

Study the Design of <Giovanni Arnolfini and His Wife> on Visual Perception

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Abstract: 60 students as participants were recruited to complete a questionnaire about the visual perception feeling of different design in stereoscopic, plane and color of <Giovanni Arnolfini and His Wife>. Data was analyzed via Human Engineering research-Semantic Differential Method. The result shows that there is a slight difference in visual perception for the image change between different groups of people. Also the original is consistent with the human visual features and it's perfect in design.

Introduction

Human Engineering is a new edge science that research the relationship between human, machine and environment by using various methods and data. Aim of this article is to

explore whether the image is comfortable for people on the vision perception (Jun Xu, Tao, 2012). < Giovanni Arnolfini and His Wife> (Figure 1) which size is 82 * 60mm is an oil painting drawn on the board, created by the The Netherlands Renaissance painter Jan Van Eyck in 1434. As a world-wide acknowledged pioneering work in oil painting history, now it's in the possession of the National Gallery in London. The painting depicts a picture where a couple are holding a wedding ceremony in the bedroom. In this picture, the middle-class life and the gesture of the couple as well as interior furnishing all reflect the changes during the time of Netherlands Renaissance, and people's improved quality of life (Tian Liu, 2013). However, research on this work is controversial. The debate mainly focuses on whether the design is scientific. Based on relevant literature and a designed survey in this paper, from a visual perception perspective, set out to investigate various feelings of different groups towards this painting, whether the design structure is perfect, whether it is conform to the visual principle of Human Engineering, so as to take this picture's design as a reference and enrich the theoretical contents of design constitution.



Figure 1 <Giovanni Arnolfini and His Wife>

Test Method and Arrangement

Test Subjects. The subjects of this research were 60 college students. They were divided into two groups: A. 30 Art major students and B. 30 non-art major students. Art major students have been

trained with aesthetic and visual perception while non-art major students, who are mainly from economic management major, computer major, management of cultural industry major and other majors, haven't taken any specific aesthetic and visual perception training.

Test Arrangement. We used the SD (Semantic Differential Method) to carry out a

questionnaire. The questions used bipolar adjective matching, such as comfortable and uncomfortable, obvious and not obvious, etc.. The answer used 5 options to reflect various subjective feelings of these two types of people. The 5 options "Extremely uncomfortable, Uncomfortable, General, Comfortable, Extremely comfortable" were weighted by 5 points: 1, 2, 3, 4, 5. Data was then collected and analyzed to obtain the perception of these test groups(Canqun He, 2013).

Procedure. The research evaluated the comfort degree on the interior light and space of < Giovanni Arnolfini and his wife >. For the plane composition, elements included the sizes of window, characters, chandelier and mirror; For stereoscopic composition, the related contents were existence of window, chandelier, mirror, puppy, shoes; For color composition, the changes were hue, light and purity on the portrait.

Results and Analysis

1) Visual perception of the portrait in changed plane composition

Plane is the two-dimensional space concept against the three-dimensional space where

people live. It is the art activity in two-dimensional space and could also be interpreted as a form that is invested with art. Principles of Formalist Aesthetics from plane composition include tempo and rhythm, symmetry and balance, contrast and harmony, proportion and moderation, change and unity etc(Li Dan, Lan Ma, 2007). This principle was manifested in the questionnaire of < Giovanni Arnolfini and his wife > as window shrank, character shrank, chandelier shrank, mirror shrank and total shrank. The purpose is to test the actual feeling of the proportion and moderation in this principle. The conclusions are as follows:

When the window was Shrank, the feelings of art major students (group A) and non-art major students (group B) were totally different. Group A in the light, saturation, and overall perception of more than 2.8, that is between discomfort and in general, tend to the general feeling; and Group B for saturation and brightness feeling hold similar feelings, for light, average just 2, hold uncomfortable attitude(Figure2).

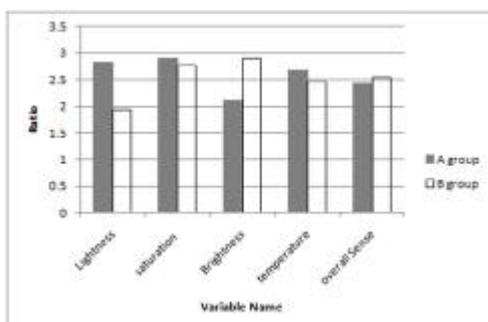


Figure 2 The vision sense when window shrank

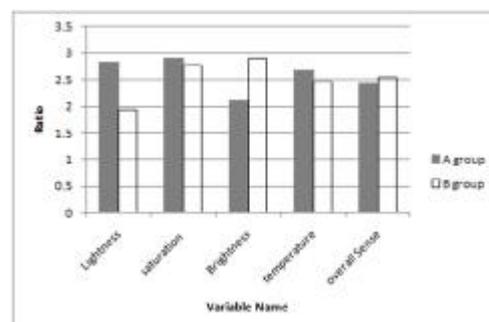


Figure3 The vision sense when characters shrank

In the case that the proportion of characters was shrank, The average experience of Group A and B in the light, the brightness of disagreement, but the saturation, the overall perception of well-being and feeling less, indicating that in these three areas, whether it is a Group A or Group B have similar feelings(Figure 3).

