중년여성을 위한 토루소 원형 설계에 관한 연구

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Design of Torso Patterns for Middle Aged Women

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국문요약

본 연구는 중년여성의 상반신을 대상으로 기존원형에 대한 평가를 실시한 후 이를 기본으로 제도법을 수정 · 보완하여 중년여성 체형에 맞는 상반신 토루소 연구원형을 제작하기 위한 목적으로 연구되었다.

연구 대상은 35세에서 59세의 중년여성으로 하였으며, 45세를 전후로 체형이 변한다는 선행 연구를 토대로 중년 전기(35세~45세), 중년 후기(46세~59세)로 나눠 연구하였다.

연구원형 제작을 위해서 97년 국민체위조사보고 자료에 나온 35세~59세에 해당하는 신체치수를 사용하여 대학에서 교재로 사용되고 있는 4가지 원형을 설계하고 이를 CADsystem을 이용하여 각 Pattern간의 차이를 정확하게 비교하고, 4가지 원형의 실험복을 제작하여 착의 실험을 통해 객관적 평가 11항목, 주관적 평가 23항목에 대해 설문 조사를 하여 문제점을 파악하였다. 이를 기초로 연구원형을 제작하였고 제작 후 연구원형의 신체 적합성을 알아보기 위해 기존원형과 마찬가지로 착의 실험을 하여 평가하였다.

실험 결과 기존원형들이 착용시 진동부분과 뒤중심부분의 당김으로 인해 착용자가 불편함을 느끼는 것으로 나타났고 외관상으로는 가슴둘레와 엉덩이둘레 부분에 여유분량이 중년여성 체형에 비해 상대적으로 적었으며 가슴선, 허리선, 엉덩이선의 위치 역시 중년여성의 체형과는 맞지 않은 것으로 나타났다. 대체로 중년 전기에 비해 중년 후기에서 수정 · 보완이 더 요구되었는데 특히 나이가 들수록 등이 뒤로 젖혀지는 현상으로 인해 측면에서 봤을 때 허리가 들어가는 현상이 두드러져 뒤허리부분의 수정이 요구되었다. 이에 연구원형에서는 기존원형에서 나타났던 가슴선, 허리선, 엉덩이선의 위치 조절을 위해 앞목기준선을 위로 2cm 올려 주었고 가슴둘레와 엉덩이둘레 부분에 여유분을 각각 2cm더 주어 제작하였으며 중년 후기에서 두드러지게 나타났던 뒤허리부분의 문제점을 허리중심선 설정시 1~2cm 안쪽으로 설정하여 체형변화를 반영하였다.

이에 따른 연구원형에 대한 주관적 · 객관적 착의 평가 결과는 착용시 기존원형에서 나타났던 진동부분과 뒤중심부분의 당김이 없어지고 외관상 가슴선, 허리선, 엉덩이선이 기존원형보다 개선된 것으로 나타났으며, 전체적인 외관에서도 전 · 후기 모두 기존원형 보다 좋은 것으로 평가되었다.

I. INTRODUCTION

Many middle aged women tend to buy much more apparel than before, in proportion to an increase in leisure time, economic welfare, social activity, interest in self-image making, and so on. Recently, the trend of buying apparel prevails. Consumers' purchase decisions relative to fit incorporate perceptions of physical comfort, psychological well-being, and an attractive appearance(Garner and Kearney-Cooke, 1996: Labat and Delong, 1990). With the development of new technology and it is rapid growth, the ready-to-wear, mass producted system has come to take a large portion of production type in the apparel industry. Most mass-produced ready-to-wear apparel is intended to fit the young. After many of older women have bought ready-to-wear, they often have to make some adjustment to get a better fit for their body shape. In particular, most middle aged women have frequently complained of the poor fit of ready-to-wear garments, since their body shape has changed after childbirth. The apparel size system for middle aged women is considered not to be systematic and moreover not to be standardized. First of all it is very difficult in many ways and creates many problems that pattern making for the stratum of youth is directly applied for middle aged women. To make clothing more comfortable, pattern making should be drafted with consideration of characteristics of somatotypes.

This study was designed to compare 4 experimental patterns(Model pattern 1,2,3,4) of middle aged women's upper body, to suggest a new torso pattern for middle aged women by modifying the existing drafting method, and to compare this suggested torso pattern with the best experimental patterns(Model pattern 1, 3).

