한국의류산업학회지
제20권 제4호, 2018
<연구논문>

pISSN 1229-2060
eISSN 2287-5743
Fashion & Text. Res. J.
Vol. 20, No. 4, pp.439-448(2018)
https://doi.org/10.5805/SFTI.2018.20.4.439

Development of Basic Pattern of Wedding Dress I
- Focused on Torso Pattern for Top Dresses -

Sookhee Kwon†

Dept. of Fashion & Textiles, Jeju National University; Jeju, Korea

Abstract: This thesis intends to suggest a new wedding dress pattern through researches on history and changes of wedding dress, researches on silhouette and details and analyses of existing basic patterns. In this study, to develop torso patterns of top dresses selected as preferred designs through literature reviews and company surveys, dress form sizes suitable for standard sizes were selected and study basic patterns were made using draping techniques. The study finds characteristics of body type dimension that is changed when wearing brassiere (hereinafter, 'bra') for wedding dress through customer surveys for development of basic patterns of wedding dress. That is, wearing wedding bra was used for the purpose of increasing the bust size and we will evaluate later whether this increase helps completeness of aesthetic impression through wearing evaluation. As the result, it was found out that top torso pattern wearing wedding bra made wearers feel more comfortable and in the aspect of aesthetic impression, it provided impacts on women's beautiful silhouettes. The effects of whether a bra is used or not on changes in patterns were reviewed through the degree of polymerization of finished patterns. When a bra for dresses was worn, the waist front length increased by1.7cm, the bust circumference increased by 2.1cm, and the amount of dart increased by 1.5cm in the patterns. A new torso pattern for top dresses, which will solve problems evaluated in each of the above from the aspect of composition of pattern by a method through analysis of existing basic patterns and multi-dimensional cut patterns wearing wedding bra, will be suggested.

Key words: wedding dress, top dress, wedding bra, draping, torso pattern

1. Introduction

Unlike ready-made clothes, wedding dresses have strong design elements and are the clothes pursuing beauty of a bodyline. In consideration of characteristics of these wedding dresses, the purpose of this study is to develop basic pattern of wedding dress.

A wedding is an important event having social significance and it can be said that wedding dress of a bride is meant to be a symbolic representation of these events. These days, majority of brides in Korea use wedding dress as a bridal wear and it is a reality that researches on wedding dress are not enough in the field of clothes compared to its ratio of usage.

As seen in any region, wedding dress business has a large market size. In addition, Korean clothes industry dominates international market through technical skills and development of designs and is a high value added industry of clothes. However, despite that hands-on workers engaged in Korean wedding dress business have excellent capability, Korean wedding dress industry has issues to be solved. It is absence of creative designs. Limit of Korean wedding dress design is that it did not transcend the designs mainly by imitation. As desires of customers become diverse, we must respond to development and interests in wedding dress designs. Above all, it is lack of experienced technical skills. Products of pieces of proper works are only possible when manufacturing technical skills are available for various designs. A product with expression of harmony can be produced only when sensuous, creative design, perfect pattern and sewing are all accomplished simultaneously.

Under the reality that actual hands-on education for designing and manufacturing wedding dresses, causes of these problems can be solved through establishment of theories of wedding dresses and preparation of systematic theories for improvement of high-level capability of hands-on workers of wedding dresses and also through improvement of technical skills and there are tasks of wedding dress business and academy. With the purpose of solving these tasks, this thesis intends to suggest a new basic pattern through researches on history and changes of wedding dress, researches on silhouette and details and analyses of existing original patterns.

In this study, for suggesting a new pattern of wedding dress, we have implemented customer and business surveys and suggested basic pattern of wedding dress research through analyses of existing patterns and comparison of fashions of multi-dimensional com-

†Corresponding author; Sookhee Kwon
Tel. +82-64-754-3532, Fax. +82-64-725-2591
E-mail: sookhee@jejunu.ac.kr

position, new research basic pattern was structured to fit body type of contemporary women and is the most basic pattern which is possible to be changed to various designs. This study measured the body dimensions with or without the use of a dress calibration bra to examine the completeness and validity of torso patterns in the torso for the top dress. It was also thought that even without wearing a dress bra, measurements of body measurements could be made in the production of flat patterns by applying an increase in the body. The purpose of these wedding dress research patterns is to make clothes majoring students and businesses access easily to wedding dress patterns and to suggest top dress torso patterns with improvement of silhouette while fitting to body types of customers.

2. Theoretical background

2.1. Preference for the aesthetics and neckline design of dress

Esthetic appreciation means that you wear clothes to be pleasant and to achieve the beauty of your appearance. It can be seen as an attempt to achieve the beauty of one's exterior through the clothing or decoration, and the beauty of the garment can be expressed through the appearance and personality of the wearer in a combination with the color, texture, and form (Lee, 1982).

Neckline, which indicates the highest preference for dresses in preceding research, is the top neckline. Kim (2007) had a tank top (26.57%), Lee (2008) had a shoulder exposure (55.7%), Jeon (2014) had a top neckline (70%), and Choi and Ku (2014) had a bared top neckline (43.11%).

