

# A study on the Hand and the Sensibility Image of Preferred Underwear Textiles

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**Abstract :** The purpose of this study is to investigate the preference of the hand and the sensibility image of underwear textiles according to seasons. According to a recent survey of 109 college students, using a 7 scale evaluation to the preference of the hand and the sensibility image among 13 summer and 10 winter underwear textiles. The data was analyzed through mean, SD, factor analysis, t-test, Person correlation analysis and regression analysis using SPSS Win 11.0. The summer underwear textiles were classified according to six tactile factors: stiffness/surface unevenness, weight, elasticity, moistness, extension, and warm-cool and 3 sensibility image factors: elegant individual, modern, and sporty-casual. The winter textiles were classified according to six tactile factors: stiffness/surface unevenness, elasticity, warm-cool, drapability, moistness and flexibility and divided into 2 sensibility images: modern elegant and sporty-casual. Factors expressing hand and sensibility image according to season showed significant difference. In the summer, weight, in the winter, drapability and flexibility showed significant difference at the hand factor evaluation. The hand factors: weight, warm-cool and modern sensibility image factors effect the preference of summer underwear textile, also the hand factors-elasticity, stiffness/surface unevenness and the sensibility image factor-easy-sport-casual-effect the preference of winter textiles. Therefore, the thin, light, and cool textiles which are also gorgeous and sporty-casual are preferred for summer underwear textiles while soft, simple and comfortable textiles are preferred for winter textiles.

**Key Words :** underwear, college students, hand, sensibility image, season

## I. Introduction

The new trends in underwear will likely be more fashionable and functional due to the variety of designs and textiles. Underwear is a kind of inner wear that is generally called 'under-clothing', it mainly keeps the body warm and absorbs the body's secretion of sweat to prevent contamination of outer clothing. However, the new recognition of inner wear as a fashion item that represent a consumer's own characteristics or image is forcing an upgrade of inner wear fashion(Oh, 2003;

Fashionn.com, 2003. 1. 10; Textiletimes, 2002. 5. 4).

One of the new trends in underwear that has developed is functional underwear which includes wormwood, ocher, elvan, keto-glutamine to increase comfort, hygienic property, while decreasing irritation to the skin. Likewise, sterility, anti-bacterial benefits, deodorant, anti-static as well as dryness. Moreover, the selection of the characteristic textiles has increased in the industry in response to consumers' taste or seasonal needs (Fashionn.com, 2001. 10. 31; Fashionn.com, 2001. 11. 19; Fashionn.com, 2000. 5. 10; Fashionn.com, 2003. 6. 20).

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Adults prefer functional inner wear, while on the other hand, youths prefer fashionable innerwear (Fashionn.com, 2001. 11. 19). The new trend in inner wear is that youth are representing their fashion, taste and personality through their inner wear. Some textiles such as velvet, denim, leather, and synthetic suede are now used as inner wear textiles, while knit and spandex, traditionally inner wear, is now used as outer wear to look good and as sports wear (Oh, 2003; Fashionn.com, 2001. 6. 8; Fashionn.com, 2002. 9. 30; Fashionn.com, 2001. 3. 29).

Recently, inner wear which is designed as outerwear is most popular within the younger age group because of the denudation fashion trends. It has also increased attention to special inner wear such as 'designer innerwear' for consumers who have special body types, and 'corrected innerwear' for people who want the appearance of ideal body lines (Oh, 2003; Fashionn.com, 2000. 5. 10; Fashionn.com, 2000. 9. 27).

Therefore, the new trends of innerwear have increased the importance of textiles as well as design, so further studies should be planned with various inner wear textiles that satisfies consumer needs.

Previous studies about underwear were limited by purchase behavior (Chung, 1997; Kim *et al.*, 2001; Choi *et al.*, 1998; Chung & Kim, 2002), wearing sensation (Cho, 1989; An, 1986; Lee, 1998; Gu, 1983; Kim, 1982; Jeon, 1986), history of underwear (Kim, 1997), hygienic property (Choi, 1988; Lee, 1988; Lee, 1989), and easy-washing of textiles (Chung & Na, 1999).

