

A Study on the Princess Line by Body Types (Part I)* – Focused on Body Types of A & H –

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Abstract

The main purpose is to study the effects of princess lines on different body types and to disguise any imperfections by using diverse princess lines. We separated testers body shapes into specific body types, A, H by applying both the direct and the indirect measurements.

Following are the results of the study:

- 1. These are the resulting illusion effects when the shoulder width of the princess line was fixed. In case of the armhole princess line, the illusion occurred that the waist intervals were narrow or wide in A-line silhouette. In case of the shoulder princess line, when the waist interval was narrow, it appeared to show narrow shoulder in A-line silhouette. While the wide waist interval shows the wide shoulder width in H-line silhouette. It regards body type H in the same light as H-line silhouette when the waist interval is narrow, it appeared to show narrow shoulder width in A-line silhouette. When the waist interval was wide, it appeared to give the narrow shoulder width.*
- 2. When the princess lines waist width was fixed in order to study illusion effects of waist widths. Generally, for body type A, whether the waist interval of princess line is narrow or wide, the princess line is located comparatively wide, in A-line silhouette appeared to show relatively slender waist. For body type H, whether the waist interval is narrow or wide, the princess line is situated comparatively narrow interval, H-line silhouette appeared to show slim waist but the differences are not significant.*
- 3. The illusion effects of the hip were studied by fixating the width of the skirt and varying the locations of princess line and waist widths. For the location of both armhole and shoulder princess line in H and A-line silhouette, the narrow shoulder width and the waist appeared to show narrow hips. While they are wide appeared to show wide hips.*
- 4. With both waist and skirt widths fixed, all two body types showed taller and slender postures when the princess line originated from the shoulder compare to the armhole.*

Key words : body type, princess line, illusion effects.

I. Introduction

The importance of design is embossed in var-

ious fields more than before in accordance with in the emotional society. One of the importance facts is the line that can have effect on the appearance in accordance with the wearing person.

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*This work was supported by Hanyang University, Korea, made in the program year of 2000.

The line is caused esthetic effect for illusion if you are using the line effectually, you can disguise any imperfections and to show yours to advantage.

Jeung, Jae-eun¹⁾ said that ideal body shape for the modern society is tall, light, long arms and legs, finally the slim style and then we are applying the length line in order to head toward this ideal figure.

The princess line is a representative length line. The princess line is made up straight and curved lines, it has divided function inside of the silhouette space as a seam line which is from armhole or shoulder to waist dart. It is also composed of two lines with angles, the effect of vertical line adds to the effect of angle became to emphasis the silhouette overall body. Expecially there are several correction effects by using illusion effect that is the shape looks narrower or wider. However, the same princess lines will have varying degrees of effects on different body types because of different characteristics in each body type.

It is the significant thing to understand the body characteristics, because people have different characteristics in each body types, to grasp a fit costume. The front silhouette plays an important role to understand body type visually. When you are under construction the costume, width and length are so different even within

similar round measure, for that reason, to reflect characteristics of each body type is do to understand the figure factors(shoulder width, shoulder angle of inclination, waist thickness, hips width, back length, hips length etc.) among those figure size or the shape. In previous researches, body types were classified according to only the body size.

The purpose of this study is to classify body types according to body shape as well as body size. Also, it is to find the suitable princess lines that make the body shape look better.

II. The Study Methods and Procedures

1. Design Selection and Production

1) Design Selection

The princess line have various shapes according to application methods. For that reason, in this study it was focused to the one piece dress; its position and waist space of the princess line, and skirt widths were variable.

The 16 pieces experiment dresses were designed in associated with each design. <Table 1> shows experiment designs and the signs.

2) Wearing Testee Selection

So as to choose testee, we measured chest,

<Table 1> Signs of the Various Princess Lines

Sign	Design	Sign	Design
AP ₁	Arm hole princess line started from S.P to arm hole 1/3	W ₁	Waist width 6.5cm of the princess line from C.F
AP ₂	Arm hole princess line started from S.P to arm hole 2/3	W ₂	Waist width 10cm of the princess line from C.F
SP ₁	Shoulder princess line started from N.P to shoulder 1/2	H	H line skirt is fixed up from hip line directly get down to hem
SP ₂	Shoulder princess line started from N.P to shoulder 2/3	A	A line skirt is from side line to 4cm

¹ Jae-Eun Jung, "A Study on Real Body Size and Ideal Body Shape of 18 to 26 Year-Old Women", Unpublished Master's Thesis, (Seoul University, 1993), pp.40-50.

