Comparison of Color Psychological Aspects for Single Color between Japanese and Chinese

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Abstract
In this study, color psychological aspect was investigated among some Japanese and Chinese students. Forty five colors were selected as stimuli, and forty three questions were asked. The answers were analyzed using histogram intersection method. Four sets of histogram intersection values were obtained for four comparison pairs, which included Chinese female/male (C-FM), Japanese female/male (J-FM), Japanese and Chinese females (F-JC), Japanese and Chinese males (M-JC). From these values, the differences between various groups' answers to each question could be analyzed. Then, mean difference test was used to compare these four pairs. The general order of differences among the four pairs from small to big was C-FM<J-FM<F-JC<M-JC.

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Keywords: color psychological aspect, comparison, correlation analysis, mean difference test, single color, histogram intersection

1. Introduction
Experimental studies of color psychology began in 1894 when Cohn proposed the first empirical approach to color preferences. Since then, a considerable number of studies have been conducted. Recently, more and more studies have begun to use the semantic differential method introduced by Osgood et al. and the factor analysis first devised by Spearman. These studies were typically concerned with whether a large number of color psychological aspect scales can be reduced to a smaller number of categories or factors. For instance, in Ou et al.'s research on single color emotion, he extracted three factors called “color activity”, “color weight”, and “color heat”. At the same time, some studies compared color emotion between the genders. Some studies of color preference showed evidence of significant gender difference, while others indicated little difference between the genders. There were also studies comparing color emotion in different countries. For X. P. Gao's study on cross-cultural color emotion, subjects from seven different regions took part in the investigation. The results indicated that there was no distinct difference among the groups from different regions. But S. Shoyama's research on Japanese and Korean ideas about the color of clothing for older people identified differences between the two countries' people, which meant that various aspects of culture and tradition influenced their color preferences.

More than ten years ago, H. Chijiiwa surveyed university students majoring in design in 20 countries (23 regions) and constructed a worldwide database of color psychological aspects of young people. He adopted the principle component analysis method, and found that in all the countries and regions, common aspects amounted to 70%
and special aspects amounted to 30%\textsuperscript{10}. Since then, the political and economic situations of the countries have changed significantly, especially in China, while at the same time, the ideology and values had altered considerably. Thus, indicating that people's color psychology may have changed. Therefore, we took advantage of this color stimuli and questionnaire to investigate Chinese and Japanese students again. Our aim is to find out the relationships of color to nationality and gender.

However, the form of survey was different. This investigation used projection by computer instead of color samples. In addition, the analysis method was also different, because the aim was different. In this study, the histogram intersection method was applied to compare the experimental results between the different groups of respondents, that is, Chinese female/male (C-FM), Japanese female/male (J-FM), Japanese and Chinese females (F-JC), and Japanese and Chinese males (M-JC). Correlation analysis was performed and difference mean test was used to compare the difference in scale of nationality to that of gender.

2. Methods
2-1 Stimuli
In this study, we chose 45 colors from the research conducted by H. Chijiwa, which included 40 chromatic colors and 5 achromatic colors (except silver and gold). These chromatic colors included 4 tones, and each tone included 10 colors from the Munsell color wheel\textsuperscript{10}. “Munsell Conversion” program (CMC2) was applied to transform 45 colors from the Munsell color system to RGB. The color names and parameters in the two systems are shown in Table 1.

2-2 Questionnaire
Interviews were in the form of questionnaires containing 43 questions. These questions were divided into several categories: the color of hair and eyes (Q1~Q2); three favorite colors (Q3); color of clothing (Q4~Q6) and housing (Q7~Q14); color in memory (Q15~Q20), color image (Q21~Q26); meaning of color (Q27~Q41); most familiar color to people in the respondent's country (Q42); and the color representing the socio-culture of the city where the respondent lives (Q43). The questionnaire is shown in the Appendix\textsuperscript{10}. Chinese and Japanese questionnaires were used for Chinese and Japanese respondents respectively.

