

Relationship between cognition/attitude on colors and color preference style

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ABSTRACT

In order to clarify the psychological aspect of color preference, we examined the relationship between cognitive factors of individuals such as color stereotype and color consciousness and their color preference style. 297 subjects answered the degree of liking for each of 12 colors by checking on visual analog scales (VAS), and their degrees of color stereotype and color consciousness were measured using originally developed inventory. Analyzing the relationship between the cognitive factors and the degrees of extremity of the highest and the lowest of 12 VAS scores, we found that color stereotype had relation to both degrees; the higher the color stereotype, the higher the degrees of extremity. On the other hand, color consciousness had no relation to these indices of color preference style, but it had relation to the degree of preference of specific colors (e.g., pink and brown). We concluded that the subjects with higher color stereotype would have the fastidious color preference style in which they like and dislike the particular color extremely probably because they tend to develop a fixed imagery in each color and are not able to see other aspects of it.

1. INTRODUCTION

Previous studies of color preference showed what colors were generally preferred and what colors were not. For example, Dittmar (2001)¹ reported that blue was liked and yellow was not liked by younger and older native Germans. Japan Color Research Institute (1995)² analyzed color preferences of Japanese through over ten years and reported that black, white, blue and red were more popular than the other colors. Generally, the results of these studies are compatible with each other regardless of the age, sex, or the nationality of the people tested.

Despite the accumulation of these populational data, however, the mental process of individuals generating and expressing color preference has not been clarified. There have been only a few studies investigating how color preferences were formed by our cognitions, attitudes, beliefs, lifestyles, and past experiences. Holmes & Buchanan (1984)³ examined the color preferences for cars, shirts, and the other concrete objects, and showed that the preferred colors changed largely by the object. This result suggested that an imagery or an association made by cognitive processing affects color preference. Charles & Moyer (1992)⁴ asked female undergraduate students to judge the images of themselves and of their favorite colors using the same semantic differential scales, and found a significant positive correlation between both images. This study also indicated that color preference was closely related to such cognitive factors as self-cognition and self-expression.

Recently, Takahashi and Hanari (to be published)⁵ explored the effect of “cognitive focusing” on color preference. Subjects were given the same color preference test twice at an interval of 4 weeks using the same scales on the same 12 colors as those in the present study. Half of the subjects were given another task just before the second test in which they selected the most and the least preferred colors, and answered the reasons why they selected those colors as detailed as possible. As a result, they largely changed the color preference style in the second test, such that the most preferred color was more highly liked and the least preferred color was more highly disliked, resulting in the preference scores for 12 colors with wider distribution. On the other hand, another half of subjects who were not given the preceding task did not change their color preference style so much.

The above studies suggested that the cognitive processing played an important role on color preference. Consequently, in this study, we examined the relationship between cognition/attitude on colors and color preference. We hypothesized such cognitive factors as stereotype and consciousness on colors would have certain effects on the style of color preference. In this study, we called typical

believes in colors *color stereotype*, and a special interest in colors and high sensibility for colors *color consciousness*. In the experiment, we used 12 color names and visual analog scales to measure the degree of like/dislike for each color.

2. METHOD

Subjects: Data of 297 undergraduate students (119 males and 178 females) were analyzed.

Procedures: Each subject answered a questionnaire having two sections. In the first section, the names of 12 colors (red, orange, yellow, yellow green, green, blue, purple, pink, brown, white, gray, and black) were presented with the visual analog scales (VAS). VAS used in this study was a horizontal line with a length of 130 mm. The left edge of the line indicated “do not like at all,” and the right edge indicated “like very much.” Subjects answered the degree of preference for each of 12 colors by entering handwritten slash (/) on the line.

