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Effects of Color and Size of Motif on Image Perception of Paisley Patterns

Two elements of paisley textile design (color and size of motif) were manipulated to investigate their effects on people's perception. Korean and Caucasian American women were selected to represent Asian and Western countries to compare the differences in image perceptions of paisley patterns between two cultures. The participants were 168 female university students composed of 84 Caucasian Americans and 84 Koreans. The experimental design was a 2 × 2 × 7 factorial design: two levels of perceiver's culture, two levels of motif size, and seven levels of the motif color. The four factors used to account for image perception were an elegance factor, individuality factor, maturity factor, and femininity factor. The results of the present study confirm that image perception can be different according to the color and size of a motif and the perceiver's culture. In the results, Americans perceived the paisley pattern as more preferable than Koreans did. Red background + Orange motif was perceived as the most feminine and Dark blue background + Sky blue motif and Dark gray background + Gray motif was perceived as the most masculine in both cultures. Compared to the big motif, the small motif was perceived as more elegant in both cultures.

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Textile design is a major design factor during the clothing design process. In textile design, the color and size of the motif are important design elements (Wilson, 2001), which influence the image perception of textile design. Additionally, the image perception will vary depending across different cultures. Finding out appropriate and appealing design elements when designing a textile for a certain culture will help the apparel industry become more profitable in international markets. As the fashion industry is more involved in globalization, cross-cultural studies of the image perception for textile design are necessary for the development of products. In particular, image preferences of Asian countries and Western countries will be different as they have distinctively different cultural and historical backgrounds (DeLong, 1998).

In this study, a paisley textile pattern was selected as a motif to investigate the image perceptions of textile designs. The paisley textile pattern has been popularly used for interior and apparel design throughout history. The design has had several cultural mixtures and influences (both Asian and Western) during its development process. The first paisley pattern started in the 18th century in India and later developed for use in India, Persia, and Europe; however, the actual word 'Paisley' originated from the town of Paisley in Scotland (Fujioka, 1989; Joyce, 1993). In the 19th century in Europe, the paisley textile pattern became very popular and the pattern is still in demand for use in modern designs

worldwide. However, applying the same design elements directly from the historical era to modern designs may not be suitable. The paisley pattern is known for its organic shapes; depending on its motif color, layout, and size, the design creates different looks from a conservative image to a modern and dramatic image (Joyce, 1993). Determining design elements of paisley textile patterns that work best for different cultures will be applicable to textile design and apparel design industries.

Color is the first thing people react to when viewing textile design (Cha, 1999). "A mediocre design can be made into a good one with beautiful color, and an excellent design can be spoiled with poor color choices" (Joyce, 1993, p. 97). Many studies exist on general color preferences as well as color preferences of specific products including clothing. However, often, Western concepts of color have often been generalized to other countries (Aslam, 2006).

The perceptions of color and color preferences for clothing have been studied extensively. Lind (1993) studied color usage for clothing and compared the similarities with color preferences for abstract colors. Radeloff (1991) examined the relationship between color preferences and the personalities of the perceivers. However, few studies specifically researched color preferences or perceptions on textile design in different cultures. Joyce (1993) stated that, "Typical paisley colors are combinations of rich red, blue, green, and gold with brown and black, although innovative color combinations can give the classic paisley design a fresh look, for both fashion and home decorating" (p. 53). Studies showed that different hue, chroma, and value of color dimensions of products give different image perceptions (DeLong, 1998; Francis & Evans, 1988). In this study, various combinations of hue, chroma, and value were used to investigate the differences and similarities of the image perceptions of the participants from two different cultures.

After color is decided for a motif, the next thing to consider in regards to the image of textile patterns is the size of the motif. Myers (1989) in explaining the relative visual attraction stated that, "Any figure may gain or lose weight based on its size" (p. 98). In producing a textile design, three factors (the size of motifs, the layouts, and the desired end-use of the fabric) influence each other to determine the textile design size (Wilson, 2001). An appropriate and attractive motif scale is decided based on the product type that a textile design is created for. Whether a design is for interior purposes or for textile purposes, the repetition of a design varies and the motif scale within the repeat changes (Wilson, 2001). Usually, a motif is smaller within one repeat for apparel design use and larger for interior design use (Yates, 1996).