2-3 Respondents
A total of 596 students were surveyed. They included 190 Japanese girls from Nara Women’s University; 35 Japanese boys from Nagaoka University of Technology; and 218 Chinese girls, and 153 Chinese boys from Xi'an Polytechnic University. All the respondents had normal color vision.

2-4 Experiment
The survey was divided into five sessions. For each session, the students were gathered in a dark room with just enough light for reading the questionnaire. The 45 color stimuli were displayed by a projector. The respondents were asked to watch the color stimuli and answer the questionnaire.

2-5 Analysis Method
Histogram intersection was used to compare the color psychological aspect between the different groups. This method was first presented by M. J. Swain and D. H. Ballard\textsuperscript{11}. The original aim was to develop visual skills for robots. Later, it was widely applied to evaluate image similarity\textsuperscript{12}.

Color indexing recognized images or image components based upon histogram distributions of the color of pixels, and M. J. Swain and D. H. Ballard introduced a histogram matching method called Histogram Intersection. Given a pair of histograms shown as Fig.1, the image histogram $H(I)$ and the model histogram $H(M)$ respectively, each containing n bins. The result of the intersection of $H(I)$ and $H(M)$ is the number of pixels from the model that have corresponding pixels of the
Table 1: The parameters of 45 color stimuli in Munsell and RGB color system

<table>
<thead>
<tr>
<th>No.</th>
<th>Color name</th>
<th>H</th>
<th>V</th>
<th>C</th>
<th>R</th>
<th>G</th>
<th>B</th>
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<tbody>
<tr>
<td>1</td>
<td>pale red</td>
<td>8.0R</td>
<td>8.5</td>
<td>2.3</td>
<td>233</td>
<td>209</td>
<td>203</td>
</tr>
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<td>pale orange</td>
<td>8.6YR</td>
<td>8.4</td>
<td>3</td>
<td>235</td>
<td>207</td>
<td>176</td>
</tr>
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<td>pale yellow</td>
<td>9.1Y</td>
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<td>3.2</td>
<td>235</td>
<td>231</td>
<td>178</td>
</tr>
<tr>
<td>4</td>
<td>pale yellowish green</td>
<td>2.8GY</td>
<td>8.6</td>
<td>3.2</td>
<td>217</td>
<td>221</td>
<td>170</td>
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<td>8.4GY</td>
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<td>200</td>
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<td>192</td>
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<td>205</td>
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<td>2.7</td>
<td>191</td>
<td>215</td>
<td>228</td>
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<td>218</td>
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<td>132</td>
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<td>135</td>
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<td>12.1</td>
<td>221</td>
<td>122</td>
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<td>45</td>
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<td>0.6GY</td>
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<td>11.4</td>
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<td>16</td>
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<td>6.0G</td>
<td>4.6</td>
<td>7</td>
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<td>4.8</td>
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<td>134</td>
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<td>4.5</td>
<td>7.2</td>
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<td>66</td>
<td>88</td>
<td>123</td>
</tr>
<tr>
<td>39</td>
<td>dark purple</td>
<td>0.2P</td>
<td>3.9</td>
<td>2.7</td>
<td>96</td>
<td>92</td>
<td>112</td>
</tr>
<tr>
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<td>3.1</td>
<td>3.8</td>
<td>99</td>
<td>65</td>
<td>84</td>
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<tr>
<td>41</td>
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<td>N</td>
<td>9.2</td>
<td>0</td>
<td>234</td>
<td>234</td>
<td>234</td>
</tr>
<tr>
<td>42</td>
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<td>7.9</td>
<td>0</td>
<td>198</td>
<td>198</td>
<td>197</td>
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<td>43</td>
<td>a little light gray</td>
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<td>6.1</td>
<td>0</td>
<td>150</td>
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<td>150</td>
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<tr>
<td>44</td>
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<td>0</td>
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<tr>
<td>45</td>
<td>black</td>
<td>N</td>
<td>2.5</td>
<td>0</td>
<td>62</td>
<td>63</td>
<td>62</td>
</tr>
</tbody>
</table>
Fig. 1 The example of image histogram \( H(I) \) and model histogram \( H(M) \)

same color in the image. To obtain a fractional match value between 0 and 1, the intersection is normalized by the number of pixels in the model histogram. The normalized histogram intersection is as follows:

\[
H(I, M) = \frac{\sum_{j=1}^{n} \min(I_j, M_j)}{\sum_{j=1}^{n} M_j}
\]