Variation of the Design	A.H Princess Line		Shoulder Princess Line		
	1/3	2/3	1/2	2/3	
H Line Sill.	Walst W. 6.5 cm				
		AP ₁ W ₁ H	AP ₂ W ₁ H	SP ₁ W ₁ H	SP ₂ W ₁ H
H Line Sill.	Walst W. 10 cm				
		AP ₁ W ₂ H	AP ₂ W ₂ H	SP ₁ W ₂ H	SP ₂ W ₂ H
A Line Sill.	Walst W. 6.5 cm				
		AP ₁ W ₁ A	AP ₂ W ₁ A	SP ₁ W ₁ A	SP ₂ W ₁ A
A Line Sill.	Walst W. 10 cm				
		AP ₁ W ₂ A	AP ₂ W ₂ A	SP ₁ W ₂ A	SP ₂ W ₂ A

<Fig. 1> Experiment Dresses by Variation of Each Design.

waist, and hip size of 46 university students. Then, we could choose 15 testee conform to <Table 2> which shows Korean 20 ages women's mean value by way the 1st test.

² Yoo-kyung Choi, "Shape classification of body type on adult female and its variation of size and shape according to their age.", Doctoral dissertation(Seoul National University, 1997).

³ National anthropometric survey of Korea, Korea Research Institute of Standards and Science, National Institute of Technology and Quality(NITAQ), (1997).

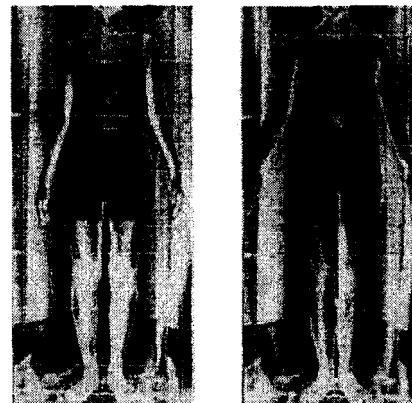
<Table 2> Mean Value for Twenties of Korean Women (Unit: cm, kg)

Bust	Waist	Hip	Height	Weight
81.7	65.6	89.2	160	52.2

We had measured the front body width of 15 testee, who were selected for 1st test, by the automatic body photograph equipment, Silhouetter. The figure selection was based on the study by Choi, Yoo-kyung²⁾ in the Korea Industry Norm³⁾, hip size is similar with average scope, shoulder, waist, hip's ratio are measured, the person who has shoulder width is narrow than hip width, so-called A body type, all similar body sizes are called H body type. Two wearing models were chosen for each type.

3) Body Measurement

The chosen testee were measured by direct measurement method using Martin style measurement, which is presented in <Table 3>. The front silhouette pictures shown in <Fig. 2> were used for indirect measurement.



<Body type A> < Body type H>

<Fig. 2> Silhouette pictures of each body type.

<Table 3> Body Measurement of Each Body Type Testee (Unit : cm. kg)

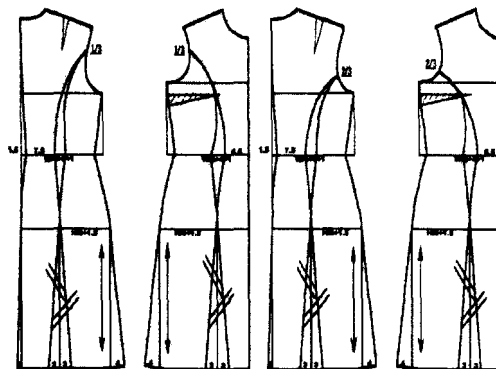
Body type		A	H
Height	Side neck h.	132.9	135.7
	Shoulder h.	128.3	131.3
	Armhole h.	119.2	121.8
	Bust point h.	114.8	114.2
	Waist h.	99.1	102.4
	Hip h.	78.1	81.7
	Crotch h.	69.2	73
Knee h.	40.5	43.9	
Width	Neck w.	13.5	12.5
	Shoulder point w.	31.3	31.7
	Bust w.	21.0	24.8
	Waist w.	21.3	23.4
	Hip w.	33.6	31.7
Girth	Bust c.	79.0	84.0
	Waist c	60.8	70.0
	Hip c	91.5	92.5
Length	Back l.	37	38.0
	Knee l.	58.5	59.0
	Arm l.	53	55
	Hip l.	19.0	19.5
Etc	Drop*	12.5	8.5
	Weight	48	56.0
	Height	160.0	162.0

* Hip c.~Bust c.

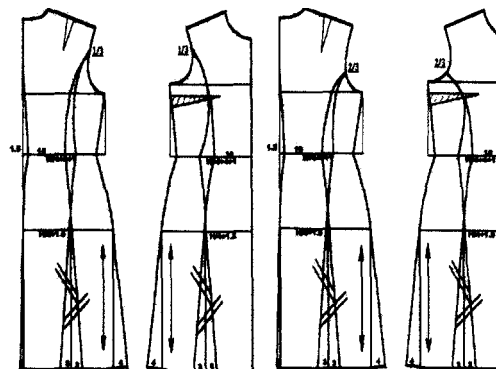
4) Manufacturing of Experiment Cloth

The textile for this study was made of 100% cotton cloth and original form was come from the cultural original form of Gang, Soon-hee's⁴⁾. The armhole princess line was originated from S.P to 1/2, 2/3 point of the armhole. The shoulder princess line was originated from S.P to 1/2, 2/3 point of the shoulder. The waist interval which is the connection of the princess line was 6.5 cm or 10 cm from the center front line.