However, the subject of further underwear studies should focus on the hand and the sensibility image of textiles according to consumer preference.

The purpose of this study is that,

1. Knowing the preferences of college students to the hand and the sensibility image of underwear textiles.
2. Comparing the differences of the hand and the sensibility image of underwear textiles by gender and season.
3. Analyzing the effects of the hand and the sensibility image on the preference of underwear textiles.

## II. Methods

### 1. Subjects and Method

This survey was conducted at H college in Choong Nam in Korea from April 14 to May 9, 2003, on the hand and sensibility image to underwear textiles of 109 students with majors in clothing. The investigation method consists of presenting underwear textiles and then the subject evaluates the hand and the sensibility image of it using 7 scale evaluation.

### 2. The evaluation of the hand and the sensibility image of textiles

13 summer and 10 winter underwear textiles which are on the market were presented for evaluation of the hand and the sensibility image with a simple sized 20 cm × 30 cm. After the subject observed materials with visual and tactual sense, one kind of the preferred textile was selected by season and then evaluated the hand and the sensibility image with an adjective pair with the 7 scale evaluation (1 is strongly agree; 7 is disagree). The purpose of this study is the investigation of the hand and the sensibility image of preferred underwear textiles, therefore, the subjects evaluated the hand and the sensibility image score only for the most preferred textiles. The questionnaire which was used for this study is similar to ones used in preceding research, (Kim & Na, 2003) changing some adjective pairs. It consisted of 10 questions about sensibility and 28 questions for the hand. Reliability coefficient (Cronbach's alpha) of total questions was 0.757.

### 3. Material

The characteristics of underwear textiles are presented at <Table 1> and <Table 2>. The summer textiles (from S1 to S13) are usually composed of

&lt;Table 1&gt; Characteristics of textiles for summer underwear

No.	fiber content	yarn count	structure	width (inch)	weight (g/yd <sup>2</sup> )	thickness (mm)	color	pattern
S1	cotton 75% polyester 25%	40's 50d	jacquard	60	220	0.44	Peach	floral
2	cotton 75% polyester 25%	40's 50d	jacquard	60	220	0.4	Light Blue	dot
S3	cotton 55% polyester 45%	30's 150d	jacquard	60	230	0.5	Gray/White	stripe
S4	cotton 55% polyester 45%	30's 150d	jacquard	60	230	0.4	Bluish Gray/White	geometrical
S5	cotton 75% polyester 25%	40's 50d	mesh	60	210	0.41	Light Blue	stripe
S6	cotton 72% polyester 28%	40's 75d	jacquard	60	190	0.45	White	non-objective
S7	cotton 75% polyester 25%	40's 50d	jacquard	60	220	0.42	Light Peach	stripe
S8	cotton 60% polyester 40%	40's 100d	jacquard	58	210	0.49	Bluish Gray/White	non-objective
S9	cotton 75% polyester 25%	40's 50d	jacquard	60	225	0.42	Light Brown	traditional
S10	cotton 70% polyester 30%	30's 100d	jacquard	60	210	0.59	Peach/White	floral
S11	cotton 100%	30's	jacquard	60	230	0.45	White	geometrical
S12	cotton 75% polyester 25%	40's 50d	jacquard	60	220	0.43	White	floral
S13	cotton 75% polyester 25%	40's 50d	jacquard	60	220	0.4	Light Blue	floral

blended yarn of cotton and polyester. The weave is mainly jacquard, and the pattern is mostly made of structure-jacquard. The samples S3 and S4 were color jacquard, and S10 is composed of a mixture of structure and color-jacquard. In the winter textiles (from W1 to W10), most fiber content is cotton mixed polyester (the same as summer material), but the blend ratio of polyester was slightly higher (ratio of the blended yarn of cotton and polyester) than summer ones. The weaves of samples W2 and W3 were plain and the rest of them were jacquard. The pattern of W2

and W3 were embossing, W8 and W9 were color jacquard, the rest of them were formed by structure jacquard. Commercial underwear textiles are changed according to season. Although weight and thickness are similar, fine structure, like gauge, and design, like color, are different.