In this study, two elements of textiles design, color and size of motif, were manipulated to investigate their effects on people's perception. Korean and Caucasian American women were selected to represent Asian and Western countries to compare the differences in the image perception of paisley patterns between the two cultures. The objectives of the research were (1) to evaluate the effect of the color of the paisley pattern motif on the image perception of Korean and American women and (2) to evaluate the effect of the size of the paisley pattern motif on the image perception of Korean and American women.

METHOD

The experimental design was a $2 \times 2 \times 7$ factorial design: two levels of perceiver's culture (American and Korean), two levels of motif size (big and small), and seven levels of the motif color. The dependent variable was the image perception of paisley patterns. A questionnaire with 14 stimuli was used as an instrument for the research.

Participants

The participants were 168 female university students composed of 84 Caucasian Americans and 84 Koreans. Korean participants were recruited from a university in a metropolitan city in Korea. American participants were recruited from a university in an Eastern state in the U.S. The age range of the participants was 18 to 35 and the mean age was 21.78. The experiment was administered in classrooms in Korea and was administered at libraries and cafeterias in the U.S.

Stimuli

The stimuli were 14 paisley patterns, which were seven colors of the same pattern with big and small sizes for each. A paisley motif image was scanned from a textile design book and the color and the size were modified using Adobe® Photoshop®. The variations of hue (color name), chroma (brightness-dullness), and value (lightness-darkness) of the color dimension were selected based on the Munsell® color system (Long & Luke, 2001; Munsell, 1915); the color variations were selected in order to represent various color combinations frequently used in textile design. The Munsell® color system is described with initials representing hue followed by two numbers representing value and chroma separated by a slash. For example, 5R 4/10 indicates a pure red at value 4 and chroma 10. Each hue has 10 sub-steps and 5 indicates the purest hue. The selected color combinations were: (1) Warm analogous color scheme: a red background (5R 4/10) + an orange motif (2.5YR 6/10). (2) Cold analogous color scheme: a dark blue background (5PB 4/10) + a sky blue motif (5PB 6/6). (3) Complementary color scheme: a yellow-green background (5GY 5/5) + an orange motif (2.5YR 6/10). (4) Less saturated complementary color scheme: a dark green background (5G 4/4) + a brown motif (5R 4/3). (5) Less saturated analogous color scheme: a brown background (2.5YR 3/4) + a beige motif (2.5YR 8/4). (6) Achromatic and chromatic color scheme: a gray background (N 4/) + a red motif (5R 4/10). (7) Achromatic color scheme: a dark gray background (N 3/) + a grey motif (N 7/).

The size of the big motif was 2 inches in width and the small motif was 1 inch in width. The two motif sizes selected were determined to be frequently used textile motif sizes in clothing design. The size of the stimulus for the big motif was 8.5 × 4 inches and the small motif was 6.5 × 3 inches (Figure 1).

Figure 1. *Stimuli in Big Size and Small Size*

Questionnaire

In order to use a semantic differential scale, five factors determined to be suitable for textile pattern evaluation were selected; these were attractiveness factor, elegance factor, individuality factor, maturity factor, and femininity factor. Twenty-two pairs of adjectives were selected from previous literature about image perception on textile patterns and clothing (Damhorst, 1990; Kang, 1996; Kim, 2000; Lee, 2002) and one pair of adjectives was added. In total, 23 bipolar adjectives for the evaluation of paisley image perception were selected.