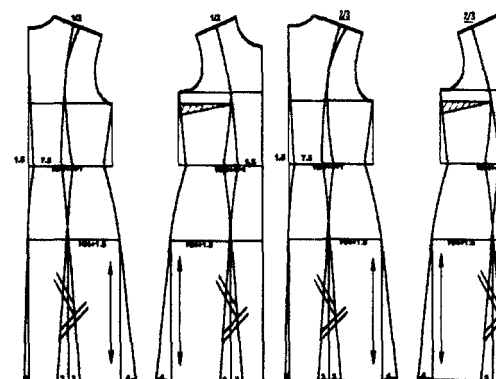
The H line skirt was fixed up from hip circumference directly get down and A line is from side line 4 cm, the intersection of lines 3



<Fig. 3> Arm hole Princess Line Pattern with Waist Width 6.5 cm.

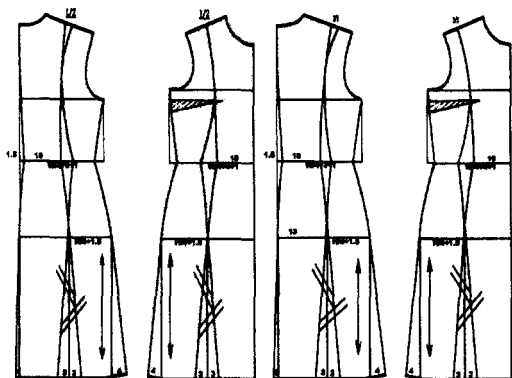


<Fig. 4> Arm Hole Princess Line Pattern with Waist Width 10cm.



<Fig. 5> Shoulder Princess Line Pattern with Waist Width 6.5cm.

⁴ Soon-hee Gang, *Pattern Marking of Clothing and Apparel*, (Seoul: KyoMunSa Publishing Co., 1990), pp.23-35.



<Fig. 6> Shoulder Princess Line Pattern with Waist Width 10cm.

cm each. The skirt length was knee-deep, the sleeve was standard half sleeve style, and the sleeve mountain was $A.H/4+3cm$.

We had made 16 experiment clothes for each two body types. Therefore, total 32 pieces of one piece experiment dress were associated with the location of the princess line (armhole line, shoulder) each of two types, the waist width of the princess line each of two types, and the skirt width each of two types.

The pattern of each experiment cloths is shown as follows from <Fig. 3> to <Fig. 6>.

2. Wearing Evaluation Production

We put testee of each body type on 16 types the one piece dresses with princess line designed, and then took a front picture as the wearing evaluation stimulation. There was encircled 2.5mm black type along the line in order to seize the figure.

3. Wearing Evaluation Test

1) Selection of the Evaluation Committee

It should be composed by the ten graduate students, majoring in clothing and textiles. As they had general understanding and learning of apparel design, they would evaluate the experiment dresses by using visual judgement.

2) The Evaluation Test Procedure

The each slid pictures which was consisted with associated design facts like location of the princess line, waist interval of the princess line, skirt width, showed appraisers for 10 seconds interval. They evaluated the design with associated facts at the same time by multi-point comparative ranking method.

Concrete evaluated methods were formed one pair for 4 facts. Then, they conferred rank on

<Table 4> Evaluation Items of Design Facts

Design facts	Evaluation items	
Position fix of the princess line (Waist width, skirt silhouette)	Shoulder width Narrow	Shoulder width Wide
	1.....2.....3.....4	
Waist width fix of the princess line (Position of the princess line, skirt silhouette)	Waist Thin	Waist Thick
	1.....2.....3.....4	
Skirt silhouette fix (Position of the princess line, waist width variation)	Hip Narrow	Hip Wide
	1.....2.....3.....4	
Waist width, Skirt silhouette fix of the princess line (Position variation of the princess line)	As a whole slim As a whole short	As a whole fat As a whole tall
	1.....2.....3.....4	

the paper according to the evaluated items. For example, the 1st rank was the narrowest one among these "the shoulder width appeared narrow - wide" and the widest appeared to look is 4th rank <Table 4>. We allowed the grade according to the rank to be able to verify them which one is superiority or inferiority.

4. Data Analysis

We had found out average ranking(M) and attentional degree for each of items on assorted design with evaluated items. The mutual estimated results from appraisers were obtained by Kendall's coefficient of consistency W.

III. Results and Considerations

1. The Illusion of the Shoulder Width by the Location of the Princess Line

It was mentioned in <Table 5> that the illusion effect of the shoulder width was arisen by the location, waist width of the princess line, and variation of the skirt silhouette in the same

body types.