In the second section, three questions to measure the degree of color stereotype and three questions to measure the degree of color consciousness were presented. Subjects were asked to answer each question according to the six-grade system. The questions of color stereotype were the following three sentences. (1) “I think that everyone has a well-matched and an ill-matched color.” (2) “I think that there are masculine colors and feminine colors.” (3) “I think that there are proper colors for generations such as children, adults, and the olds.” We defined mean rating of these three questions as color stereotype (CS) score of each subject. The questions of color consciousness were the following three sentences. (1) “When I select my clothes, I carefully consider which color is suitable to me.” (2) “When I take a note in the class, I use plenty of color pens.” (3) “I am very interested in a trend in colors.” We defined mean rating of these three questions as color consciousness (CC) score of each subject. The time required for subjects to fill in the questionnaire was about 5 minutes.

3. RESULTS AND DISCUSSION

First, we analyzed mean VAS score for each of 12 colors. As shown in Table 1, black, white, and blue came at the top 3 of 12 colors in both male and female subjects. On the contrary, yellow green and purple were not preferred relatively. Pink showed a large sex difference; the female subjects preferred it more than the male subjects did. These results are similar to those in the earlier studies.

Table 1: Mean VAS scores for 12 colors.

	black	white	blue	red	orange	green	pink	brown	yellow	gray	purple	yellow green
all subjects	76.7	76.1	72.2	63.5	56.3	55.8	55.4	54.6	54.2	53.6	49.9	47.8
male	79.4	73.8	74.8	62.9	54.2	57.3	46.1	56.4	51.2	58.2	48.7	48.0
female	74.9	77.7	70.5	63.9	57.7	54.8	61.6	53.5	56.2	50.6	50.6	47.7

Secondly, we analyzed the relationship between VAS score for each of 12 colors and the cognitive factors (CS score and CC score) in male and female subjects separately. In male subjects, significant negative correlations of CS score with VAS scores for green ($r = -.199, p < .05$) and purple ($r = -.188, p < .05$) were found. In female subjects, correlation coefficients between CS score and any VAS scores of 12 colors were not significant. Totally we did not find strong relationship between the degree of color stereotype and the preference of any specific colors. On the other hand, CC score had significant positive correlations with pink ($r = .231, p < .05$), orange ($r = .186, p < .05$), and brown ($r = .184, p < .05$) in male subjects. In female subjects, CC score had a positive correlation with pink ($r = .276, p < .01$) and a negative correlation with brown ($r = -.160, p < .05$). Subjects having higher color consciousness tended to prefer pink regardless of their sex. Contrastingly, the relationship between the

preference for brown and the CC in male subjects and that in female subjects were in the opposite direction. Though it is not easy to explain these results as a whole, some colors (e.g., pink and brown) would have a greater variety of images and meanings than the others, and these images, positive one or negative one, might be influenced by the degree of color consciousness of individuals, their sex, and also the interaction of these factors.

Next, we analyzed an average, a standard deviation, the highest and the lowest of 12 VAS scores in each subject. Moreover, we calculated the degree of extremity of the highest (DEH) and the degree of extremity of the lowest (DEL). DEH was the mean of differences between the highest VAS score and the other 11 scores in each subject. DEL was the mean of differences between the lowest VAS score and the other 11 scores in each subject. Thus, DEH and DEL indicated how extremely the most preferred and the least preferred colors stood out from the other 11 colors, respectively. Table 2 shows correlation coefficients among those indices, CS score, and CC score (all subjects' data). CS score had significant positive correlations with standard deviation, DEH, and DEL, and had a significant negative correlation with the lowest. These results mean that subjects having higher color stereotype showed VAS results with wider-distributed scores among 12 colors, and like or dislike the particular colors more extremely than subjects having lower color stereotype. On the other hand, CC score did not correlate with any indices significantly.