Internet search results on the style of neckline with both shoulders and sleeves exposed, covering the chest below the armpits, and the term recognized by the consumer and the vendor is ‘top dress’ or ‘top neckline’. Among these two terms, the more common one is the term top dress. Thus, in this study, the neckline, which passes under the armpits and covers the chest, is defined as the top neckline dress or top dress.

2.2. A dress bra

Wedding bra is similar in size to a regular bra, but its side shape is characterized by a large protruding curve on the breast and no shoulder straps. It is common for consumers to adjust their bust circumference with a suitable wedding bra before wearing a wedding dress. This is because most rental wedding dresses have protruding breasts that can not be covered with regular bras (Park, 2005).

Choi(2017)’s study on the effects of wearing a bra for dresses found that wearing a bra is “important”, with an average of 3.71 to 4.26. The highest in the effect of “making the silhouette of the outer garment beautiful” was found to be 4.26 on average, and “better overall bust balance” appeared at 4.22 on average, and replied that it was an important effect. “making a natural breast shape” and “to prevent the B.P point from appearing on the garment” were also considered important effects. The market for dress bra is professional and expanding. Currently, a dress mold bra which is generally worn in a dress shop when fitting a dress, has a smooth advantage of not revealing the dress's outer dress bra line. The size are S (75), M (80), L (85), XL (90).

2.3. Dress size classification and dress form

Kim (2007) found that the basic upper body dimensions used to make wedding dresses were waist and bust circumference. When producing wedding dresses, the average bust circumference was 86 cm, with a waist circumference of 66cm and the waist back length of 38 centimeters. The smallest size was classified as ‘W44’, the average size was ‘W55’, and the larger size was ‘W66’. ‘W55’ was set at an average bust circumference of 86 cm and waist circumference of 66cm the basic torso dimension of the wedding dress shop. Based on the size ‘W55’, a gap of the bust circumference 6cm and the waist circumference 5cm at intervals of size.

Korean Agency for Technology and Standards stated that the definition of a standard body is ‘a standard virtual model of a standard body in a three-dimensional space, and a standard dress form is described as a full-made clothing body based on the shape of the standard virtual model.’ When draping techniques is performed on such a standard body shape to develop the torso round, it is possible to obtain greater expected effects from matching and wearing than from a flat design made using conventional measuring dimensions (Kim, 2006).

2.4. Preceding research of top dress torso patterns

Hong (2011) introduced a basic design pattern for wedding dresses by developing dress pattern considering feet and aesthetics for Korean women in their 20s. Four existing dress basic patterns were selected and systems were analyzed for the first and second wearing test. Based on the results, a new pattern was developed for Koreans who maximized the benefits of each prototype and suggested a basic design pattern for the wedding dress.

Kim et al. (2017) analyzed the dress form conditions in the U.S., France, Japan and Korea and selected Korea’s Nonno product 55 size dress based on the standard body size of Korean women aged 25 to 34. A princess line pattern for a wedding dress is presented by the draping method.

While there is a high probability of making dresses that fit into a standard body shape, it would be better to produce patterns with draping cutting to ensure the stability of the fit of human body. In these studies, a standard body was used to find the reason why the

basic pattern was suggested as a draping cutting.

3. Method

The study was implemented for helping manufacturing of wedding dress patterns by supplementing issues through customer questionnaire surveys on actual status of wearing wedding dress and preference designs. It was produced patterns of body top design preferred the most by Korean women in their 20s~40s for developing wedding basic pattern appropriate for body line of a woman. The methods and procedures are as follows.

3.1. Method and content of the company survey

The survey period was from January 10 to May 12, 2017. I visited the company and interviewed the dress designer and store manager in the form of a survey. The research company selected three companies to rent, sell, and produce dresses in Jeju and checked the status of the dress company's design, the status of use of bra for the dress, and the size response system. The survey included 2 questions on how to adopt the dress design of company, 2 questions on the dress possession and preference of each neckline, 3 questions on the use and actual condition of the dress, and 7 questions on dress size.

3.2. Measurement items and targets of change in body dimensions on wearing dress bra

A consumer physical measurement to measure the increase in body dimensions caused by wearing dress bra was conducted on women residing in Jeju Island from February 22, 2016 to February 22, 2017. In this survey, 50 people were tested for physical measurements, assuming that they had ever worn dresses as women between the ages of 21 and 34.

After measuring the 10 body parts (Chest circumference, Bust circumference, Waist circumference, Hip circumference, Bust point-bust point, Waist front length, Front interscye, Back interscye, Neck point to breast point, Waist back length) as they were, the subjects were re-measured after wearing the Bra M (80) size for the dress. It was conducted in accordance with the standard method of human body size survey of Korea.

3.3. Selecting a dress form and bra

Dress form was first considered in the company survey in terms of its large holdings. It was reviewed the average number of age between 20 and 34 for Size Korea and the title 85-91-160 for adult women's clothing size, which requires fitness, among those given in KS K 0051. Thus, a dress form was chosen that was close to the average size of the bust circumference, waist circumference, and hip circumference of each section of each somatotype. Following this analysis, trade mark Pig dress form no. 9 was selected, padded to the waist line according to the reviewed dimensions, and adjusted to the actual waist line of the dress form. The bra size for the dress was M.

