

The Hierarchy of Images according to Construction Factors of the Flared Skirts

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Abstract

This study analyzed hierarchy of image for visual evaluation of flare skirt. This study analyzed expression words about flare skirt with frequency data of image expression words with different length and volume of flare. Stimuli for the study were set to be 4 different volume of flare (90°, 180°, 270°, 360°) and 3 different length of skirt(48cm, 58cm, 68cm). Stimuli were made by using I-Designer which is Virtual Sewing System. From simulation of flare skirt, the subjects were asked to write down suggested adjective freely and selected 210 adjectives. With this, we chose total 38 adjectives considering frequencies in the pre-study. And we analyzed the combination process of expression words according to construction factor of flare skirt and hierarchy of image from dendrogram which was resulted by hierarchical cluster analysis. 'Feminine' got high score in all 12 flare skirt. When the skirt was short, it was vivid, and as the skirt got longer, ordinary and pure image showed. Also, as the volume of flare got larger, the average of visual effect was higher than visual image. Visual hierarchy construction according to construction factors of flare skirt could be divided into visual image and visual effect, and visual image was shown to be form 'A type - large volume of flare and short skirt length', 'H type-small volume of flare and short skirt length' and 'X type - large volume of flare and long skirt length'.

Key Words : Virtual Sewing System, I-Designer, visual hierarchy construction

I . Introduction

Acting as an important medium, the visual characteristics of clothes influences the whole image. Image is an actively interpreted result of accumulated data through direct or indirect experiences about making images of objects or

phenomena. Image of clothes could be measured by people's reaction when they encounter clothes, in other words, expression word¹⁾. There are countless perception words about objects. Even though each vocabulary concept may be recognized differently by periods or culture area, the main idea generally

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seems to be the same. Started with these thoughts, Semantic Differential Scales theory is developed with Osgood as the center and is used as a tool to measure attitude toward the subject²⁾.

The flare skirt is characterized with 3-dimensional shape that beauty is determined by obtained curves when the fabric is draped. Various visual image could be seen by changes in wearer's figure, thickness, weight and texture direction of fabric, pattern making method, skirt width and length. Because the flare skirt includes complex factors in various faces, various studies are achieved. As we look at the previous studies about flare skirt, studies about relationship between variables in figure of wearer and 3-dimensional shape of flare skirt³⁾⁴⁾, and relationship between material and making method⁵⁾⁶⁾, and virtual wearing⁷⁾⁸⁾ are studied.

This study analyzed expression words about flare skirt with frequency data of image expression words with different length and volume of flare. Cluster process of image expression words of the flare skirt was schematized with dendrogram from hierarchical cluster analysis and hierarchy structure of image according to component factors of flare skirt was analyzed with considering the meanings. The study about analyzing image differences from expression words according to the component factors of flare skirt could be used as the basic data to set the relationship between conditions of clothes image and clothes components.

The purpose of this study is shown as follows.

1) Analyze common word according to the variables of flare skirt.

2) Recognize construction factors according to the variables of flare skirt, and classify the

expression word by factors, and analyze it.

3) Analyze the hierarchy of image according to the construction factors of flare skirt.

II. Methodology

1. Subject of Study

This study was carried out by surveying randomly chosen 370 female college students. We passed out total 370 survey paper but only 365 were collected. Excluding 3 incomplete papers, 362 survey answers were used as data of this study. The pre-research was carried out in May, 2007 and then the main research was executed from June to October, 2007. The residence of the subjects was mostly Seoul and Gyeonggi area.

2. Making of Stimulus

Stimuli were made by using I-Designer which is Virtual Sewing System. I-Designer is an operation system that makes 3-D simulation out of clothes based on pattern, characteristics of fabric and body data. In the pre-research for making of stimuli, the most affective factors for appearance were shown to be silhouette, volume of flare, and skirt length. Therefore, stimuli for the study were set to be 4 different volume of flare (90°, 180°, 270°, 360°) and 3 different length of skirt(48cm, 58cm, 68cm). For patterns for making of stimuli, patterns of flare skirt were drawn by using Super Alpha: Plus Yuka Pattern CAD System. Pattern data was used to convert pattern made by CAD to DXF file format. Fabric was chosen by using characteristic data of cotton with a built-in I-Designer program. When pattern and fabric were decided, the program simulated 3-D figure of clothes imaginatively

skirt length	volume of flare			
	90°	180°	270°	360°
48cm				
58cm				
68cm				

<Figure 1> Classification of clothing stimuli

with using pattern and imaginary model. As the simulation repeated, the drape looked more natural and clear. Especially, as the width of the flare got larger, the program needed to repeat more. However, in the pre-study⁹⁾, 8–10 times was set to be the proper number of repeats. But in case of 90° of width, large number of repeats was not possible, therefore, the number of repeats was regulated by the volume of flare. Clothing stimuli are shown in <Figure 1>.