1) Case of the Armhole Princess Line

When the armhole princess line is situated over 1/3 from S.P point, AP₁W₁A design (armhole 1/3, waist interval 6.5 cm, A-line silhouette) in body type A appeared the narrowest shoulder, whereas AP₁W₂A design (armhole 1/3, waist interval 10cm, A-line silhouette) appeared to show the widest shoulder. However, situated 2/3 princess line did not show any distinctively different to illusion in body type A (p≤0.05).

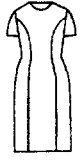
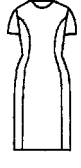


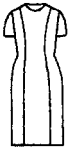




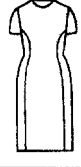


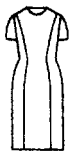



For the body type H, the princess lines location was set at 1/3 point of the armhole did not show significant differences, but when situation 2/3 armhole princess line at AP₂W₁A (armhole 2/3, waist interval 6.5cm, A-line silhouette) appeared the narrowest shoulder width, at AP₂W₂A design (armhole 2/3, waist interval 10cm, A-line design) cause illusion to display wide (p≤0.05).

Therefore, armhole princess line for the both type A and H, when A-line silhouette illusion can rise depends on narrow or wide of the waist

<Table 5> The Illusion of the Shoulder Width by the Location of the Princess Line

		Body type A				Body type H			
		Design	M	W	χ^2	Design	M	W	χ^2
Illusion Effects of Shoulder Width	A.H 1/3	AP ₁ W ₁ H	2.00	.304	9.120*	AP ₁ W ₁ H	2.00	.124	3.720
		AP ₁ W ₂ H	2.90			AP ₁ W ₂ H	2.50		
		AP ₁ W ₁ A	1.80			AP ₁ W ₁ A	2.40		
		AP ₁ W ₂ A	3.30			AP ₁ W ₂ A	3.10		
	A.H 2/3	AP ₂ W ₁ H	2.40	.228	6.840	AP ₂ W ₁ H	2.70	.272	8.160*
		AP ₂ W ₂ H	3.40			AP ₂ W ₂ H	2.30		
		AP ₂ W ₁ A	2.10			AP ₂ W ₁ A	1.70		
		AP ₂ W ₂ A	2.10			AP ₂ W ₂ A	3.30		
	Shoulder 1/2	SP ₁ W ₁ H	2.90	.124	3.720	SP ₁ W ₁ H	1.80	.296	8.880*
		SP ₁ W ₂ H	2.80			SP ₁ W ₂ H	3.00		
		SP ₁ W ₁ A	1.90			SP ₁ W ₁ A	2.00		
		SP ₁ W ₂ A	2.40			SP ₁ W ₂ A	3.20		
Shoulder 2/3	SP ₂ W ₁ H	2.70	.412	12.360**	SP ₂ W ₁ H	2.60	.152	4.560	
	SP ₂ W ₂ H	3.20			SP ₂ W ₂ H	2.60			
	SP ₂ W ₁ A	1.30			SP ₂ W ₁ A	1.80			
	SP ₂ W ₂ A	2.80			SP ₂ W ₂ A	3.00			

* p≤0.05, ** p≤0.01.

		Design							
A.H 1/3 part					Shoulder 1/2 part				
	AP ₁ W ₁ H	AP ₁ W ₂ H	AP ₁ W ₁ A	AP ₁ W ₂ A		SP ₁ W ₁ H	SP ₁ W ₂ H	SP ₁ W ₁ A	SP ₁ W ₂ A
A.H 2/3 part					Shoulder 2/3 part				
	AP ₂ W ₁ H	AP ₂ W ₂ H	AP ₂ W ₁ A	AP ₂ W ₂ A		SP ₂ W ₁ H	SP ₂ W ₂ H	SP ₂ W ₁ A	SP ₂ W ₂ A

<Fig. 7> Design of Changed Waist Width and Silhouette of the Princess Line.

princess line. In particular, narrow shoulder for body type A at the 1/3 armhole princess line and narrow shoulder at body type H at 2/3 armhole princess line appeared to show these body characteristic.

2) Case of the Shoulder Princess Line

When the shoulder princess line was situated 1/2 shoulder part from S. N. P, it did not display distinctively different. When the princess line location was set at 2/3 point of the shoulder, body type A showed the narrowest shoulder was SP₂W₁A(shoulder 2/3, waist interval 6.5 cm, A-line silhouette). The widest one was the SP₂W₂A(shoulder 2/3, waist interval 10 cm, H-line silhouette)($p \leq 0.01$).

For body type H, when the princess line location was set at 1/2 point of the shoulder, it was appeared to give the narrowest shoulder to SP₁W₁A(shoulder 1/2, waist interval 6.5cm, H-line silhouette). The widest one was the SP₁W₂A(shoulder 1/2, waist interval 10 cm, A-line silhouette)($p \leq 0.05$).