3.4. Pattern design and making of experimental clothes

The pattern of top dress with and without dress bra is produced in a draping technique and arranged in flat pattern to complete the line. It is possible to check the volume according to the wearing and not wearing a dress bra and check the finish line obtained from the draping. To take advantage of this result, move it precisely onto the pattern sheet and present the notches in the flat pattern shown. The material for the experimental clothes is muslin for jackets and is made in a lined, intra-structure sewing technique for actual top dresses.

3.5. Pattern completion and polymerization comparison

And the polymerization of the two patterns depending on whether a bra was used showed changes in the dimensions and curvature of the parts representing the volume of the breast region. Of the two patterns, we could confirm the validity of the pattern (with bra on) with a clear volume line.

3.6. Wearing test (Expert evaluation and subject evaluation respectively)

To examine the validity of the developed pattern, three subjects within the range of ±5cm around the bust circumference of the research pattern were selected for a test clothes and a visual description evaluation. Experimental clothes were worn by two bodies for feasibility review of the developed study pattern, which were then observed by the evaluator and displayed on a five-point scale for each assessment question. ‘very yes’ will be rated as a 5 point, ‘a little bit yes’ as a 4 point, ‘medium’ as a 3 point, ‘be a little bit no’ as a 2 point, and ‘not at all’ as a 1 point. Three subjects within ±5cm the bust circumference of the researcher type were selected to evaluate the description of the subjects. Evaluators were 23 students taking pattern majors.

The test subjects include 23 major professors who majored in clothing construction and have professional knowledge on basic patterns. For the description evaluation items, see Lee (2010), Hong (2011), who studied the torso pattern of the dress. A total of 32 items were reconstructed with the following items: 9 items related to the front, 11 items related to the side, 9 items related to the back, and 3 items overall. The three subjects took turns wearing two testing clothes, and evaluators viewed the subjects and evaluated them using the Likert’s scale for each assessment question.

The examination of the wearer is the result of the response of the three subjects.

4. Results & disccussion

4.1. Results of dress company survey

The survey was conducted by three companies in Jeju City that were considered to be responsible for lending, sales and production of dresses.

The survey of the quantity of dress design retained in the store finds out which necklines are preferred because consumers are likely to encounter dress design and the vendor has a design preference. According to a survey on the retention of the neck line by design held in stores, top (Sweet-heart/Straight across) was 52.5% for A companies, 17.6% for Bateau/ Boat neck, and 15.7% for Off-shoulder. For B companies, top (Sweet-heart/Straight across) was 62.6%, Bateau/Boat neck was 13.2%, and Off-shoulder 9.9% were followed. For C companies, Top (Sweet-heart/Straight across) was 43.5%, Off-shoulder 10.5%, and High neck 7.5%. The quantity retained by neckline is as shown in Table 1. These results tended to be the same as the preceding study (Choi & Ku, 2014; Jeon, 2014; Kim, 2007; Lee, 2008).

All three businesses had very high reserves of top (Sweet-heart/ Straight across) lines. The company's high retention rate of this neckline indicates that the retention rate is high for the benefit of a good size cover rate and can be modified depending on the customer, which is the preferred level of the consumer (Table 2).

Three companies surveyed used bra for dresses. If the dress is equipped with a breast calibration pad, it is also included because it has the effect of wearing a dress bra. The reason why she wear a dress bra was to save the volume of her breast. Other answers were to position the breast to prevent the dress from sliding down, to make sure the dress size was adjusted, to gather the breast.

Table 1. Quantity retained of the company's neckline

Neckline \ Company	A	B	C
Top (sweet-heart/straight across)	107(52.5%)	57(62.6%)	87(43.5%)
Bateau / Boat neck	36(17.6%)	12(13.2%)	12(6.0%)
Off-shoulder	32(15.7%)	9(9.9%)	21(10.5%)
High neck	9(4.4%)	5(5.5%)	15(7.5%)
Halter neck	5(2.5%)	3(3.3%)	10(5.0%)
V-neck	4(1.9%)	3(3.3%)	43(21.5%)
Etc. (Asymmetric/Illusion/Jewel/Square)	11(5.4%)	2(2.2%)	12(6.0%)
Sum	204(100%)	91(100%)	200(100%)

Table 2. Order of neckline with high consumer preference

Company	Customer's neckline preference
A	Top (sweet-heart/straight across)>Illusion neck>Off-shoulder>V-neck>High neck>Halter neck
B	Top (sweet-heart/straight across)>V-neck>Off-shoulder> Illusion neck>Halter neck
C	Top (sweet-heart/straight across)>V-neck>Halter neck>Off-shoulder> Asymmetric>Illusion neck

The distribution of the three companies 'size retention rates is mostly 55 in size and 66 in size. Presented in the following Fig. 1. This is a high retention rate based on sizes 55 and 66, which are highly distributed among consumers. Except for this standard size, 44 size and 'plus size' are separated into an exceptional size, which are classified too small or positive and have a low retention volume. While 44 sizes can usually be fixed with fittings, 'the plus size' or larger cover has a separate fit. However, the ratio has a relatively small distribution chart compared to 55 and 66 sizes combined. As a result, 55 and 66 sizes, which are generally held by companies, will be used to determine the size of dress forms for dress pattern.

