



# The Role of Color Psychology in Interaction Design

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**Abstract:** Interaction design is a multidisciplinary profession in which psychology plays an important role. The purpose of design is to solve the problem, and a better solution can provide a better user experience, so the key to our user experience lies in the user's psychology. As early as the end of the Spring and Autumn period in China, the first theoretical document on design "Kaogong Ji" recorded the "five elements and five colors" (color), and the importance and role of humanistic care for design. Color affects our perceptual system, and color psychology is a subjective feedback to the objective world. On the basis of introducing the concept of color psychology and interaction design, the principles and methods of interaction design are proposed by using color psychology.

**Keywords:** color psychology, interactive design, user experience, work test record

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## 1. Introduction

As early as the end of the Spring and Autumn period, "Examination of work records" recorded that design should be full of humanistic care. With the development of the Internet, "human-centered" interaction design is deeply rooted in people's hearts. How to satisfy the people-oriented user experience is the key to interaction design. In the design process, how to meet the needs of users is not judged by design principles, and the knowledge of psychology provides a certain direction for the theoretical system of interaction design.

At present, the most systematic and comprehensive scholar of design psychology research is Donald Norman, a cognitive scientist and psychologist. He wrote *The Design of Everyday Life* in the 1980s. "The appearance of the design should provide key clues for the correct operation of the user." He called his research "material psychology" and used a large number of design cases to explore the user's psychological state of use, so that the definition of design psychology became more perfect! People engaged in art creation and art appreciation, they accept visual information accounts for about 70% of all information, and color occupies an extremely important position in visual art. "Color psychology is people's subjective reflection of the objective world. When different wavelengths of light act on people's visual organs and produce color, it will inevitably cause people to produce certain psychological activities, which are emotional." In the process of interaction design, we make use of color, an important factor, to analyze people's psychology when using, and apply scientific methods in color psychology to make interaction more in line with users' psychological expectations, so that the user experience will be better.

## 2. Color psychology and interaction design

### 2.1 Color psychology

Color psychology is a conceptual achievement in the study of the relationship between color and human psychology. Although color psychology has not been formally incorporated into psychology, the influence of color on human psychology is objective, and the research results in the field of color psychology have been used to solve people's psychological problems in real life." In different years, in different areas, people's love for color may be different. But similar physiological mechanisms and external stimuli in humans make the psychological effects of color much the same.

In his book, Donald Norman defines "instinct, behavior, and reflection" as the three stages of design, and this research approach based on user psychology generally guides design. In order to design good interactive works, interaction designers need to observe and understand human behavior, analyze user psychology through human behavior, study the relationship between factors influencing and driving these behaviors and users themselves on the basis of understanding human interaction and what kind of interaction they need, and make reasonable designs on these factors. In order to study the use of people more comfortable, change the way of human behavior design. Personal experience shows that color has an important impact on people's psychological activities, especially the relationship with emotion is very close. People's first feeling is vision, and the biggest impact on vision is color, and people's behavior is dominated by color emotions. "The process of the formation of

color perception is that the eye, as the information that arouses the excitement of nerve cells, takes in the light source color or the object color, enters the nerve center of the brain through the nervous system, and then processes it, compares with the large number of color signals stored in the brain, determines the newly absorbed color nature, and produces mental processes such as imagination, thinking, and emotion of color.”The physiological mechanism of color perception is the physiological basis of color psychology. Before understanding and grasping the nature of color deeply and scientifically, we should make clear the physiological mechanism of color perception. Color psychology plays a guiding role in the practice of interaction design. Only by understanding the basic laws of color’s visual influence on people’s psychological activities can we better understand and master the needs of users. In accordance with such basic laws, interaction design can be carried out to continuously improve the visual experience of products so as to better meet the needs of users. Color psychology is closely connected with human daily life, so its research significance is very important. In a sense, it can meet the new requirements of consumers for the quality of life, meet the needs of designers’ personal design, and also meet the needs of the theoretical development of color psychology.

## 2.2 Interaction design

Interaction design (interaction design) In which interaction is communication, mutual is interaction, is the design field that defines the interaction between people and things, people and the environment, and people, and is used to design the behavior of artificial systems. It refers to the process of designers analyzing, predicting, planning, and exploring the interaction between products and users. Interaction design mainly studies the functional design and experience design of people, products, environments and systems. For users, interaction design is how to make users use the product simpler and more convenient. And the use of this product has a good user experience design. It is committed to understanding user expectations, analyzing user behavior and psychology, and conducting research on user behavior when interacting with products. At the same time, it also includes understanding the various effective ways of interaction, as well as the interactive behavior and interactive psychology that they bring, and strengthening and expanding.

“Kao Gong Ji” recorded: “Man is eight feet long, Chongge four feet, called the third rate;” Husband long search four feet, four feet Chongren, called the fourth class; Car halident often, chong its four feet, called the five; “The spear is always four feet, and the halberd is four feet for worship, which is called the sixth grade.”The meaning of this text is that the dimensions of the parts of the car should be the size of the human body. Another example is, “a Lu is a Lu tool, and the length of the six feet is six inches, while the length of the search is four feet, the chariot is always four feet, the chieftain spear is always four feet, and the Yi spear is always three feet.” “Every soldier who has no more than three bodies can use all three bodies, but there is no body, and it is harmful.”