A principle component factor analysis was performed on the scores for the 23 bipolar adjectives scales, using the Varimax Rotating Method. The result disclosed four factors and the attractiveness factor was found to be unrelated. After the first factor analysis, three pairs of inappropriate adjectives were eliminated and an 'I like-I dislike' adjective was classified separately as the preference variable. A second factor analysis was performed on 19 scales and the analysis produced four factors (Table 1). The four factors used to account for image perception were elegance factor, individuality factor, maturity factor, and femininity factor. The elegance factor included 7 adjective pairs: dignified - not dignified, high quality - shabby, noble – shallow, elegant – not

Table 1. *The Result of Factor Analysis of Pattern Image Perception*

Factor 1. Elegance	Factor Loading	Factor 2. Individuality	Factor Loading
Dignified - Not Dignified	0.81	Daring - Timid	0.80
High Quality - Shabby	0.78	Individual - Ordinary	0.75
Noble - Shallow	0.77	Splendid - Plain	0.67
Elegant - Not Elegant	0.76	Prominent - Not Prominent	0.66
Refined - Rustic	0.76	Conservative - Liberal	-0.65
Good Taste - Bad Taste	0.61		
Intellectual - Not Intellectual	0.60		
% of Variance = 23.81 %		% of Variance = 15.35 %	
Cumulative % = 23.81 %		Cumulative % = 39.16 %	
Eigenvalue = 4.52 α =.87		Eigenvalue = 2.92 α =.78	
Factor 3. Maturity	Factor Loading	Factor 4. Femininity	Factor Loading
Cute - Not Cute	0.72	Soft - Hard	0.78
Youthful - Mature	0.72	Feminine - Masculine	0.72
Classic - Modern	-0.64	Warm - Cold	0.62
Neat - Sloppy	0.59		
% Of Variance = 11.78 %		% of Variance = 10.09 %	
Cumulative % = 50.94 %		Cumulative % = 61.03 %	
Eigenvalue = 2.24 α =.65		Eigenvalue = 1.92 α = .59	

elegant, refined – rustic, good taste - bad taste, and intellectual - not intellectual. The individuality factor included 5 adjective pairs: daring – timid, individual – ordinary, splendid – plain, prominent - not prominent, and conservative – liberal. The maturity factor included 4 adjective pairs: cute – not cute, youthful – mature, classic – modern, and neat – sloppy. The femininity factor included 3 adjective pairs: soft – hard, feminine – masculine, and warm – cold.

All the adjective scales had a factor loading of .59 or greater and accounted for 61.03% of the variance for the 19 scales. The reliabilities of each factor were assessed using Cronbach's alpha. The reliability for the elegance factor was $\alpha = .87$, the individuality factor was $\alpha = .78$, the maturity factor was $\alpha = .65$, and the femininity factor was $\alpha = .59$.

Procedures

Each participant was randomly assigned to two of 14 stimuli and as a result, 12 or 13 participants were assigned to each stimulus. The participants were asked to evaluate the stimuli with the 23 bipolar adjectives and record their agreement or disagreement to the word pairs on 7-point semantic differential scales ranging from –3 to 3 (-3 = strongly disagree, 3 = strongly agree). The questionnaire also included questions about the academic year, age, and the nationality of participants.

Analysis

The data were analyzed by the SPSS statistical package. The statistical analyses conducted for this research were descriptive analysis, factor analysis, Cronbach's α, three-way analysis of variance, *t*-test, chi-square test, and Duncan's multiple range test.

RESULTS

Image Perception according to Perceiver's Culture, Motif Size, and Motif Color

A three-way ANOVA was conducted to compare the image perception according to the perceiver's culture, motif size, and the motif color; the results are presented in Table 2. The significance was

Table 2. *ANOVA Result: Comparison of Image Perception According to Perceiver's Culture, Motif Size, and Motif Color*

