A Study on Development of Chinese Men's Apparel Sizing System II

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Abstract

The purpose of this study is to provide for some basic data useful to production of the apparels fit and measured well for the Chinese men. For this purpose, Chinese men's apparel measurements and specifications were determined per area group(Beijing and Shanghai) according to the Men's Wear Specifications (GB/T 1335.1-1997), National Standards of People's Republic of China. The results of this study can be summarized as follows;

1. As a result of dividing the Chinese men into Beijing and Shanghai men and thereby, setting stature and upper chest circumference for upper garments and stature and waist for lower garments.

2. As a result of analyzing the correlational distributions of stature and upper chest circumference measurements by region (Beijing and Shanghai) and type of physique, it was found that the coverage rate of the selected sizes was higher in Shanghai sample than Beijing sample in case of the sample with thicker waist circumferences.

3. As a results of analyzing the correlations according to the three-fold classifications of stature /upper chest circumference/waist for garment specifications by region (Beijing and Shanghai) and type of physique, "A" type was most covered , followed by "B", "C" and "Y" types.

Key words: Men's Wear Specifications, stature and upper chest circumference, stature and waist, type of physique

I. Introduction

Since the establishment of Sino-Korean diplomatic relationship in 1992, numerous Korean apparel companies have advanced into the Chinese apparel markets due to the geographic and cultural advantages. Although China's economy has grown rapidly with their great socio-cultural changes, many Korean apparel companies have failed to establish in the Chinese apparel market due to poor understanding of Chinese consumers' needs and their fashion culture as well as institutional, custom-wise and cultural differences and various political, social and cultural obstacles.[1]

Now, Korean apparel companies who have learned lessons from their failures are attempting to shift from the low-price marketing strategy to the high-price strategy through license, collaboration or joint venture agreements with the

local apparel companies. If Korean apparel companies want to sharpen their competitive edges against other foreign rivals in the great potential Chinese market being liberalized, they are requested to arrange a systematic and efficient business strategy based on their lessons learned from their failures.[2] In order to advance effectively into the Chinese apparel market rapidly changing, it is necessary for the Korean apparel companies to survey Chinese constitutions thoroughly, to develop the patterns fitting the constitutions by region, to reinforce the merchantability through development of creative and differential designs, to reduce the costs and enhance mobility through localization of the production bases, to maximize the sales efficiency by segmenting the target markets and to develop a unique marketing route through a longer-term investment strategy

Efficient strategies for the Korean apparel companies to advance into the Chinese markets can be enumerated in multi-faceted ways as above, but it is essential to plan and develop high value-added commodities in order to sharpen their competitive edges. In this vein, it seems to be pre-requisite to develop the commodities fitting Chinese constitutions, and to this end, it is necessary to collect precise information on their constitutions and reflect them on apparel designs.

Likewise, if the Korean men's wear companies can advance into the Chinese markets effectively, it is essential to survey Chinese men's constitutions, sizes and patterns, but the database is very insufficient. Since China is very wide with various peoples, it may be reasonable to develop some unified apparel specifications and patterns not for all the population but for each region in order to enhance fitting and perfection of the apparels.

With such basic conceptions in mind, this study was aimed at improving the physical fitness of the Korean apparels for Chinese men and thereby, providing for some basic data useful to the Korean companies doing business in China. To this end, those men aged in their 20's, 30's and 40's and living in the Chinese capital, Beijing, and the Chinese fashion center, Shanghai, were sampled randomly and thereupon, According to a preceding study[3][4][5][6][7], the sizes of the apparels for male adult Chinese were set for each group by using the tripartite classification of stature/upper chest circumference/waist circumference.

II. Methods of Study

1. Body measurement

For the subjects of this study, 414 Chinese men aged between 20 and 50 and living in Beijing and Shanghai and engaged in office works or other professional jobs were randomly sampled and thereupon, 389 men were finally selected in consideration of age distribution. Then, the subjects' body sizes were measured from July 1 to 18, 2000.

The measurement list required for understanding of Chinese adults' constitutions and manufacturing of their apparel patterns was determined in reference to the "National Anthropometric Survey of Korea" in 1997[8] as well as their standard constitution measurement methods and terms before being referred to men's apparel pattern producers for advice.

Those living in Beijing accounted for 53.50% (208 persons) and those living in Shanghai accounted for 46.5% (181 persons). On the other

hand, those in their 20's accounted for 47.56% (185 persons), those in their 30's for 31.36% (122 persons) and those in their 40's accounted for 21.08% (82 persons).

2. Data processing and Analysis

In order to enhance the reliability of the body measurements suggested by this study, their values exceeding $\pm3\sigma$(σ: SD) from their means were dismissed as abnormal extreme ones to be treated as missing values and then, processed statistically using the SAS System for Window Release 6.12). The methods of analysis used for this study can be summarized as follows. Measurements of 38 items and calculated values of one item (Röhrer Index) - a total of 39 items - were used for analysis.

1) In order to set the apparel size specifications for Chinese male adults by dividing them into Beijing and Shanghai groups, the sample adults' basic physique and body sizes were set in reference to the China standard, GB.

2) A correlational distribution table was produced about size specifications of the basic two items or stature and upper chest circumference for Chinese male adults' jacket for each of the sample groups.

3) A correlational distribution table was produced about size specifications of the basic two items or stature and waist circumference for Chinese male adults' trousers for each of the sample groups.

4) The sizes of the apparels for male adult Chinese were set for each group by using the tripartite classification of stature/upper chest circumference/waist circumference.