3. Method of Analysis

SPSS Package 14.0 for Windows was used for data analysis. In order to find out differences in expression word according to the variables of flare skirt, we carried out frequency analysis and understood the tendency of expression word from proportional distribution of main expression words which had more than 20 frequencies. Next, we executed frequency analysis in order to check the most affective factors for appearance of flare skirt. The flare skirt for visual evaluation was combined 4 different volumes of flare (90°, 180°, 270°, 360°), and 3 different length of skirt (48cm, 58cm, 68cm) as variables. From simulation of flare skirt, the subjects were asked to write down suggested adjective freely and selected 210 adjectives. With this, we chose total 38 adjectives considering frequencies in the pre-study. And we analyzed the combination process of expression words according to construction factor of flare skirt and hierarchy of image from dendrogram which was resulted by hierarchical cluster analysis.

III. Result and Discussion

1. Analysis of Common Words According to Variables of Flare Skirt

<Table 1> shows the list of common words according to variables selected from visual expression words of flare skirt in order of higher average value to lower value.

As we looked at the common words according to the volume of flare, 'feminine' got the highest average value in 90°, and 'ordinary', 'simple', 'neat', 'tidy', 'pure', 'looks like having a short upper body', and 'noble' in this order. In 180°, 'feminine' also got the highest average value, and then, 'natural'. In 270°, also 'feminine' had the highest value and then 'glamorous in hip' was next. In 360°, 'feminine' got the highest value and 'glamorous in hip' was next.

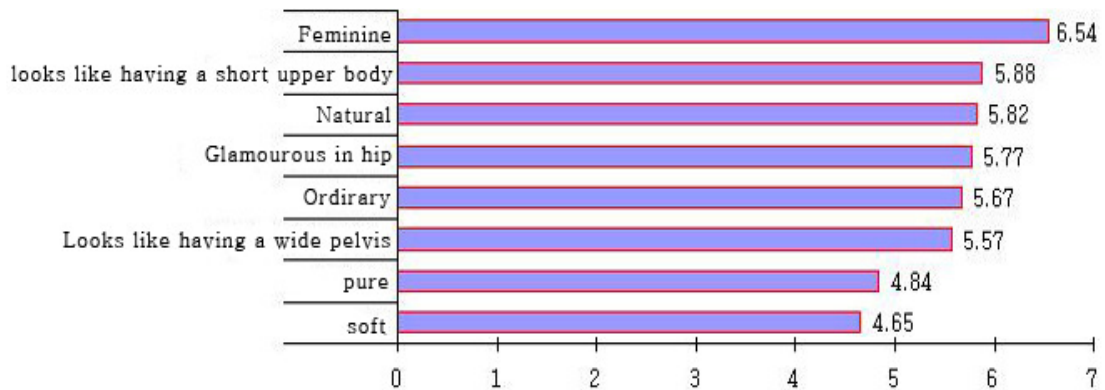
Looking at the common words according to the skirt length, 'feminine' got the highest average value in 48cm, and then 'vivid', 'active' in this order. In 58cm, 'feminine' also had the highest value, and then 'pure' was next. In 68cm, 'looking old' got the highest value, and then 'not cute', 'feminine', and 'heavy' in order.

As a result of examining which showed average value of visual main expression word of flare skirt, 'feminine' got the highest value of 6.54, and then, 'looks like having a short upper body (avg 5.88)', 'natural (avg 5.82)', 'glamorous in hip (avg 5.77)', 'ordinary (avg 5.67)', 'looks like having a wide pelvis (avg 5.57)', 'pure (avg 4.84)' and 'soft (avg 4.65)' in the order. <Figure 2> shows the result of average value of visual main expression words of flare skirt 'Feminine' got high score in all 12 flare skirt. When the skirt was short, it was vivid, and as the skirt got longer, ordinary and pure image showed. Also, as the volume of flare got larger, the average of visual effect was higher than visual image.