As for the example in Fig. 1, the histogram intersection will be calculated as follows:

\[
H(I, M) = \frac{\min(2,1) + \min(3,2) + \min(1,3)}{1 + 2 + 3} = 0.67
\]

In our study, the color histogram was obtained using 45 colors and the frequency of each color selected in each question was counted. Thus, the colors selected for each question were mapped into a discrete color space containing 45 colors. The color histogram for each question was a 45-dimensional vector. \( I_i \) and \( M_j \) represent the frequency of color \( j \) selected for each question in the group \( I \) and \( M \). \( H(I, M) \) was the histogram intersection value of the group \( I \) and \( M \). For any two groups, the larger the value of the histogram intersection, the more similar the two groups were.

3. Results and Discussion

3-1 Results of Color Histogram and Discussion

There were four groups of respondents: Japanese males, Japanese females, Chinese males, and Chinese females. Each group had 43 color histograms corresponding to the 43 questions. Each color histogram was a 45-dimensional vector which was the percentage of each color. The standard deviations of 45 percentages for each question of each group were obtained respectively. Three smallest (most even) and three biggest (most concentrated) values of each group are shown in Table 2. The following are the detailed instructions to these questions which had very concentrated or even answers.

In Japanese male group, the most even answers were to the concept of schoolwork (Q34), the color of curtains (Q11) and the color of building’s front door (Q9), which belonged to the meaning of color and color of housing. The most concentrated answers were to the color of hair (Q1), the concept of danger (Q38) and the color of lawn (Q17). To Q1, 80% students selected the color No.45—black; to Q38, 77.1% students selected the color No.21—vivid red; to Q17, 77.1% students selected the color No.25—vivid green.

In Japanese female group, the most even answers were to the concept of dedication (Q33), the concept of schoolwork (Q34) and the favorite colors (Q3). The most concentrated answers were to the color of suits (Q4), the color of lawn (Q17) and the color of walls (Q10). To Q4, 74.1% students selected the color No.45—black; to Q17, 65.8% students selected the color No.25—vivid green; to Q10, 61.4% students selected the color No.41—white.

In Chinese male group, the most even answers were to the concept of city (Q31), the concept of schoolwork (Q34) and the concept of elegance (Q39), all of which belonged to the
meaning of color. The most concentrated answers were to the color of hair (Q1), the color of walls (Q10) and the most familiar color of the country's people (Q42). To Q1, 73.2% students selected the color No.45—black; to Q10, 56.6% students selected the color No.41—white; to Q42, 50.7% students selected the color No.21—vivid red.

In Chinese female group, the most even answers were to the color of door (Q14), the color of floor (Q12) and the color of building's front door (Q9), all of which belonged to the color of housing. The most concentrated answers were to the color of hair (Q1), the most familiar color of the country's people (Q42) and the color of lawn (Q17). To Q1, 63.3% students selected the color No.45—black; to Q42, 56.7% students selected the color No.21—vivid red; to Q17, 52.3% students selected the color No.25—vivid green.

As a whole, the questions that were selected very different colors were mainly about some abstract concepts such as Q31, Q33, Q34, Q39, and color preferences such as Q3, Q9, Q11, Q12. However, the questions that had almost consistent answers focused on body feature such as Q1, natural color such as Q17, and custom such as Q10 and Q38. Most people used to white wall and red sign for danger. It's very interesting that both Chinese males and females selected vivid red to Q42. In Chinese classic celebration, vivid red must be chosen, that is famous Chinese red in the world.

3-2 Results of Histogram Intersection and Discussion

In order to learn the relationships of color to gender and nationality, the four pairs of histogram intersection were analyzed. The first two pairs consisted of different genders from the same country, C-FM and J-FM. The third and forth pairs were the same gender in different countries, F-JC and M-JC. Three smallest (most different) and three biggest (most similar) histogram intersection values of 43 questions for each pair are shown in Table 3. The following are detailed descriptions of four pairs of histogram intersections.