III. Results of the Study and Discussions

1. Classifications of constitutions by drop size

The sample men's constitutions were classified into four types as shown in Table 2 in terms of drop size (difference between upper chest circumference and waist) according to GB Constitution Classification standards.9) Namely, the drop size 17~22cm was classified into "Y" type, 12~16cm into "A" type, 7~11cm into "B" type and 2~6cm was classified into "C" type.

2. Setting of basic measurement items and size intervals

The basic measurement items for Chinese male adults' apparels were set at stature and upper chest circumference for jackets and stature and waist circumference for trousers in accordance with the Chinese standard for men's apparels or GB/T 1335.1-1997. Since GB sets the size intervals at 5cm for stature, 4cm for upper chest circumference and 2cm for waist circumference, this study set the size intervals at equal 5 cm for stature (160~190cm), equal 4cm for upper chest circumference (76~108cm) and equal 2cm for waist circumference (66~108cm). <Table 1>

<Table 1> GB constitution types and scope of drop sizes

Constitution type	Scope of drop sizes
"Y" type	17~22cm
"A" type	12~16cm
"B" type	7~11cm
"C" type	2~6cm

<Table 2> Technical statistics about basic body item measurements

unit: cm

Basic item \ Statistical values	Mean	SD	Min.	Max.	Variance coefficient	Range
Stature	172.2	5.8	157.7	188.3	3.4	30.6
Upper chest circumference	93.2	6.3	76.1	108.0	6.7	32.9
Waist circumference	82.9	9.0	65.2	107.1	10.8	41.9

<Table 3-1> Ytype correlational distribution of the measurements of stature and upper chest circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
76		1 3.70 100.00 25.00					1 3.70
80				1 3.70 100.00 6.67			1 3.70
84		1 3.70 100.00 25.00					1 3.70
88			2 7.41 28.57 66.67	4 14.81 57.14 26.67	1 3.70 14.29 33.33		7 25.93
92			1 3.70 14.29 33.33	5 18.52 71.43 33.33		1 3.70 14.29 100.00	7 25.93
96	1 3.70 16.67 100.00	1 3.70 16.67 25.00		3 11.11 50.00 20.00	1 3.70 16.67 33.33		6 22.22
100		1 3.70 33.33 25.00		2 7.41 66.67 13.33			3 11.11
104							
108					1 3.70 100.00 33.33		1 3.70
total	1 3.70	4 14.81	3 11.11	15 55.56	3 11.11	1 3.70	27 100.00

3. Distribution of measurements

The following is a summarized a result of analyzing the relational distribution of the measurements of the two basic items (stature and upper chest circumference) for jackets and another two basic items (stature and waist circumference) for trousers by dividing the sample into Beijing and Shanghai groups.

1) Correlational distribution of stature and upper chest circumference measurements

(1) Beijing region

The results of analyzing the correlational distribution of the measurements of stature and upper chest circumference for 4 types of male adult Chinese physique classified based on drop sizes are summarized in <Table 3-1>, <Table 3-2>, <Table 3-3> and <Table 3-4>.

<Table 3-2> A type correlational distribution of the measurements of stature and upper chest circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
76								
80								
84		2 3.57 22.22 20.00	3 5.36 33.33 33.33	1 1.79 11.11 5.26	2 3.57 22.22 15.38	1 1.79 11.11 33.33		9 16.07
88	2 3.57 11.76 100.00	4 7.14 23.53 40.00	1 1.79 5.88 11.11	6 10.71 35.29 31.58	4 7.14 23.53 30.77			17 30.36
92		3 5.36 18.75 30.00	3 5.36 18.75 33.33	5 8.93 31.15 26.32	4 7.14 25.00 30.77	1 1.79 6.25 33.33		16 28.57
96		1 1.79 11.11 10.00	1 1.79 11.11 11.11	4 7.14 44.44 21.05	3 5.36 33.33 23.08			9 16.07
100			1 1.79 33.33 11.11	2 3.57 66.67 10.53				3 5.36
104								
108				1 1.79 50.00 5.26		1 1.79 50.00 33.33		2 3.57
total	2 3.57	10 17.86	9 16.07	19 33.93	13 23.21	3 5.36		56 100.00

<Table 3-3> B type correlational distribution of the measurements of stature and upper chest circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
76				1 1.33 100.00 4.55			1 1.33
80			2 2.67 66.67 6.67		1 1.33 33.33 14.29		3 4.00
84		2 2.67 22.22 18.18	4 5.33 44.44 13.33	2 2.67 22.22 9.09		1 1.33 11.11 33.33	9 12.00
88		1 1.33 11.11 9.09	4 5.33 44.44 13.33	2 2.67 22.22 9.09	2 2.67 22.22 28.57		9 12.00
92	1 1.33 5.00 50.00	6 8.00 30.00 54.55	6 8.00 30.00 20.00	5 6.67 25.00 22.73		2 2.67 5.00 28.57	20 26.67
96	1 1.33 6.67 50.00	1 1.33 6.67 9.09	6 8.00 40.00 20.00	5 6.67 33.33 22.73		2 2.67 13.33 66.67	15 20.00
100		1 1.33 9.09 9.09	4 5.33 36.36 13.33	4 5.33 36.36 18.18	2 2.67 18.18 28.57		11 14.67
104			4 5.33 57.14 13.33	3 4.00 42.86 13.64			7 9.33
108							
total	2 2.67	11 14.67	30 40.00	22 29.33	7 9.33	3 4.00	75 100.00

The "Y" type of physique is distributed in the total 16 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm and 175cm, the measurements of upper chest circumference are distributed highly at the intervals of 88cm, 92cm and 96cm. Part0icularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 175/92 (18.52%) and 175/88 (14.48%).