II. METHOD

Middle aged women between 35 and 59 years of age were chosen for this study. They were divided into two groups, according to the body figure changes before and after 45 years of age(Son, 1989). The first was the women aged between 35 and 45, the former term aged group, and the other between 46 and 59, the latter term aged group.

Four experimental patterns were prepared that are used as transcripts of lectures in university. Zand the body sizes of women between 35 and 45 years of age and between 46 and 59 years of age were drafted. Their body measurements were from report data of National Anthropometric Survey of Korea 1997(Table 1).

We found many problems in the course of comparing the 4 experimental patterns(Model pattern 1, 2, 3, 4), using a CAD system(PAD System). To make a systematic comparison, a wearing test with the foundation that was made by the 4 experimental patterns was conducted. The 4 experimental patterns were evaluated in the wearing test. The first was a sensory evaluation. There were 3 subjects in each middle aged women's group. According to 11 postures, the subjects evaluated a 5 scale Likert type. The other was evaluated by a panel, observing the subjects. Two patterns were suggested, based on the results of the two methods.

<Table 1> body measurements in pattern drafting

unit : cm

measurements	35~45 years	46~59 years
height	157.0	153.4
shoulder breadth	39.0	39.1
chest circumference	84.8	86.7
bust circumference	86.7	90.2
bust point breadth	16.3	16.9
shoulder neck-bust point length	25.9	27.2
front width	30.8	31.1
back width	35.6	36.0
back length	38.9	38.5
shoulder neck-b.p-waist line length	41.5	41.5
shoulder neck-biscapular-waist line length	42.3	42.3
waist circumference	72.9	79.2
hip circumference	91.0	91.7
hip length	19.9	19.9

III. RESULT & DISCUSSION

1. Comparison of the 4 experimental torso patterns

Experimental patterns on the idea of body pattern analysis were prepared. The patterns were drafted differently for the former term and the latter term of middle age. <Table 2> was exhibited measurements for drafting in 4 Model Patterns. Model Pattern 2 had needed a great many measurements in drafing.

<Table 2> Measurements for drafting in 4 model patterns

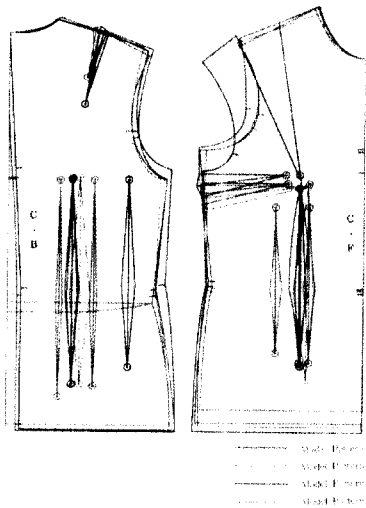| Model Patterns	Measurements for drafting	N
Model Pattern 1	bust circumference, center back length, waist circumference, hip circumference, hip depth	5
Model Pattern 2	bust circumference, center back length, shoulder width, bust point width, bust point length, front full length, back full length, waist circumference, hip circumference, hip depth, chest width, back width	12
Model Pattern 3	bust circumference, waist circumference, hip circumference, bust point length, center back length	5
Model Pattern 4	shoulder width, bust circumference, front interscye breadth, back interscye breadth, front full length, bust point length, bust point width, waist circumference, hip circumference	9

Measurements in drafting in 4 Model Patterns was indicated <Table 3>. In the dart, Model Pattern 3 was just waist dart without side dart in front bodice draft and Model Pattern 4 was not shoulder dart in back bodice draft.

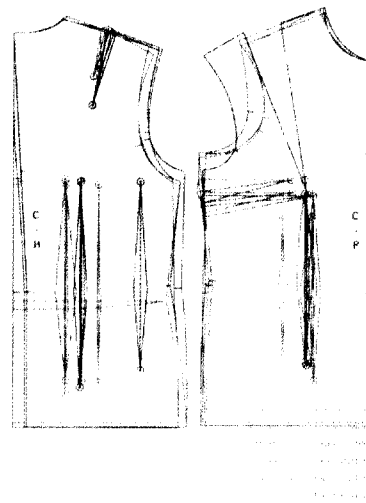<Table 3> Comparison of measurements in drafting in 4 model patterns