3-2-1 Results and Discussion of C-FM

For C-FM, the answers to the following questions were very similar: the closest color to your hair (Q1), the color most familiar to people in your country since antiquity (Q42), the color with the most oppressive feeling (Q24); the answers to the following questions were very different: the color of your jacket (Q5), the color of your suit (Q4), the color of your sweater (Q6).

It was reasonable that Chinese females and males gave similar answers to Q1, Q42, and Q24. Question Q1 was usually decided by race, and all the Chinese people belonged to a yellow race having black eyes, black hair, and
yellow skin. Question Q42 was about the national culture, which is associated only with nationality. Question Q24 was a kind of color image. It's very interesting that the most different questions dealt with clothing color.

This indicates that there were no gender differences for questions based on physical characteristics, national culture, and color image, but a significant gender difference for questions on preferences such as clothing color.

3-2-2 Results and Discussion of J-FM
For J-FM, the answers to the following questions were similar: the closest color to your eyes (Q2), the color of a lawn in summer (Q17), and the color that expresses the concept of a rural district (Q36). The answers to the following questions were very different: the color that represents the socio-cultural city where you live (Q43), the color of the curtains in your room (Q11), and the closest color to your hair (Q1).

The question Q2 was also associated with race, so there was no gender difference among people of the same race. Q17 was about a kind of natural color in memory, and Q36 about the concept of a rural district, so there should be no gender difference. To Q43, the answers were very different because the question was about the culture of a city. There can be two possible reasons: the respondents came from different cities, or the respondents had different understandings of the socio-cultural city.

Question Q11 was about color preference, so the responses differed. Question Q1 was about physical characteristics, but the answers were very different. Compared to the results for C-FM, the position of Q1 was the opposite. In China, the answers were very similar because hair color is associated with race. But in Japan, the answers to Q1 had significant gender difference indicating that more and more girls have begun to dye their hair as aesthetics have altered, and the hair color has become a part of their personality.

3-2-3 Results and Discussion of F-JC
For F-JC, the answers to the following questions were similar: the color with the most oppressive feeling (Q24), the color of the sun in mid-summer (Q15), and the color of a lawn in summer (Q17). The answers to the following questions were very different: the color of your suit (Q4), the color of the window frames in your room (Q13), the most familiar color to people in your country since antiquity (Q42). The result for Q24 was the same as in C-FM. The other two questions, Q15 and Q17, both dealt with impressions of nature. Therefore, the answers were very similar. Q4 and Q13 were on color preference, so the answers were very different. As for Q42, it was associated only with nationality. The results indicate that there were no nationality differences in color image and impressions of nature, but there were nationality differences in color preference and familiar colors.
3-2-4 Results and Discussion of M-JC

For M-JC, the answers to the following questions were similar: the closest color to your hair (Q1), the color of the sun in mid-summer (Q15), the color with the most oppressive feeling (Q24); the answers to the following questions were very different: the color that expresses the concept of a city (Q31), the color that expresses the concept of woman (Q41), the color that represents the socio-culture of the city where you live (Q43).

The similarity in answers to Q1 meant that most of the Japanese and Chinese males didn't dye their hair. Q15 and Q24 were not influenced by nationality. The differences for Q31 and Q41 suggested that Japanese and Chinese males had various concepts of cities and women. In general, the socio-culture of a city is decided by its politics, economy, history, customs, and so on. Therefore, different cities in one country may have different socio-cultures, what is more in two cities of various counties. Hence Q43 had very different answers.

In summary, the questions with similar answers focus on color memory and color images, and those with very different answer were relative to preference. Color memory and color image were not influenced by gender or nationality, but the choice of housing and clothing was very much affected by gender and nationality. The meaning of a color was decided by the concept itself, and is influenced by not only nationality and gender, but also many other personal factors.