The "A" type of physique is distributed in the

<Table 3-4> C type correlational distribution of the measurements of stature and upper chest circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
76							1 2.27 100.00 100.00	1 2.27
80								
84								
88		1 2.27 33.33 14.29	1 2.27 33.33 10.00	1 2.27 33.33 9.09				3 6.82
92		2 4.55 50.00 28.57		1 2.27 25.00 9.09	1 2.27 25.00 11.11			4 9.09
96	2 4.55 13.33 66.67	2 4.55 13.33 28.57	5 11.36 33.33 50.00	1 2.27 6.67 9.09	3 6.82 20.00 33.33	2 4.55 13.33 66.67		15 34.09
100	1 2.27 7.14 33.33		4 9.09 28.57 40.00	4 9.09 28.57 36.36	5 11.36 35.71 55.56			14 31.82
104		1 2.27 33.33 14.29		1 2.27 33.33 9.09		1 2.27 33.33 33.33		3 6.82
108		1 2.27 25.00 14.29		3 6.82 75.00 27.27				4 9.09
total	3 7.32	7 17.07	9 21.95	11 26.83	7 17.07	3 7.32	1 2.27	41 100.00

total 23 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm, 175cm and 180cm, the measurements of upper chest circumference are distributed highly at the intervals of 88cm, 92cm and 96cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 175/88 (10.71%) and 175/92 (8.93%).

The "B" type of physique is distributed in the total 27 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm and

175cm, the measurements of upper chest circumference are distributed highly at the intervals of 92cm, 96cm and 100cm. Particularly, the distributions are high at such combined int0ervals of stature and upper chest circumferences as 165/92, 170/92 and 170/96 (each 8.00%).

The "C" type of physique is distributed in the total 22 intervals of stature and upper che0st 0circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 170cm and 175cm, the measurements of upper chest circumference are distributed highly at the intervals of 96cm and 100cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 170/96 (11.36%), 170/100 (9.09%) and 175/100 (9.09%).

On the other hand, as a result of reviewing the coverage rate of 17 sizes selected for Beijing

<Table 4-1> A type correlational distribution of the measurements of stature and upper chest circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
76								
80								
84		1 5.88 20.00 33. 33	1 5.88 20.00 16.67		2 11.76 40.00 50.00		1 5.88 20.00 100.00	5 29.41
88		1 5.88 33.33 33.33	1 5.88 20.00 16.67	1 5.88 33.33 50.00				3 17.65
92			2 11.76 66.67 33.33			1 5.88 33.33 100.00		3 17.65
96				1 5.88 50.00 50.00	1 5.88 50.00 25.00			2 11.76
100		1 5.88 33.33 33.33	1 5.88 33.33 16.67		1 5.88 33.33 25.00			3 17.65
104								
108		1 5.88 100.00 16.67						1 5.88
total		3 17.65	6 35.29	2 11.76	4 23.53	1 5.88	1 5.88	17 100.00

sample by type of physique in the Beijing region, it was found that the rate of "Y" type was 74.06% in 9 sizes out of the total 17 ones, "A" type 82.15% in 15 sizes, "B" type 78.67% in 16 sizes and the rate of "C" type was 65.89% in 12 sizes out of the total 17 ones. Thus, "A" type was most covered by 17 sizes, followed by "B", "Y" and "C" types.

(2) Shanghai region

The results of analyzing the correlational distribution of the measurements of stature and upper chest circumference for 4 types of male adult Chinese physique classified based on drop sizes are summarized in <Table 4-1>, <Table 4-2>, <Table 4-3> 0and <Table 4-4>.

<Table 4-2> A type correlational distribution of the measurements of stature and upper chest circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
76							
80		1 1.85 50.00 11.11	1 1.85 50.00 5.27				2 3.70
84	1 1.85 10.00 100.00	2 3.70 20.00 22.22	5 9.26 50.00 26.32	1 1.85 10.00 6.67	1 1.85 10.00 12.50		10 18.52
88		3 5.56 14.29 33.33	7 12.96 33.33 36.84	8 14.81 38.10 53.33	3 5.56 14.29 37.50		21 38.89
92		2 3.70 20.00 22.22	3 5.56 30.00 15.79	2 3.70 20.00 13.33	2 3.70 20.00 25.00	1 1.85 10.00 50.00	10 18.52
96		1 1.85 12.50 11.11	3 5.56 37.50 15.79	2 3.70 25.00 13.33	2 3.70 25.00 25.00		8 14.81
100				1 1.85 50.00 6.67		1 1.85 50.00 50.00	2 3.70
104				1 1.85 100.00 6.67			1 1.85
108							
total	1 1.85	9 16.67	19 35.12	15 27.78	8 14.81	2 3.70	54 100.00

<Table 4-3> B type correlational distribution of the measurements of stature and upper chest circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
76								
80			2 2.78 66.67 6.25	1 1.39 33.33 7.14				3 4.17
84		5 6.94 62.50 29.41	2 2.47 25.00 6.25	1 1.39 12.50 7.14				8 11.11
88	1 1.39 8.33 100.00	3 4.17 25.00 17.65	6 8.33 50.00 18.75	2 2.78 16.67 14.29				12 16.67
92		3 4.17 17.65 17.65	7 9.72 41.18 21.88	4 5.56 23.53 28.57	3 4.17 17.65 50.00			17 23.61
96		4 5.56 22.22 23.53	8 11.11 44.44 25.00	4 5.56 22.22 28.57	2 2.78 11.11 33.33			18 25.00
100			5 6.94 62.50 15.63	1 1.39 12.50 7.14		1 1.39 12.50 100.00	1 1.39 12.50 100.00	8 11.11
104		1 1.39 20.00 6.67	2 2.78 40.00 6.25	1 1.39 20.00 7.14	1 1.39 20.00 16.67			5 6.94
108		1 1.39 100.00 6.67						1 1.39
total	1 1.39	17 23.61	32 44.44	14 19.44	6 8.33	1 1.39	1 1.39	72 100.00

The "Y" type of physique is distributed in the total 15 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm and 180cm, the measurements of upper chest circumference are distributed highly at the intervals of 84cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 170/92 (11.76%) .