<Table 2> provides differences of 8 main expression words with 12 kinds of stimuli. Except 90° 68cm and 270° 48cm, the first image

<Table 1> Common words according to variables of flare skirt (above avg 4.5/ above avg 5.0)

variable		common word
volume of flare	90°	feminine, ordinary, simple, neat, tidy, pure, looks like having a short upper body, noble, natural, stable, looking old, not cute, gentle, classic, stiff, not wanting-to buy
	180°	feminine, natural, looks like having a short upper body, glamorous in hip, ordinary, active
	270°	feminine, glamorous in hip, vivid, active, looks like having a wide pelvis, rhythmic, casual, natural, short upper body, soft, looks younger, cute, looks like having a big belly, modern, cool,
	360°	feminine, glamorous in hip, pure, wide pelvis, looks like having a short upper body, natural, soft, looks fatter generally
skirt length	48cm	feminine, vivid, active, cool, looks youger, cute, light, casual, rhythmic, natural, soft, looks like having longer legs, modern, looks like having thinner legs, looks like having a short upper body, glamorous in hip, simple, attractive, pretty, sporty, practical, wanting-to-buy
	58cm	feminine, pure, noble, looking old, natural, ordinary, not cute, neat, glamorous in hip, looks like having a short upper body, looks like having a wide pelvis, heavy, not wanting-to-buy, stable, stifle
	68cm	looking old, not cute, feminine, heavy, stifle, classic, pure, gentle, noble, not wanting-to-buy, ordinary, out-of-style, not pretty, looks like having a short upper body, glamorous in hip, calm, looks fatter generally, elegant, looks like having a wide pelvis, not attractive, inactive, neat, tidy, formal, stable, looks like having thicker legs, looks like having shorter legs, rough



<Figure 2> Average value of visual main expression words of flare skirt

of all stimuli was 'feminine'. The first image for 90° 68cm was 'ordinary' and 270° 48cm was 'glamourous in hip'. The second image for 90° 68cm and 270° 48cm was 'feminine'. From these

results, 'feminine's had the strongest image regardless of skirt length and volume of flare of flare skirt.

<Table 2> Differences in visual expression of 8 main expression word for each 12 kinds of flare skirt

Construction Factors		glamorous in hip	looks like having a short upper body	looks like having a wide pelvis	pure	soft	ordinary	feminine	natural
90°	M	4.11	5.22	4.07	5.00	5.05	4.99	5.66	5.27
48cm	S.D.	1.41	1.41	1.47	1.32	1.32	1.49	1.02	1.19
90°	M	4.06	5.15	4.30	5.28	4.29	5.54	5.56	4.89
58cm	S.D.	1.40	1.28	1.36	1.08	1.54	1.24	1.10	1.26
90°	M	4.39	5.12	4.48	5.28	4.07	5.84	5.68	4.63
68cm	S.D.	1.65	1.41	1.47	1.23	2.01	1.20	1.25	1.57
180°	M	4.75	4.86	4.40	4.24	5.22	4.08	5.51	5.17
48cm	S.D.	1.35	1.25	2.48	1.06	1.12	1.35	0.95	1.12
180°	M	4.35	4.75	4.15	5.07	4.86	4.68	5.66	5.23
58cm	S.D.	1.27	1.16	1.44	1.16	1.40	1.17	1.00	1.12
180°	M	4.97	4.91	4.75	5.03	4.46	5.07	5.64	4.77
68cm	S.D.	1.58	1.41	1.44	1.18	1.77	1.41	1.15	1.55
270°	M	5.64	4.88	5.32	4.28	4.85	4.12	5.42	4.70
48cm	S.D.	1.20	1.25	1.25	1.15	1.23	1.40	1.10	1.37
270°	M	4.93	4.77	4.80	4.95	4.39	4.58	5.45	4.62
58cm	S.D.	1.38	1.10	1.41	1.05	1.61	1.31	0.99	1.55
270°	M	5.33	5.11	5.03	5.00	4.62	4.72	5.42	4.41
68cm	S.D.	1.44	1.35	1.45	1.15	1.70	1.54	1.21	1.54
360°	M	4.90	4.65	4.45	4.31	5.01	4.11	5.48	5.03
48cm	S.D.	1.40	1.31	1.39	1.26	1.30	1.40	1.31	1.28
360°	M	5.46	5.21	5.24	4.88	4.46	4.48	5.47	4.64
58cm	S.D.	1.29	5.06	1.32	1.01	1.43	1.18	1.15	1.35
360°	M	4.86	4.88	4.43	5.13	4.34	4.67	5.50	4.18
68cm	S.D.	1.72	1.48	1.60	1.16	1.83	1.59	1.43	1.83

