumference/stature		24.0	1.9	16.1	31.0	7.9	14.9
	axilla circumference/bust circumference		43.8	2.8	28.6	55.1	6.4	26.5
	back neck circumference/stature		10.1	.7	8.1	13.9	6.9	5.9
	back neck circumference/bust circumference		18.4	1.6	13.5	24.9	8.7	11.4
L E N G T H	waist front length/stature		20.5	1.1	14.1	27.0	5.4	13.0
	cervical to breast point length/stature		16.5	1.4	12.7	24.2	8.5	11.6
	cervical to waist length/stature		25.2	1.3	17.6	29.6	5.2	12.0
	bishoulder to breast point length/stature		14.6	1.4	10.8	23.8	9.6	13.0
	bishoulder, breast point to waist length/stature		24.8	1.3	18.9	29.7	5.2	10.8
	front interscye, length/stature		20.3	1.3	14.1	28.1	6.4	14.0
	front interscye fold, length/stature		20.8	1.4	14.0	25.4	6.7	11.3
	bust point-bust point/stature		11.1	1.2	8.1	15.9	10.8	7.7
	crotch length/stature		46.3	2.7	32.4	57.1	5.8	24.6



<Table 3> Continue

(n=1,095)

Item	Statistics	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
L E N G T H	bishoulder, upperarm, to axilla length/stature	7.7	.8	5.2	12.5	10.4	7.3
	upperarm length/stature	18.8	.9	12.1	24.5	4.8	12.4
	arm length/stature	33.2	1.3	9.8	39.5	3.9	29.7
	waist to hip length/stature	14.0	1.2	7.4	20.5	8.6	13.1
	outside waist malleous length/stature	59.8	1.3	46.5	64.7	2.2	18.2
	outside leg length/stature	63.6	1.3	51.6	70.7	2.0	19.1
	back cervical to outside shoulder length/stature	12.1	.7	9.6	14.1	5.8	4.5
	side cervical to outside shoulder length/stature	8.0	.6	6.1	11.9	7.5	5.8
	bishoulder length/stature	24.8	1.4	17.6	30.9	5.6	13.3
	back interscye, length/stature	22.6	1.6	17.9	32.3	7.1	14.5
	back interscye fold, length/stature	21.8	1.9	16.5	27.9	8.7	11.4
	scye depth/stature	11.6	1.1	8.6	22.9	9.5	14.3
	waist back length/stature	23.8	1.2	18.6	28.6	5.0	10.0
	total length/stature	86.6	1.4	73.2	94.8	1.6	21.6
	bishoulder to scye, length/stature	16.1	1.1	12.2	25.9	6.8	13.7
	cervical to waist length/stature	25.5	1.2	19.6	30.5	4.7	10.9
	bishoulder, scapular, to back waist length/stature	25.6	1.4	17.5	32.7	5.5	15.3
	back waist to gluteal fold, length /stature	20.0	1.2	13.0	27.5	6.0	14.4
	thigh vertical length/stature	17.3	1.0	11.3	20.9	5.8	9.6
	(back neck circumference/2+side neck to waist circumference length)/stature	30.2	1.4	22.4	34.9	4.6	12.5
	(back neck circumference/2+side neck to bust point length)/stature	21.6	1.5	17.6	29.5	6.9	11.9