Source of Variance		df	Elegance *F*	Individuality *F*	Maturity *F*	Femininity *F*	Preference *F*
Main Effect	Culture(A)	1	0.82	0.00	177.98**	0.60	41.83**
	Size(B)	1	10.90**	2.73	0.08	0.20	2.61
	Color(C)	6	4.2	5.9	7.31	7.89**	4.79
2-way ANOVA	AxB	1	2.28	4.95*	6.05*	6.22*	7.03**
	AxC	6	0.39	2.25*	1.77	7.49**	0.79
	BxC	6	0.5	0.91	0.73	0.88	0.97
3-way ANOVA	AxBxC	6	1.17	2.00	0.89	0.55	0.74
Residual		312	*M*	*M*	*M*	*M*	*M*
Culture	Korean	172	4.21	4.15	5.38	4.16	2.83
	American	168	4.31	4.14	4.15	4.24	4.01
Size	Small	170	4.44	4.05	4.78	4.22	3.57
	Large	170	4.07	4.23	4.76	4.18	3.26
Color	BSb	49	4.15(c)	4.13(b)	4.24(d)	3.84(cd)	4.20(a)
	RO	50	4.23(bc)	4.70(a)	4.58(cd)	4.90(a)	3.86(ab)
	YgO	48	3.96(c)	4.58(a)	4.67(bc)	4.46(b)	2.75(d)
	GB	49	4.01(c)	3.98(b)	5.01(ab)	4.03(bcd)	3.00(cd)
	BB	48	4.59(ab)	3.76(b)	5.01(ab)	4.20(bc)	3.29(bcd)
	GR	48	4.10(c)	4.05(b)	5.23(a)	4.24(bc)	3.04(cd)
	GG	48	4.77(a)	3.78(b)	4.69(bc)	3.71(d)	3.73(abc)

*$p < .05$, **$p < .01$

BSb : Dark blue background + Sky blue motif, BB : Brown background + Beige motif, RO : Red background + Orange motif, GR : Gray background + Red motif, YgO : Yellow green background + Orange motif, GG : Dark gray background + Gray motif, GB : Dark green background + Brown motif

measured at a $p < .05$ level. The result indicated that there were significant main effects on culture, motif size, and motif color on image perception. The culture of the perceiver had a significant main effect on maturity and preference. Koreans perceived the stimuli as more mature than Americans did and Americans preferred the stimuli more than Koreans did. Motif size had a significant main effect only on the elegance factor. A small motif was perceived as more elegant when compared to a big motif. Motif color had a significant main effect only on femininity. The results of the Duncan's multiple range test showed that Red background + Orange motif was perceived as the most feminine and Dark blue background + Sky blue motif and Dark gray background + Gray motif were perceived as the most masculine.

Interaction Effect

There was a double interaction effect between culture and motif size on individuality, maturity, femininity, and preference (Table 3). Americans perceived the big motif more as individual than the small motif and Koreans were influenced minimally by the motif size when perceiving the individuality of the paisley motif (Figure 2). Koreans perceived the big motif as more mature than the small motif and Americans perceived the small motif as more mature than the big motif (Figure 3). Koreans perceived the small motif more feminine than the big motif and Americans perceived the big motif as more feminine than the small motif (Figure 4). Koreans preferred the big motif less than the small motif and Americans preferred the big motif more than the small motif (Figure 5).

Table 3. *Means of Individuality, Femininity, Maturity, and Preference According to the Culture and the Size of the Pattern*

Size Culture	Individuality		Maturity		Femininity		Preference	
	Small *M (SD)*	Large *M (SD)*	Small *M (SD)*	Large *M (SD)*	Small *M (SD)*	Large *M (SD)*	Small *M (SD)*	Large *M (SD)*
Korean	4.18(1.11)	4.11(1.14)	5.28(0.94)	5.49(0.87)	4.31(0.17)	4.01(1.10)	3.23(1.86)	2.43(1.48)
American	3.92(1.11)	4.36(1.13)	4.28(0.90)	4.02(0.93)	4.13(1.04)	4.35(1.04)	3.92(1.81)	4.11(1.80)

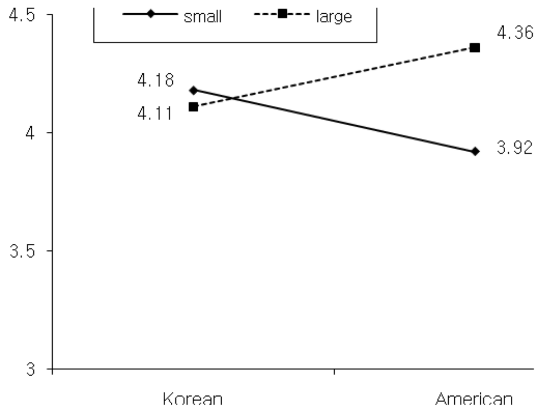

Figure 2. *Means of Individuality Factor According to the Culture and the Size of the Pattern*

