

## Color Composition of Cityscape and its Visual Impression

**T. Ishida, F. Kawaguchi**

*Department of Architecture and Architectural Engineering, Kyoto University  
Kyoto Daigaku Katsura, Nishikyo-ku, Kyoto, 615-8540 (JAPAN)*

Corresponding author: T.Ishida (ishida@archi.kyoto-u.ac.jp)

### ABSTRACT

Colors in a cityscape is one of the essential factors that determine our visual impression of that place. This study examined how we recognize color composition of a cityscape and how perceived color composition related to our visual impression of the cityscape. In the experiment 1, subjects produced the arrangement of three colors to represent their recognized color composition of a cityscape. Then, visual impression of cityscapes and the three-color arrangement were evaluated using "calm - active" and "chaotic - orderly" axis. In the experiment 2, the same experiments were conducted using the nine-color arrangement. The results indicated that the subjects generally chose the colors that covered large areas and/or were conspicuous in the cityscape.

### 1. INTRODUCTION

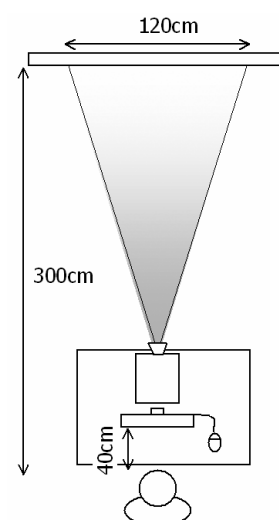
A cityscape brings us various visual impressions. In particular, colors in cityscapes must be one of the significant elements that determine our impressions. To plan appropriate color environment, it will be helpful if we know the relations between color composition of a cityscape and our visual impression. In our previous study<sup>1)</sup>, we investigated the relation between spatial color distribution and visual impression of cityscapes using a color mosaic method. We found characteristics of color distribution that gave strong effects on our visual impression such as visual liveliness and comfort. Little is known, however, how we recognize the color composition of a cityscape and how that color composition relates to our visual impression of the cityscape. In this study we investigated this problem.

### 2. EXPERIMENT 1: Color Composition of a Cityscape Using Three Colors

#### 2.1 Methods

The experiment 1 consisted of two experiments. In the experiment 1-1, we examined how subjects represented the color composition of a cityscape using only three colors. The subjects produced the arrangement of three colors to represent their recognized color composition of a cityscape. Thirty color pictures taken from Kyoto and Osaka city were used for the experiment. Four subjects, students and a staff of the department of Architecture, participated in the experiment. The subjects viewed one of the cityscapes projected on a screen and produced a three-color arrangement using a color palette on the computer (Figure 1 and 2).

In the experiment 1-2, the subjects evaluated visual impressions of the cityscapes and the three-color arrangements made by the subjects in the experiment 1-1. Three major visual impressions of cityscapes were examined: activity (active - calm), organization (orderly-chaotic) and preference (harmonious-inharmonious). The subjects gave a score for each of three visual impressions after viewing a projected picture of the cityscapes and a three-color arrangement. The evaluation for the cityscapes and the color arrangements were done in the separate experimental sessions. Our main concern in the experiment 1-2 was how