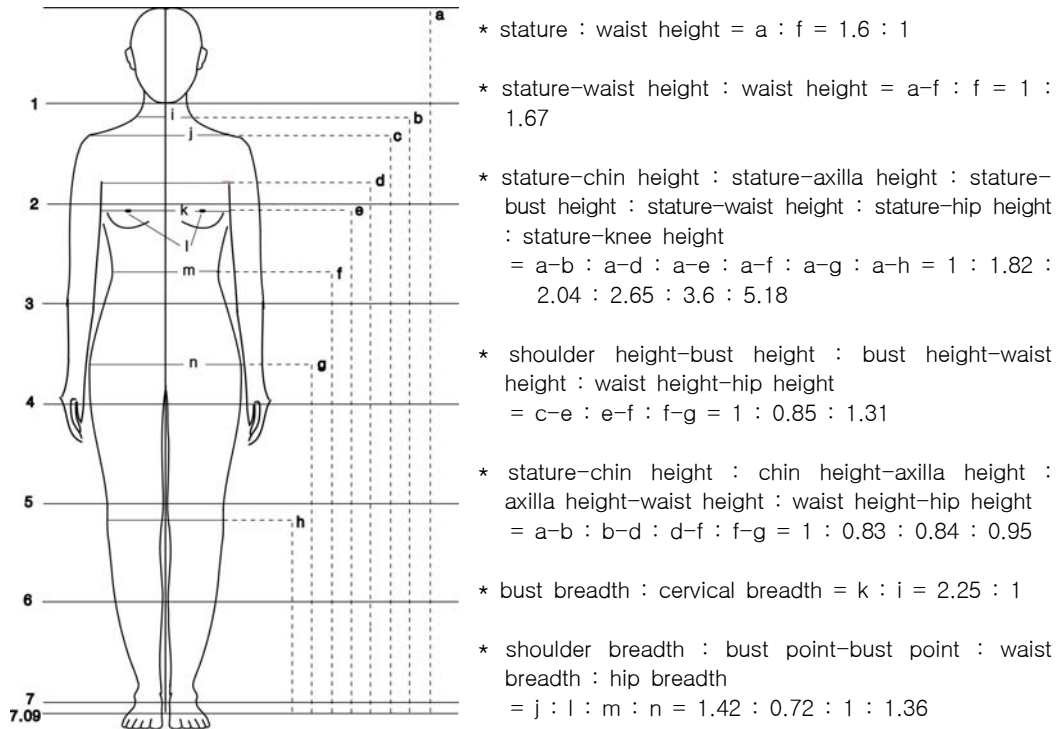
**2. Setting proportional dimension standards of High-Frequency group of Chinese women**

1) Decision and analysis of the items in the proportional dimension standards

(1) Decision of the items in the proportional dimension standards

The items that are thought to be the standard items for the proportional dimension standards and the items thought important in the making of the patterns for the clothing were divided into mainly circumference items and length items, and a total of 23 items were presented in <Table 4>. The circumference items use half of the dimension in time of the

production of patterns, the half measure of each items was used to make the 9 items including the (chest circumference)/2, and for the length items 14 items were selected by stature/7.09 as the average Chinese woman has a stature of 7.09 times of the length of her head. The measure of the length items in the proportional dimension standards for Chinese women was selected by the proportion to their stature, and the measure of the circumference items was selected by the proportion to the (chest circumference)/2. Therefore, the (chest circumference)/2 was selected as the representative item for the proportional dimension standard.



<Figure 1> The Front Proportion View for High-Frequency Group

<Table 4> The Items in the Proportional Dimension Standards

Item		Item	
L E N G T H	stature	C I R C U M F E R E N C E	chest circumference/2
	stature/7.09		waist circumference/2
	waist back length		hip circumference/2
	waist to hip length		bust circumference/2
	cervical to waist length		bust point-bust point
	back neck circumference/2+cervical to waist length		neck base circumference
	cervical to breast point length		front interscye fold, length/2
	back neck circumference/2+cervical to breast point length		back interscye fold, length/2
	back cervical height-knee height		axilla depth
	back cervical height-hip height		
	arm length		
	waist height-knee height		
	waist height		
	waist height-crotch height		

- Shadow part: the representative item in the dimension standard.

(2) Analysis of the items of the proportion dimension standards

<Table 5> The average measure of Chinese High Frequency group women in the items related to the dimension standards (unit: cm, n=1,095)