3-3 Mean Difference Test

Before discussing the mean difference test, the relationships between 43 questions were investigated. The histogram of all the respondents for 43 questions was made, and histogram intersection for each combination of 43 questions was obtained, i.e. 903 combinations. The three biggest standard scores (similar) were 2.44, 2.31 and 2.21; the three smallest standard scores (different) were -2.04, -2.01 and -2.00. Our main concern is general aspect of color psychology. If there are many similar questions, the results may shift to the unexpected direction. Here the standard scores showed only a few similar questions, so we remained 43 questions.

The mean difference test method was used to compare the four pairs. First, the normality test of each group was performed. At the same time, mean and standard deviation of each pair were obtained. The results are shown in Table 4. The larger the value of the mean, the more similar the two pairs were. Therefore, the order of differences among the four pairs from small to big should be C-FM<J-FM<F-JC<M-JC.

Table 4 Tests of normality for each group
(*This is a lower bound of the true significance.)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Statistic</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-FM</td>
<td>73.0</td>
<td>7.1</td>
<td>0.120</td>
<td>0.127</td>
</tr>
<tr>
<td>J-FM</td>
<td>62.2</td>
<td>9.8</td>
<td>0.093</td>
<td>0.200*</td>
</tr>
<tr>
<td>F-JC</td>
<td>57.6</td>
<td>12.0</td>
<td>0.099</td>
<td>0.200*</td>
</tr>
<tr>
<td>M-JC</td>
<td>52.5</td>
<td>12.4</td>
<td>0.074</td>
<td>0.200*</td>
</tr>
</tbody>
</table>

Except for the group C-FM, the other three groups, J-FM, F-JC, and M-JC, all belonged to the normal distribution. Also, these histogram intersection values corresponded, so the paired sample mean difference test could be used. Then mean difference tests comparing C-FM with J-FM, J-FM with F-JC, and F-JC with M-JC, respectively, were performed. The results are shown in Table 5. The significance level of the test for C-FM and J-FM had three asterisks (*), but the test for F-JC and M-JC had only one asterisk, indicating that the difference between C-FM and J-FM was significant, and much stronger than the

Table 5 The results of mean difference test
(*0.05, ***0.001)

<table>
<thead>
<tr>
<th></th>
<th>paired sample t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
</tr>
<tr>
<td>C-FM and J-FM</td>
<td>7.20</td>
</tr>
<tr>
<td>J-FM and F-JC</td>
<td>2.09</td>
</tr>
<tr>
<td>F-JC and M-JC</td>
<td>2.50</td>
</tr>
</tbody>
</table>
difference between F-JC and M-JC. The order of differences should be C-FM < J-FM < F-JC < M-JC.

The above was the general order of 43 questions. If only considering a special field of color psychology, different order might be obtained. The histogram intersection values of color preference (Q3) and preferences in clothing color (Q4, Q5 and Q6) are shown in Table 6 as examples. From Table 6, the order of the values for Q3 among the four pairs was C-FM < F-JC < M-JC < J-FM, for the mean of Q4, Q5 and Q6 was J-FM < C-FM < M-JC < F-JC. And t-test was performed to Q4, Q5 and Q6. The results showed there were no significant differences between any two groups. Then the standard scores of the four questions between the neighboring two groups were obtained. Only two items got the standard scores more than 1.96, i.e. between J-FM and C-FM, and between M-JC and F-JC in Q4. It indicated that in the preference of suits color, the difference of F-JC was bigger than M-JC, and the difference of C-FM was bigger than J-FM, and the significant level was 5%.

### 3-4 Correlation Analysis and Discussion

To analyze the differences further in color psychological aspect between C-FM and J-FM, and the differences between F-JC and M-JC, correlation analysis was performed, resulting in the scatter diagrams shown in Fig.2 and Fig.3. Fig.2 shows the scatter diagram of histogram intersection values for C-FM and J-FM. Fig.3 shows the scatter diagram of histogram intersection values for F-JC and M-JC.