#### 4. Analysis Method

##### 1) The characteristic of materials

Thickness of the textiles was measured until  $10^{-2}$  mm

&lt;Table 2&gt; Characteristics of textiles for winter underwear

No.	fiber content	yarn count	structure	width (inch)	weight (g/yd)	thickness (mm)	color	pattern
W1	cotton 50% polyester50%	siro-38s	jacquard	60	230	0.38	White/Gray	melange
W2	cotton 50% polyester50%	60's 50d bright	embossing	56	175	0.36	Dark Red	floral
W3	cotton 50% polyester50%	60's 50d bright	embossing	56	175	0.45	Wine	floral
W4	cotton 65% polyester35%	40's 75d bright	jacquard	48	190	0.6	Peach	floral
W5	cotton 65% polyester35%	40's 75d bright	jacquard	48	190	0.51	Pink	floral
W6	cotton 55% polyester45%	40's 75d	jacquard	60	230	0.46	Gray/White	bird's eye
W7	cotton 55% polyester45%	40's 50d	jacquard	60	230	0.42	Gray/White	geometrical
W8	cotton 55% polyester45%	30's 150d	jacquard	60	230	0.49	Beige/ Gray	stripe
W9	cotton 65% polyester35%	40's 75d bright	jacquard	48	190	0.52	Ivory/Beige	geometrical
W10	cotton 100%	30's	jacquard	60	230	0.44	Khaki	geometrical

using the thickness- gauge, and the weight of the textiles was measured with an electronic balance.

## 2) Analysis of data

SPSS Win 11.0 is used for statistical analysis of average and SD of evaluation scores. The t-test carried out for seasonal factors analysis show the hand and the sensibility image by gender and season. Pearson correlation analysis executed for the correlation to the hand with the sensibility image, it was also executed on the regression analysis for effect of the hand and the sensibility image on the preference.

## III. Results and Discussion

### 1. The hand and the sensibility image of underwear textiles

#### 1) The factors of the hand

The preferred textiles of seasonal underwear were

selected from previous research (Kim *et al.*, 2003) and then executed with the hand evaluation using these textiles. The scale for which the specific value of factors is above 1 was selected for the factor analysis and Varimax crossing rotation was used. The reliability of each factor was verified using Cronbach's alpha.

The hand factors of summer underwear textiles are classified by 6 factors as in <Table 3> - 'stiffness/surface unevenness', 'weight/moistness', 'elasticity', 'flexibility', 'extension' and 'warm-cool'. The explanation of the total variance (cumulative pct.) appeared with 56.56%. The 'stiffness/surface unevenness' which is the first factors includes rough, harsh, hard, crisp, uneven, soft, stiff, and straight ratings. It is explained that the characteristics of underwear which is directly in contact with the skin so the possibility of a similar feeling were classified the same category. In summer, heavy, coarse, thick, stick, and damp characteristics was classified with in the factor of 'weight/moistness'. The factor of 'elasticity' includes elastic, recover, and springy characteristics. Flexibility' includes the parching,