	Item	M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
C I R C U M F E R E N C E	chest circumference/2	42.7	2.9	35.3	53.0	6.8	17.7
	waist circumference/2	35.8	4.1	25.8	55.0	11.5	29.3
	hip circumference/2	46.0	2.8	31.6	59.7	6.1	28.1
	bust circumference/2	43.6	3.5	35.4	56.0	8.0	20.7
	(bust point) ~ (bust point)	17.6	1.8	13.3	25.0	10.2	11.7
	neck base circumference	37.4	2.0	31.2	44.5	5.3	13.3
	front interscye fold, length/2	16.5	1.1	11.8	20.2	6.7	8.4
	back interscye fold, length/2	17.3	1.4	13.2	21.9	8.1	8.7
	axilla depth	10.4	1.3	6.8	17.3	12.5	10.5
L E N G T H	stature	158.9	5.4	140.5	178.7	3.4	38.2
	stature/7.09	22.4	.8	19.8	25.2	3.6	5.4
	waist back length	37.7	2.0	30.5	48.5	5.3	18.0
	waist to hip length	22.3	2.1	11.8	33.3	9.4	21.5
	cervical to waist length	40.0	2.2	26.5	48.4	5.5	21.9
	back neck circumference/2+cervical to waist length	48.0	2.3	33.8	55.9	4.8	22.1
	cervical to breast point length	26.3	2.2	20.7	37.7	8.4	17.0
	back neck circumference/2+cervical to breast point length	34.3	2.4	28.0	45.9	7.0	17.9
	back cervical height-knee height	92.7	4.0	76.0	116.6	4.3	40.6
	back cervical height-hip height	57.2	3.1	44.3	85.4	5.4	41.1
	arm length	52.7	2.7	15.4	60.6	5.1	45.2
	waist height-knee height	56.8	3.1	46.0	71.6	5.5	25.6
	waist height	99.5	4.2	83.9	115.1	4.2	31.2
	waist height-crotch height	28.1	2.8	-3.9	65.7	10.0	69.6

<Table 5> shows the average, standard deviation, minimum value, maximum value, coefficient of variation and extent of the high frequency group for the 23 items related to the proportion dimension standards that are used for the establishment of the proportional dimension standards for Chinese women. The average stature was 158.9cm with minimum measure of 140.5cm and maximum measure of 178.7cm. The average (chest circumference)/2 was 42.7cm with minimum measure of 35.3cm and maximum measure of 53cm.

2) Decision of the size according to the proportion

(1) Analysis of the proportion of the stature and (chest circumference)/2.

The size in the proportion dimension standards was set by the representative stature and chest circumference/2 and in the decision of the size, too, it was decided by the proportion of stature to the chest circumference/2. To decrease the deviation between each size when selecting the size, the statures of Chinese women were divided

at an interval of 1.5cm to cover the minimum and maximum stature with the standard of the average stature of 158.92cm of the High Frequency group. With the idea that a tall person will have a wide bust and a short person will have a narrow bust to have a generally balanced beautiful body, the proportion index value of 26.9 between stature and (chest circumference)/2 was found out to select each size of the proportion of the High Frequency group, of which result is shown in <Table 6>.

(2) Selection of the size of the proportional dimension standards

As the measure of stature and chest circumference/2 is an important measure that decided the size of the dimension standards, the measure of stature and chest circumference /2 is adjusted little by little as long as the proportion is not changed. And then the final sizes of the proportional dimension standards for Chinese women are selected as shown in <Table 7>. The basic size of the proportional

<Table 6> Measure of (chest circumference)/2 per each range of stature according to the proportion of stature and (chest circumference)/2

(unit: cm, n=1,095)

stature	chest circumference/2	index of (chest circumference/2)/stature
140.92	37.91	26.9
142.42	38.31	26.9
143.92	38.71	26.9
145.42	39.12	26.9
146.92	39.52	26.9
148.42	39.92	26.9
149.92	40.33	26.9
151.42	40.73	26.9
152.92	41.14	26.9
154.42	41.54	26.9
155.92	41.94	26.9
157.42	42.35	26.9
158.92	42.75	26.9
160.42	43.15	26.9
161.92	43.56	26.9
163.42	43.96	26.9
164.92	44.36	26.9
166.42	44.77	26.9
167.92	45.17	26.9
169.42	45.57	26.9
170.92	45.98	26.9
172.42	46.38	26.9
173.92	46.78	26.9
175.42	47.19	26.9
176.92	47.59	26.9
178.42	47.99	26.9
179.92	48.40	26.9

- Shadow part: Average measure of the High Frequency group.

dimension standards for Chinese women was decided as averages of stature and chest circumference/2 were 159cm and 42.8cm respectively. And then other sizes were decided with a deviation of 1.5cm for the stature and 0.4cm for the chest circumference/2.

