

# Human affectiveness on color arrangements in geometrical figures

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## Summary

We investigate influences of geometrical shapes to color preferences.

We conducted an experiment of color assignments to segments within a square.

The results suggest that

- colors in a wider range tend to be employed if the number of the segments is larger.
- symmetry is less sensed for diagonal arrangements.

## Experiment

### ■ Procedure



Respondents were requested to select a color specimen card and assign it to each segment of a presented geometrical figure.

The time for the color selection was not limited. Assigning one color to two or more segments were allowed.

The color specimens were based on PCCS\*. Employed specimens are 24-hues of the "vivid" tone.

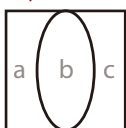


\*) The PCCS (Practical Color Co-ordinate System) is a color system proposed by Nihon Sikiken Co., Japan. It introduces the concept of "tone" as the combination of brightness and saturation. The hue circle of the PCCS is designed where the intervals between the adjacent hues are psychologically identical anywhere in the circle.

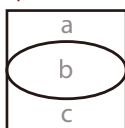
### ■ Presented geometrical figures

The size of each square was 6cm x 6cm. These figures were presented in random order.

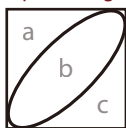
3-elliptical vertical



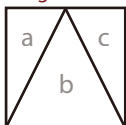
3-elliptical horizontal



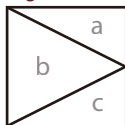
3-elliptical diagonal



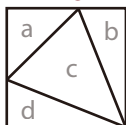
3-triangular vertical



3-triangular horizontal



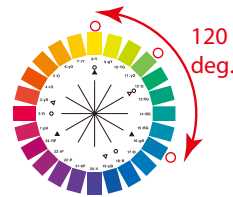
4-triangular




## Analysis

We focused on the range of hues selected by a respondent at the assignment to a figure.

The range is defined by the center angle of the minimum sector containing all the selected hues in the hue circle.



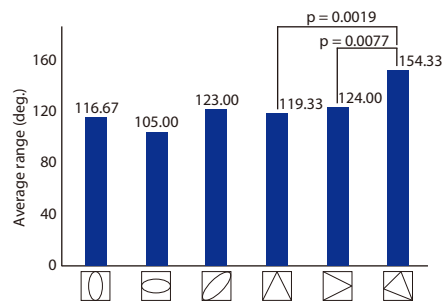
Example:

If the hues with  are selected, the range is defined as 120 degrees.

## Results and discussion

The number of respondents was 45 (female: 17, male: 28).

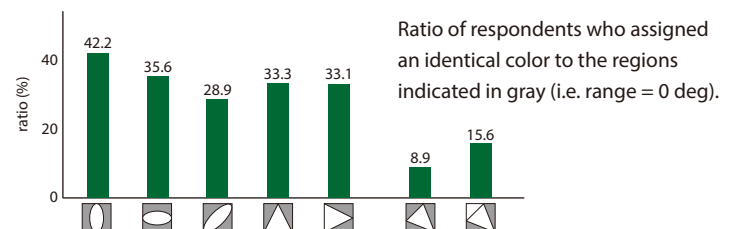
### ■ Hue ranges



The results of the single-sided paired t-test for intra-observer differences indicate that the range for the "4-triangular" figure is significantly larger than that for "3-triangular" figures.

It suggests that colors in a wider range tends to be employed in the case that the region is separated to more segments.

### ■ Ratio of symmetrical assignments



The ratio of respondents who assigned colors symmetrically descends in the order of "vertical," "horizontal," and "diagonal" in the cases of the "3-elliptical" figures.

The ratios are obviously smaller for the "4-elliptical" figure.

It suggests that the symmetry is less sensed if the segments are diagonally arranged.

## Conclusion

- The results indicate that the tendency of color assignments is obviously dependent on geometrical conditions.