The "A" type of physique is distributed in the total 23 intervals of stature and upper chest

<table 4-4> C type correlational distribution of the measurements of stature and upper chest circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
76								
80								
84			1 2.94 100.00 11.11					1 2.94
88	1 2.94 25.00 50.00	1 2.94 25.00 11.11	2 5.88 50.00 22.22					4 11.76
92		4 11.76 44.44 44.44	1 2.94 11.00 11.11	4 11.76 44.44 44.44				9 26.47
96	1 2.94 11.11 50.00	2 5.88 22.22 22.22	2 5.88 22.22 22.22	1 2.94 11.11 11.11	2 5.88 22.22 50.00	1 2.94 11.11 100.00		9 26.47
100		2 5.88 28.57 22.22	2 5.88 28.57 22.22	2 5.88 28.57 22.22	1 2.94 14.29 25.00			7 20.59
104			1 2.94 33.33 11.11	1 2.94 33.33 11.11	1 2.94 33.33 25.00			3 8.82
108				1 2.94 10.00 11.11				1 2.94
total	2 5.88	9 26.47	9 26.47	9 26.47	4 11.76	1 2.94		34 100.00

circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 170cm, 175cm, the measurements of upper chest circumference are distributed highly at the intervals of 84cm, 88cm and 92cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 175/88 (14.81%) and

170/88 (12.96%).

The "B" type of physique is distributed in the total 26 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm and 175cm, the measurements of uppe00r chest circumference are distributed highly at the

intervals of 88cm, 92cm and 96cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 170/96(11.11%) and 170/92 (9.72%).

The "C" type of physique is distributed in the total 21 intervals of stature and upper chest circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm and 175cm, the measurements of upper chest circumference are distributed highly at the intervals of 92cm, 96cm and 100cm. Particularly, the distributions are high at such combined intervals of stature and upper chest circumferences as 165/92?175/92 (each 11.76%).

On the other hand, as a result of reviewing the coverage rate of 016 sizes selected for Shanghai sample by type of physique in the Shanghai region, it was found that the rate of "Y" type was 64.68% in 9 sizes out of the total 16 ones, "A" type 79.61% in 14 sizes, "B" type 84.43% in 16 sizes and the rate of "C" type was 70.56% in 13 sizes out of the total 16 ones. Thus, "B" type was most covered by 16 sizes, followed by "A", "C" and "Y" types.

As a result of analyzing the correlational distributions of stature and upper chest circumference measurements by region (Beijing and Shanghai) and type of physique, it was found that the coverage rate of the selected sizes was higher in Shanghai sample than Beijing sample in case of the sample with thicker waist circumferences.

3) Correlational distribution of stature and waist circumference measurements

(1) Beijing region

The results of analyzing the correlational distribution of the measurements of stature and waist circumference for 4 types of male adult Chinese physique classified based on drop sizes are summarized in <Table 5-1>, <Table 5-2>, <Table 5-3> and <Table 5-4>.

The "Y" type of physique is distributed in the total 11 intervals of stature and waist circumference measu0rements combined. While the measurements of stature are distributed highly at the intervals of 175cm, the measurements of waist circumference are distributed highly at the intervals of 72cm and 76cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 175/76cm (25.50%) and 175/72cm (20.00%).

The "A" type of physique is distributed in the total 28 intervals of stature and waist circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm, 175cm and 180cm, the measurements of waist circumference are distributed highly at the intervals of 72cm, 74cm, 76cm, 78cm and 80cm. Particularly, the distributions are hight at such combined intervals of stature and waist circumferences as 175/74cm (15.50%), 165/78cm, 175/76cm, 175/78cm, 180/74cm and 175/72cm. (each 6.00%).

The "B" type of physique is distributed in the total 40 intervals of stature and waist circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm and 175cm, the measurements of waist circumference are distributed highly at the intervals of 82cm, 84cm and 86cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 175/82cm (6.25%) and 175/94cm (4.69%).

The "C" type of physique is distributed in the total 32 intervals of stature and waist circum-

<Table 5-1> Y type correlational distribution of the measurements of stature and waist circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66		1 3.85 50.00 100.00			1 3.85 50.00 33.33		2 7.69
68							
70				2 7.69 100.00 14.29			2 7.69
72			2 7.69 40.00 66.67	3 11.54 60.00 21.43			5 19.23
74			1 3.85 50.00 33.33		1 3.85 50.00 33.33		2 7.69
76				5 19.23 83.33 35.71		1 3.85 16.67 100.00	6 23.08
78	1 3.85 33.33 100.00	1 3.85 33.33 33.33		1 3.85 33.33 7.14			3 11.54
80				2 7.69 100.00 14.28			2 7.69
82		1 7.69 50.00 33.33		1 7.69 50.00 7.14			2 7.69
84							
86							
88					1 3.85 100.00 33.33		1 3.85
90							
92							

<Table 5-1> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
94		1 3.85 100.00 33.33					1 3.85
96							
98							
100							
102							
104							
106							
108							
total	1 3.85	3 11.54	3 11.54	14 53.85	3 11.54	1 3.85	26 100.00