3) Setting proportional dimension standards for Chinese women

(1) Proportion analysis of dimension standards items

With the idea that a bigger size will have a larger measure per each part and a smaller size will have a less measure per each part to have a generally balanced body, the chest circumference/2 and the proportion of circumference items and the proportion of stature and length items were analyzed on the basis of the item measure of each part of the basic size in order to select the measure of each size that has the same proportion as the High Frequency group of Chinese women,

<Table 7> Selection of the size of the proportional dimension standards

(unit: cm, n=1,095)

stature	Newly adjusted stature	chest circumference/2	Newly adjusted (chest circumference)/2	index
140.92	141.0	37.91	38.0	26.9
142.42	142.5	38.31	38.4	26.9
143.92	144.0	38.71	38.8	26.9
145.42	145.5	39.12	39.2	26.9
146.92	147.0	39.52	39.6	26.9
148.42	148.5	39.92	40.0	26.9
149.92	150.0	40.33	40.4	26.9
151.42	151.5	40.73	40.8	26.9
152.92	153.0	41.14	41.2	26.9
154.42	154.5	41.54	41.6	26.9
155.92	156.0	41.94	42.0	26.9
157.42	157.5	42.35	42.4	26.9
158.92	159.0	42.75	42.8	26.9
160.42	160.5	43.15	43.2	26.9
161.92	162.0	43.56	43.6	26.9
163.42	163.5	43.96	44.0	26.9
164.92	165.0	44.36	44.4	26.9
166.42	166.5	44.77	44.8	26.9
167.92	168.0	45.17	45.2	26.9
169.42	169.5	45.57	45.6	26.9
170.92	171.0	45.98	46.0	26.9
172.42	172.5	46.38	46.4	26.9
173.92	174.0	46.78	46.8	26.9
175.42	175.5	47.19	47.2	26.9
176.92	177.0	47.59	47.6	26.9
178.42	178.5	47.99	48.0	26.9
179.92	180.0	48.40	48.4	26.9

- Shadow part: adjusted size of dimension standards. Bold underline: basic size.

of which result is shown in <Table 8>. It was shown that the ratio of waist circumference/2 to the chest circumference/2 was 83.6%, the hip circumference/2 to the chest circumference /2 was 107.9% and the bust circumference/2 to the chest circumference/2 was 102.2%. In addition, the waist back length to stature was 23.8%, the waist to hip length to stature was 14% and the arm length to stature was 33.2%. The waist height was 62.6% and the difference between the back cervical height and hip height and that of between the waist

height and knee height were 36.0% and 35.8% respectively, thus having a similar ratio.

(2) Selection of measure per items of the proportional dimension standards

The proportion of chest circumference/2 and circumference and the proportion of stature and length were analyzed on the basis of the item measure per each part of the basic size which is the average measure of the High Frequency group. in order to select the measure of each size of the proportion of

<Table 8> Proportion on items related to dimension standards

(n=1,095)

Item		M	SD	Min. Value	Max. Value	Coefficient of Variation	Range
BASICS	(chest circumference/2)/stature	26.9	1.9	22.2	32.6	7.1	10.4
	(waist circumference/2)/(chest circumference/2)	83.6	5.4	65.7	131.0	6.5	65.2
CIRCUMFERENCE	(hip circumference/2)/(chest circumference/2)	107.9	4.9	71.4	128.0	4.5	56.6
	(bust circumference/2)/(chest circumference/2)	102.2	3.4	79.8	123.6	3.3	43.8
	bust point-bust point/(chest circumference/2)	41.2	3.6	30.2	58.6	8.7	28.4
	neck base circumference/(chest circumference/2)	87.9	4.5	72.4	106.8	5.1	34.4
	(front interscye fold, length/2)/(chest circumference/2)	38.8	2.6	22.7	47.8	6.7	25.0
	(back interscye fold, length/2)/(chest circumference/2)	40.7	2.2	31.8	48.4	5.4	16.6
	axilla depth/(chest circumference/2)	24.3	2.1	16.2	36.2	8.6	20.0
LENGTH	waist back length/stature	23.8	1.2	18.6	28.6	5.0	10.0
	waist to hip length/stature	14.0	1.2	7.4	20.5	8.6	13.1
	cervical to waist length/stature	25.2	1.3	17.6	29.6	5.2	12.0
	(back neck circumference/2+cervical to waist length)/stature	30.2	1.4	22.4	34.9	4.6	12.5
	cervical to breast point length/stature	16.5	1.4	12.7	24.2	8.5	11.6
	(back neck circumference/2+cervical to breast point length)/stature	21.6	1.5	17.6	29.5	6.9	11.9
	(back cervical height-knee height)/stature	58.3	1.7	46.9	78.2	2.9	31.2
	(back cervical height-hip height)/stature	36.0	1.8	27.3	57.2	5.0	29.9
	arm length/stature	33.2	1.3	9.8	39.5	3.9	29.7
	(waist height-knee height)/stature	35.8	1.4	31.1	44.4	3.9	13.3
waist height/stature	62.6	1.1	59.0	66.0	1.8	7.0	
(waist height-crotch height)/stature	17.7	1.7	-2.5	42.7	9.6	45.1	

the Chinese women who belonged to the High Frequency group. The proportional dimension standards of Chinese women selected by the measure of items that has the same proportion per each part in each size are shown in <Table 9>.