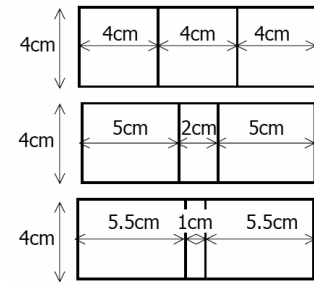


**Figure 1:** Plan view of the experiment set-up.

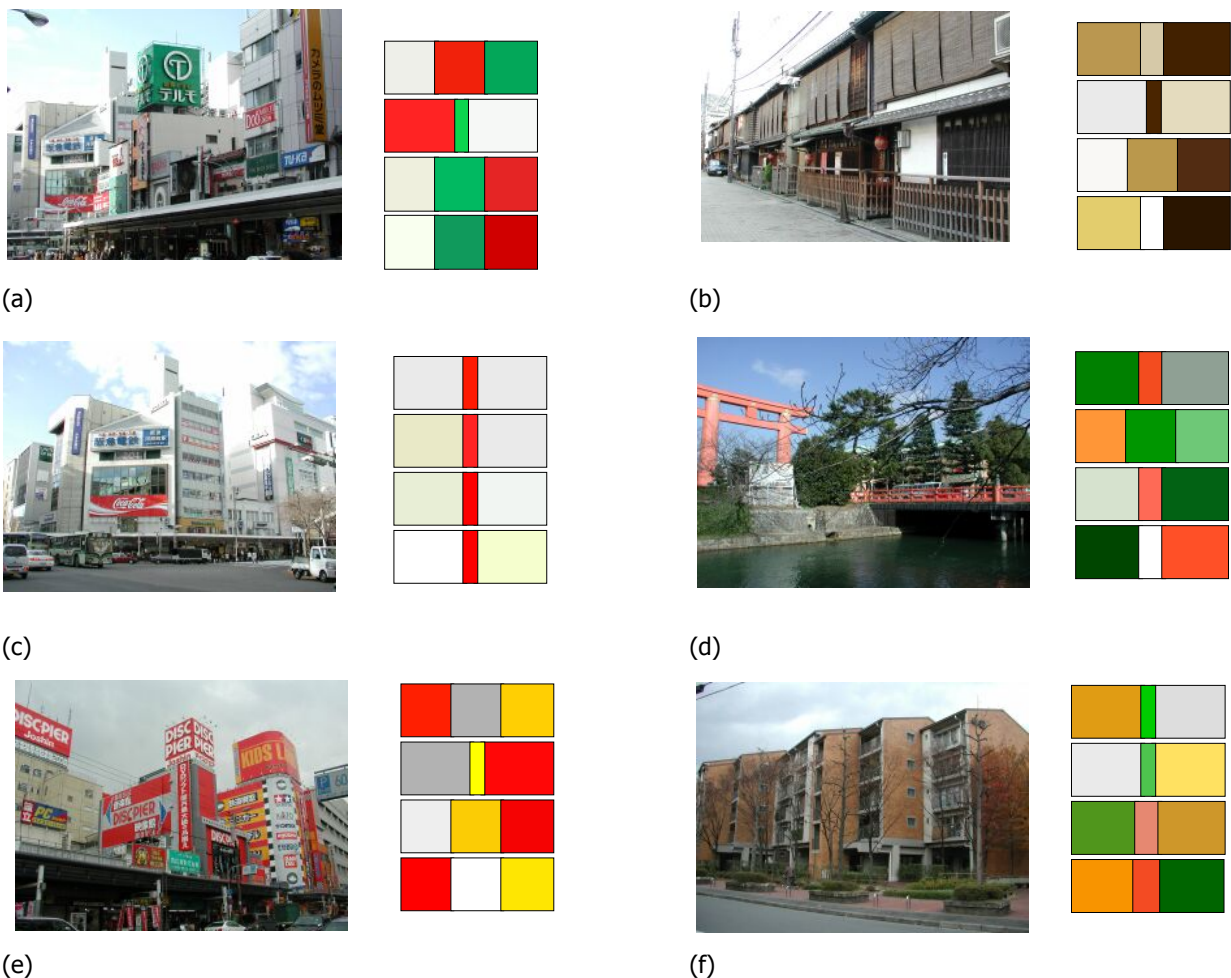
psychological evaluation for the cityscape and the three-color arrangements related to each other.

## 2.2. Results

Figure 3 shows typical examples of the cityscape pictures and the three-color arrangements produced by four subjects. As we can see from this figure, the subjects produced similar color arrangements using three colors for the most of the cityscapes. In many cases, they selected the colors that occupied large areas in a cityscape as the representative colors. Highly saturated and conspicuous colors were also selected as the representative colors of the cityscapes. In addition, some of these color selection seemed to be influenced by contextual meaning of the cityscape. That is, subjects tended to select colors of symbolic or traditional objects in that cityscape such as vermilion of a gateway to a shrine.