<Table 5-2> A type correlational distribution of the measurements of stature and waist circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66							
68							
70		2 3.57 33.33 20.00	2 3.57 33.33 22.22		1 1.79 16.67 7.69	1 1.79 16.67 33.33	6 10.71
72		1 1.79 14.29 10.00	2 3.57 28.58 22.22	2 3.57 28.58 10.53	2 3.57 28.58 15.38		7 12.50
74	1 1.79 11.11 50.00			5 3.57 55.55 55.55	3 5.36 33.33 23.08		9 16.07
76	1 1.79 11.11 50.00	3 5.36 33.33 30.00		3 5.36 33.33 15.79	2 3.57 22.22 15.38		9 16.07
78		2 3.57 22.22 20.00	2 3.57 22.22 22.22	4 7.14 44.44 21.05	1 1.79 11.11 7.69		9 16.07

<Table 5-2> Continue

upper chest(cm) / stature(cm)	160	165	170	175	180	185	total
80		1 1.79 20.00 10.00	2 40.00 33.33 22.22		1 1.79 20.00 7.69	1 1.79 20.00 33.33	5 8.93
82				1 1.79 100.00 5.26			1 3.57
84		1 1.79 50.00 10.00			1 1.79 50.00 7.69		2 5.36
86			1 1.79 20.00 11.11	2 3.57 40.00 10.53	2 3.57 40.00 15.38		5 8.93
88				1 1.79 100.00 5.26			1 1.79
90							
92				1 1.79 100.00 5.26			1 1.79
94						1 1.79 100.00 33.33	1 1.79
96							
98							
100							
102							
104							
106							
108							
total	2 5.36	10 17.86	9 16.07	19 33.93	13 23.21	3 5.36	56 100.00

ference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm, 175cm and 180 cm, the measurements of waist circumference

<Table 5-3> B type correlational distribution of the measurements of stature and waist circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66							
68							
70			1 1.33 100.00 3.33				1 1.33
72		1 1.33 25.00 9.09	2 2.67 50.00 6.67		1 1.33 25.00 14.29		4 5.33
74		1 1.33 33.33 9.09	2 2.67 66.67 6.67				3 4.00
76			2 2.67 50.00 6.67	1 1.33 25.00 4.55		1 1.33 25.00 33.33	4 5.33
78				1 1.33 50.00 4.55	1 1.33 50.00 14.29		2 2.66
80		2 2.67 33.33 18.18	2 2.67 33.33 6.67		2 2.67 33.33 28.57		6 8.00
82		1 1.33 9.09 9.09	3 4.00 27.27 10.00	6 8.00 54.55 27.27	1 1.33 9.09 14.29		11 14.67
84		3 4.00 27.27 27.27	6 8.00 54.55 20.00	2 2.67 18.18 9.09			11 14.67
86	2 2.67 22.22 16.66	2 2.67 22.22 18.18	.2 2.67 22.22 6.67	2 2.67 22.22 9.09		1 1.33 11.11 33.33	9 12.00
88			1 1.33 33.33 3.33	2 2.67 66.67 9.09			3 4.00

<Table 5-3> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
90		1 1.33 11.11 9.09	4 5.33 44.44 13.33	2 2.67 22.22 9.09	1 1.33 11.11 14.29	1 1.33 11.11 33.33	9 12.00
92			2 2.67 66.67 6.67	1 1.33 33.33 4.55			3 4.00
94			1 1.33 20.00 3.33	3 4.00 60.00 13.67	1 1.33 20.00 14.29		5 6.67
96			2 2.67 100.00 6.67				2 2.66
98				1 1.33 100.00 4.55			1 1.33
100							
102							
104				1 1.33 100.00 4.55			1 1.33
108							
total	2 2.67	11 14.67	30 40.00	22 29.33	7 9.33	3 4.00	75 100.00

are distributed highly at the intervals of 88cm, 92cm, 94cm, 96cm and 98cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 170/92cm (12.20%), 165/88cm, 165/92cm, 170/98cm, 175/94cm, 175/96cm, 180/92cm and 180/96cm (each 4.89%).

(2) Shanghai region

The results of analyzing the correlational distribution of the measurements of stature and waist circumference for 4 types of male adult Chinese physique classified based on drop sizes are summarized in <Table 6-1>, <Table 6-2>, <Table 6-3> and <Table 6-4>.

The "Y" type of physique is distributed in the total 11 intervals of stature and waist circumference measurements combined. While the measurements of stature are distributed highly at the intervals of 165cm and 175cm, the measurements of waist circumference are distributed

<Table 5-4> C type correlational distribution of the measurements of stature and waist circumference (Beijing)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66							
68							
70							
72							
74							
76							
78							
80							
82		1 2.44 100.00 16.67					1 2.44
84							
86				1 2.44 50.00 9.09	1 2.44 50.00 10.00		2 4.88
88		2 4.88 50.00 33.33		1 2.44 25.00 9.09		1 2.44 25.00 25.00	4 9.76
90					1 2.44 100.00 10.00		1 2.44
92	1 2.44 11.11 50.00	1 2.44 11.11 16.67	5 12.20 55.56 62.50		2 4.88 22.22 20.00		9 21.95
94			1 2.44 16.67 12.50	2 4.88 33.33 18.18	2 4.88 33.33 20.00	1 2.44 16.67 25.00	6 14.63
96	1 2.44 14.29 50.00	1 2.44 14.29 16.67		2 4.88 28.57 18.18	3 7.32 42.86 30.00		7 17.07
98			2 4.88 40.00 25.00	1 2.44 20.00 9.09	1 2.44 20.00 10.00	1 2.44 20.00 25.00	5 12.20