However, the princess line set on the 2/3 shoulder point did not show distinctively different. Then, the shoulder princess line can clearly appeared to give characteristic body figure in body type A on 2/3 shoulder, and in the body

type H on shoulder 1/3. The body type A, similar in A-line silhouette turns up when the waist width is narrow, the shoulder width appeared narrow conversely, When waist width is wide in H-line silhouette appeared to show wider shoulder width. For body type H, it maintained this status. H-line silhouette was similar with ones body character when the waist width was narrow. The shoulder width appeared narrow. The other way A-line silhouette was different with ones body. When waist width was wider, shoulder width appeared wider.

2. The Illusion of the Waist Thickness according to Waist Widths of Princess Line

The waist thickness illusion cause like follows <Table 6> in the same body established waist widths of princess line, location of the princess line and change of the skirt silhouette.

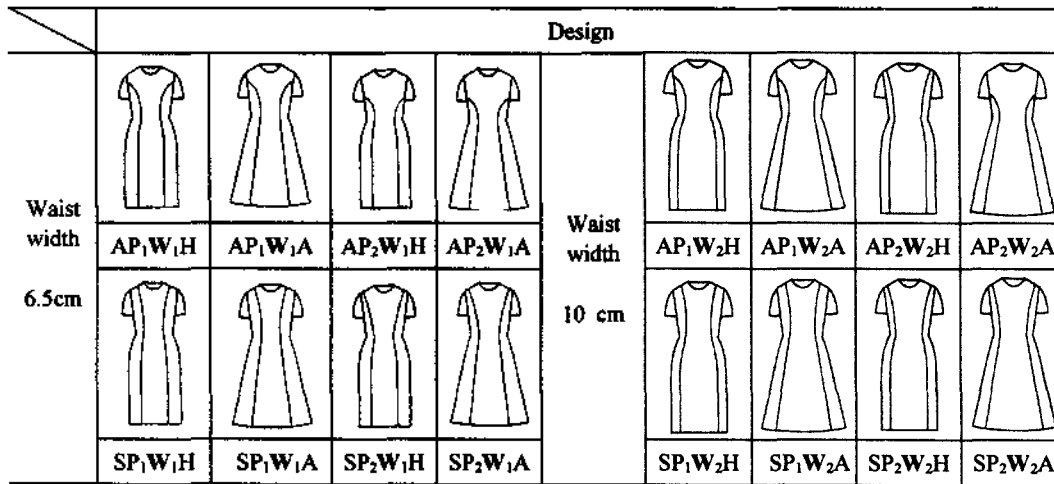
1) Case of the Waist Narrow Interval of the Princess Line

When the waist width was fixed at C.F point 6.5cm, in case of the waist interval is narrow, you can observe illusion effects according to location of the princess line and skirt silhouette, for body type A in the armhole princess line appeared slender waist at AP₁W₁H(armhole 1/3,

<Table 6> The Illusion of the Waist Thickness by Waist Widths of Princess Line

Illusion of the Waist Thickness		Body type A				Body type H			
		Design	M	W	χ^2	Design	M	W	χ^2
		Waist width	6.5cm	AP ₁ W ₁ H	1.50	.404	12.120 **	AP ₁ W ₁ H	1.60
AP ₁ W ₁ A	2.40			AP ₁ W ₁ A	2.50				
AP ₂ W ₁ H	2.60			AP ₂ W ₁ H	2.60				
AP ₂ W ₁ A	3.50			AP ₂ W ₁ A	3.30				
10cm	SP ₁ W ₁ H		3.60	.724	21.720 ***	SP ₁ W ₁ H	1.70	.256	7.680
	SP ₁ W ₁ A		2.20			SP ₁ W ₁ A	2.50		
	SP ₂ W ₁ H		3.10			SP ₂ W ₁ H	3.30		
	SP ₂ W ₁ A		1.10			SP ₂ W ₁ A	2.50		
Waist width	6.5cm	AP ₁ W ₂ H	3.30	.368	11.040*	AP ₁ W ₂ H	1.80	.188	5.640
		AP ₁ W ₂ A	2.30			AP ₁ W ₂ A	2.30		
		AP ₂ W ₂ H	2.90			AP ₂ W ₂ H	2.90		
		AP ₂ W ₂ A	1.50			AP ₂ W ₂ A	3.00		
	10cm	SP ₁ W ₂ H	2.50	.172	5.160	SP ₁ W ₂ H	2.10	.068	2.040
		SP ₁ W ₂ A	1.90			SP ₁ W ₂ A	2.40		
		SP ₂ W ₂ H	3.20			SP ₂ W ₂ H	2.60		
		SP ₂ W ₂ A	2.40			SP ₂ W ₂ A	2.90		

* p≤0.05, ** p≤0.01, *** p<0.001



<Fig. 8> Design of Changed Position and Silhouette of the Princess Line.
(Waist width of the princess line 6.5cm, 10cm).

waist interval 10cm, H-line silhouette) and thick waist at AP₂W₂A (armhole 2/3, waist interval 6.5 cm, A-line silhouette) (p≤0.01). These results occur body type H as well (p≤0.05), generally when the waist widths of the princess line is

narrow even though the same waist interval, princess line for the A and body type H are comparatively high situated 1/3 armhole line, the waist appeared to show narrow for the H-line silhouette, on the contrary A-line silhouette

situated 2/3 armhole appeared to show thicker.