In the survey of vision perception feeling about < Giovanni Arnolfini and his wife > in smaller chandelier, Group A and Group B to feel the light is between 2 and 3, between the general case of discomfort and, while in other areas are close to 3, that is, in general, and in the overall perception are very close, close to 3, the general .Apparently, the smaller chandelier affects the spatial location,visual effect and perspective change a lot (Figure 4).

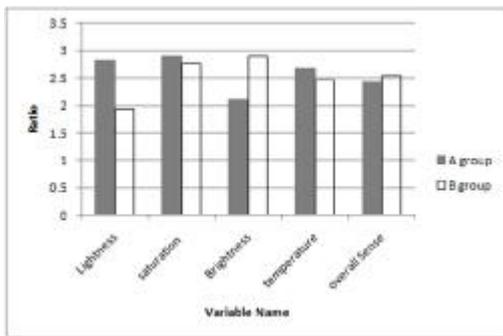


Figure 4 The vision sense when Chandelier Shrank

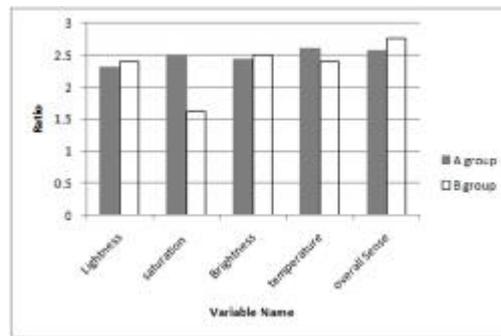


Figure 5 The vision sense when Mirror Shrank

The research to reduce the proportion of the mirror showed that group A compared to the lower saturation feelings and group B, group A is uncomfortable and generally between group B is 1.5, between particularly uncomfortable and uncomfortable, but in other areas, group A and group B almost all of the general feeling(Figure 5).

No matter group A or group B, the answers of visual perception for the shrank total portrait were focused on obvious or extremely obvious(Figure 6). Group A and group B on experience saturation is between 1.5 and 2, feel as uncomfortable. In the sense of lightness and well-being among uncomfortable, but on the overall perception of both the general.

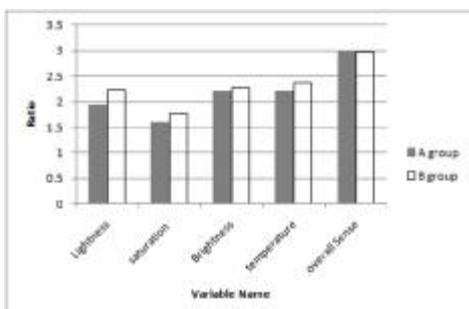


Figure 6 The vision sense when total shrank

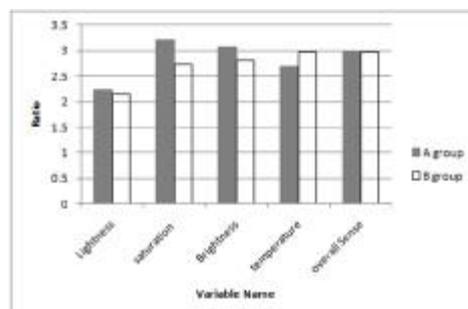


Figure 7 The vision sense without window

In general, the answers regarding the secondary elements amassed on general, obvious and not obvious. On average between 2 and 3. That is the main character or a substantial scaling, both art students and non-art students answer basically general and uncomfortable.

2)The visual perception of portrait in changed stereoscopic composition

The major content of survey for < Giovanni Arnolfini and his wife > in changed stereoscopic composition is to study and explore the interior space presented in this portrait and the relationship between its elements, which include spaciousness, the sense of volume and scale. In the investigation, spaciousness and the sense of volume as well as the sense of scale were emphasized in the case of no window, no chandelier, no mirror, no puppy or no shoes.