4.2. Results of torso pattern design on top dress

4.2.1. Results on the change of body dimensions by using a dress bra

According to the results of the surveys of changes in body sizes after using a bra for dresses, the amounts of changes in body sizes after wearing a bra are as follows. In the case of the small size group with bust circumferences in a range of 75~81cm, the average amounts of changes after wearing a bra for dresses were increases by 3.21cm in bust circumferences, 1.25cm in chest circumferences, 0.49cm in bust point-bust point, and 3.06cm in waist front lengths. In the case of the group with bust circumferences in a range of 81~87cm, which are close to those of the standard somatotype, the average amounts of changes were increases by 2.54cm in bust circumferences, 1.25cm in chest circumferences, 0.44cm in bust point-bust point, and 2.39cm in waist front lengths. In the case of

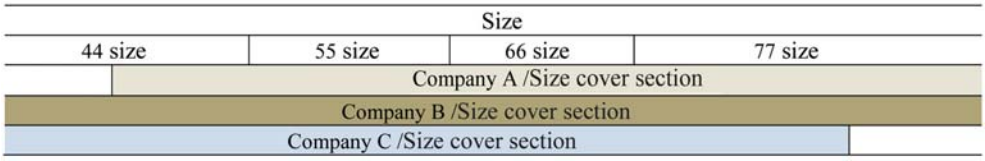

Fig. 1. Unit size cover section.

Table 3. Incremental comparison for each part of the size interval (n = 50)

Part group	Bust circumferences				Chest circumferences				Bust point-bust point				Waist front lengths				Person (%)
	Size		Increment		Size		Increment		Size		Increment		Size		Increment		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
75~81cm	80.20	.48	3.21	.48	78.20	1.59	1.65	.41	15.3	.42	.49	.26	38.6	1.73	3.06	.49	10 (20)
81~87cm	84.00	2.00	2.54	.63	81.70	2.68	1.21	.54	15.6.	54	.44	.18	40.8	2.22	2.39	.61	20 (40)
87~93cm	90.30	1.87	2.31	.57	86.90	.80	1.49	.62	15.6.	49	.50	.37	43.8	1.02	2.00	.56	15 (30)
93~99cm	97.70	.50	1.84	.27	93.90	.51	1.50	.31	17.4	.38	0.48	.59	44.9	.98	1.64	.30	5 (10)

the group with bust circumferences in a range of 87~93cm, which are slightly larger than those of the standard somatotype, the average amounts of changes were increases by 2.31cm in bust circumferences, 1.49cm in chest circumferences, 0.50cm in bust point-bust point, and 2.0cm in waist front lengths. In the case of the group with large bust circumferences in a range of 93~99cm, the average amounts of changes were increases by 1.84cm in bust circumferences, 1.50cm in chest circumferences, 0.48cm in bust point-bust point, and 1.64cm in waist front lengths.

For small breasts, the increase was greatest after wearing a dress bra. This shows that the dress bra is making the volume of bust larger. In addition, to increase the bust circumference to the size of a dress that is almost of a standard size, some bras for the dress may increase the size around the breasts.

An incremental comparison table for each section of the size section shows the change in the bust circumference group in groups less than 81cm to 87cm and groups less than 87cm to 93cm slightly larger than the standard body type. The circumference group of the breasts between 75 and 81cm has a small variation. The group, which is larger than the standard size, does not have any significant changes. The group is not used to increase the volume of the breast, but because it is used to compensate for the sagging or wide chest line (Table 3).

The wearing of a dress bra showed a change in body size measurements. This can be seen as an emphasis on aesthetic aesthetics, as mentioned in theoretical settings, or as a special measure of body type correction. It was close to 55 and 66 sizes selected by dress companies, as shown in a company survey. This is possible due to the high cover rate covered by this size. The dress bra thus marked the silhouette of a dress that was rented, sold, and manufactured, and was used for cover of insufficient parts of the body.

4.2.2. Results of pattern design

4.2.2.1. Results of dress form selection

Dress forms for top dress torso pattern were selected. For pattern of dress considering fitness and aesthetic impression, we have based Trade mark Pig dress form no. 9, which is used for the purpose of education. Reason for selecting the dress form in no. 9 was because it showed it's size with the highest cover ratio in our prior survey on wedding dress.

To determine the suitability of dress form no. 9, the data were analyzed in a study on human body dimensions in Korea. According the results of the surveys with companies, the average size of adult womenswear with large stocks was close to 86cm, which is close to the average of 55 size (bust circumference 85cm) and 66 size (bust circumference 88cm). It is close to bust circumference 84.93cm, waist circumference 72.82cm, and hip circumference 93.81cm, which are the average sizes of 20-34 year old women in South Korea according the 7th Size Korea. The upper garment size name 85-91-160 that requires fitness, which was selected from among the adult womenswear sizes under Korean Agency for Technology and Standards' KS K 0051 because the ratio of the standard somatotype was high, is for body sizes as follows; bust circumference 85.0cm, waist circumference 68.9cm, and hip circumference 91.0cm. Trade mark Pig body no. 9 with bust circumference 87.04cm, waist circumference 64.00cm, and hip circumference 92.16cm, which are close to the average values of individual regions by body type (normal body type, N); bust circumference 85.5cm, waist circumference 76.6cm, and hip circumference 91.3cm, was selected.

