

“Introducing a trick of the eyesight into architecture.”

## Introduction

Today, we live in a space which has depth, width and height. We watch various three-dimensional things like cups, cloths, animals and so on, through our eyes. In our daily life, we take them for granted. However, we sometimes experience that we see things as if they were bent and changed into peculiar shapes. That is a trick of the eyesight. It makes us see strange shapes of things through their eyes, although we can see right shapes of things in another view. There are many kinds of tricks. For example, some of these tricks are used for road signs and advertisements because it makes us see them more clearly and in bigger size from a car than from a street. In addition, some pictures are part of this trick because we watch pictures as if they had depth or space. Thus, we often experience tricks of the eyesight in our daily life. They are so mysterious and interesting for me that I would like to learn what they are like. That is why I chose this topic for this essay. I carried out various experiments and a research on theory of the tricks in this class. Then, I found through the experiments and theory that a trick of the eyesight can make people see things larger than they actually are. When I found it, I thought it should be introduced into architecture. According to Ministry of Land, Infrastructure and Transport, “the average area of a house in Japan is about 95m<sup>2</sup>. On

the other hand, that in America is about 148m<sup>2</sup> (Ministry, 2006). Therefore, a house in Japan is much smaller than in America. It is difficult for us Japanese to secure a large space for a house because Japan is narrow and mountains occupy three-fourth of area of the country and we have little flat land. Especially in Tokyo, there are a lot of buildings in a small space. The space of the land is almost occupied and the price of it is very expensive there. Thus, we can see that the land is so small that we cannot build a large house in Japan. Therefore, I think that a trick of the eyesight, which makes us see things larger than they are, should be introduced into architecture. Therefore, I would like to explain how this trick is used in architecture. I will discuss how the largeness of the room has an effect on our minds, what the trick is like through the result and analyze of my experiment, and how interior designers make us feel rooms larger with the trick.

Experiments that the largeness of the room has an effect on our mind

First, I think it is the theory that we feel more comfortable when we are in a large room than when in a small one. According to Hiromitsu Kobayashi and Akiko Moto (2006), they carried out their experiment to research how the room has an effect on our minds or pulse. 15 students had each seat in three different rooms for 20 minutes. These three rooms were white and have the same height and width; the height was 2400mm and the width was 900mm. However, the depth of them was different from each; the

depth of one room was 900mm, another one was 1800mm, and the other one was 3600mm. (...) The researchers asked students in which room they felt more comfortable. “As a result, 10 of them felt comfortable in the room with 1800mm depth and the rest of them felt so in the room with 3600mm depth” (p.3). On the other hand, “13 of them felt uncomfortable in the room with 900mm depth” (p.3). Thus, people feel uncomfortable when they are in a small room. However, “they felt more comfortable in the room with 1800mm depth than in the room with 3600mm depth” (p.3). The reason was that they felt the width of the room with 1800mm looks as if it was longer than that of the room with 3600mm because the shorter depth made them feel the width longer. Therefore, if the room-width was longer, students would feel more comfortable. Besides, Hironobu Takahashi, who is a master of Kyusyu Institute of Design, and Naoyuki Oi, who is an assistant professor of Faculty of Design of Kyusyu University, (2004) found that people feel comfortable in a larger and simpler room. They asked 10 subjects to see pictures which Japanese traditional architecture and Western European architecture. (...) Then, the researchers asked them what made them feel comfortable with these pictures. As a result, “7 of them felt comfortable with the largeness of the room and 8 of them felt comfortable with the simplicity of it” (Takahashi, Oi, 2004, p.2). From this experiment, the researchers found that the largeness and simplicity in the room made people feel

comfortable. Thus, the largeness of space has an effect on our minds.

My experiment about the trick of the eyesight

Second, I had the experiment about the trick of the eyesight. The Purpose of this experiment was how the largeness of the room is changed by the trick of the eyesight. I made four kinds of black rectangular parallelepiped boxes, which had a same width of 4cm and depth of 5cm and different height which was 3cm, 6cm, 9cm, and 12cm each. I put these 4 boxes in a room and saw how it is like. The room had a depth of 21cm, a width of 20cm, and a height of 15cm and its color was white. First, I put the boxes on the room like figure 1 and 2.



Figure 1



Figure 2

I asked 7 students to see the inside of the room from 2 directions, A and B like figure 3 and 4.



Figure 3. Seeing from A



Figure 4. Seeing from B

As a result, 3 of them felt the room was larger by seeing it from direction A than direction B, 2 of them chose direction B because they felt it larger by seeing it from direction B and 1 of them couldn't understand it. I am afraid of saying I couldn't get to a conclusion from this experience. I should have shown them how to see inside the room. The reason why I couldn't handle this experiment was that they saw inside the room in a different way. In the experiment, those who chose direction A, saw inside the room in a certain distance so that they felt the room was larger from direction A than from direction B like figure 5 and 6.



Figure 5. Seeing from A in a certain distance

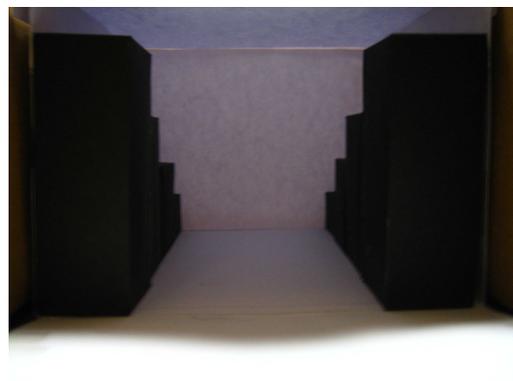


Figure 6. Seeing from B in a certain distance

On the other hand, those who chose direction B, saw inside it in a short distance so that they felt it larger from direction B because the largest box was out of sight like figure 7 and 8.