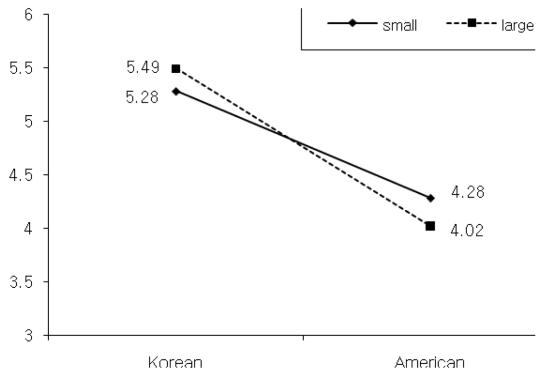

Figure 3. *Means of Maturity Factor According to the Culture and the Size of the Pattern*

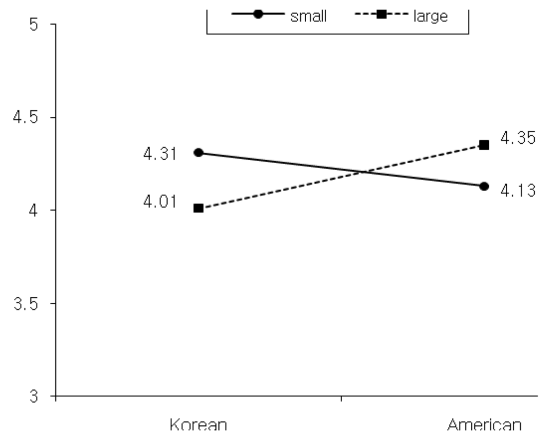

Figure 4. *Means of Femininity Factor According to the Culture and the Size of the Pattern*

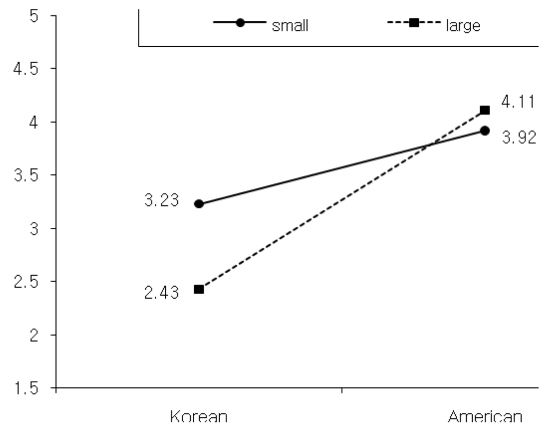

Figure 5. *Means of Preference According to the Culture and the Size of the Pattern*

There was a double interaction effect between culture and motif color on individuality and femininity (Table 4). Koreans perceived Dark blue background + Sky blue motif and Red background + Orange motif as more individual than Americans did (Figure 6). Americans perceived Yellow green background + Orange motif, Dark green background + Brown motif, Brown background + Beige motif, and Dark gray background + Gray motif as more individual than Koreans did.

In the perception of femininity, Koreans perceived Red background + Orange motif and Gray background + Red motif as more feminine than Americans did (Figure 7). Americans perceived Dark blue background + Sky blue motif and Dark gray background + Gray motif as more feminine than Koreans did. There was no triple interaction effect between culture, motif size, and motif color.

Table 4. *Means of Individuality and Femininity Factors According to the Culture and the Color of the Pattern*

Color Culture		BSb *M (SD)*	RO *M (SD)*	YgO *M (SD)*	GB *M (SD)*	BB *M (SD)*	GR *M (SD)*	GR *M (SD)*
Individuality	Korean	4.56(0.89)	4.82(1.00)	4.42(1.15)	3.85(1.27)	3.64(1.07)	4.08(1.00)	3.59(0.93)
	American	3.68(0.85)	4.58(1.15)	4.74(1.47)	4.13(0.77)	3.88(0.94)	4.02(1.10)	3.96(1.26)
Femininity	Korean	3.21(0.93)	5.21(0.74)	4.44(0.94)	3.97(0.97)	4.28(1.01)	4.69(0.98)	3.28(0.97)
	American	4.49(0.77)	4.57(0.80)	4.47(0.94)	4.10(1.32)	4.13(1.16)	3.79(0.97)	4.14(1.14)