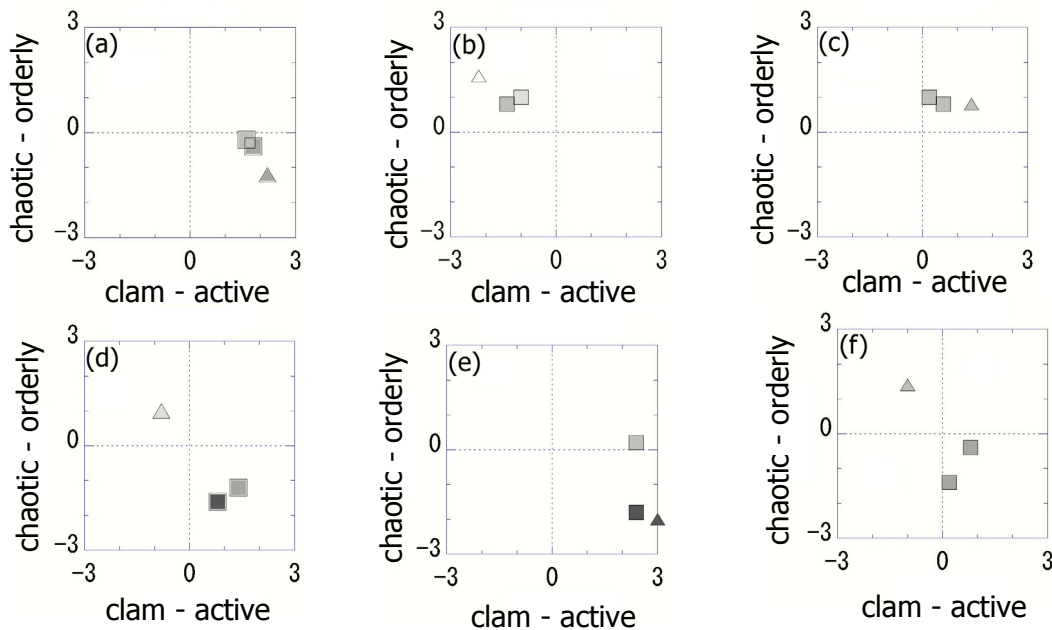
**Figure 2:** The frames for the three-color arrangement. The subjects selected one of the three frames to represent the colors in the cityscape.



**Figure 3:** Examples of cityscape pictures and their color compositions made up using three colors by each of four subjects. (Experiment 1-1)

The results of the experiment 1-2 are shown in figure 2. The mean score for the activity (horizontal axis) and organization (vertical axis) are plotted for six cityscapes shown in figure 3. Triangle symbols indicate the mean score of the evaluation for the cityscape pictures. Square symbols indicate that for the three-color arrangements. The results of two different color arrangements are shown. The cityscape (c), the evaluation for the cityscape and those for the three-color arrangement

are similar. However, the result of the cityscape (d) is quite different from that of the color arrangements.

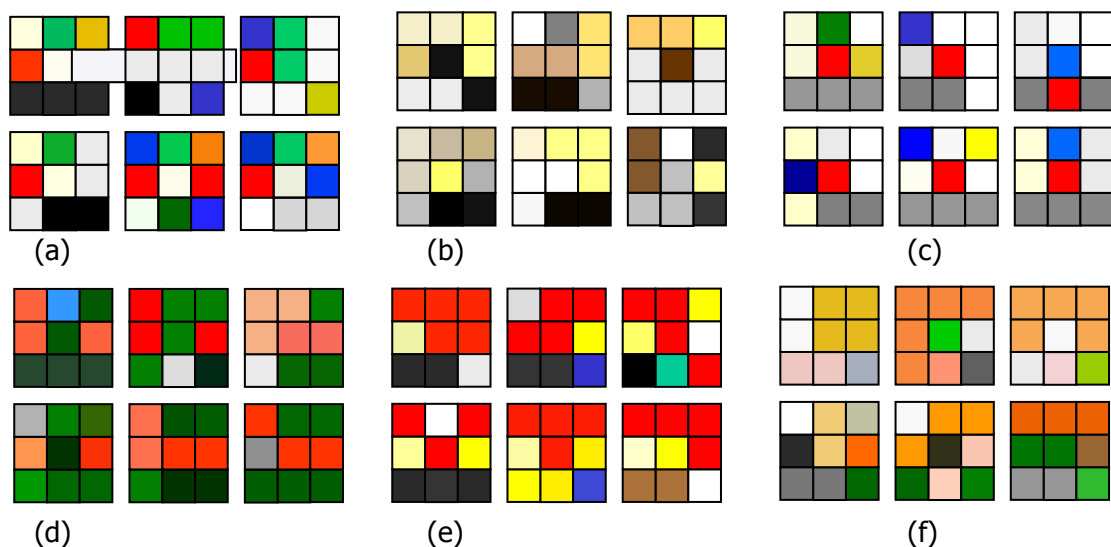


**Figure 4:** The results of the experiment 1-2. The mean score for the activity (horizontal axis) and organization (vertical axis) are plotted for the six cityscapes shown in figure 3. Triangle symbols; the cityscapes, Square symbols; two of the three-color arrangements.