<Table 5-4> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
100				1 2.44 100.00 9.09			1 2.44
102				1 2.44 100.00 9.09			1 2.44
104		1 2.44 50.00 16.67		1 2.44 50.00 9.09			2 4.88
106				1 2.44 100.00 9.09			1 2.44
108						1 2.44 100.00 25.00	1 2.44
total	2 4.88	6 14.63	8 19.51	11 26.83	10 24.39	4 9.76	41 100.00

<Table 6-1> Y type correlational distribution of the measurements of stature and waist circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
66		1 6.25 33.33 33.33			1 6.25 33.33 25.00		1 6.25 33.33 100.00	3 18.75
68			1 6.25 50.00 20.00		1 6.25 50.00 25.00			2 12.50
70				1 6.25 100.00 50.00				1 6.25
72		1 6.25 50.00 33.33				1 6.25 50.00 100.00		2 12.50

<Table 6-1> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
74			1 6.25 100.00 20.00					1 6.25
76			1 6.25 33.33 20.00	1 6.25 33.33 50.00	1 6.25 33.33 25.00			3 18.75
78					1 6.25 100.00 25.00			1 6.25
80								
82		1 6.25 50.00 33.33	1 6.25 50.00 20.00					2 12.50
84								
86			1 6.25 100.00 20.00					1 6.25
88								
90								
92								
94								
96								
98								
100								
102								
104								
106								
108								
total		3 18.75	5 31.25	2 12.50	4 25.00	1 6.25	1 6.25	16 100.00

highly at the intervals of 74cm and 76cm. Particularly, the distributions are even (9.09%) in all 11 intervals of stature and waist circumference measurements combined.

The "A" type of physique is distributed in the total 28 intervals of stature and waist circumference measurements combined. While the measurements of stature are distributed highly at the

<Table 6-2> A type correlational distribution of the measurements of stature and waist circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66							
68		1 1.85 20.00 11.11	3 5.56 60.00 15.79		1 1.85 20.00 12.50		5 9.26
70			4 7.41 100.00 21.05				4 7.41
72		2 3.70 28.57 22.22		4 7.41 57.14 26.67	1 1.85 14.29 12.50		7 12.96
74	1 1.85 9.09 100.00	2 3.70 18.18 22.22	4 7.41 36.36 21.05	3 5.56 27.27 20.00	1 1.85 9.09 12.50		11 20.37
76		1 1.85 14.29 11.11	3 5.56 42.86 15.79	2 3.70 28.57 13.33	1 1.85 14.29 12.50		7 12.96
78			2 3.70 40.00 10.53	1 1.85 20.00 5.26	1 1.85 20.00 12.50	1 1.85 20.00 50.00	5 9.26
80		1 1.85 16.67 11.11		2 3.70 33.33 13.33	3 5.56 50.00 37.50		6 11.11
82		2 3.70 50.00 22.22	2 3.70 50.00 10.53				4 7.41
84			1 1.85 50.00 5.26	1 1.85 50.00 5.26			2 3.70
86							
88				2 3.70 50.00 13.33		1 1.85 50.00 50.00	3 5.56
90							

<Table 6-2> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
92							
94							
96							
98							
100							
102							
104							
106							
108							
total	1 1.85	9 16.67	19 35.19	15 27.78	8 14.81	2 3.70	54 100.00

<Table 6-3> B type correlational distribution of the measurements of stature and waist circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
66								
68								
70			2 2.78 66.67 6.25	1 1.39 33.33 7.14				3 4.17
72				1 1.39 100.00 7.14				1 1.39
74		1 1.39 100.00 5.88						1 1.39
76		1 1.39 100.00 5.88						1 1.39
78		5 6.94 62.50 29.41	3 4.17 37.50 9.38					8 11.11
80			1 1.39 25.00 3.13	3 4.17 75.00 21.43				4 5.56

<Table 6-3> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	190	total
82	1 1.39 7.14 100.00	3 4.17 21.43 17.65	6 8.33 42.86 18.75	2 2.78 14.29 14.29	2 2.78 14.29 33.33			14 19.44
84		2 2.78 16.67 11.76	8 11.11 66.67 25.00	1 1.39 8.33 7.14	1 1.39 8.33 16.67			12 16.67
86		2 2.78 40.00 11.76	2 2.78 40.00 6.25	1 1.39 20.00 7.14				5 6.94
88		1 1.39 12.50 5.88	3 4.17 37.50 9.38	2 2.78 25.00 14.29	1 1.39 12.50 16.67		1 1.39 12.50 100.00	8 11.11
90			4 5.56 57.14 12.50	1 1.39 14.29 7.14	1 1.39 14.29 16.67	1 1.39 14.29 100.00		7 9.72
92			1 1.39 33.33 3.13	2 2.78 66.67 14.29				3 4.17
94			1 1.39 50.00 3.13		1 1.39 50.00 16.67			2 2.78
96		1 1.39 50.00 5.88	1 1.39 50.00 3.13					2 2.78
98								
100								
102								
104		1 1.39 100.00 5.88						1 1.39
106								
108								
total	1 1.39	17 23.61	32 44.44	14 19.44	6 8.33	1 1.39	1 1.39	72 100.00

<Table 6-4> C type correlational distribution of the measurements of stature and waist circumference (Shanghai)

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
66							
68							
70							
72							
74							
76							
78							
80			1 2.94 100.00 11.11				1 2.94
82		1 2.94 50.00 11.11	1 2.94 50.00 11.11				2 5.88
84	1 2.94 100.00 50.00						1 2.94
86			1 2.94 100.00 11.11				1 2.94
88		3 8.82 42.86 33.33	1 2.94 14.29 11.11	3 8.82 42.86 33.33			7 20.59
90		2 5.88 50.00 22.22	1 2.94 25.00 11.11	1 2.94 25.00 11.11			4 11.76
92		2 5.88 50.00 22.22	1 2.94 25.00 11.11			1 2.94 25.00 100.00	4 11.76
94	1 2.94 33.33 50.00	1 2.94 33.33 11.11			1 2.94 33.33 25.00		3 8.82
96				3 8.82 75.00 33.33	2 5.88 25.00 50.00		5 14.71