Patterns / middle age group measurements in drafting	Model Pattern1		Model Pattern 2		Model Pattern 3		Model Pattern 4	
	Former	latter	Former	latter	Former	latter	Former	latter
front neck circumference	11	12	11.2	11.7	11	11.4	10.6	11.2
back neck circumference	8	8.1	8.1	8.4	7.3	7.5	7.3	7.7
front shoulder length	12.4	13	12.3	12	12.7	13.4	13.3	13
back shoulder length	12.4	13	12.8	12.5	12.7	13.4	13.3	13
front interscye breadth	17.5	18	15.4	15.5	18.8	19.5	15.4	15.5
back interscye breadth	19	19.5	17.8	18	16.6	17.2	17.8	18
bust circumference	47.4	49	47.4	49.1	46.3	48	23.2+22.2= 45.4(f+b)	24+23=47 (f+b)
bust line	21.4	22	21.6	22.5	23.5(f) 20(b)	24(f) 20.5(b)	20.6(f) 21.4(b)	20.8(f) 21.6(b)
bust point length	·	·	26	27.2	26	27.2	26	27.2
bust point width	(F.I.B/2)+ 0.7=9.4	(F.I.B/2)+ 0.7=11.3	8.1	8.4	9.2	9.5	8.1	8.4
waist circumference	19.7+18.73= 38.4	20.3+21.3=4 1.6	22(f)+19.5(b) =41.5	23(f)+ 20.8(b)= 43.8	38.5	41.6	21.9(f)+20.6 (b)=42.5+1= 43.5	23.4(f)+22.1(b) =45.5+1=46.5
hip circumference	24.2+23.2= 47.4	24.4+23.4= 47.8	47.4	47.8	47.5	47.8	47.5	47.8
amount of front dart	3(waist) 3.5(under arm)	2.2(waist) 3.5(under arm)	1.7(side) 3.1(under arm)	1.4(side) 3(under arm)	1.6(waist) 6.5(shoulder)	0.7(waist) 5.5(shoulder)	3(waist) 3.7(under arm)	3(waist) 3.1(under arm)
amount of back dart	0.6(center back) 1.5(waist) 2(shoulder)	0.9(center back) 0.7(waist) 2(shoulder)	1(side) 1.2(shoulder)	0.5(side) 1.2(shoulder)	2(center back) 2(side) 1.5(shoulder)	2(center back) 2(side) 1.4(shoulder)	3(waist)	3(waist)
front full length	42.4	42	41.5	41.5	42.4	42	41.5	41.5
center back length	38.9	38.5	42.3	42.3	39	38.5	39	38.5

* f : front, b : back, F.I.B : front interscye breadth

The experimental patterns exhibited many difference in length. In the neck girth, Model pattern 4 using the back neck girth in the drafting method, was the smallest. In the bust girth, Model pattern 2 and 4 using the back width, bust width in the drafting method was the most narrow. In the front bust line, Model pattern 3 was lower than the other experimental patterns. The total length of Model pattern 2, connecting the bodice pattern and skirt pattern in the drafting method, was short in comparison with the other experimental patterns. In the dart position, back dart of Model pattern 3 was closer to the side seam in comparison with the other experimental patterns. In the latter middle aged, the same as in the former middle aged, the front bust line of Model pattern 3 was situated highest. Total length, however, appeared the longest in Model pattern 4(Fig1,2).

<Figure 1> Comparison of experimental
patterns in the former middle age group

<Figure 2> Comparison of experimental
patterns in the latter middle age group

2. Wearing test

Eight foundations were made and worn. In the sensory evaluation(Table 4), in the former middle age group, Model pattern 2 was the best fit. In the latter middle age group, Model pattern 1 was the best fit. Because Model Pattern 1 was great of easy amount that amount of dart was a little at the similar circumference comparing with the other Model Patterns. The poorest fit was experimental Model pattern 3.