The volume feeling could be divided into two aspects: the amount of physical and the amount of psychological. The amount of physical means size, quantity and weight. The amount of psychological is the different psychological feeling for the same amount of physical. It is a kind of ‘illusion’ from people’s experience. This article mainly refers to the amount of psychological, which is people’s ‘illusion’ for the painting without window, chandelier, mirror, puppy or shoes. The result shows that the factors changing the amount of psychological varies. The answers are different whether in group A or group B(Figure7-11).

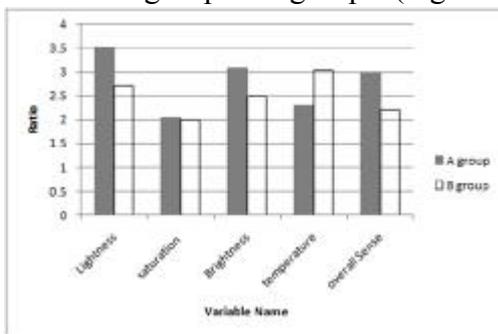


Figure8 The vision sense without chandelier

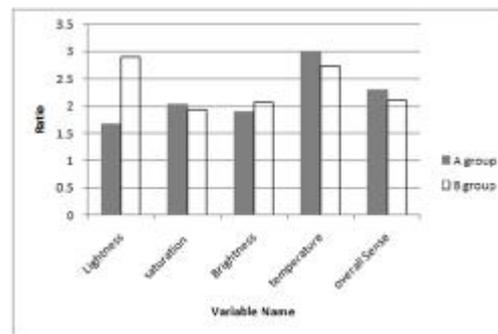


Figure 9 The vision sense without mirror

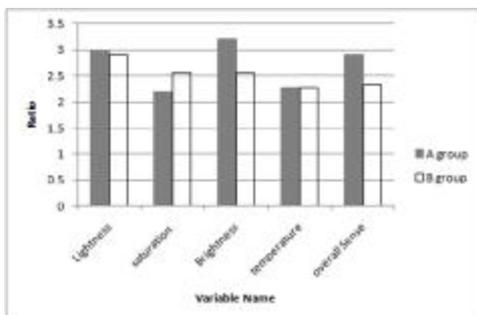


Figure 10 The vision sense without puppy

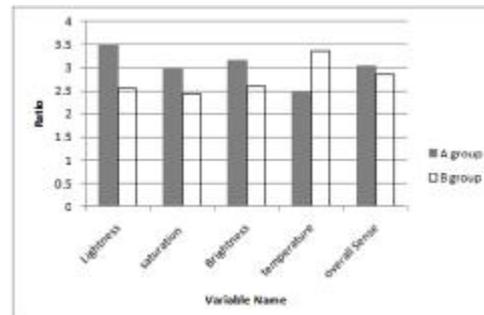


Figure 11 The vision sense without shoes

There are three meanings of stereoscopic: space tension, space depth and space

movement. The survey aimed to test the stereoscopic visual feeling in Human Engineering, from a visual perception perspective, through shrank characters, shrank mirror, no chandelier and no mirror. Shrinking the characters was the test for the whole interior space. It turns out that the shrinking of characters have a great impact for people’s visual feeling(Jian Zhang, 2004). The space with shrank characters become narrow and people are uncomfortable or extremely uncomfortable with the whole painting. Shrinking or removing the mirror were to test the stereoscopic of the visual perception of the image before and after the change. Because in <Giovanni Arnolfini and His Wife>, the mirror has depicted the characters in front of the picture and revealed where the painting viewer stood, so removing or shrinking the mirror had affected the space depth. For the non-art students, however, they did not know the background of this art to feel the mirror’s change in detail. As a

result, 85% of them selected 'General' option when they were asked the stereoscopic influence of the picture with removed or shrank mirror.

Sense of scale is a concept of comparison. Small shape may have a large scale while large shape can be with small scale. Scale is the perception of this art's size and the reflection of object's quantity, length and volume property in people's mind. Sense of scale is obtained from the joint activities of visual, kinaesthesia and tactility. It could be concluded from the investigation of < Giovanni Arnolfini and his wife > with shrank window, shrank characters, shrank chandelier, shrank mirror and the whole shrank painting, that people have different feelings of the major factor and secondary factor. In the sense of scale test where proportion of the characters and the whole picture were reduced, their answer average between 4 and 5, is comfortable or particularly comfortable; and a secondary factor windows, chandeliers and mirrors shrink, their average is between 2 and 3, is uncomfortable and general.