2. Classification of expression word according to construction factor of flare skirt

Based on frequency data of 38 visual expression word of flare skirt, we analyzed main component of simulated flare skirt according to the changes in volume of flare and skirt length. By trying the varimax rotation using principal component analysis,

we could sample 3 factors. The cumulative percent of variance of those 3 factors was 59.25% and the factor of X type got 32.29% of variance and it was showed to be the most important factor, then the factor of A type 15.11% and the factor of H type 11.85%. <Table 3> shows the result of factor analysis.

<Table 3>Factor analysis according to construction factors of the flared skirts

factor & item		M.	S.D.	factor loading	eigen value	Cronbach's α	cumulative variance
factor I Xtype	180° 68cm	3.86	.43	.79	3.88	.62	32.29
	360° 68cm	3.80	.45	.78			
	270° 68cm	3.84	.41	.78			
	270° 58cm	3.97	.40	.65			
	360° 58cm	3.96	.42	.58			
factor II Atype	270° 48cm	4.34	.39	.88	1.81	.84	47.40
	360° 48cm	4.41	.44	.85			
	180° 58cm	4.20	.36	.40			
factor III Htype	90° 58cm	4.10	.31	.69	1.42	.70	59.25
	180° 48cm	4.47	.31	.61			
	90° 68cm	3.89	.36	.51			
	90° 48cm	4.48	.39	.50			

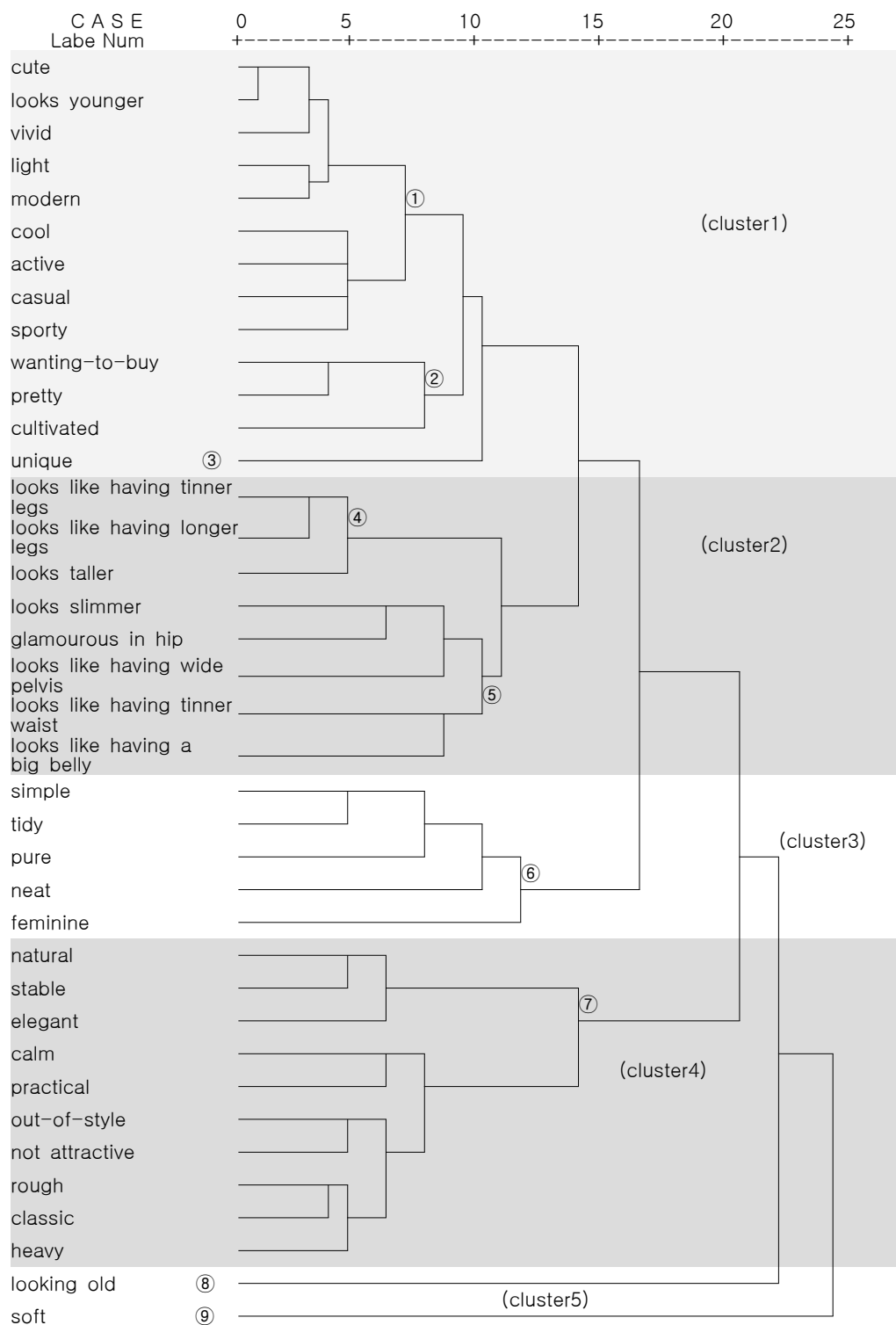
3. The hierarchy of image according to construction factor of flare skirt