<Table 6-4> Continue

upper chest(cm) \ stature(cm)	160	165	170	175	180	185	total
98			2 5.88 75.00 22.22	1 8.82 25.00 11.11			3 8.82
100			1 2.94 50.00 11.11		1 2.94 50.00 25.00		2 5.88
102							
104				1 2.94 100.00 11.11			1 2.94
106							
108							
total	2 5.88	9 26.47	9 26.47	9 26.47	4 11.76	1 2.94	34 100.00

intervals of 170cm and 175cm, the measurements of waist circumference are distributed highly at the intervals of 80cm, 82cm and 86cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 170/70cm and 175/72cm (each 8.51%).

The "B" type of physique is distributed in the total 34 intervals. While the measurements of stat0ure are distributed highly at the intervals of 165cm, 170cm and 175cm, the measurements of waist circumference are distributed highly at the intervals of 80cm, 84cm and 86cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 170/82cm (10.45%) and 170/80cm (8.96%).

The "C" type of physique is distributed in the total 28 intervals. While the measurements of stature are distributed highly at the intervals of 165cm, 170cm and 175cm, the measurements of waist circumference are distributed highly at the intervals of 88cm and 90cm. Particularly, the distributions are high at such combined intervals of stature and waist circumferences as 165/88cm, 175/88cm and 175/96cm (each 9.38%).

4. Setting of the Apparel Sizes for Chinese Male Adults

The apparel sizes for 4 types of physique classified based on drop sizes for Beijing and Shanghai regions can be suggested as follows according to the tripartite classifications.

1) Beijing regions

As a result of analyzing the correlational distributions of stature/upper chest circumference /waist circumference, the sizes for jackets and trousers could be set as shown in <Table 7> by

<Table 7> Apparel Sizes for Chinese Male Adults by 4 types of physique(Beijing)

unit:cm

Y type		
waist \ stature upper chest	170	175
88	70	70
92		72
96		76
100		80

A type			
waist stature upper chest	165	170	175
84	70	70, 72	
88	76		70, 74
92	80	76	76
96		80	78

B type				
waist \ stature upper chest	165	170	175	180
84	74	76		
88		80		
92	84	84	80	
96		86	84	
100		90		94

C type				
waist \ stature upper chest	165	170	175	180
92	88			
96	90	90		
100		94	94	94

combining the stature/upper chest circumference measurements with the waist circumference measurements based on <Table 3> and <Table 5>.

In case of "Y" type physique, a total of 5 sizes could be set with the combinations of 20 stature intervals 170cm and 175cm, 4 upper chest circumference intervals between 88cm and 100cm and 4 waist circumference intervals of 70cm, 72cm, 76cm and 80cm.

In case of "A" type physique, a total of 11 sizes could be set with the combinations of 3 stature intervals between 165cm and 175cm, 4 upper chest circumference intervals between 84cm and 96cm and 6 waist circumference intervals between 70cm and 80cm.

In case of "B" type physique, a total of 10 sizes could be set with the combinations of 4 stature intervals between 165cm and 180cm, 5 upper chest circumference intervals between 84cm and 100cm and 7 waist circumference intervals of 74cm, 76cm, 80cm, 84cm, 86cm, 90cm and 94cm.

In case of "C" type physique, a total of 6 sizes could be set with the combinations of 4 stature intervals between 165cm and 180cm, 3 upper chest circumference intervals between 92cm and 100cm and 3 waist circumference intervals of 88cm, 90cm and 94cm.

When reviewing the distribution of total sizes centering around stature by each type of physique, it could be known that in case of "Y" type, 4 sizes are set at the interval of 175cm which amounts to 80.00%. In other words, the absolute majority of "Y" type males in Beijing are as high as 175cm. In case of "A" type, the sizes are almost same at each interval of stature, while in case of "B" type, 5 sizes are set at the interval of 175cm which amounts to 50.00%. In case of "C" type, 4 sizes are set at the intervals of 165cm and 170cm which amounts to 66.77%.

2) Shanghai regions

As a result of analyzing the correlational distributions of stature/upper chest circumference

/waist circumference, the sizes for jackets and trousers could be set as shown in <Table 8> by combining the stature/upper chest circumference measurements with the waist circumference measurements based on <Table 4> and <Table 6>.

In case of "Y" type physique, a total of 5 sizes could be set with the combinations of 4 stature intervals 165cm and 180cm, 4 upper chest circumference intervals between 84cm and 96cm and 4 waist circumference intervals of 66cm and 72cm.

In case of "A" type physique, a total of 15 sizes could be set with the combinations of 4 stature intervals between 165cm and 180cm, 4 upper chest circumference intervals between 84cm and 96cm and 9 waist circumference intervals between 68cm and 84cm.

In case of "B" type physique, a total of 9 sizes could be set with the combinations of 3 stature intervals between 165cm and 175cm, 5 upper chest circumference intervals between 84cm and 100cm and 7 waist circumference intervals of 76 cm, 78cm, 82cm, 84cm, 86cm, 88cm and 94cm.

In case of "C" type physique, a total of 8 sizes could be set with the combinations of 3 stature intervals between 170cm and 180cm, 4 upper chest circumference intervals between 84cm and 96cm and 6 waist circumference intervals of 80cm and 90cm.