In Fig.2, the point farthest from the diagonal line is Q1 (the color closest to hair), indicating that the answer to Q1 was most different

<table>
<thead>
<tr>
<th>Histogram intersection value</th>
<th>Mean of Q4, Q5 and Q6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Q4</td>
</tr>
<tr>
<td>C-FM</td>
<td>73.4</td>
</tr>
<tr>
<td>J-FM</td>
<td>64.5</td>
</tr>
<tr>
<td>F-JC</td>
<td>68.8</td>
</tr>
<tr>
<td>M-JC</td>
<td>66.6</td>
</tr>
</tbody>
</table>

![Fig.2 The scatter diagram of histogram intersection values of C-FM and J-FM](image-url)
Fig. 3 The scatter diagram of histogram intersection values of F-JC and M-JC

Fig. 4 Comparisons of the centers of gravity between Fig. 2 and Fig. 3
between C-FM and J-FM. Q43 (the color that expresses the socio-culture of the city where you live), Q29 (the color that expresses the concept of war), Q11 (the color of curtains), Q42 (the most familiar color to people in your country since antiquity), Q23 (the color with the lightest feeling), and Q27 (the color that expresses the concept of happiness) are also the questions for which the difference in histogram intersection values is greater than 20. G1 is the center of gravity of 43 questions in Fig.2. These questions located at the lower right corner, which suggested Chinese females and males were very consistent to these questions, but Japanese females and males were very different.

In Fig.3, the point farthest from the diagonal line is Q1 (the color closest to hair), showing that the answer to Q1 was most different between F-JC and M-JC. Q43 (the color that expresses the socio-culture of the city where you live), Q4 (the color of your suit), Q41 (the color that expresses the concept of woman), Q31 (the color that expresses the concept of city), Q39 (the color that expresses the concept of elegance), and Q11 (the color of curtains) are also the questions for which the difference in histogram intersection values is greater than 20. G2 is the center of gravity of 43 questions in Fig.3. From the scatter diagram, Q1 and Q4 were located in the upper left of the diagonal line, and other five questions in the opposite location. It meant Japanese and Chinese males were consistent to Q1 and Q4, but females were inconsistent; to Q43, Q31, Q41, Q11 and Q39, females were consistent but males were inconsistent.

Fig.4 is the combination of Fig.2 and Fig.3. In Fig.4, G1 is farther from the diagonal line than G2. The reasoning is supported by the result of Table 5.

Correlation analysis was also conducted to color preference (Q3) and preferences in clothing color (Q4, Q5 and Q6). Q3 was at the lower right corner in Fig.2, which suggested the differences in C-FM were smaller than that in J-FM. In Fig.3, Q3 was very near to the diagonal line, which suggested that there were almost no differences between F-JC and M-JC. In Fig.4, the location of Q3 in Fig.2 was farther from the diagonal line than in Fig.3, which suggested that the difference between J-FM and C-FM was bigger than that between F-JC and M-JC. G3 and G4 were the centers of gravity of Q4, Q5 and Q6 in Fig.2 and 3 respectively. G3 was almost on the diagonal line, which indicated that there were almost no differences in clothing color between C-FM and J-FM. G4 was at the upper left of the diagonal line. It indicated that the difference in F-JC was bigger than that in M-JC. In Fig.4, the location of G4 was farther from the diagonal line than G3, which indicated that the difference between F-JC and M-JC was bigger than that between C-FM and J-FM in the preference of clothing color.

4. Conclusions

In this study, we used 45 colors as stimuli, and investigated the Japanese and Chinese students’ color psychological aspects by a questionnaire, which included 43 questions. The histogram intersection method was used to analyze these answers, and the color psychology differences between the various groups were obtained. Mean difference test and correlation analysis were performed on the basis of these histogram intersection values. The following conclusions can be drawn.

(1) From the four sets of color histogram, it indicated that the respondents were inconsistent to abstract meaning of color and color preference, but consistent to natural color and custom. For instance, lawn is vivid green, red sign means dangerous.

(2) These histogram intersection values suggested that body color (hair and eye), color memory and image were not influenced by gender and nationality; there were significant gender differences in color preference both in Japan and China, and existed nationality differences in these questions relative to
custom and social culture.

(3) From the value of each pair’s mean and mean difference test, the general order of differences among the four pairs from small to big was C-FM<<J-FM<F-JC<M-JC.