The other way the shoulder princess line case, body type A in the SP₂W₁A(shoulder 2/3, waist interval 6.5cm, A-line silhouette) looks the narrowest, in the SP₁W₁H(shoulder 1/3, waist interval 6.5cm, H-line silhouette)($p \leq 0.01$) looks thicker. The body type H did not show distinctively different according to the designs.

2) Case of the Waist Wider Interval of the Princess Line

When the waist width was fixed at C.F 10cm, in case that the interval is wider in body type A only armhole princess line displays distinctively different($p \leq 0.05$) so, the waist of AP₂W₂A(armhole 2/3, waist interval 10cm, A-line silhouette) appeared to show thin but in the waist of AP₁W₂H(armhole 1/3, waist interval 10cm, H-line silhouette) appeared to show thick. In general, for the body type A, whether the waist intervals were narrower or wider, line was located comparatively high at 2/3 of shoulder or 2/3 of armhole, A-line silhouette like A type body caused

illusion to look thin waist for relative effect of contrast.

On the contrary, when the situation of the princess line was comparatively narrow, H-line silhouette unlike body type A caused illusion of thick waist because of making roomy feeling.

On the other side, for the body type H, whether the waist intervals are narrow or wider, H-line silhouette situated thin waist but it does not turn up distinctively different.

3. An Illusion of the Width Hips according to Skirt Silhouette

The width hips illusion effect follow the situation of skirt silhouette in the same types of bodies, waist interval of the princess line turns up the <Table 7>.


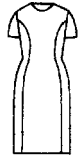
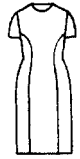
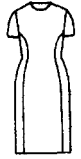




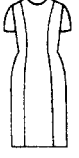
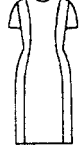
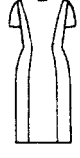
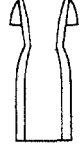



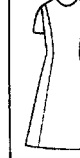
1) Case of H-line silhouette

In case of the skirt silhouette is H-line silhouette, armhole princess line in body type A, AP₁W₁H(armhole 1/3, waist interval 6.5cm, H-line silhouette) appeared to give the narrowest

<Table 7> Illusion of the Width Hips by Skirt Silhouette

		Body type A				Body type H			
		Design	M	W	χ^2	Design	M	W	χ^2
Illusion of the width hip	H Sill.	AP ₁ W ₁ H	1.30	.684	20.520***	AP ₁ W ₁ H	1.50	.436	13.080**
		AP ₁ W ₂ H	3.40			AP ₁ W ₂ H	2.80		
		AP ₂ W ₁ H	1.90			AP ₂ W ₁ H	2.20		
		AP ₂ W ₂ H	3.40			AP ₂ W ₂ H	3.50		
	A Sill.	SP ₁ W ₁ H	1.30	.484	14.520**	SP ₁ W ₁ H	1.10	.672	20.160***
		SP ₁ W ₂ H	2.90			SP ₁ W ₂ H	3.10		
		SP ₂ W ₁ H	2.40			SP ₂ W ₁ H	2.30		
		SP ₂ W ₂ H	3.40			SP ₂ W ₂ H	3.50		
A Sill.	AP ₁ W ₁ A	1.30	.576	17.280***	AP ₁ W ₁ A	1.60	.244	7.320	
	AP ₁ W ₂ A	3.30			AP ₁ W ₂ A	3.00			
	AP ₂ W ₁ A	2.10			AP ₂ W ₁ A	2.50			
	AP ₂ W ₂ A	3.30			AP ₂ W ₂ A	2.90			
A Sill.	SP ₁ W ₁ A	1.10	.644	19.320***	SP ₁ W ₁ A	1.30	.592	17.760***	
	SP ₁ W ₂ A	2.60			SP ₁ W ₂ A	3.10			
	SP ₂ W ₁ A	2.70			SP ₂ W ₁ A	2.10			
	SP ₂ W ₂ A	3.60			SP ₂ W ₂ A	3.50			

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p < 0.001$.

		Design							
H Line					A Line				
		AP ₁ W ₁ H	AP ₁ W ₂ H	AP ₂ W ₁ H		AP ₂ W ₂ H		AP ₁ W ₁ A	AP ₁ W ₂ A
Sill.					Sill.				
		SP ₁ W ₁ H	SP ₁ W ₂ H	SP ₂ W ₁ H		SP ₂ W ₂ H		SP ₁ W ₁ A	SP ₁ W ₂ A

<Fig. 9> Design of Changed Position and Waist Width of Princess Line.
(H line silhouette, A line silhouette).

width of hip, while AP₁W₂H and AP₂W₂H (armhole 1/3 of 2/3, waist interval 10cm, H-line silhouette) appeared to show the widest width hips, so it showed clearly distinctively different ($p \leq 0.001$). It happened same in body type H ($p \leq 0.01$).