4.2.2.2. Results of research pattern design

Dress form was properly padded at the waist and calibrated as described in the previous chapter. We have produced patterns for the two statuses in a draping techniques in order to compare patterns wearing wedding bra and without wearing wedding bra. In comparison of the two patterns (a pattern for the body wearing wedding bra and without wearing bra), it is believed that wearing or not of wedding bra provides big impacts on production and fitness of dress pattern because it showed many differences in bust line.

Align Muslin's breast lean line with the dress form's bust circumferences line. Position the center line of the muslin at 1/2 of the bodice and fix the selvage line so that it falls vertically. Sweep outward from the center front line and pin it to the princess line and side lines. The breast volume line of dress form with on dress bra is so large that it is slightly more sophisticated in the center of B.P,

Fig. 2. Results of draping techniques.

which is precisely pinned. Do not pull the muslin and keep it in place so that it is naturally attached to the curvature of the body. The circumference of the waist line is fixed with a pin to form a natural line, and the bottom line is completed by holding a 1cm flare amount in the line. The finished base line, which takes 1cm flare volume in the line, has the effect of making the line look slim. This is to prevent torso pattern parts from being affected by the condition of the wearer's lower abdomen and the condition of the hip volume. At the end of the process, the muslin is organized and all work places are marked. Fig. 2 is the result of draping of each parts according to wearing or not wearing a dress bra.

The process of connecting the seam lines and checking the finish lines on the front, side, and back was as shown in Fig. 3. Ensured that the connection of each pattern is natural. It is possible to check the volume according to wearing or not wearing a dress bra and check the completion line of patterns obtained by the draping. To take advantage of this result, moved it precisely onto the pattern sheet and present it as a flat pattern with notch.

4.2.3. Results of assessment of wearing test

4.2.3.1 Experimental clothes

An experimental clothes was made with two complete patterns according to wearing and not wearing a bra for the top neckline dress. The fabric of the sides for experimental clothes on torso pattern is used for the muslin for the jacket as it considers the material is not stretched and is also made of the same thickness as a real dress. In order to examine the Princess line and the side line of body, a line for dresses, RIGILENE POLYESTER BONING 6mm -

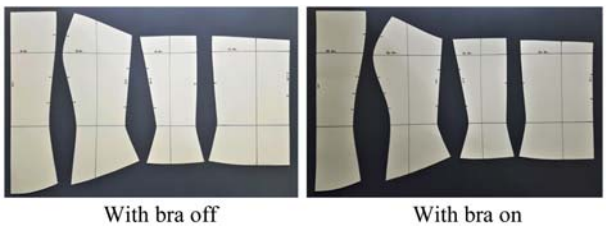

Fig. 3. Completion by flat pattern with notch.

Fig. 4. Dress form, design line tape & experimental clothes.

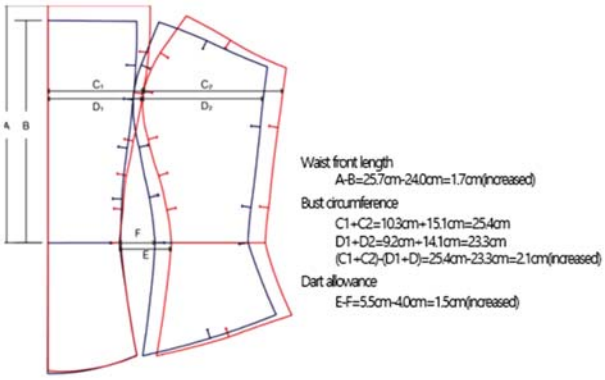

Fig. 5. Comparison of patterns by polymerization.

white, was used on the lining. The dress form and wearing results based on the top neckline dress torso test of two types (with bra on or off) manufactured by the above method are shown in Fig. 4. The effects of whether a bra is used or not on changes in patterns were reviewed through the degree of polymerization of finished patterns. When a bra for dresses was worn, the waist front length increased by 1.7cm, the bust circumference increased by 2.1cm, and the amount of dart increased by 1.5cm in the patterns (Fig. 5).

As shown above, suitability of the pattern was evaluated after being tested as a torso experimental clothes. Polymerization of patterns showed changes in the dimensions and curvature of the areas representing the bust area volume. When a bra for dresses was worn, the waist front length, the bust circumference and the amount of dart considerably increased in the patterns.

Fig. 6. Subject wearing experimental clothes.

4.2.3.2. Wearing test results

Top neckline dresses' experimental clothes were made of patterns according to wear and not wear a dress bra. An experimental garment was made and applied to each dress form to identify the developed torso pattern. The assessment items for experimental clothes were divided into front, side, back and overall items, and the total 32 items were assessed by giving each detailed item. The top dress torso experimental clothes were worn by three subjects with body types within the standard deviation from the standard somatotype. They were given practical training, and the evaluators were 23 students in the pattern major class.

The subject wearing experimental clothes was shown in Fig. 6. In order to determine the stability, consistency, and predictability of each item in the collected questionnaire, the Cronbach's α coefficient was used as a confidence factor. Since social sciences generally recognize that there is no significant problem with the reliability of measurement metrics, this study also considers evaluating reliability based on 0.6 or higher. This study used these Cronbach's α coefficients to verify the reliability of measurement tools based on internal consistency and results in satisfaction at 0.7 or higher.