&lt;Table 3&gt; Hand Factor of Textiles for Summer Underwear

Factor	Korean hand description terms	English terms	Factor loading	Eigen Value	Cum.pct (%)	alpha
stiffness/ surface unevenness	geochilda/geochiljianhda	Rough	.89	4.30	15.37	.87
	kkasilkkasilhada/kkasilkkasilhajianhda	Harsh	.75			
	ttagttaghada/ttaktakhajianta	Hard	.74			
	ppeospeoshada/ppeospeoshajianhda	Crisp	.72			
	otoldotlhada/otoldotlhajianhda	Uneven	.71			
	budeuleobda/budeuleobjianhda	Soft	-.61			
	ppeodchinda/ppeodchijianhneunda	Stiff	.53			
	him-i-issda/him-i-eobsda	Straight	.43			
weight/ moistness	mugeobda/gabyeobda	Heavy	.80	3.54	28.02	.84
	tubaghada/tubaghaji-anhda	Coarse	.79			
	dukkeobda/yalbda	Thick	.76			
	kkeunjeogkkeunjeoghada/kkeunjeogkkeunjeoghaji-anhda	Stick	.70			
	nugnughada/nugnughaji-anhda	Damp	.62			
elasticity	tanlyeog-i-issda/tanlyeog-i-eobsda	Elastic	.86	2.46	36.80	.79
	hoebogseong-ijohda/hoebogseong-inappeuda	Recover	.76			
	sinchugseong-i-issda/sinchugseong-i-eobsda	Springy	.75			
flexibility	bosongbosonghada/bosongbosonghaji-anhda	Parched	.68	1.89	43.57	.51
	maekkeuleobda/maekkeuleobji-anhda	Smooth	.59			
	gamginda/gamgiji-anhneunda	Cling	.54			
	seonggeulda /seonggeulji-anhda	Loose	.45			
extension	neul-eonanda/neul-eonaji-anhneunda	Stretch	.81	1.86	50.20	.61
	neul-eojinda/neul-eojiji-anhneunda	Droopy	.75			
warm-cool	chomchomhada/chomchomhaji-anhda	Dense	.71	1.78	56.56	.60
	chagabda/tatteushada	Cold	.58			
	geonjohada/geonjohaji-anhda	Dry	-.46			
	si-wonhada/deobda	Cool	.42			

smooth, clingy feeling, also included are loosely spaced factor which effects airing. The nature of drooping or stretching is sorted as 'extension'. 'Warm-cool' classified by the degree of thickness, cold, cool and dry sensation.

The hand factors of winter underwear textiles are also classified with 6 factors (Table 4), 'stiffness/surface unevenness', 'elasticity', 'warm-cool', 'drapability', 'moistness' and 'flexibility' and then the explanation of the total variance (cumulative pct.) is 54.78%. Stiffness/surface unevenness which is the first factor includes hard, stiff or straight, also rough and knotty natures. It is explained by the characteristic of underwear which is directly in contact with the skin, so the possibility of a similar feeling was classified in the same category. 'Elasticity' includes elasticity, flexibility and recovery. 'Warm-cool' contains chilly, or cool feeling, and thick or heavy appearances (weight) which effects insulation. The nature of drooping or rolling categorized in

'drapeability'. The 'moistness' is the feeling of dryness, dampness and thickness. 'Flexibility' represents the nature of smoothness, softness and density.

Factors expressing hand and sensibility image according to season showed distinct differences. By the result of the hand evaluation of underwear textiles according to season, 'weight/moistness' factor is selected in summer and 'drapeability' and 'flexibility' factors are selected in winter. Namely, in summer, as apposed to winter, the characteristic of light, thin and dry are deemed important factors because of their effects on comfort when wearing. On the other hand, in winter, the textiles which include the nature of extensible, rolling, soft, smooth and dense are evaluated as a important factors due to the increase of insulation adhering closely to the body. It can be explained in the same way with the preceding research (Chung & Na, 1999) which indicated weight as the most important factor to the hand in