<Table 4> sensory evaluation

patterns middle age / posture group		Model pattern1		Model pattern2		Model pattern3		Model pattern4	
		former	latter	former	latter	former	latter	former	latter
1		5	5	5	4.5	4	3.5	5	5
2		4.5	5	5	4.5	2.5	2.5	4.5	3.5
3		4.5	4.5	5	4	2	1	4.5	3.5
4		4	5	5	4.5	2	2.5	4.5	3.5
5		5	4.5	5	4	2.5	2	5	4
6		4.5	4	5	4	2	2	4.5	3
7		5	4.5	5	4.5	2.5	2.5	4.5	4
8		4.5	5	5	5	3	3	5	4.5
9		4.5	4.5	5	4.5	3	2	4	4
10		5	5	5	5	3.5	3	5	4.5
11		4.5	4.5	5	4.5	1.5	2	4	3.5
average		4.64	4.68	5	4.45	2.59	2.36	4.59	3.91

The 8 experimental patterns were evaluated by a panel with photo output on the front, side and back shapes(Table 5). In length, bust line, waist line and hip line were higher than their bust line, waist line and hip line. In the Side view of the body, bust line, waist line and hip line appeared sloped. Ease of Hip girth was insufficient. The fastening part of the center back, therefore, was opened.
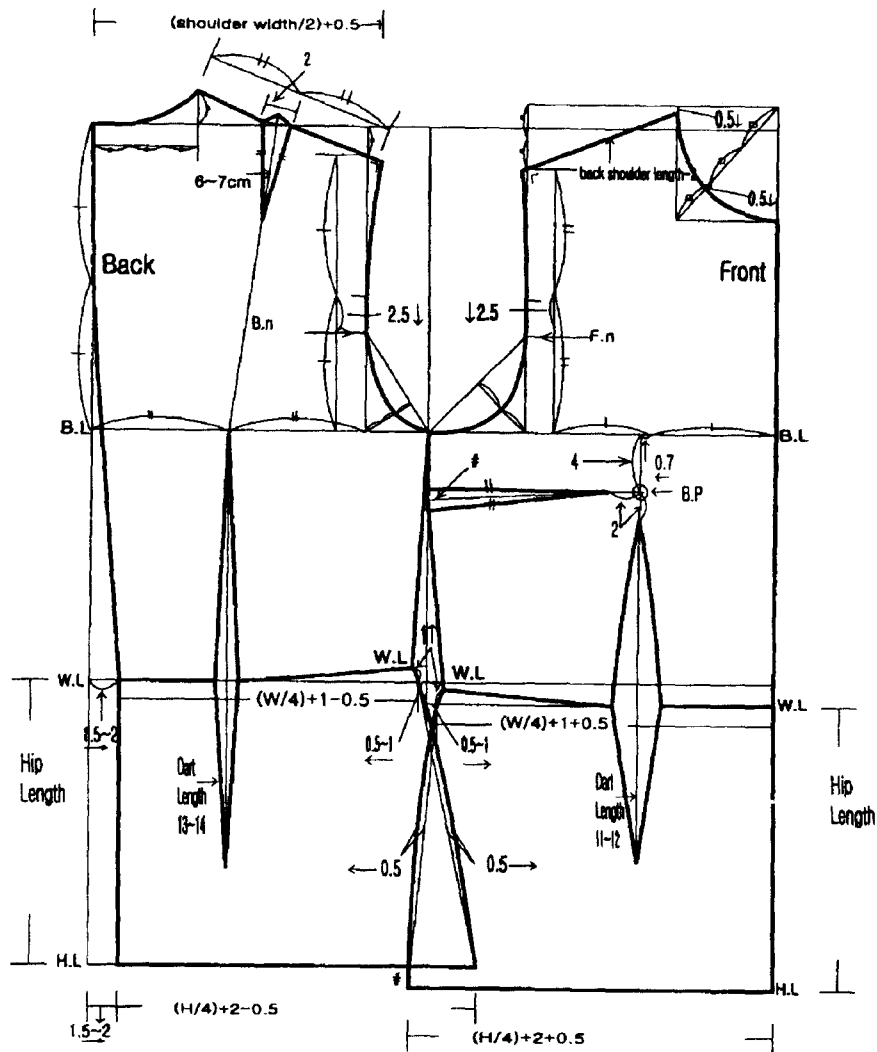
<Table 5> objective evaluation