In case of shoulder princess line, when the princess line and waist interval were narrow, the width hips appeared to show narrow. When the shoulder and waist interval were wider, the hip appeared to show wider without distinction of all two body types (for body type A $p \leq 0.01$, for body type H $p \leq 0.001$).

2) Case of A-line Silhouette

It regards A-line silhouette in the same light as H-line silhouette, the hip in armhole princess line as well shoulder princess line appeared to show wider when narrow shoulder and waist interval but the width hips appeared to show wider in wider shoulder and waist interval. These present conditions maintained A and body type H, A-line silhouette emphasizes A body shape's character, so the distinctively different more clearly turns up in body type A ($p \leq 0.001$).

4. Illusion of Overall Body Line according to Skirt Silhouette and Waist Width

The illusion of the overall body line turned up the <Table 8> according to the skirt silhouette, waist interval, and the change of the princess line in the same body types.

1) Case of the Waist Interval 6.5cm, 10cm in the H-line Silhouette Princess Line

To look the most slimiest is the SP₁W₁H design for all two body types.

In H-line skirt silhouette with waist interval 6.5cm, 10cm designs, all two body types showed narrow hips when the princess line origination points were at 1/2 of the shoulder.

When the waist interval 6.5cm in the princess line, in A body type appeared to show taller in SP₂W₁H design and for H body type is in SP₁W₁H design. An instance the waist interval 10cm in the princess line, the SP₁W₂A design for all two body types showed taller.

2) Case of the Waist Interval 6.5cm, 10cm in the A-line Silhouette Princess Line

To look the most slimiest is the SP₂W₁A design for body type A and the SP₁W₁A design is for body type H. When the waist interval is at 10cm, for all two body types showed slender in SP₁W₂A design.

For SP₁W₁A design, body type A and H show-

<Table 8> Illusion of Overall Body line by Skirt Silhouette and Waist Width

	Body type A				Body type H			
	Design	M	W	χ^2	Design	M	W	χ^2
Illusion Effects - Slim	AP ₁ W ₁ H	2.60	.372	11.16*	AP ₁ W ₁ H	2.70	.500	15.000**
	AP ₂ W ₁ H	3.50			AP ₂ W ₁ H	3.60		
	SP ₁ W ₁ H	1.60			SP ₁ W ₁ H	1.40		
	SP ₂ W ₁ H	2.30			SP ₂ W ₁ H	2.30		
	AP ₁ W ₂ H	3.10	.528	15.840***	AP ₁ W ₂ H	2.80	.808	24.240***
	AP ₂ W ₂ H	3.50			AP ₂ W ₂ H	4.00		
	SP ₁ W ₂ H	1.70			SP ₁ W ₂ H	1.40		
	SP ₂ W ₂ H	1.70			SP ₂ W ₂ H	1.80		
	AP ₁ W ₁ A	2.90	.844	25.320***	AP ₁ W ₁ A	2.90	.640	19.200***
	AP ₂ W ₁ A	4.00			AP ₂ W ₁ A	3.70		
	SP ₁ W ₁ A	1.60			SP ₁ W ₁ A	1.30		
	SP ₂ W ₁ A	1.50			SP ₂ W ₁ A	2.10		
AP ₁ W ₂ A	2.90	.668	20.040***	AP ₁ W ₂ A	2.80	.856	25.680***	
AP ₂ W ₂ A	3.80			AP ₂ W ₂ A	4.00			
SP ₁ W ₂ A	1.50			SP ₁ W ₂ A	1.20			
SP ₂ W ₂ A	1.80			SP ₂ W ₂ A	2.00			
Illusion Effects - Tall	AP ₁ W ₁ H	1.70	.832	24.960***	AP ₁ W ₁ H	2.10	.308	9.240*
	AP ₂ W ₁ H	1.30			AP ₂ W ₁ H	1.70		
	SP ₁ W ₁ H	3.30			SP ₁ W ₁ H	3.20		
	SP ₂ W ₁ H	3.70			SP ₂ W ₁ H	3.00		
	AP ₁ W ₂ H	1.80	.664	19.920***	AP ₁ W ₂ H	2.20	.328	9.840*
	AP ₂ W ₂ H	1.40			AP ₂ W ₂ H	1.60		
	SP ₁ W ₂ H	3.40			SP ₁ W ₂ H	3.20		
	SP ₂ W ₂ H	3.40			SP ₂ W ₂ H	3.00		
	AP ₁ W ₁ A	2.30	.496	14.880**	AP ₁ W ₁ A	2.10	.308	9.240*
	AP ₂ W ₁ A	1.30			AP ₂ W ₁ A	1.70		
	SP ₁ W ₁ A	3.30			SP ₁ W ₁ A	3.20		
	SP ₂ W ₁ A	3.10			SP ₂ W ₁ A	3.00		
AP ₁ W ₂ A	1.90	.772	23.160***	AP ₁ W ₂ A	2.20	.268	8.040*	
AP ₂ W ₂ A	1.20			AP ₂ W ₂ A	1.70			
SP ₁ W ₂ A	3.50			SP ₁ W ₂ A	3.10			
SP ₂ W ₂ A	3.40			SP ₂ W ₂ A	3.00			

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p < 0.001$.

ed taller when the princess line originating from 1/2 point of the shoulder.