<Table 4> Hand Factor of Textiles for Winter Underwear

Factor	Korean hand description terms	English terms	Factor loading	Eigen Value	Cum. pct (%)	alpha
surface unevenness /stiffness	otoldotolhada/otoldotolhajianhda	Uneven	.79	4.22	15.08	.84
	geochilda/geochiljianhda	Rough	.75			
	ppeosppeoshada/ppeosppeoshajianhda	Crisp	.70			
	kkasilkkasilhada/kkasilkkasilhajianhda	Harsh	.67			
	ttagttaghada/ttakttakhajianta	Hard	.58			
	ppeodchinda/ppeodchijianhneunda	Stiff	.56			
	kkeunjeoggeolinda/kkeunjeoggeoliji-anhneunda	Stick	.47			
elasticity	tanlyeog-i-issda/tanlyeog-i-eobsda	Elastic	.84	2.51	24.04	.77
	hoebogseong-ijohda/hoebogseong-inappeuda	Recover	.76			
	sinchugseong-i-issda/sinchugseong-i-eobsda	Springy	.70			
warm-cool	chagabda/ttatteushada	Cold	.81	2.37	32.49	.72
	si-wonhada/deobda	Cool	.81			
	seonggeulda /seonggeulji-anhda	Loose	.48			
	mugeobda/gabyeobda	Heavy	.44			
drapability	neul-eonanda/neul-eonaji-anhneunda	Stretch	.77	2.17	40.23	.56
	neul-eojinda/neul-eojiji-anhneunda	Droopy	.76			
	gamginda/gamgiji-anhneunda	Cling	.49			
moistness	tubaghada/tubaghaji-anhda	Coarse	.74	2.16	47.94	.64
	geonjohada/geonjohaji-anhda	Dry	.63			
	nugnughada/nugnughaji-anhda	Damp	.62			
flexibility	maekkeuleobda/maekkeuleobji-anhda	Smooth	.79	1.91	54.78	.68
	chomchomhada/chomchomhaji-anhda	Dense	.74			
	budeuleobda/budeuleobjianhda	Soft	.52			

summer. This research also described that the important factors for purpose of wearing is sanitation for summer, insulation for winter.

As shown above, the most important factor which effects the hand is the stiffness/surface unevenness (cumulative pct.: summer 15.37%, winter 15.08%) because the characteristic of underwear which is in direct contact with the skin. One previous study (Lee. *et al.*, 2002) which studied shirts, and blouses also indicated that stiffness/surface unevenness as one of the important factors of clothing items touching the skin.

**2) The factors of sensibility image**

<Table 5> and <Table 6> represent the results of the analysis of sensibility image for underwear textiles according to seasonal preference.

Sensibility image for summer underwear textiles was classified into 3 factors : ‘elegant-individual’, ‘modern’, and ‘sporty-casual’ (Table 5) and then the explanation of

total variance (cumulative pct.) of the 3 factors is 63.08% which is relatively well explained by the sensibility image.

The sensibility image for winter underwear textiles was divided into 2 factors of ‘modern elegance’ and ‘sporty-casual’, the explanation of total variance (cumulative pct.) of the 2 factors is 67.94%. The pair of adjectives ‘elegant-individual’, ‘modern’ and ‘sporty-casual’ used for summer textiles renamed.

The factor of ‘elegant-individual’ includes refined, luxurious and cute individual characteristics. ‘Modern’ includes the sexy and brilliant feeling. The sporty, casual characteristics are sorted as ‘sporty casual’.

‘Modern elegant’ and ‘sporty casual’ for winter underwear textiles with adding some sensibility adjectives as like ‘modest’, ‘cute’ and ‘comfortable’. Each different adjective applied to different season, ‘modest’ and ‘comfortable’ for winter, meaning that each season contains different sensibility image factors.

<Table 5 > Sensibility Image Factor of Textiles for Summer Underwear

Factor	Korean sensible image description terms	English terms	Factor loading	Eigen Value	Cum. pct (%)	alpha
elegant-individual	selyeondoeda/selyeondoeji-anhda	Refined	.79	2.42	24.20	.74
	gogubseuleobda/gogubseuleobji-anhda	Luxurious	.77			
	gwi-yeobda/gwi-yeobji-anhda	Cute	.71			
	gaeseongjeog-ida/gaeseongjeog-iji-anhda	Individual	.58			
modern	segsihada/segsihaji-anhda	Sexy	.85	2.14	45.58	.53
	hwalyeohada/hwalyeohaji-anhda	Brilliant	.67			
sporty casual	seupotihada/seupotihaji-anhda	Sporty	.86	1.75	63.08	.70
	kaejyu-eolhada/kaejyu-eolhaji-anhda	Casual	.85			