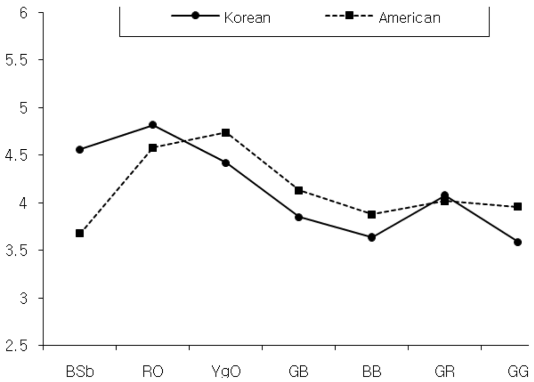

Figure 6. *Means of Individuality Factor According to the Culture and the Color of the Pattern*

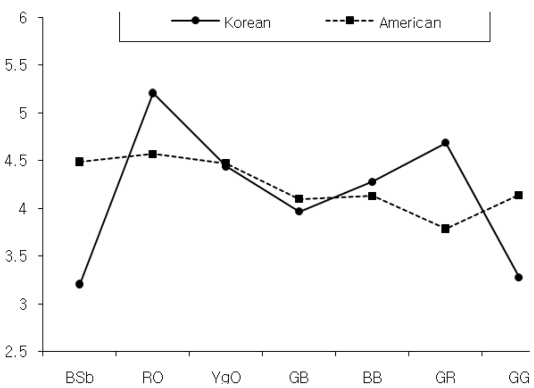

Figure 7. *Means of Femininity Factor According to the Culture and the Color of the Pattern*

A *t*-test was conducted in order to see the differences in preferences for each 14 paisley motifs between Koreans and Americans and the results are presented in Table 5 and Figure 8. The results of the *t*-test showed that there were no significant differences in the preference of small motifs between Koreans and Americans. Among the big motifs, Dark blue background + Sky blue motif, Red background + Orange motif, Brown background + Beige motif, and Dark gray background + Gray motif were preferred more by Americans than Koreans.

Table 5. *Difference of Pattern Preference between Koreans and Americans*

Color \ Culture	Korean	American	*t*
	M (SD)	*M (SD)*	
BSb –S	4.15(1.77)	4.75(1.54)	-0.90
BSb – L	3.00(1.54)	4.92(1.00)	-3.63**
RO- S	3.77(2.09)	4.42(1.62)	-0.86
RO – L	2.77(2.77)	4.58(4.58)	-2.40*
YgO – S	2.42(1.24)	3.08(1.78)	-1.06
YgO – L	2.25(1.06)	3.25(1.82)	-1.65
GB – S	3.42(2.39)	3.50(1.98)	-0.09
GB – L	2.00(1.68)	3.17(1.59)	-1.78
BB –S	3.33(2.06)	3.67(1.78)	0.43
BB –L	1.88(1.19)	4.33(1.67)	-4.22**
GR – S	2.67(1.56)	3.92(1.93)	-1.75
GR – L	2.42(1.62)	3.17(2.04)	-1.00
GR – S	2.75(1.36)	4.08(1.93)	-1.96
GR – L	2.75(2.75)	5.33(5.33)	-5.17**

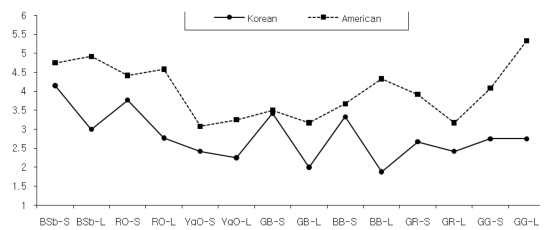

Figure 8. *Means of Preference According to the Culture and the Size and the Color of the Pattern*

DISCUSSION

The results of this study confirm that image perception can differ according to the color and size of a motif and the perceivers' culture. In the results, Americans perceived the paisley pattern as more preferable than Koreans did. One of the results

shows that Koreans perceived the stimuli as more mature than the Americans did. As participants were young female college students, Koreans may have preferred the pattern less because it was considered too mature an image. This implication suggests that in the Korean market, paisley textile patterns can serve as a better selling point in clothing design for an older generation.