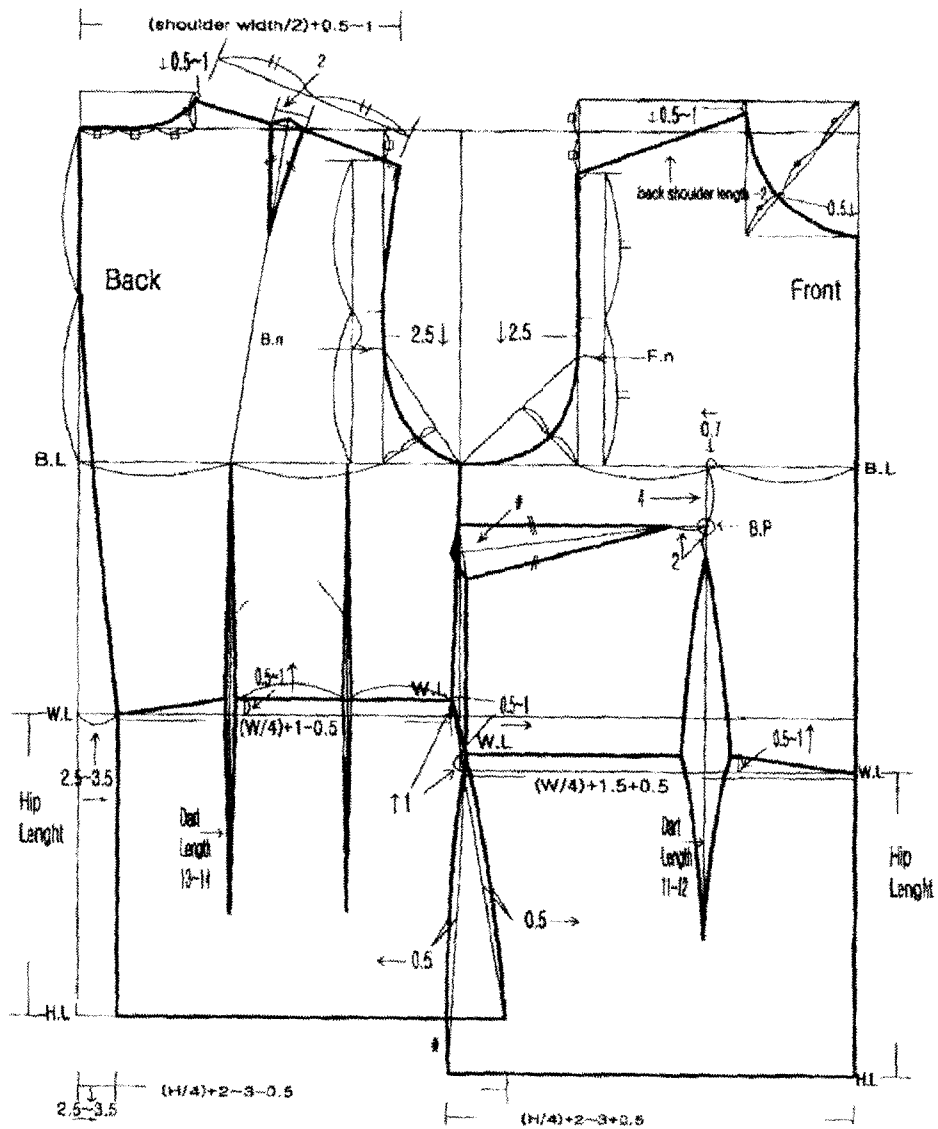|	patterns / items	Model pattern1		Model pattern2		Model pattern3		Model pattern4	
	middle age group	former	latter	former	latter	former	latter	former	latter
f r o n t	1. center front vertical line	5	5	5	5	5	5	5	5
	2. abdominal region	4	3.8	3.6	3.7	5	4	5	4.1
	3. across chest	1	1.9	1.4	2.2	1	1.8	1	1.8
	4. front dart position	5	5	5	3.9	4.6	4.5	5	3.5
	5. length and amount of front dart	5	5	5	4.5	4.4	3.9	3.6	2.4
s i d e	6. bust horizontal line	1.8	2	1.4	1.5	2	2.2	2	2
	7. waist horizontal line	3	2.5	1.6	2.5	2.4	2.7	3.4	3
	8. hip horizontal line	2.8	2.5	2.8	1.5	2.6	2.7	2.8	2
b a c k	9. center back vertical line	5	5	4.2	5	5	5	4.2	5
	10. center back vertical line	1.4	3	1.6	3.1	1	3.3	2	2.5
	11. in bottom of back waist	2.2	3.1	2.2	2	2	3.2	2	2.6
	12. ease of hip region	1	1	1	1	1	1	1	1
	13. back dart position	5	5	4.2	4	2.4	1.6	4	4
	14. length and amount of back dart	5	4.8	4.2	3.6	3.8	3	2.6	3.5
t o t a l	15. total appearance	4.4	3.9	4.2	3	4.6	3.5	4	3.8
	16. neck base position	5	3.5	4	3	4.6	3.2	3.8	3
	17. shoulder slope	4.8	3.9	4.6	3.4	4.4	4	4.2	4
	18. armhole girth	3.6	4.1	4.4	3.5	5	4.5	5	3.9
	19. waist line	2.4	3.2	3	3.8	4.4	4	4	3.4
	20. bust line	2.4	3.1	3.2	2.9	4.4	3.9	2.2	2.9
	21. ease of bust girth	4.8	3.6	5	3.6	5	4	5	3.8
	22. ease of waist girth	4.4	4	3.6	3.5	5	3	5	2.6
	23. underarm region	1	1.5	1	1.5	1	2	1	2.5
	average	3.48	3.50	3.31	3.12	3.50	3.30	3.38	3.14