5. The Illusion of the Princess Line by Figure Type

1) Body type A

When the princess line originated from 1/3 point of the armhole, A-line silhouette appeared to show the narrowest shoulder width. When the waist width was fixed at 6.5cm in H-line silhouettes princess line locations were 1/3 point of the armhole, this showed the narrowest waist width. The body type A and H showed narrow

		Design			
Illusion Effects - Slim	Illusion Effects - Tall				
		AP ₁ W ₁ H	AP ₂ W ₁ H	SP ₁ W ₁ H	SP ₂ W ₁ H
	Illusion Effects - Tall				
		AP ₁ W ₂ H	AP ₂ W ₂ H	SP ₁ W ₂ H	SP ₂ W ₂ H
	Illusion Effects - Tall				
		AP ₁ W ₁ A	AP ₂ W ₁ A	SP ₁ W ₁ A	SP ₂ W ₁ A
	Illusion Effects - Tall				
		AP ₁ W ₂ A	AP ₂ W ₂ A	SP ₁ W ₂ A	SP ₂ W ₂ A

<Fig. 10> Design of Changed Position of the Princess Line (with Fixed Princess Line Waist Width and Fixed H/A Line Silhouette).

hips when narrow interval and narrow waist design of the princess line. When the princess line originated from the shoulder, the interval is as narrow the length line is getting emphasis to display wholly taller and slender postures.

2) Body type H

When the princess line originated from 2/3 point of the armhole, A-line silhouette appeared to show the narrowest shoulder width. When the waist width was fixed at 6.5cm in H-line silhouettes, princess line locations were 1/3 point of the armhole, this showed the narrowest waist width. The body type A and H showed narrow hips when narrow interval and narrow waist design of the princess line. When the princess

line originated from the shoulder, the interval is as narrow appeared to show taller and slender postures.

IV. Conclusion

This study has the purpose to present useful data for manufacturing patterns and costume designs by using these diverse effects of princess lines in conformity to classified testers through front shape. Illusion effects of these tests were studied with different body types and designs, and appropriate the princess lines were suggested to consumers.

1. The illusion of the shoulder width by the location of the princess line.

In case of the armhole princess line, the illusion occurred that the waist intervals were narrow or wide in A-line silhouette. In case of the shoulder princess line, when the waist interval was narrow, it appeared to show narrow shoulder in A-line silhouette. While the wide waist interval shows the wide shoulder width in H-line silhouette. It regards body type H in the same light as H-line silhouette when the waist interval is narrow, it appeared to show narrow shoulder width in A-line silhouette. When the waist interval was wide, it appeared to give the narrow shoulder width.

2. The illusion of the waist thickness by the waist widths of princess line.

Generally, for body type A, whether the waist interval of princess line is narrow or wide, the princess line is located comparatively wide, in A-line silhouette appeared to show relatively slender waist. For body type H, whether the waist interval is narrow or wide, the princess line is situated comparatively narrow interval, H-line silhouette appeared to show slim waist but the differences are not significant.

3. The illusion of the hips width by the skirt silhouette.

For the location of both armhole and shoulder princess line in H and A-line sil-

houette, the narrow shoulder width and the waist appeared to show narrow hips. While they are wide appeared to show wide hips.

4. The illusion of the overall body line according to the skirt silhouette and waist interval.

In H and A line skirt silhouette with narrow waist width designs, both of two body types showed narrow hips when the princess line origination points were at 1/2 of the shoulder. It did not turn up body type A and H.

5. The illusion of the princess line by figure type.

For body type A, when the waist interval for the princess line was narrow in A-line silhouette, it appeared to show narrow shoulder. If it originated from 2/3 point of the shoulder of armhole, A-line silhouette appeared to show the slim waist. When the narrow interval of princess line and narrow waist intervals design showed narrow hips for effect of the long length line.

For body type H, when the princess line originated from 2/3 point of the armhole appeared to show narrow waist width, and the A-line silhouette displayed the narrowest shoulder width. However, when the princess line originated from 1/2 point of the shoulder, it appeared to show the narrowest shoulder width. When the waist width was fixed at 6.5cm in H-line silhouette princess line locations were 1/3 point of the armhole, it showed the narrowest waist width. When the princess line originated from the shoulder, the interval was as narrow the length line was getting emphasis to give wholly taller and slender postures.

From the results, the 16 designed princess line were put on the different body types, which

would cause lots of optical illusion effects. Therefore, when you manufacture the cloth, you should consider the characteristics of the body types and the lines for designs to make up for or alleviate the imperfections of the body.

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