In order to classify 38 chosen adjectives, cluster analysis was carried out. Through hierarchical cluster analysis, we looked at the combination process of visual expression words of flare skirt. As a result, <Figure 3> schematizes the linkage process of image expression word from dendrogram. And as considering the meaning, we could analyze construction of visual hierarchy of flare skirt. 38 expression words of flare skirt were divided into 9 sub cluster, and this was clustered again into 5. As we looked at the combination process of expression words, sub cluster 1 which was composed of 13 expression words, 'cute' and 'looks younger' were combined in the most closely related relationships, and 'vivid' was added and then, 'light' and 'modern' joined and then, 'cool', 'active', and 'casual' were added.

Therefore, sub cluster 1 and sub cluster 2, and 'ordinary' were combined to show cute, casual and younger looking 'A type - large volume of

flare and short skirt length' visual image expression word of flare skirt. Therefore, sub cluster 4 and sub cluster 5 were combined to show the combination process of visual effect expression word of figure related. Hence, sub cluster 6 was simple, tidy, and neat 'H type -small volume of flare and short skirt length' visual image expression word of flare skirt. Therefore, sub cluster 7 was combined to form stable, elegant, and older looking 'X type-large volume of flare and long skirt length' visual image expression words of flare skirt. Because sub cluster 8 and 9 lastly connected to each cluster, older looking and soft visual image could be considered to be the general image of the flare skirt.

Visual hierarchy construction according to construction factors of flare skirt could be divided into visual image and visual effect, and visual image was shown to be form 'A type - large volume of flare and short skirt length', 'H type-small volume of flare and short skirt length' and 'X type - large volume of flare and long skirt length'.



<Figure 3> Linkage process of visual main expression words of flare skirt

IV. Conclusion

This study analyzed hierarchy of image for visual evaluation of flare skirt. Stimuli were made by using I-Designer which is Virtual Sewing system. In the pre-research for making of stimuli, the most affective factors for appearance were shown to be silhouette, volume of flare, and skirt length. Therefore, stimuli for the study were set to be 4 different volume of flare (90°, 180°, 270°, 360°) and 3 different length of skirt(48cm, 58cm, 68cm). 'Feminine' got high score in all 12 flare skirt. When the skirt was short, it was natural, and as the skirt got longer, ordinary and pure image showed. Also, as the volume of flare got larger, the average of visual effect was higher than visual image. By trying the varimax rotation using principal component analysis, we could sample 3 factors. The cumulative percent of variance of those 3 factors was 59.25% and the factor of X type got 32.29% of variance and it was showed to be the most important factor. Visual hierarchy construction according to construction factors of flare skirt could be divided into visual image and visual effect, and visual image was shown to be form 'A type - large volume of flare and short skirt length', 'H type-small volume of flare and short skirt length' and 'X type - large volume of flare and long skirt length'.

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