3. Suggestion of new torso patterns

The suggested pattern was based on Model pattern 1. The bust, waist and hip line were similar to Model pattern 3. In the drafting method, 2cm ease of bust line was added only in the latter middle aged group.

Considering the bust point tended downward in aging, the basic line of the front neck point was raised 2 cm. Considering the abdominal region protrusion in aging, 2-3 cm ease of hip girth was added (Fig 3, 4).
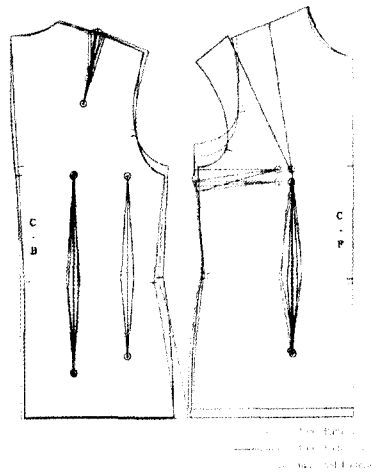

<Figure 3> Drafting method of suggested pattern for the former middle age group
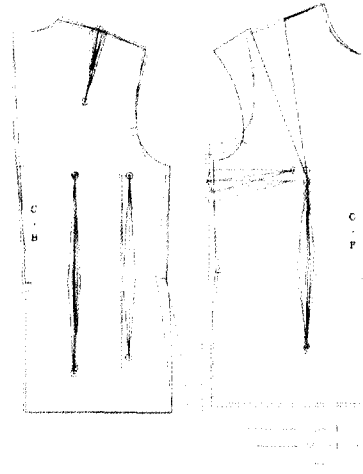
<Figure 4> Drafting method of suggested pattern for the latter middle age group

After several steps of correction, two experimental patterns were made. The suggested torso patterns, with changes, appeared very comfortable in activity.

As a result of the panel committee's evaluation, suggested torso patterns have been found more practical than other experimental patterns in terms of bust line, waist line and hip line(fig 5, 6). In the total appearance, ease of back waist was more suitable than before.

<Figure 5> Comparison of experimental
patterns and suggested pattern for the
former middle age group

<Figure 6> Comparison of experimental
patterns and suggested pattern for the latter
middle age group

IV. CONCLUSIONS

When the women wore foundation made with experimental patterns, they felt uncomfortable due to pulling in the armhole and center-back parts. The space of bust girth and hip girth were small for the middle-aged-women's bodies and the locations of bust line, waist line and hip line were not suitable for them either.

Generally, it is much more necessary to modify the existing patterns in the first term of middle-age than in the last term. In particular, the wast line should be adjusted because the shape of back-bend of middle-aged women gives more concavity. So this suggested torso pattern was modified as follows. First, the basic neck line was raised 2 cm to control the lines of bust, waist and hip. Second, a 2 cm space was added to that of bust and hip girth. Third, the space was modified by adding about 1 or 2 cm on to the back-waist.

As a result of sensory and objective evaluations on the existing four patterns, it was found that the pulling in the armhole and center back part should be removed. Moreover, it is necessary to mend some lines, that is, bust, waist and hip. We suggested new torso patterns, reflecting the result of this comparative study. The evaluation found that the lateral of the suggested pattern was improved and that the entire appearance was better than before.

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