### 3. EXPERIMENT 2: Color Composition of a Cityscape Using Nine Colors

#### 3.1 Methods

We carried out the experiment to test color composition using nine colors. As in the experiment 1, the experiment 2 consisted of two parts. In the experiment 2-1, we examined how subjects represented the color composition of a cityscape using nine colors. The subjects produced the arrangement of nine colors to represent their recognized color composition of a cityscape. Forty colors pictures taken from Kyoto and Osaka city were used for the experiment. Six subjects, students of the department of Architecture, participated in the experiment 2. The procedure and experimental set-up is the same as in the experiment 1-1.

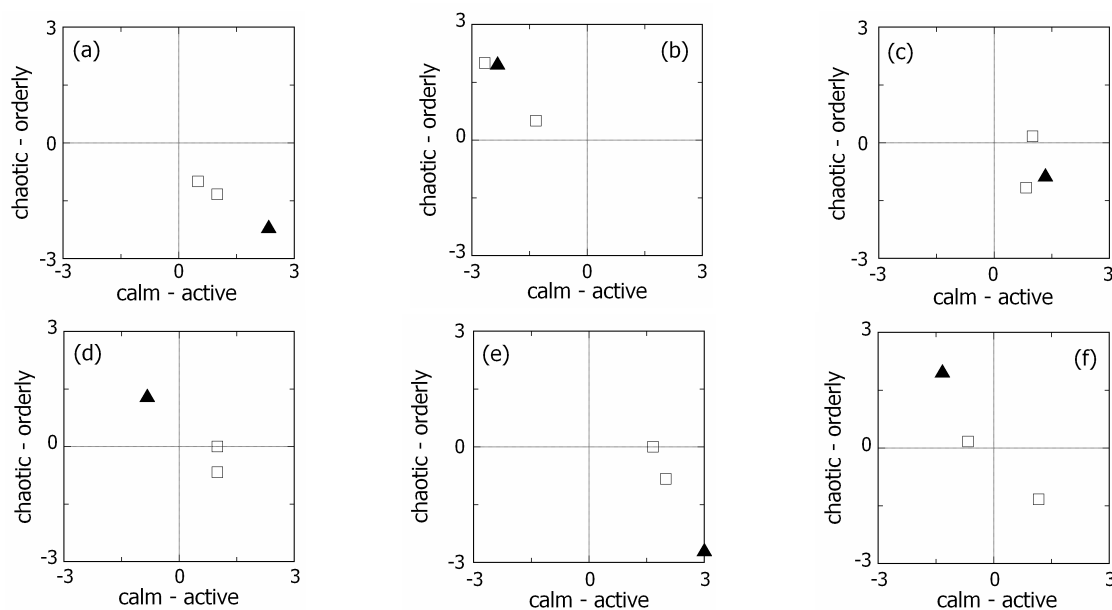


**Figure 5:** The examples of the results of the experiment 2-1. The nine-color arrangements composed by six subjects are shown for each of the six cityscapes (a) - (f) in the figure 3.

In the experiment 2-2, the subjects evaluated visual impressions of the cityscapes and the nine-color arrangements made by the subjects in the experiment 2-1. The same visual impressions as in the experiment 1-2 were evaluated: activity (active - calm), organization (orderly-chaotic) and preference (harmonious-inharmonious). The procedure and experimental set-up were the same as in the experiment 1-2.

### 3.2. Results

Figure 5 presents typical examples of the nine-color arrangements produced by six subjects for each of six cityscape pictures shown in the figure 3. The subjects selected various colors in the experiment 2-1, however, they produced similar color arrangements using nine colors. The results of the visual impression for six pictures (a) to (f) and nine-color arrangements are plotted in figure 6 as in the figure 4.



**Figure 6:** The results of the experiment 2-2. The mean score for the activity (horizontal axis) and organization (vertical axis) are plotted for the six cityscapes (a) - (f) shown in figure 3. Triangle symbols; the cityscapes, Square symbols; two of the nine-color arrangements.

## 4. CONCLUSIONS

1. The subjects produced similar color arrangements as the color composition of cityscapes using three and nine colors.
2. The colors that occupied large areas in the cityscape were commonly selected as the representative colors. Highly saturated and conspicuous colors were also selected. In some cases, the color selection seemed to be influenced by contexts of the cityscapes.
3. The color arrangements composed by the subjects generally gave similar visual impression to that of the cityscape. However, some cityscapes having traditional buildings or complex textures gave different visual impression from the color arrangements.

### Acknowledgement

The authors thank Kunihiro Toyonaga for his contribution to conducting the experiment 2.

### References

1. T. Ishida and K. Yagi, "Relationship between visual impression of a city landscape and its characteristics of color", Proceedings of AIC Midterm Meeting Warsaw, pp.99-108 (1999)