<Table 6 > Sensibility Image Factor of Textiles for Winter Underwear

Factor	Korean sensible image description terms	English Terms	Factor loading	Eigen Value	Cum. pct (%)	alpha
modern- elegant	gaeseongjeog-ida/gaeseongjeog-iji-anhda	Individual	.90	4.10	41.03	.92
	hwalyeohada/hwalyeohaji-anhda	Brilliant	.88			
	segsihada/segsihaji-anhda	Sexy	.84			
	selyeondoeda/selyeondoeji-anhda	Refined	.83			
	gogubseuleobda/gogubseuleobji-anhda	Luxurious	.83			
sporty casual	kaejyu-eolhada/kaejyu-eolhaji-anhda	Casual	.84	2.69	67.94	.77
	seupotihada/seupotihaji-anhda	Sporty	.82			
	susuhada/susuhaji-anhda	Modest	.71			
	gwi-yeobda/gwi-yeobji-anhda	Cute	.68			
	pyeon-anhada/pyeon-anhaji-anhda	Comfortable	.46			

Therefore, these results showed that summer underwear emphasized a fashionable image and winter underwear emphasized a comfortable feeling.

## 2. The hand and the sensibility image factors according to gender

<Table 7> showed the results of differences in the hand and the sensibility image factors according to gender by t-test.

There is no significant difference between genders in the hand and the sensibility image factors in summer underwear textiles.

On the other hand, in winter underwear textiles, modern elegance sensibility image showed significant difference between genders.

The females who participated in this study evaluated the winter textiles that there is nothing characteristic, brilliant, elegance and luxury. They also have a more negative (1 point: strongly agree-7 point: strongly disagree) point of view than male to the hand and the

<Table 7> Hand and Sensibility Image Factor of Winter Underwear Textiles According to gender (t-test)

	Factor	Male (Mean)	Female (Mean)	t
Hand	surface unevenness /stiffness	-.33	.06	1.476
	elasticity	-.26	.05	1.181
	warm-cool	-.22	.04	.988
	extension	.34	-.06	-1.519
	moistness	-.14	.02	.641
	flexibility	-.07	.01	.323
	rigidity	-.01	.00	.061
	surface property	-.35	.06	1.564
	wrinkle resistance	-.40	.07	1.813
	Sensibility Image	modern elegant	-.68	.12
sporty casual		.14	-.03	-.622

\*\* P < .01

sensibility image of textiles, so, the evaluation score of the factors is higher than that of males. In the previous studies (Chung and Na, 1999), there are some results that females' standards of evaluation of hand and

sensibility image factor is relatively higher than that of males resulting in female students evaluating more negatively to the flexibility factor than males.

### 3. The correlation of the hand and the sensibility image factors

The results of the correlation of the hand and the sensibility image factors for underwear textiles represented in <Table 8>. This analysis used the Pearson correlation analysis.

In summer, 'modern' image correlates with 'weight'

and 'warm-cool' also 'sporty-casual' showed correlation with 'extension'. Therefore, thin, light, dry and cool textiles represent the 'modern' sensibility image well, and extended textiles represent the 'sporty casual' sensibility image.

In winter underwear textiles, 'modern elegant' correlate with 'elasticity' and 'moistness', and 'easy-sporty-casual' correlated with 'elasticity'. Therefore, the textiles which has good elasticity, recovery and flexibility as well dry and not coarse represents the sensibility image of 'modern elegant', and textiles which have good elasticity, recovery and flexibility represent

<Table 8> The Correlation among Hand and Sensibility Image Factor

Factor	Summer			Factor	Winter	
	elegant-individual	modern	sporty casual		modern elegant	easy-sporty casual
stiffness/surface unevenness	.33	.32	.31	surface unevenness/stiffness	.00	.11
weight	.32	.81*	.23	elasticity	.97**	.99**
elasticity	.00	.11	.42	warm-cool	.35	.14
moistness	.30	.01	.05	extension	.02	.01
luster	.18	.03	.06	moistness	.90*	.05
extension	.14	.33	.89*	flexibility	.10	.42
warm-cool	.06	.62*	.10	rigidity	.17	.14
				surface property	.01	.21