Table 2: Correlation coefficients among average, standard deviation, the highest, the lowest, DEH, DEL, CS score and CC Score. Results of all subjects. (** $p < .01$; * $p < .05$)

	average	standard deviation	the highest	the lowest	DEH	DEL	CS score
average	-						
standard deviation	-.404**	-					
the highest	.219**	.528**	-				
the lowest	.636**	-.827	-.218**	-			
DEH	-.765**	.716**	.461**	-.722**	-		
DEL	-.024	.749**	.457**	-.786**	.323**	-	
CS score	-.096	.184**	.085	-.166**	.144*	.137*	-
CC score	.076	.003	.039	.051	-.043	-.006	.092

Finally, we tried another analysis. In order to explore the interaction between color stereotype and color consciousness, subjects were divided into four groups by a combination of the relative degree of CS score and CC score. We assumed from distributions of these scores that high CS was over 5.33 and low CS was under 4.00, while high CC was over 4.33 and low CC was under 3.00. As a result, we extracted 25 subjects for high CS & high CC group, 15 subjects for high CS & low CC group, 22 subjects for low CS & high CC group, and 34 subjects for low CS & low CC group. ANOVAs of two factors (high/low of CS \times high/low of CC) were conducted for average, standard deviation, the highest, the lowest, DEH, and DEL. The analysis revealed significant main effects of CS in all indices except average. Standard deviation, the highest, DEH, and DEL were larger while the lowest was smaller in high CS group than in low CS group. These results presented more clearly those of the correlation analysis mentioned above, and indicated again that subjects with high color stereotype had strong likes and dislikes about color. In addition, the interaction between high/low of CS and high/low of CC was marginally significant in DEH ($F=2.88$, $df=1,92$, $p < .10$). As shown in Figure 1, the effect of CS on DEH was clearer in high CC group than in low CC group. DEH means the degree of preferring the most favorite color compared with other colors. Thus, larger DEH might reflect a lacking of the cognition that "each color has each fascination." Therefore, high CS group may have a fastidious color preference style, on the other hand, low CS group may have a more flexible color preference style. And such difference was striking in subjects with high CC.

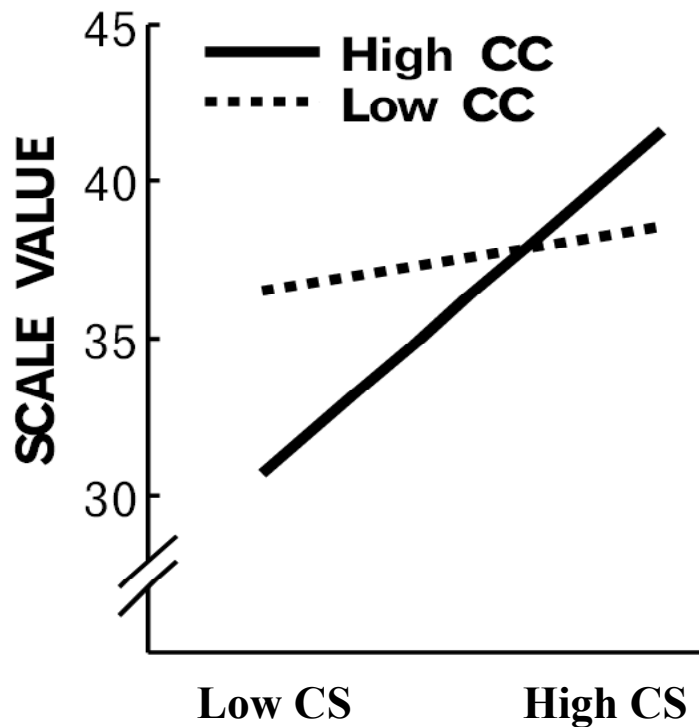


Figure 1: Degree of extremity of the highest (DEH) in high CS and low CS by high and low CCs.

4. CONCLUSIONS

Summarizing the results, subjects' color consciousness had relations to the degree of preference of specific colors (especially pink and brown), but had no relation to the style of color preference. Contrastingly, subjects' color stereotype had little relation to the degree of preference of specific colors, but had a closer relation to their color preference style. It could be supposed that subjects with higher CS scores showed fastidious or "choosy" style of color preference because they were likely to develop a fixed imagery in each color and could not see other aspects of it. We conclude that psychological background of color preference could not be fully understood only from a viewpoint of the color itself, but cognitive factors of individuals such as those examined in this study would have an important role in its generation and expression. Further study is needed in order to clarify such cognitive processing in color preference.

References

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