As shown in Table 4, if we looked at the items with a high evaluation score of the two experimental clothes, both of them were tested for good fit for wearing and for high degree for not having any pull or wrinkles. In addition, an average of 4.00 points or more were also evaluated for assessment of the princess line and the top neckline. The location of the bust line and the waist line, which are the reference lines, were also evaluated as "good" and some said that the armhole part of clothing is effectively protecting the upper chest.

Table 4. Expert evaluation of experimental clothes (*n*=23)

	Evaluation question	With bra off		With bra on		*t*	*p*
		M	*SD*	*M*	*SD*		
Front	1. Is the chest fitting well?	3.12	.61	3.48	.61	-1.185	0.171
	2. Is there no pulling or collection in the chest?	3.81	.67	3.82	.32	0.001	1.000
	3. Is the waist fitting well?	4.28	.64	4.43	.68	-0.601	0.487
	4. Are there any pull or grease in the waist?	3.67	.48	4.19	.51	-3.312	0.001
	5. Is the Princess Line properly positioned and shaped?	4.35	.74	4.57	.74	-0.830	0.400
	6. Is the top armhole well?	3.05	.59	4.18	.65	-5.831***	0.000
	7. Is the location of the top line proper?	2.67	.58	4.42	.50	-9.507***	0.000
	8. Is the chest volume appropriate?	2.90	.44	4.57	.50	-5.831***	0.000
	9. Is the overall appearance of the front appropriate?	3.19	.50	4.25	.46	-9.507***	0.000
	Sum	3.46	.36	4.28	.19	-8.558***	0.000
Side	10. Is the chest line appropriate?	3.19	.46	4.38	.50	-7.385***	0.000
	11. Is the chest fitting well?	4.81	.67	4.62	.32	-9.107**	0.003
	12. Is there no pulling or collection in the chest?	4.28	.51	4.57	.60	-0.227	0.783
	13. Is the waist line properly located?	4.71	.44	3.48	.51	-1.185	0.190
	14. Is the waist fitting well?	4.35	.56	4.24	.54	0.281	0.780
	15. Are there any pull or grease in the waist?	4.38	.50	4.43	.51	-0.917	0.365
	16. Are there any pull or grease in the waist?	4.19	.60	4.33	.48	-0.849	0.401
	17. Is the top armhole well?	3.19	.00	4.29	.46	-5.831***	0.000
	18. Is the top neckline-chest volume- waist line naturally well fitted?	2.71	.64	4.25	.44	-9.507***	0.000
	19. Is the chest volume appropriate?	2.81	.51	4.57	.50	-5.831***	0.000
	20. Is the overall appearance of the side appropriate?	3.19	.87	4.25	.46	-9.507***	0.000
	Sum	3.72	.19	4.39	.18	-11.692***	0.000

Table 4. Expert evaluation of experimental clothes (continued) (*n*=23)

Back	21. Is the overall appearance of the side appropriate?	4.12	.61	4.24	.50	-0.515	0.610
	22. Is there no pulling or collection in the chest?	4.29	.56	4.62	.44	-3.072**	1.000
	23. Is the waist fitting well?	4.52	.51	4.57	.51	0.611	0.544
	24. Are there any pull or grease in the waist?	4.62	.48	3.48	.51	-3.312	0.001
	25. Is the Princess Line properly positioned and shaped?	4.52	.51	4.24	.54	0.000	1.000
	26. Is the top armhole well?	4.38	.59	4.33	.48	0.642	0.524
	27. Is the top line properly located?	4.43	.58	4.48	.51	-0.303	0.764
	28. Is the amount of seam allowance appropriate?	4.62	.50	4.43	.51	1.220	0.225
	29. Is the overall appearance in the back appropriate?	4.05	.50	4.29	.50	-1.341	0.187
	Sum	4.40	.28	4.43	.09	-.499	0.621
Overall	30. Is the overall fit appropriate?	3.86	.65	4.33	.48	-9.507***	0.000
	31. Is the overall silhouette well expressed?	2.43	.58	4.48	.46	-6.831***	0.001
	32. Is the aesthetic expression of the overall dress well expressed?	2.62	.50	4.43	.51	-9.507***	1.000
	Sum	3.24	.37	4.43	.43	-9.601***	0.000
	Cumulative total	3.81	.18	4.32	.11	-10.884***	0.000

*p<.05, **p<.01, ***p<.001

The item with the average difference in the two experimental clothes is whether the location of the top line is adequate, the size of the breast area is adequate, the bust volume is natural, Is the expression of aesthetics is good and the silhouette is well expressed.

There was no impact on items such as matching, pulling or wrinkling, reference lines such as bust and waist lines, and princess line. However, the volume of the bust differed significantly, indicating that the dress bra had a significant impact on the representation of silhouette and aesthetics.

The average on which three of the evaluators actually wore them to assess their sense of wear on experimental clothes was shown as Table 5. Overall, it received high marks with more than 4.00 points.

However, the items of activity were lower than the overall average, due to the phenomenon of wearing a bra, where the effect of calibration and the dress are closely attached. The wearing of the dress bra received high marks for calibration, volume and wearing satisfaction. Six subjects wearing the bra are presented in Fig. 7.