The basic size of proportional dimension standards for Chinese women had the stature of 159cm, chest girth/2 of 42.8cm, waist girth/2 of 35.8cm, hip girth/2 of 46.2cm, breast girth/2 of 43.7cm, nipple horizontal length of 17.6cm,

lower neck size of 37.6cm, (front armpit point length)/2 of 16.6cm, (back armpit point length) /2 of 17.4cm, and armpit thickness of 10.4cm.

The length category had the length of the back of 17.8cm, hip side length of 22.3cm, neck side nipple waist size length of 40.1cm, back neck size/2+ side neck nipple waist size length of 48cm, neck side nipple length of 26.2cm, back neck size/2+ side neck nipple length of 34.3cm, and arm length of 52.8cm.

<Table 9> Proportional dimension standards for Chinese women

(unit: cm, n=1,095)

CIRCUMFERENCE	stature	chest circumference/2	waist circumference/2	hip circumference/2	bust circumference/2	bust point – bust point	neck base circumference	front interscye fold, length/2	back interscye fold, length/2	axilla depth
SIZE	141.0	38.0	31.8	41.0	38.8	15.7	33.4	14.7	15.5	9.2
	142.5	38.4	32.1	41.4	39.2	15.8	33.8	14.9	15.6	9.3
	144.0	38.8	32.4	41.9	39.7	16.0	34.1	15.1	15.8	9.4
	145.5	39.2	32.8	42.3	40.1	16.2	34.5	15.2	16.0	9.5
	147.0	39.6	33.1	42.7	40.5	16.3	34.8	15.4	16.1	9.6
	148.5	40.0	33.4	43.2	40.9	16.5	35.2	15.5	16.3	9.7
	150.0	40.4	33.8	43.6	41.3	16.6	35.5	15.7	16.4	9.8
	151.5	40.8	34.1	44.0	41.7	16.8	35.9	15.8	16.6	9.9
	153.0	41.2	34.4	44.5	42.1	17.0	36.2	16.0	16.8	10.0
	154.5	41.6	34.8	44.9	42.5	17.1	36.6	16.1	16.9	10.1
	156.0	42.0	35.1	45.3	42.9	17.3	36.9	16.3	17.1	10.2
	157.5	42.4	35.4	45.7	43.3	17.5	37.3	16.5	17.3	10.3
	159.0	42.8	35.8	46.2	43.7	17.6	37.6	16.6	17.4	10.4
	160.5	43.2	36.1	46.6	44.2	17.8	38.0	16.8	17.6	10.5
	162.0	43.6	36.4	47.0	44.6	18.0	38.3	16.9	17.7	10.6
	163.5	44.0	36.8	47.5	45.0	18.1	38.7	17.1	17.9	10.7
	165.0	44.4	37.1	47.9	45.4	18.3	39.0	17.2	18.1	10.8
	166.5	44.8	37.5	48.3	45.8	18.5	39.4	17.4	18.2	10.9
	168.0	45.2	37.8	48.8	46.2	18.6	39.7	17.5	18.4	11.0
	169.5	45.6	38.1	49.2	46.6	18.8	40.1	17.7	18.6	11.1
171.0	46.0	38.5	49.6	47.0	19.0	40.4	17.8	18.7	11.2	
172.5	46.4	38.8	50.1	47.4	19.1	40.8	18.0	18.9	11.3	
174.0	46.8	39.1	50.5	47.8	19.3	41.1	18.2	19.0	11.4	
175.5	47.2	39.5	50.9	48.2	19.4	41.5	18.3	19.2	11.5	
177.0	47.6	39.8	51.4	48.6	19.6	41.8	18.5	19.4	11.6	
178.5	48.0	40.1	51.8	49.1	19.8	42.2	18.6	19.5	11.7	
180.0	48.4	40.5	52.2	49.5	19.9	42.5	18.8	19.7	11.8	

- Shadow part: size of dimension standards. Bold underline: basic size.