3) The visual perception of portrait in changed color composition

Color, as a dominant language element, its semantic function is the most prominent one

in the whole signifier semiotic system. One of the reason is that as a kind of visual perception symbol, color brings people with emotion and emotional information via perception experience, namely, it is a kind of semantic. Also the psychological attributes or characteristics particularly belonging to each color are the semantic information of design language. For instance, the green dress on the lady and the color of the curtain behind have semantic meanings(Fei Guo, 2008) . Through testing the contrast on space, quantity and quality after changing the light, hue and purity, we got the summary as followings:

The result of < Giovanni Arnolfini and his wife > hue change test shows that Change hue, and saturation to feel light, and they are not comfortable, and the bright and well-being of a sense of feel is inconsistent, Group A that the change in brightness feeling uncomfortable and well-being biased and general. In the overall perception, Group A uncomfortable, Group B is biased comfortable(Figure 12).

In the test to the change of light, the art students' answers were not identical because their sense of color were not the same. It's like to draw a tree in spring, some students would paint it with bright color while some others preferred the contrary color with gray tone to be harmonic and transparent. So their feedback were different. But most non-art students were uncomfortable or extremely uncomfortable with the changed light. We could see that the visual perception of art students and non-art students for color composition principle are totally different(Figure 13).

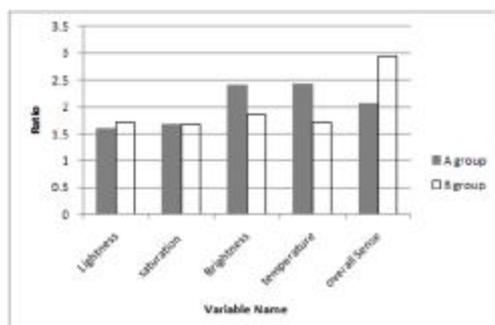


Figure 12 The vision sense when changed hue

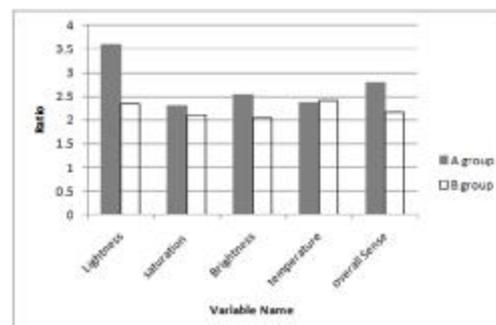


Figure 13 The vision sense when changed light

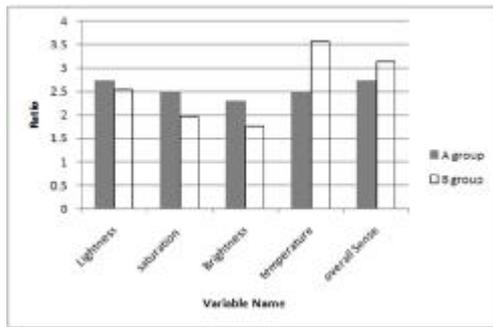


Figure 14 The vision sense when Changed Purity

For the purity change of <Giovanni Arnolfini and His Wife>, the answers of art students various from ‘Extremely uncomfortable’ to ‘Extremely comfortable’ and ‘General’. The transformed purity had another kind of beauty in their eyes. However 90% of the non-art students felt uncomfortable or extremely uncomfortable with the change of purity(Figure 14).

Generally, art students and non-art students’ feelings of the color composition change were not the same but still in line with visual habits of people. People feel <Giovanni Arnolfini and His Wife> with the changed light, hue and purity according to their own individual aesthetic. But on the whole, people’s visual habits were severely affected by the change of light, hue and purity.

Conclusion and Discussion

Add it all up, three points are as followings: (1)Plane composition: the shrinking of any elements in this art has different effects on visual perception of different groups.(2)Stereoscopic composition: the visual beauty of the original painting will be abated if any factores of this chamber work is shrank or disappeared.(3)Color composition: the change of light, purity and hue also has great influence on people’s appreciation of the art. So whatever changes on <Giovanni Arnolfini and His Wife> cannot be as perfect as the original. The composition of design elements are perfectly harmonious in the creation of the artist. Even though ergonomics at that time did not have the development and progress as it has nowadays, the portrait is still in accordance with the visual principle of Human Engineering.

References

- [1]Jun Xu, Tao. Ergonomics [M] Beijing: China Textile Press, 2012.
- [2]Tian Liu. Finney Couple from Three-dimensional Image on the Arno Interpretation [J], the United States and Age: 2013.
- [3]Canqun He. Ergonomic and Artistic Design [M]. Changsha: Hunan University Press, 2013.
- [4]Li Dan, Lan Ma. Plane Composition [M] Liaoning: Liaoning Fine Arts Publishing Department, 2007.
- [5]Jian Zhang. Visual Forms of Life [M] Beijing: China Academy of Fine Arts Publishing Department, 2004.
- [6]Fei Guo. Semantic Function in the Language Component [J] Chongqing: Packaging Engineering, 2008.