

# Effect of Visual Stimulus on Psychology

## How Color Psychology Used in Lives

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### ABSTRACT

How can color influence our lives? Color psychology is studied by scientists around the world. Color, as well as visual stimulus, is associated with many aspects in psychology. The research focus of this article is how color and visual stimuli can influence psychology. Through literature review and analysis, the author comes to the following conclusion: Images and colors are also used in clinical therapy. The color of a picture on a social media platform can influence the number of people who like it. The color of a room can linked with how stressful people who live in the room. A good visual stimulus can even reduce pain.

**Keywords:** color, psychology, media, visual stimuli, stress, pain tolerance and threshold

### 1. INTRODUCTION

This is a colorful world. People are used to the color around them, which could lead to a sort of ignorance. But can these colors influence their daily lives? The answer is absolutely yes. It is hard to imagine a world of no color. But how? According to the article Elliot & Maier (2014), many scientists in the past has proved that color can have a real impact on humans' behaviour and choices [1]. Colors will affect people subtly in people's lives. Nowadays, color psychology has become an significant subject. Subjectively, it is also a kind of reaction and behavior. Color psychology begins through vision, from perception, emotion to memory, thought, will, symbol and so on, its reaction and change are extremely complex. The application of color attaches great importance to the causal relationship, that is, from the accumulation of experience in color to the psychological standard of color, when what stimulation can produce what reaction, are the content to be discussed in color psychology. For example, people are more likely to agree that people in red are more attractive and aggressive. The reason of this phenomenon may be that the color red often links with blood, lives, and death [1]. Similar discovery are made by different scientists.

This article explains color psychology from three aspects: color psychology and social media, color psychology and pain tolerance, color and stress and tells how color psychology manifest itself in daily lives.

### 2. COLOR PSYCHOLOGY & SOCIAL MEDIA

In this highly developed society, people cannot live without social media platforms. Can color influence our experience using the social media? Social media is used to transfer information to the public. Sometimes, it can also lead the society to another path. Therefore, how is the internet experience seem more and more important. Visual art can be a direct stimulus when people first see a message from the internet. Whether people like this message, whether the message can catch a person's attention are in some ways depend on these visual stimuli. Different colors can bring people different feelings. Generally speaking, red can give everyone with positive feeling, can mobilize the enthusiasm of the person adequately. Even in some management occasions, the appropriate use of red is more conducive to arouse the emotions of the other side, to express the dissatisfaction in the heart. Orange is not only a warm and energetic color, but also helpful to stimulate appetite. Many foods are packaged in orange based on the feelings it brings to people. In psychology, there are also statistical appropriate orange has a healing effect on people's mind. Yellow is one of the most seemingly bright colors, symbolizing the future and hope, and has the effect of stabilizing emotions and increasing appetite for normal people. Of course, because it is bright and easy to recognize, it is also often used for warning. For example, yellow is used for the wait of traffic lights, and

the clothes of traffic police are also bright yellow. Green does not belong to cool color or warm color, it is a kind of relatively mean among them tonal, in most circumstances green looks to be able to make a person feel very comfortable. Blue can make people calm. We look at the sea to see the blue sky will always rise point relaxed and happy feeling. Blue itself has the effect of regulating nerve, sedation and tranquility. Blue lights are used in medicine to treat insomnia and lower blood pressure. Purple symbolizes nobility, but it also has a mysterious and melancholy flavor. People who like this color are characterized by individuality and creativity.

In Chung-En Yu et.al (2020), it is concluded that the

number of “likes” and comments on a social media is linked with the appearance and the color of the post. Scientists collect amount of “likes” on Instagram and found the similarity of these images [2]. They “measured” the color based on “LCH”(lightness (i.e., perceived brightness), chroma (i.e., richness/saturation), and hue (i.e., perceived color[s])). They found that the color yellow is most likely to appear in the “liked” posts, and then Violet, orange-yellow and Violet-red [2]. Also, color seems to have different meanings in different kinds of pictures. For example, violet is most frequently appeared in the pictures of city views, and yellow is mostly in the picture of tourism and landscape [2].

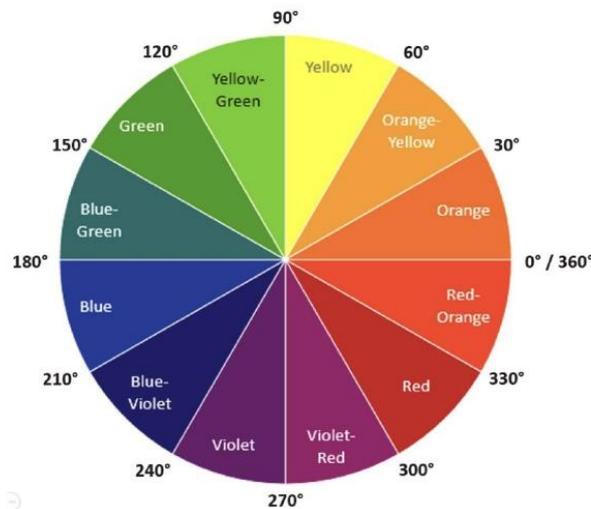


Figure 1 Color wheel (hue) [2]

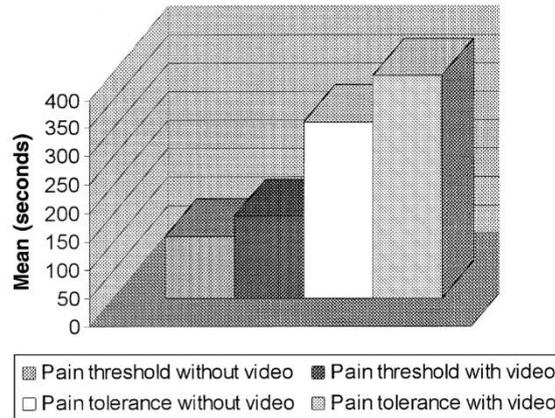
This analysis of color in the social media can indicated that the color of a images is associated with the number of “likes” it can get. This conclusion may be used by people who like to share their photographs on the internet and want to get more fans.