<Table 9> Continue

(unit: cm, n=1,095)

L E N G T H	stature	chest circumference /2	stature/7.09	waist back length	waist to hip length	cervical to waist length	back neck circumference/2 + cervical to waist length	cervical to breast point length	back neck circumference/2 + cervical to breast point length	back cervical height - knee height	back cervical height -knee height	arm length	waist height - knee height	waist height	waist height - crotch height
	141.0	38.0	19.9	33.6	19.7	35.5	42.6	23.3	30.5	82.2	50.8	46.8	50.5	88.3	25.0
	142.5	38.4	20.1	33.9	20.0	35.9	43.0	23.5	30.8	83.1	51.3	47.3	51.0	89.2	25.2
	144.0	38.8	20.3	34.3	20.2	36.3	43.5	23.8	31.1	84.0	51.8	47.8	51.6	90.1	25.5
	145.5	39.2	20.5	34.6	20.4	36.7	43.9	24.0	31.4	84.8	52.4	48.3	52.1	91.1	25.8
	147.0	39.6	20.7	35.0	20.6	37.0	44.4	24.3	31.8	85.7	52.9	48.8	52.6	92.0	26.0
	148.5	40.0	20.9	35.3	20.8	37.4	44.8	24.5	32.1	86.6	53.5	49.3	53.2	93.0	26.3
	150.0	40.4	21.2	35.7	21.0	37.8	45.3	24.8	32.4	87.5	54.0	49.8	53.7	93.9	26.6
	151.5	40.8	21.4	36.1	21.2	38.2	45.8	25.0	32.7	88.3	54.5	50.3	54.2	94.8	26.8
	153.0	41.2	21.6	36.4	21.4	38.6	46.2	25.2	33.0	89.2	55.1	50.8	54.8	95.8	27.1
	154.5	41.6	21.8	36.8	21.6	38.9	46.7	25.5	33.4	90.1	55.6	51.3	55.3	96.7	27.3
	156.0	42.0	22.0	37.1	21.8	39.3	47.1	25.7	33.7	90.9	56.2	51.8	55.8	97.7	27.6
	157.5	42.4	22.2	37.5	22.1	39.7	47.6	26.0	34.0	91.8	56.7	52.3	56.4	98.6	27.9
	159.0	42.8	22.4	37.8	22.3	40.1	48.0	26.2	34.3	92.7	57.2	52.8	56.9	99.5	28.1
	160.5	43.2	22.6	38.2	22.5	40.4	48.5	26.5	34.7	93.6	57.8	53.3	57.5	100.5	28.4
	162.0	43.6	22.8	38.6	22.7	40.8	48.9	26.7	35.0	94.4	58.3	53.8	58.0	101.4	28.7
	163.5	44.0	23.1	38.9	22.9	41.2	49.4	27.0	35.3	95.3	58.9	54.3	58.5	102.4	28.9
	165.0	44.4	23.3	39.3	23.1	41.6	49.8	27.2	35.6	96.2	59.4	54.8	59.1	103.3	29.2
	166.5	44.8	23.5	39.6	23.3	42.0	50.3	27.5	36.0	97.1	59.9	55.3	59.6	104.2	29.5
	168.0	45.2	23.7	40.0	23.5	42.3	50.7	27.7	36.3	97.9	60.5	55.8	60.1	105.2	29.7
	169.5	45.6	23.9	40.3	23.7	42.7	51.2	28.0	36.6	98.8	61.0	56.3	60.7	106.1	30.0
	171.0	46.0	24.1	40.7	23.9	43.1	51.6	28.2	36.9	99.7	61.6	56.8	61.2	107.0	30.3
	172.5	46.4	24.3	41.1	24.2	43.5	52.1	28.5	37.3	100.6	62.1	57.3	61.8	108.0	30.5
	174.0	46.8	24.5	41.4	24.4	43.8	52.5	28.7	37.6	101.4	62.6	57.8	62.3	108.9	30.8
	175.5	47.2	24.8	41.8	24.6	44.2	53.0	29.0	37.9	102.3	63.2	58.3	62.8	109.9	31.1
	177.0	47.6	25.0	42.1	24.8	44.6	53.5	29.2	38.2	103.2	63.7	58.8	63.4	110.8	31.3
	178.5	48.0	25.2	42.5	25.0	45.0	53.9	29.5	38.6	104.1	64.3	59.3	63.9	111.7	31.6
	180.0	48.4	25.4	42.8	25.2	45.4	54.4	29.7	38.9	104.9	64.8	59.8	64.4	112.7	31.9

- Shadow part: size of dimension standards. Bold underline: basic size.