This means that in the manufacture of weapons, the length of weapons should not exceed 3 times the height of the general soldier. Otherwise, not only will it be bad for the war, but it will also hurt yourself. The design in the book is full of humanistic feelings, which brings us a lot of conceptual inspiration, the pursuit of craftsman spirit, the pursuit of the truth of design, and the pursuit of people-oriented concept. This coincides with the current fashionable interaction design concept, in line with the concept of human service, users in the use of the process of good experience. Pay attention to the user’s visual and psychological feelings, as well as aesthetic feelings to pay attention to the interactive design. Design products can create mappings in people’s hearts, so that people have a sense of beauty and pleasure. All of them come from the fact that people can feel and perceive design, and have a common understanding of the information conveyed by design. It can even be said that feeling and perception are the basis of all design psychology.

## 3. The association of color, symbol

“Zhou Li Kaogong Ji” recorded: “The east said green, the west said white, the south said red, the north said black, the sky said dark, the earth said yellow.” Associate the five colors with the orientation. It contains the ancient people’s specific cosmology and aesthetics. At the same time of receiving the external color light stimulation, the visual organ will automatically evoke the color memory traces related to the brain, and through the process of analysis, comparison, imagination, judgment, etc., associate the present color with the past visual experience, and form a new concept. This creative thinking process is called “color association”. The ancients used the five colors to compare the five elements, which is the result of the color connection.

When the color of the nerve causes the nerve cell excited information, it will be input into the brain and nerve center through the nervous system, resulting in color perception. The judgment of a certain color phenomenon is not only through vision, but also includes other feelings, memories and thinking of the all-round understanding of color. Therefore, the color association is also all-round, including the cold and warm association of color, the strong and weak association of color, the light and heavy association of color, and so on. Understanding how different people associate with a certain color is of great

reference value for product design. For example, the Olympic rings (Olympic symbols). The five rings of different colors will remind people of the people of different lands, and the people of that land. Blue is reminiscent of Europe, yellow is Asia, green is Australia, red is the Americas, black is Africa. This association later formed fixed symbols and signs that spread widely around the world.

“The symbolic meaning of color is that when a color has a close connection with the things it is associated with, shows a special meaning, and is recognized and spread by people in the society, the symbolic meaning of this color and something is formed.”For example, some countries and nations give each color a specific meaning, and over time, its color becomes a sign of something. The symbols of color have relative commonality, stability and coherence in the world.”In essence, color and symbolism are not inextricably linked in most cases.”Even if there is, it is accidental or approximate, and by no means equivalent. But with the active participation of the imagination function of the human brain, there is an extremely wonderful reciprocal relationship between the two. Because people in different times, different regions, different nationalities, different histories, different religions, different classes and other backgrounds have different experiences of color, their color feelings are also different, and the color symbols given specific meanings are also different. The symbol of color, in general, is because it is a historical accumulation of human phenomena, is a symbolic form of social consciousness. Therefore, it has a relatively stable inheritance in a certain environment, and plays the dual functions of marking and spreading in social behavior.

Through association and the use of artistic imagination, people can express and create things that do not exist. The result of association is a series of new ideas, new emotional changes. Designers should make full use of the power of color association, guide the viewer’s association, make it resonate, in order to achieve the purpose of aesthetic and promote sales.

## 4. Color psychology in user experience

In interaction design, color often receives more visual information than shape, and the difference in color can produce different feelings and impressions in the same interface design. How to make better use of the aesthetic function and visual benefit of color is the key of color in interaction design. For example, in interactive interface design, different colors have different psychological effects on people.

### 4.1 Red

In the spectrum, red has the longest wavelength and the strongest visual impact. As a result, it has been the main color of many successful interaction designs, such as KFC, Coca-Cola, Manchester United and Supreme. Red not only has a radical, stimulating, mature and eye-catching feeling, but also has an important role in warning and alerting to danger. In the UI, red is mostly used as a prompt color for incorrect operations or warnings, and can also be used as a reminder of key information.

### 4.2 Green

Green is the color of nature, representing peace, hope, youth, growth and health. Green food in the logo through the extensive use of green to convey a sense of freshness and health. In the UI interface, if there is a healthy design, you can use green to show, hope, and complete. Many times, green is also the “Enter” color, which is applied to buttons, such as the on/off button in Apple systems.

### 4.3 Blue

Globally, blue is the most popular and widely used color. Blue is the color of the sea and sky, expressing harmony, peace and calm, and its color symbolizes logic, communication and understanding. The use of soft blue has a calming effect, while the strong blue can stimulate energy. Blue is also the largest color in LOGO design and UI design, such as social media and communication companies such as Alipay, Facebook, Twitter and Skype.

Nowadays, the knowledge of color psychology has been more and more applied to People’s Daily life, and all walks of life have paid more and more attention to the use of color in daily life. In the field of design, designers often use color cold and warm, heavy, near and far and dynamic sense to deal with the coordination of human-machine relationship. The psychological effects of different colors are also different. In the interaction design should be careful, reasonable choice of color. Let color play its true role and add color to the visual presentation of interaction design.

## 5. Conclusion

The study of color psychology is a science that studies the production, acceptance and application of color. It is an important basic theory in art learning. Today, color is still relatively studied. Based on the knowledge structure of psychology and art design, from the introduction of basic knowledge of color psychology and interaction design to the application of color psychology in interaction design, people can view color psychology, understand color psychology, analyze color

psychology in a more comprehensive and correct way, and summarize its rules. In the era of mobile Internet, design is increasingly affecting people's lives. In addition to paying attention to the practical durability of product design itself, the current design should also consider people's psychological needs at the spiritual level. An excellent art design work must be the result of a certain understanding and research of people's psychological needs. Designers should not only have a mature theoretical support for design from the surface visual aesthetic, but also have a more in-depth study of interface development from visual thinking, psychology and human-computer interaction.

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