

Investigation of Memory Color of Facial Flesh Using a Person's Own Picture

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ABSTRACT

Preferred flesh colors were evaluated using a person's picture as a sample to discuss the dependence of these colors on the memory color. First, the subjects were asked to color the face in their own picture (1) on the basis of their memory, (2) with reference to the reflection of their face in the mirror, and (3) with a preferred color. No clear correlation was observed between these colors and the measured facial color of the subjects. The memory color was correlated with that used in the second case mentioned above but not with the preferred color, i.e., the third case.

INTRODUCTION

In the preceding studies on the memory color of facial flesh, color patches or standard portrait photographs were used as samples for a subjective evaluation. However, it has often been pointed out that patches are different in terms of the color appearance from the portrait photographs and that the results of an evaluation using samples of a portrait photograph depend on the features of its model. Because memory color is an individual standard of the recollection for familiar objects, it is easily conceived that a person's own picture can be used as a sample for a memory color evaluation.

In this study, subjects were asked to color the facial flesh in their own picture on (1) the basis of their memory, (2) with reference to the reflection of their face in the mirror, and (3) with a preferred color, and the colors used by the subjects were compared with the measured facial color. Further, the correlation between the colors was discussed.

EXPERIMENT

Preparation of samples: We took a photograph of a subject's face from the front with careful attention to avoid shading, blown-out highlights, and reduction of his/her forehead.

Coloring the samples: The subjects (8 females and 12 males) were asked to color their own picture on a display (EIZO Flex Scan SX3031W) under 700 lx of D50 light by controlling the RGB values using Adobe Photoshop in the following process:

- 1) Reproduction of a flesh color that the subjects recall as their own flesh color (referred to as "Memory" from here on)
- 2) Reproduction of the flesh color of their face from a mirror reflection (referred to

as “Mirror” from here on)

3) Reproduction of a preferred color (referred to as “Preferred” from here on)

The colors used by the subjects were measured directly on the display by using a spectrophotometer (Gretag Macbeth Spectrolino).

Color measurement of subjects’ facial flesh: The subjects’ facial flesh color was measured using their photographs by the same method with the colors made. Five parts from the regions between the eyebrows, under the eyes, and on cheeks were selected for color measurement by reference to a report on an analysis of visual lines during color matching operations using an eye-tracking system¹⁾. The average of the five colors was employed as the representative color (referred to as “Real” from here on).

RESULTS AND DISCUSSION

The correlation among “Memory,” “Mirror,” “Preferred,” and “Real” in the case of the female subjects is listed in Tables 1(a), (b), and (c) for L*, a*, and b*, respectively. The cells of correlation with significance probability of less than 5% are filled. L* revealed a strong correlation between “Real” and “Memory” and “Memory” and “Preferred,” a* revealed a correlation between “Real” and “Preferred,” and b* revealed the correlation between “Mirror” and “Memory.” The results suggest that the lightness of a subject’s skin is recalled in association of their own skin, and this results in the subjects’ individual standard of preference. However, the hue of the memory color is not associated with the subject’s real skin. Because almost all of the female subjects had applied heavy or light makeup, “Real” refers to the color of makeup; this also suggests that the subjects select the makeup color from their preference of redness not from that of yellowness.

The results obtained in the case of the male subjects are totally different from those obtained in the case of the female subjects. All values of a*, b*, and L* revealed a strong correlation between “Real” and “Memory.” Because the male subjects did not wear makeup and had a steady unpainted face, their memory color could be formed from this everyday experience.

| (a) L* | | | | | (b) a* | | | | | (c) b* | | | | | | | |
|-----------|--------------------------|-------|--------|--------|-----------|-----------|--------------------------|-------|--------|--------|-----------|-----------|--------------------------|------|--------|--------|-----------|
| | | Real | Mirror | Memory | Preferred | | | Real | Mirror | Memory | Preferred | | | Real | Mirror | Memory | Preferred |
| Real | Correlation coefficient | 1 | .225 | .822* | .696 | Real | Correlation coefficient | 1 | .561 | .368 | .772* | Real | Correlation coefficient | 1 | .493 | .483 | .172 |
| | significance probability | | .592 | .012 | .055 | | significance probability | | .148 | .369 | .025 | | significance probability | | .214 | .225 | .683 |
| Mirror | Correlation coefficient | .225 | 1 | .281 | .178 | Mirror | Correlation coefficient | .561 | 1 | .610 | .601 | Mirror | Correlation coefficient | .493 | 1 | .781* | .284 |
| | significance probability | .592 | | .500 | .674 | | significance probability | .148 | | .108 | .115 | | significance probability | .214 | | .022 | .495 |
| Memory | Correlation coefficient | .822* | .281 | 1 | .956** | Memory | Correlation coefficient | .368 | .610 | 1 | .043 | Memory | Correlation coefficient | .483 | .781* | 1 | .354 |
| | significance probability | .012 | .500 | | .000 | | significance probability | .369 | .108 | | .919 | | significance probability | .225 | .022 | | .390 |
| Preferred | Correlation coefficient | .696 | .178 | .956** | 1 | Preferred | Correlation coefficient | .772* | .601 | .043 | 1 | Preferred | Correlation coefficient | .172 | .284 | .354 | 1 |
| | significance probability | .055 | .674 | .000 | | | significance probability | .025 | .115 | .919 | | | significance probability | .683 | .495 | .390 | |

Table 1. Correlation between “Memory,” “Mirror,” “Preferred,” and “Real” of (a) L*; (b): a*; and (c): b*. **: Significance of less than 1%; *: significance of less than 5%.

REFERENCES

1 . Deng, P., “Factors Determining Impression of Flesh Color”, *Thesis*, Chiba University, Chap.3 (2013)