The deviation of each item in the proportional dimension standards is 1.5cm for stature, 0.4cm for chest circumference/2 which represent each size of the proportional dimension standards. In addition, the waist circumference/2 usually has 0.3cm or 0.4cm deviation, and the hip circumference/2 and bust circumference/2

have 0.4cm or 0.5cm deviation. The bust point -bust point length and the front interscye fold length/2 usually have 0.2cm or 0.1cm deviation, and the back neck circumference has 0.3cm and 0.4cm deviation alternately. The back interscye fold length/2 has a deviation of 0.1cm~0.2cm, and the axilla depth has a deviation of 0.1cm.



In the length items, the waist back length has a deviation of 0.3~0.4cm, the waist to hip length and the waist height-crotch height usually have a deviation of 0.2cm or 0.3cm. The cervical to waist length usually has a deviation of 0.4cm or 0.3cm. The back neck circumference/2+cervical to waist length has a deviation of 0.4cm and 0.5cm alternately. The cervical to breast point length has a deviation of 0.2~0.3cm, and the back neck circumference /2+cervical to breast point length usually has a deviation of 0.3cm or 0.4cm. The back cervical height-knee height usually has a deviation of 0.9cm or 0.8cm. The back cervical height-hip height and waist height-knee height usually have a deviation of 0.5cm or 0.6cm. The arm length has 0.5cm deviation. The waist height usually has a deviation of 0.9cm or 1cm.

#### IV. Conclusions

1. The Rohrer's index, breadth difference, thickness difference, height ratio and head-body index are analyzed to have the district with 1% or higher distribution of subjects as selected for High-frequency district, and it extracted a total of 1,095 (79.3% of entirety) persons for High-Frequency group.

2. The stature of the average Chinese woman belonging to the High Frequency group is 7.09 times the length of the head. High-frequency group had proportion that the stature and waist height ratio was 1.6 : 1, the ratio of the stature-waist height : waist height was shown to be 1 : 1.67.

3. For the decision of the proportional dimension standards, the 23 items that are thought important for division of the proportional dimension standards and the items thought important in the making of the patterns for the clothing were selected.

4. To extract each size that has the same proportion with the high-frequency group, 26.9 is obtained as a proportional index, which was calculated using stature and breast girth/2 of the high-frequency group. Obtained were the sizes of breast girth/2 that have the same proportion depending on the interval of 1.5 cm for stature. They were selected for the number of proportional dimension standards. The basic number of proportional dimension standards of Chinese women was in the average of high-frequency group with the stature of 159cm and chest girth/2 for 42.8cm with the standard deviation of 1.5cm for stature and chest girth/2 of 0.4cm.

5. In order to extract the size of each with the same proportion with high-frequency group, it has the average of high-frequency group, namely, based on the category figure for each part of the basic average figure, the size for each category is extracted to meet the proportion with chest size/2, height and length.

The basic size of proportional dimension standards for Chinese women had the stature of 159cm, chest size/2 of 42.8cm, waist size/2 of 35.8cm, hip size/2 of 46.2cm, breast size/2 of 43.7cm, nipple horizontal length of 17.6cm, lower neck size of 37.6cm, front armpit point length/2 of 16.6cm, back armpit point length/2 of 17.4cm, and armpit thickness of 10.4cm.

The length category had the length of the back of 37.8cm, hip side length of 22.3cm, neck side nipple waist size length of 40.1cm, back neck size/2+ side neck nipple waist size length of 48cm, neck side nipple length of 26.2cm, back neck size/2+ side neck nipple length of 34.3cm, and arm length of 52.8cm.

limitations and recommendation for future studies are as follows.

1) This study is mainly subjected to 1,095 people who are 19–50 of age and live in Beijing and Shanghai and there should be cautions taken when expanding the realm.

2) The future study based on extended regions and detailed ages should be conducted to increase the reliability.

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