### 3.EFFECT OF VISUAL STIMULI ON PAIN

When a person is in a hospital, it is often stressful, urgent and sometimes even painful. The white walls and cold machines of hospitals often give people a feeling of oppression. On the contrary, if you are in a park with green plants, blue sky and white clouds around you, you will feel relaxed. In the same way, in college, people tend to feel calm. In kindergarten, colorful walls and colorful color schemes sometimes make people more imaginative. These personal experiences can fully

demonstrate that color differences can be reflected in people's feelings. However, these feelings has no scientific proves. In Tse, M. M., Ng, J. K., Chung, J. W., & Wong, T. K. (2002)., the researchers compares the changes in people's pain threshold and tolerance under different visual stimuli [3].

They first randomly divided the subjects into two groups, Group V, who watched a video of natural scenery without sound, and Group B faced with a blank white wall. There are two definitions in the research, pain threshold and pain tolerance. Pain threshold refers to the first time the person feels the pain, and pain tolerance refers to the time when the person cannot tolerant the pain anymore [3]. The figure 2 shows the result of the study.



**Figure 2** The Effect of Visual Stimuli on Pain Threshold and Pain Tolerance [3]

According to the figure 2, it can be concluded that the video of soft land scape can significantly increase both the pain threshold and pain tolerance [3].

Soft color and images can reduce pain. This may explain the reason why we will feel relaxed in the park and anxious in the hospital.

#### 4.COLOR & STRESS

How can color effect stress is always an ongoing topic of color psychology.

Scientists have found that the color of a room can affect the stress of those who live in it. Studies have found that room color has a specific effect on psychomotor activity and emotional state. Red room color was found to be associated with emotional and physical stimulation, while green was associated with inhibition [4]. In the article *The Effects of Room Color on Stress Perception: Red Versus Green Environments* written by Teresa M. Kutchma (2003), a experiment to compare the effect of color red and color green was conducted. Study subjects were 30 college students (15 female and 15 male), who were asked to spend five minutes in a white, red, or green room and fill out a pressure assessment form from the DASS (Depression, Anxiety, and Stress Scale) [4]. In this study, the white room was considered as a control variety. From the result of the mean DASS scores under every room condition, there is no significant difference between the color red and green. However, the mean DASS scores in the red room is slightly higher than that in green room (11.9 compares to 11.1), which are all higher than that in white room (9.5) [4]. The second data set compares the mean gender DASS scores, which could show a significant difference. This comparison indicated that males may be less sensitive to color than females. They rated their stress much lower than females [4].

Another similar study was introduced in the article *Effect of Color Images on Stress Reduction: Using*

*images as mood stimulants* [5]. The aim of the study is to determine whether color images can be used as “mood stimulants” [5]. The test subjects were healthy adult volunteers who were subjected to mental rather than physical stress. There were ten of them in the control group and ten in the experimental group. Salivary chromaffin A (CgA) and salivary cortisol levels were used as biochemical parameters. The subjects observed the white image and the color image respectively. By observing the changes of these two parameters, the influence of color on pressure was determined. The white image was observed as the control group, and the color image was observed as the experimental group. In the experiment, the scientists found that the CgA level of the experimental group was significantly reduced. In the experimental group, the negative mean mood score decreased, which can declare that color images can potentially change the mood of the people who look at the image [5].

The color word interference effect, which is the response delay when the experimental subjects are asked to recognize several colors, and each colored stimulus is appeared as a word that is inconsistent with the requested color name [7]. The article [6] talked about an experiment about this task. Thirty-eight students in the final year of their exams were asked to name the colors of these words related to the topic. These words produced a larger delay than the control group, and the students who were more worried about the test experienced the more interruptions [6]. This study indicated that the effect of arousal on performance depends “not only on the source of arousal, but also on the relationship between arousal and the nature of the presented stimulus”. There was no significant correlation between state anxiety and performance in the neutral word condition, but performance decreased significantly when the stimulus was related to the assumed source of the anxiety [6].

Experiments on the effects of color on stress have long been important in color psychology. Such research

has not stopped. How to use color to relieve stress, and how to improve the stress of the subjects through the surrounding color, these are very hot topics. By observing such experiments, social workers can apply the gains to urban development. For example, in order to relieve the pain caused by excessive tension, hospitals could set up rooms with relatively mild colors to relax patients. Such construction is not uncommon in the city, different buildings with different styles give people different feelings.

## **5.CONCLUSION**

This article cites seven research literatures on color psychology and tells the relationship between color psychology and people's life from four aspects. However, the paper does not systematically summarize why different colors have different effects on people's psychology from a biological point of view. Can external visual stimuli directly affect a range of biological indicators? How do these indicators relate directly to psychology? This kind of research needs further summary and discussion.

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