5. Conclusions

In this study, to develop torso patterns of top dresses selected as preferred designs through literature reviews and company surveys, body sizes suitable for standard sizes were selected and study patterns were made using draping techniques. In this case, since bra for dresses are worn to enhance the esthetics of the dresses and the dimensions of dresses are changed after wearing the bra for dresses, new study patterns were designed applying the dimensional changes. Design preference, actual states of use of bra for dresses, and systems for size correspondence were surveyed with

Table 5. *M* and *SD* of subjects on wearing of experimental clothes and bra (*n*=3, 6:bra)

	Evaluation question	*M*	*SD*
Experiment clothes	1. Is the chest area comfortable?	4.00	0.63
	2. Is the chest tight?	4.00	0.63
	3. Are the waist area comfortable?	4.20	0.40
	4. Is the waist tight?	3.80	0.40
	5. Is it appropriate to wear the top neckline?	4.00	0.89
	6. Is the top neckline tight?	1.40	0.49
	7. Is it uncomfortable to feel the endocrine glands on the skin?	4.40	0.49
	8. Is overall wear appropriate?	4.20	0.40
	9. Are they all well-attached?	4.00	0.63
	10. Is overall activity (movement) appropriate?	3.80	0.75
Bra	1. Is the chest area comfortable?	4.00	0.63
	2. Is the chest tight?	4.40	0.49
	3. Are the waist area comfortable?	4.20	0.75
	4. Is the waist tight?	4.00	0.63
	5. Is it appropriate to wear the top neckline?	4.20	0.40
	6. Is the top neckline tight?	3.80	0.40

Fig. 7. Subjects wearing the dress bra under experimental clothes.

companies that rent and produce dresses in the form of questionnaires. Dimensional changes in the bust region after using a bra were measured to analyze the changes. Thereafter, experimental clothes in two torso patterns, one for wearing a bra and the other for no bra, were made with muslin and the fits of the experimental clothes were evaluated to check the suitability and usability of the study patterns.

First, according to the results of surveys of favorite necklines, the quantities of top (sweet-heart/straight across) necklines held were very large in all the three companies. The reasons for the large quantities of top dresses held by the companies could be found as good size coverage of top dresses and the fact that the designs of top dresses can be modified according to customers. On reviewing the results of surveys of consumers' preference for necklines from the standpoint of a person related to the companies involved in the selection of dresses, a phenomenon for various necklines to be preferred evenly can be seen. However, the most preferred designs are the top (sweet-heart / straight across) dress designs in all the companies.

Second, according to the results of the surveys of changes in body sizes after using a bra for dresses, the amounts of changes in body sizes after wearing a bra are as follows. In the case of the small size group with bust circumferences in a range of 75~81cm, the average amounts of changes after wearing a bra for dresses were increases by 3.21cm in bust circumferences, 1.25cm in chest circumferences, 0.49cm in bust point-bust point, and 3.06cm in waist front lengths. In the case of the group with bust circumferences in a range of 81~87cm, which are close to those of the standard somatotype, the average amounts of changes were increases by 2.54cm in bust circumferences, 1.25cm in chest circumferences, 0.44cm in bust point-bust point, and 2.39cm in waist front lengths. In the case of the group with bust circumferences in a range of 87~93cm, which are slightly larger than those of the standard somatotype, the average amounts of changes were increases by 2.31cm in bust circumferences, 1.49cm in chest circumferences, 0.50cm in bust point-bust point, and 2.0cm in waist front lengths. In the case of the group with large bust circumferences in a range of 93~99cm, the average amounts of changes were increases by 1.84cm in bust circumferences, 1.50cm in chest circumferences, 0.48cm in bust point-bust point, and 1.64cm in waist front lengths.

Third, dress forms for top dress torso patterns were selected. According the results of the surveys with companies, the average size of adult womenswear with large stocks was close to 86cm, which is close to the average of 55 size (bust circumference 85cm) and 66 size (bust circumference 88cm). It is close to bust circumference 84.93cm, waist circumference 72.82cm, and hip circumference 93.81cm, which are the average sizes of 20-34 year old women in South Korea according the 7th Size Korea. The upper garment size name 85-91-160 that requires fitness, which was selected from among the adult womenswear sizes under Korean Agency for Technology and Standards' KS K 0051 because the ratio of the standard somatotype was high, is for body sizes as follows; bust circumference 85.0cm, waist circumference 68.9cm, and hip circumference 91.0cm. Trade mark Pig body no. 9 with bust circumference 87.04cm, waist circumference 64.00cm, and hip circumference 92.16cm, which are close to the average values of individual regions by body type (normal body type, N); bust circumference 85.5cm, waist circumference 76.6cm, and hip circumference 91.3cm, was selected.

Fourth, the top dress torso experimental clothes were made using muslin for jackets to make them with bulkiness for the feeling of actual dresses and using bonning for dresses as the lining to precisely check the entire finish lines such as the princess line and the side lines. The experimental clothes designed with draping techniques for trade mark Pig dress form no. 9, which is close to the standard somatotype, were made to be tightly attached to the upper human body by enhancing the tightness of the dresses with banding work for fitness.