Our results can be applied to fashion design. For example, fashion designers can succeed in color design for females and males. In the international garment trade, the garments for Japanese market will be different from Chinese. Of course, we can also calculate the difference order of other psychological aspects and apply them to interior design, architecture design, and so on. In addition, the results can also be referred by psychologists and sociologists. The differences in color psychology could help to analyze the gender differences of behaviors and culture differences between Japan and China.

Acknowledgments

The authors thank all the respondents from Nara Women’s University, Nagaoka University of Technology, and Xi’an Polytechnic University. Special thanks to Prof. Yamada for assisting in the investigation.

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Appendix

Questionnaire on Color Cognition of Chinese and Japanese Youth

Before proceeding to the questionnaire, please fill in each of the blanks below
Name: ____________________________
Sex: ______________________________
Age: ______________________________

First of all, answer Questions 1 and 2 while looking at the 45 color stimuli.
(Write the corresponding numbers in the boxes provided.)
Q1. What color is closest to the color of your hair? □
Q2. What color is closest to the color of your eyes? □

Similarly, answer Question 3 through 9 while looking at the 45 color stimuli.

Q3. In a general sense, what are your favorite colors? Write the numbers of three colors.
□ □ □
Describe the colors of your clothing and home.
These days, what colors do you wear most often?
Write the number of one color for each of the below.
Q4. Color of your suit □
Q5. Color of your jacket □
Q6. Color of your sweater □
What are the colors of the building where you live? Write the number of one color for each of the below.
Q7. Color of the building’s walls □
Q8. Color of the building’s roof □
Q9. Color of the building’s front door □
What are the colors of your room? Write the number of one color for each of the below.
Q10. Color of the walls □
Q11. Color of the curtains □
Q12. Color of the floor □
Q13. Color of the window frames □
Q14. Color of the door □
What colors do you associate with nature? Write the corresponding numbers in the boxes provided.
Q15. Color of the sun in mid-summer □
Q16. Color of the sky on a clear day □
Q17. Color of a lawn in summer □
Q18. Color of earth □
Q19. Color of dry sand □
Q20. Color of a lake on a clear day □

What colors do you associate with the following phrases? Write the corresponding numbers in the boxes provided.
Q21. Color with the warmest feeling □
Q22. Color with the coolest feeling □
Q23. Color with the lightest feeling □
Q24. Color with the heaviest feeling □
Q25. Color with the most gaudy feeling □
Q26. Color with the most subdued feeling □

What color do you feel is most suitable for expressing the meaning of the following concepts? Write the corresponding numbers in the boxes provided.
Q27. Happiness □
Q28. Loneliness □
Q29. War □
Q30. Safety □
Q31. City □
Q32. Peace □
Q33. Dedication □
Q34. Schoolwork □
Q35. Future □
Q36. Rural district □
Q37. Family □
Q38. Danger □
Q39. Elegance □
Q40. Man □
Q41. Woman □
Q42. What color do you think has been the most familiar color to people in your country since antiquity? □
Q43. What color do you think represents the socio-cultural climate of the city where you live (that is, the city’s characteristic color)? Write the number of the most suitable color in the box provided. □
単色を用いた色彩心理的傾向の日中比較

(2008年6月16日受付；2008年12月6日受理)

奈良女子大学大学院 薛 媛
奈良女子大学 今岡 春樹

要 旨

本研究では、日本人と中国人学生に対して色彩心理的傾向に関する調査が行われた。45色が選択肢として示され、43個の質問が行われた。グループ間の比較のために、ヒストグラムインタークション法が用いられた。中国男女間(C-FM)、日本男女間(J-FM)、男性中間(M-JC)の四つグループ間の値が得られた。それらの値によって、色彩心理的傾向の性別差異と国別差異を分析することができた。43個の質問に対するそれらの値に基づいて、グループ間の差異が検討された。平均値の差の検定や相関分析により四つグループ間の差異の順番はC-FMK-J-FMK-J-M-JCであることが分かった。

キーワード：色彩心理的傾向、単色、比較、ヒストグラムインタークション、相関分析、平均値の差の検定

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