\* P < .05, \*\* P < .01

<Table 9> Regression Analysis of the Hand and the Sensibility Image Factor on the Preference of Underwear Textiles

Season	Dependent variable	Independent variables	Constant	β	t	R	R <sup>2</sup>	F
summer	preference	elegant individual	2.431	.456	*** 5.423	.501	.251	*** 17.717
		sporty-casual		.206	*** 2.455			
regression equation: $y = 2.431 + 0.672 (\times 1) + 0.304 (\times 2)$								
winter	preference	modern elegant	3.342	.442	*** 4.974	.463	.215	*** 9.758
		drapability		.226	** 2.562			
		warm-cool		-.191	** -2.213			
regression equation: $y = 3.342 + 0.689 (\times 1) + 0.352 (\times 2) - 0.298 (\times 3)$								

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



the sensibility image of 'easy-sporty-casual'.

#### **4. The effects of the hand and the sensibility image factors on the preference of underwear textiles**

The result of the effects of the hand and the sensibility image factors on the preference can be observed in <Table 9>.

The biggest effect factors to the preference of summer underwear textiles are, 'elegant-individual' and 'sporty casual' sensibility image. In the case of winter, 'drapability' and 'warm-cool' are the factors in tactile sense, 'modern elegant' is the main factor in sensibility image. Therefore, the preference of summer textiles is related to factors of sensibility image such as refined, individual and sporty.

Also, it is more important that the hand factors, which are warm and stretch, certain to the preference of winter textiles. It implies that the hand and the sensibility image effects on the preference of underwear textiles according to gender. There are also some different factors between hand and sensibility image factors which effect the preference by season.

### **IV. Conclusion**

This study analyzed the hand and the sensibility image of underwear textiles according to season and came to the following conclusions.

1. In summer underwear textiles, the six factors; stiffness/surface unevenness, weight, elasticity, moistness, extension, and warm-cool are selected for tactile factors and the three factors ; 'elegant individual', 'modern' and 'sporty-casual' are selected for sensibility image.

2. Winter underwear textiles were classified into six different hand factors-'stiffness/surface unevenness', 'elasticity', 'warm-cool', 'drapeability', 'moistness', 'flexibility' and then divided into 2 sensibility images-'modern elegant' and 'sporty-casual'.

3. There is a difference between summer and winter in hand factors as well as the sensibility image factors. In summer, 'weight' and 'characteristic' are selected for hand and sensibility image, and 'elasticity' and 'easy' image are selected in winter.

4. In the result of the t-test to evaluate hand and sensibility image of underwear textiles by season, there is no significant difference between hand and sensibility image in summer underwear textiles, on the other hand, winter underwear textiles showed significant differences in 'modern elegance' factor. Overall, the evaluation of female students is more negative than that of males.

5. In the results of the correlation of hand and sensibility image, 'modern' image is related to 'weight' and 'warm-cool' factors, and 'sporty-casual' related to 'extension' factor in summer underwear textiles. That is, in summer, light textiles (not thick and coarse) represent 'modern' sensibility image and flexible texture represent 'sport-casual' sensibility image. 'Modern elegant' factor in winter related to 'elasticity' and 'moistness', and 'sporty-casual' factor related to 'elasticity'. Therefore, elasticity, recovery, flexibility as well as wrinkle recovery show 'modern elegant' image, and the textiles which have good elasticity, recovery and extension show 'sporty-casual' image.

6. The results of effects of hand and sensibility image on the preference of underwear textiles by season, sensibility image factors such as 'elegant-individual' and 'sporty-casual' effects on the preference of summer underwear textiles, also 'drapability', 'warm-cool' of hand factors and modern-elegant' of sensibility image factors effects the preference of winter underwear textiles.

Therefore, the textiles which are refined and sporty-casual were preferred for summer underwear textiles, and warm, stretchable and characteristic textiles were preferred for winter underwear textiles.

The generalization of the results of this research should be considered carefully because the restriction of subjects which was limited to H college students.

Further research needs to not only enlarge the area and

subjects but continue research into various underwear textiles.

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