Color

In general, Red background + Orange motif was perceived as the most feminine and Dark blue background + Sky blue motif and Dark gray background + Gray motif was perceived as the most masculine in both cultures. However, when compared within the two cultures, Koreans perceived Red background + Orange motif and Gray background + Red motif as more feminine than Americans did. Americans perceived Dark blue background + Sky blue motif and Dark gray background + Gray motif as more feminine than Koreans did. These findings imply that Koreans may associate warm color schemes with femininity while cold color schemes and achromatic color schemes with masculinity more than Americans do and Americans associate femininity and masculinity regardless of warm or cold colors in color schemes. Similar cultural differences are indicated in the literature that red is a color that a bride wears in China, but recognized as a masculine color in the UK and France (Neal, Quester & Hawkins, 2002).

Koreans perceived Dark blue background + Sky blue motif and Red background + Orange motif as more individual than Americans did. Americans perceived Yellow green background + Orange motif, Dark green background + Brown motif, Brown background + Beige motif, and Dark gray background + Gray motif as more individual than Koreans did. From this finding, Koreans perceived analogous color schemes as individual and Americans perceived complementary, less saturated, and achromatic color schemes as individual.

Among big motifs, Dark blue background + Sky blue motif, Red background + Orange motif, Brown background + Beige motif, and Dark gray background + Gray motif were preferred more by Americans compared to Koreans. The literature found that blue and red are universally favored colors by Americans (Birren, 1961; Choungourian, 1968). Lind's (1993) study also found color schemes with blue and red to be preferred. Literature shows that people in the U.S. perceive products with dark colors as rich and with high value; therefore, many expensive and high-technological products are often in dark grey colors (Stanton, Etzel & Walker, 1994).

Motif Size

Compared to the big motif, the small motif was perceived as more elegant in both cultures. Americans perceived the big motif as more individual than the small motif and Koreans were influenced minimally by motif size when perceiving the individuality of the paisley motif. Americans perceived the small motif as more mature than the big motif and Koreans perceived the big motif as more mature than the small motif. Americans perceived the big motif as more feminine than the small motif and Koreans perceived the small motif as more feminine than the big motif.

Americans preferred the big motif more than the small motif and Koreans preferred the big motif less than the small motif. The preference for the small motif by Koreans may be due to their smaller body size and the preference for the big motif by Americans may be due to their larger body size. Yates (1996) states that when determining the apparel textile size, the overall feeling of clothing on a person needs to be considered and that the large motif size may look unbalanced on a person. In this study, the overall feeling of 'largeness' in size needs to be considered in terms of the end product and in terms of cultural size differences in body shapes.

CONCLUSION

The current study supports that culture is a factor that influences the perception of paisley textile designs. In particular, the current study found the differences between Asian and Western culture. This cultural difference in textile element preference was also found when tourists from different countries

evaluated preferences of design elements in Hawaiian printed fabrics (Hyllegard & Morgado, 2001). The results suggest that when marketing to different countries that apparel and textile companies should approach textile designs with different elements appropriate for each culture as marketing strategies.

The study also supports that different colors and motif sizes separately and interactively conveyed different images to perceivers. Hyllegard and Morgado's (2001) study also found different interaction effects of several textile design elements including color and motif size on the reactions of consumers. We suggest marketers determine the types of image they want their products to convey and locate their target in the preferred image of customers so that it is possible to use the color and motif size that target customers associate with the image. Further studies on the motif size related to the motif layout and space will help produce more information about the influences of the motif size in textile designs on image perception. This study had limitations in that the stimuli were presented as a small paper format. Results could differ if the stimuli were presented on garments. For future studies, it is desirable to investigate the image perception of textile design on different garments types. Another limitation includes the light settings of the experimental environments. Different light settings affect color perceptions. The investigation of image perceptions of textile design in a controlled light setting environment is recommended for future studies.

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