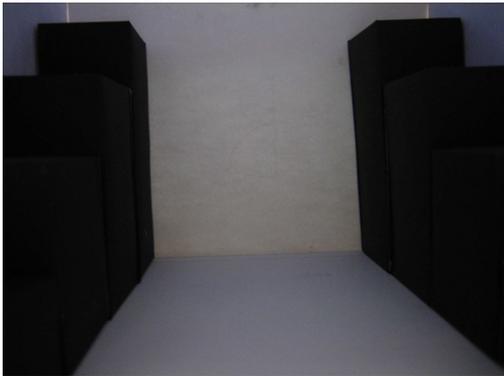


Figure 7. Seeing from A in a short distance

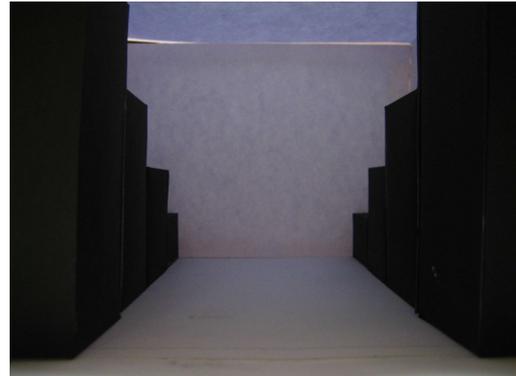


Figure 8. Seeing from B in a short distance

If I had let them know how to see inside it, almost of them would have chosen direction B. However, people can feel the room larger with the way to put three-dimensional objects on it because 5 students felt it larger when they saw inside of it from one direction.

Examples that we can feel rooms larger

Third, I will introduce some examples to make us feel rooms larger. Rieko Suzuki, who is an interior designer, (2006) found that there are three ways to do so. First, we should unify a color of things, a wall and floor in a room. For example, look at figure 9.



Figure 9. Both the right room and the left one are same largeness of space. But in the left one white and similar color to white are used and in the right one the color of the grain are used besides white. (Tostem, Oct. 31st, 2006)

These two rooms have the same space. When we look at the right room, we feel it is smaller because it is not unified in the same color. On the other hand, when we look at the left room, the color of things, wall and floor there is united, so we feel it larger than the right one. Thus, unifying a color in a room makes us feel it larger. Second, we should choose furniture with a low height. Furniture with a high height has a pressure on our feelings. Therefore we should choose furniture with a low height. Third, we should put few pieces of things on the floor. For example look at figure 10.



Figure 10. In the left room, there are two chairs with legs. And in the right one, there are

two chairs without them. (KOSUGA, Oct 31st, 2006)

In the right room, the sofas without legs keep us from seeing all of the floor. However, in the left room the sofas with legs allow us to see all around the floor. Like this, if we can see all around the floor in the room, we can feel it large. However, if it is full with things, it is so difficult to see the floor and walls that we can't feel the room large. Therefore, we should put few of things on the floor. Thus, there are some ways to make us feel rooms larger. The area in my room is about six mats and there are two desks, two bookshelves, a bed, and some big posters on the wall there. I have so many things that I can't feel it large when I am in my room. Therefore, I should have fewer things in order to feel my room larger. If you have such area in your room, you should the ways.

## Conclusion

Thus, we feel comfortable with a lot of space around us. As I discussed in first paragraph, people feel more comfortable when they are in the large room than when in the small one. Although it is difficult to spread the room in Japan as I discussed in introduction, I show in second paragraph that it is possible to do so with the trick of the eyesight through my experiment, which makes us feel the room larger than as it is. Therefore, I think we should understand and introduce this trick into architecture and interior design especially in Japan, which is narrow and has little space for buildings.

We will feel comfortable with this trick. In the future I would like to become a first architect and if I can, I would like to build a house with the trick in order to make people feel comfortable there.

#### List of reference

Kobayashi, H., Moto, A. (2005). Effects of Room-depth on Autonomic Activity Analyzed by Frequency Components of Heart Rate Variability. 石川看護雑誌

[ Ishikawa Journal of Nursing ] , 3, 1-3.

Takahashi, H. Oi, N. (2004). Research of the aesthetic value structure in space of today's Japanese people. Aesthetic evaluation of space using the Evaluation Grid Method. Retrieved October 31, 2006, from <http://www4.ocn.ne.jp/~mokkei/2004taikai.pdf>

Ministry of Land, Infrastructure and Transport. (2006). The morgue of the ground plan of improving national life. Retrieved October 20, 2006, from <http://www.mlit.go.jp/jutakukentiku/house/torikumi/jyuseikatsu/sankoshiryo.pdf>

Suzuki, R. (2006). How to choose furniture to make people feel rooms larger. Retrieved October 31, 2006, from <http://allabout.co.jp/living/basicinterior/closeup/CU20060118A/> and <http://allabout.co.jp/living/basicinterior/closeup/CU20060118A/index2.htm>

Tostem. (2006). The figure of rooms. Retrieved October 31, 2006, from <http://www.tostem.co.jp/lineup/living/woodyline/>

KOSUGA. (2006). The figure of rooms. Retrieved October 31, 2006, from <http://www.kosuga.co.jp/catalog.dir/top.htm>