Fifth, the top dress torso experimental clothes were worn by three subjects with body types within the standard deviation from the standard somatotype. The conditions of wearing were seen to evaluate 32 items with a 5 point scale of Likert, in which scores closer to 5 points mean better fitness. On reviewing the items with high evaluation scores and no difference in the averages of the two experimental dresses, it could be seen that both experimental

dresses had good fitness on wearing and were highly evaluated in terms of the existence of pull or wrinkles. In addition, the experimental clothes were scored at least 4.00 on average in the evaluation of the princess line and top necklines. The experimental clothes were evaluated as 'good' for the position of the bust line and the position of the waist line, which are reference lines, and were also highly evaluated in that the armhole portion was well wrapping the upper breast. Cronbach's alpha was used to verify the reliability of the measurement tool by internal consistency and according the results, the values were at least 0.7 for the front, side, back, and overall indicating that the confidence level was satisfied.

Sixth, the effects of whether a bra is used or not on changes in patterns were reviewed through the degree of polymerization of finished patterns. When a bra for dresses was worn, the waist front length increased by 1.7cm, the bust circumference increased by 2.1cm, and the amount of dart increased by 1.5cm in the patterns.

Unlike ready-made clothes, in the case of dresses, components such as silhouettes, necklines, collars, and trains are not diverse. However, dresses are clothes with many decorative elements, and new dresses are made by changing materials and in particular, by changing details and trimming. This is why torso patterns with stable and beautiful lines are necessary for individual necklines. Although patterns for top dresses, which are the most preferred, were presented in this study, basic patterns of detailed neckline forms will be developed in follow-up studies. In addition, through the research and development of patterns by the dress skirt, necklines and the skirt patterns will be combined by design so that more diverse dresses can be presented.

In addition, in this study where patterns were developed in the aspect of sizes, the coverage of plus sizes is low because the developed patterns are close to the standard somatotype. Since the range that can be covered with one size is limited in the case of dresses, designs and patterns of special sizes, that is, small sizes and plus sizes should be studied. In order to overcome these problems, studies to develop dress torso patterns through body type classification will be conducted as follow-up studies of this study.

In general, whereas systematic size studies and pattern studies are conducted in the academia and companies in the case of ready-made clothes, most studies are conducted centering on design and studies of patterns are not so extensively conducted in the case of dresses. Cooperation among companies and studies in the academia should be combined to systematize dress sizes and patterns. The patterns which are not disclosed currently should be shared to some extent so that self-rescue measures such as pattern studies, design development, and size system establishment can be jointly sought by companies. In this study, we used an experiential trade mark Pig dress form no. 9 that was evaluated as being less than perfect in form. The size Korea data and measurement specifications have been reviewed and corrected, but the validity of their use will be verified through further research. Further, we will further analyze the comparison of patterns and study patterns presented in the preceding study and the suitability of the dress form to provide a reasonable basis for dress form selection.

Acknowledgement

This work was supported by the research grant of Jeju National University in 2016.

References

Choi, H. O. (2017). *Development of dress brassiere for small breasted women.* Unpublished doctoral dissertation, Catholic University, Bucheon.

Choi, S. K., & Ku, M. R. (2014). A study on the dress composition lines represented in Korean wedding culture. *Journal of Korean Traditional Costume, 17*(2), 47-57.

Hong, K. H. (2011). *A study on the development of torso pattern and sleeve pattern for wedding dress.* Unpublished master's thesis, Pusan National University, Busan.

Jeon, M. J. (2014). *Development of wedding dresses in variable designs.* Unpublished doctoral dissertation, Chung-ang University, Seoul.

Kim, H. Y., Park, S. K., & Jeong, J. C. (2017). A study princess line patterns for wedding dresses - Draping technique for standard body type women from age 25 to 34 -. *The Research Journal of the Costume Culture*, *25*(6), 913-927. doi:10.29049/rjcc.2017.25.6.913

Kim, S. M. (2006). *A study on corset look pattern of Korean women in their 20s with standard body type*. Unpublished master's thesis, Sungkyunkwan University, Seoul.

Kim, Y. J. (2007). *A study on the size system of wedding dress and the preference degree of design*. Unpublished master's thesis, Sungshin Women's University, Seoul.

Korean Agency for Technology and Standards. 7th Body dimensions survey (2015). from https://sizekorea.kr/body_info_center_ reservation/index

Lee, M. H. (1982). *Modesty and aesthetics in clothing behavior and related psychological variables of college students.* Unpublished doctoral dissertation, Ewha Womans University, Seoul.

Lee, Y. H. (2008). A consumer survey and suggestions of designs for wedding shops and wedding dresses. Unpublished master's thesis, Youngnam University, Gyeongsan.

Lee, Y. M. (2010). *Development of the torso pattern for a 20-something adult woman.* Unpublished master's thesis, Dongduk Women's University, Seoul.

Park, H. Y. (2005). *A study on the classification of an bodice size of rent wedding dress.* Unpublished master's thesis, Jeonbuk National University, Jeonju.

(Received 27 June 2018; 1st Revised 9 July 2018;
2nd Revised 24 July 2018; 3rd Revised 31 July 2018;
Accepted 17 August 2018)