When reviewing the distribution of total sizes centering around stature by each type of physique, it could be known that in case of "Y" type, 2 sizes are set at the interval of 175cm which amounts to 40.00%. In case of "A" type, 6 sizes are set at the intervals of 170cm and 5 sizes are set at the intervals of 175cm which amounts to 73.33%, in case of "B" type, 4 sizes are set at the interval of 170cm and 3 sizes are set at the

interval of 165cm which amounts to 77.78%. In case of "C" type, 4 sizes are set at the intervals of 175cm which amounts to 50.00%.

<Table 8> Apparel Sizes for Chinese Male Adults by 4 types of physique(Shanghai)

Y type				
waist \ stature / upper chest	165	170	175	180
84	68			
88			66, 68	
92		70		
96				72

A type				
waist \ stature / upper chest	165	170	175	180
84		68, 70		
88	74	74, 76	72, 74	
92	80	82	78, 80	80
96	82	84	84	

A type			
waist \ stature / upper chest	165	170	175
84	76		
88	78	82	
92	86	84	84
96	82	86, 88	
100			94

C type			
waist \ stature / upper chest	165	170	175
84		80	
88	86	82, 84	86
92		88	90
96	90		

IV. Conclusions and Suggestions

This study was aimed at providing for some basic data useful to designing of the apparels fitting Chinese adult men well. To this end, 389 Chinese adult men aged between 20 and 50 living in Beijing and Shanghai were sampled to be measured for their body sizes. And the apparel sizes for 4 types of physique classified based on drop sizes for Beijing and Shanghai regions can be suggested as follows according to the tripartite classifications. The results of this study can be concluded with its limits.

1. Conclusions

1) The basic measurement items for Chinese male adults' apparels were set at stature and upper chest circumference for jackets and stature and waist circumference for trousers in accordance with the Chinese standard for men's apparels or GB/T 1335.1-1997.

2) The results of analyzing the correlational distribution of the measurements of stature and upper chest circumference for 4 types of male adult Chinese physique classified based on drop sizes; review the coverage rate of 17 sizes selected for Beijing sample by type of physique in the Beijing region, it was found that the rate of "Y" type was 74.06% in 9 sizes out of the total 17 ones, "A" type 82.15% in 15 sizes, "B" type 78.67% in 16 sizes and the rate of "C" type was 65.89% in 12 sizes out of the total 17 ones. Thus, "A" type was most covered by 17 sizes, followed by "B", "Y" and "C" types. as a result of reviewing the coverage rate of 16 sizes selected for Shanghai sample by type of physique in the Shanghai region, it was found that the rate of "Y"

type was 64.68% in 9 sizes out of the total 16 ones, "A" type 79.61% in 14 sizes, "B" type 84.43% in 16 sizes and the rate of "C" type was 70.56% in 13 sizes out of the total 16 ones. Thus, "B" type was most covered by 16 sizes, followed by "A", "C" and "Y" types.

As a result of analyzing the correlational distributions of stature and upper chest circumference measurements by region (Beijing and Shanghai) and type of physique, it was found that the coverage rate of the selected sizes was higher in Shanghai sample than Beijing sample in case of the sample with thicker waist circumferences.

3) The results of analyzing the correlational distribution of the measurements of stature and waist circumference for 4 types of male adult Chinese physique classified based on drop sizes, In Beijing, the "Y" type of physique is distributed in the total 11 intervals of stature and waist circumference measurements combined, The "A" type of physique is 28 intervals, the "B" type of physique is 40 intervals and the "C" type of physique is distributed in the total 32 intervals of stature and waist circumference measurements combined. In Shanghai, The "Y" type of physique is distributed in thetotal 11 intervals of stature and waist circumference measurement0s combined, the "A" type of physique is 28 intervals, the "B" type of physique is 34 intervals and the "C" type of physique is distributed in the total 28 intervals.

4) The results of analyzing the correlations according to the three-fold classifications of height/upper chest circumference/waist for garment specifications, in Beijing, in case of "Y" type, 4 sizes are set at the interval of 175cm which amounts to 80.00%. In other words, the absolute majority of "Y" type males in Beijing are

as high as 175cm. In case of "A" type, the sizes are almost same at each interval of stature, while in case of "B" type, 5 sizes are set at the interval of 175cm which amounts to 50.00%. In case of "C" type, 4 sizes are set at the intervals of 165cm and 170cm which amounts to 66.77%. In Shanghai, in case of "Y" type, 2 sizes are set at the interval of 175cm which amounts to 40.00%. In case of "A" type, 6 sizes are set at the intervals of 170cm and 5 sizes are set at the intervals of 175cm which amounts to 73.33%, in case of "B" type, 4 sizes are set at the interval of 170cm and 3 sizes are set at the interval of 165cm which amounts to 77.78%. In case of "C" type, 4 sizes are set at the intervals of 175cm which amounts to 50.00%. For other reference measurements, grading measures were set for each type and body part, while the average measures of major body parts were calculated.

2. Limits of study

The points to be complemented by future studies and the limits of this study can be summed up as follows;

1) Since the sample size (389 Chinese adults aged between 20 and 50 living in Beijing and Shanghai) was very small - China may be divided into 6 living spheres - the results of this study may not well be generalized. It is hoped that this study will be followed up by future studies using larger sample sizes and regions to enhance the fitness of the apparels designed for Chinese adult men.

2) As the ground for domestic apparel businesses become weaker, it is essential for Korean apparel manufacturers to secure some production bases in China, while competing with Chinese local apparel manufactures. Thus, it is

required of Korea apparel manufacturers to obtain quality information on Chinese consumers. In this regard, it is hoped that this study will be followed up by continued future studies aiming to provide some basic and useful information on Chinese apparel markets for Korean apparel businesses, and that such studies will be positively supported by the Korean government as well as colleges and industries.

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