

## Characteristics Of Colours, Interior Design And Their Psychological And Physiological Effects

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### ABSTRACT

In this study, psychologists', interior architects', designers', doctors' and advertisement writers' studies and thoughts about the impact of interior design and colors were searched. For this purpose, studies national and international studies related to colors were examined and psychological and physiological impacts of colors were investigated. The most important goal of interior design is to create physical environments that address people's physical, mental, emotional and social requirements. While creating these environments, it is crucial that people are happy, peaceful, comfortable and healthy when using them. Interior art aims at achieving visual effects and functionality. In this regard, the expectation is to design places that people can feel themselves in psychological well-being. Besides the interior art, which has an important effect on human psychology, the impact of colors on emotions has attracted scientists' attention for years. For this purpose, studies have been conducted but to a limited extent. In this study, the aim was to collect the results of related studies in the area conducted by scientists in various professional fields. Thus, it was planned to present to the reader the places that people live in more happily, peacefully and healthy; and the reasons why they use certain colours at home and in business by providing examples.

### INTRODUCTION

The main aim of interior design is to develop the functionality, enrich the aesthetics and consider the psychological effects of the interior space (Ertek,1994).

Baring in mind that an architectural work of art cannot exist without the existence of space, we should look at how architects define space; "space is an emptiness that separates people from their environment and allows them to do certain actions" (Hasol,1990).

According to Lang (1987), the buildings and designs that architects create have an influence on human behaviour. As such, architects and designers need to take action so that they create environments which also have psychological effects on the user.

Human beings both affect and are affected by the environment they live in. In other words, individuals can change and better their environment based on their needs and expectations. The individual, being the main element of interior design, shows variations with regards to culture or group. Actually, even within the same culture or group, there are differences among people in terms of age, gender, socio-economical status and personal characteristics. In interior design, all physiological, psychological and social needs of the user have to be met. There are some features that account for the harmony between the human being and the environment. These consist of the shape, colour, smell, texture, sound and symbolic meaning.

The concept of living space resulted from humans' need to protect themselves from life conditions and to meet their basic needs. Having fulfilled the basic necessities, people want to create a home where they can sustain their life in peace and comfort. The change from crowded families to core families has also resulted in the change of preferences towards more simple living spaces. Rather than gorgeous and luxurious spaces, peaceful, healthy and functional places are being preferred. Especially the individuals of today who are subject to a hectic and speedy work life prefer to live in organized, and simple places with minimal details and far from the chaos; places that will not put a burden on their eyes, body and soul. To meet these needs, a lot of studies and research

have been conducted on interior use and interior organization. These have formed the foundations for interior architecture and interior design. In interior design, there are factors which affect the individual's peace and comfort; these include the psychological effects of light regulation, the features of the material (warm or cold), sound insulation, heat comfort and the choice of colours.

Colour is an indispensable part of interior design. Thus, studying the colours for interior and the effects of colours are of vital importance. It is similar to the way how cheerful a person feels when it is sunny; and also how unhappy a person feels on a rainy day. Colour has the energy to influence both emotions and cognitive processes (Kalia, 2013).

According to Engelbrecht (2003) and Shabha (2006), psychological reactions towards colours are the result of the changes in a person's state of emotions and attention.

Once colours are perceived and transmitted to the brain, the brain produces a hormone that affects the individual's emotional state, cognitive receptivity and level of energy (Engelbrecht, 2003).

As for Torrice, Logrippio (1989), because colour waves can be absorbed by the body, the effect of colour cannot be limited to visual perception only.

Similar results were obtained in the research conducted by Harry Wohlfarth and Catherine Sam, who studied both visually impaired and non-impaired children. The results suggest that we are affected from colours in such a way that it goes beyond the visual limits. One hypothesis claims that despite the lack of visual ability, neurotransmitters in our eyes transmit the data about light to the brain and this data enables the hypothalamus to produce a certain hormone. It is exactly this hormone that has numerous effects on our psychological state, rational clarity and energy level (Zelanski, Fisher, 2003).

## **TYPES OF COLOURS**

The Dictionary of Turkish Language Society defines colour as “different sensations on the eye as a result of the way objects reflect or emit light”. In the 17th century, famous physician and mathematician Sir Isaac Newton, carried out various experiments to prove that the rainbow is comprised of all existing colours. He darkened a room and let a thin sun light enter into the room from a tiny hole. Putting a prism in front of it, he succeeded in reflecting all seven colours on a white panel, just like it is the case with a rainbow. Newton, following this experiment, named these seven colours as the Visible Spectrum. These colours are; red, orange, yellow, green, blue, indigo and violet (Zelanski, Fisher, 2003).

In nature, there are three basic colours, which are red, yellow and blue. Accent colours are formed by mixing these three. For example, the combination of red and yellow results in orange, the combination of blue and yellow results in green, and the combination of blue and red results in purple. Colours located opposite each other on the colour spectrum are called transverse colours. These colours are blue and orange, purple and yellow, green and red.

Another categorization is based on the effects colours have on people, namely cold and warm. Warm colours are red, orange and yellow; whereas cold colours are blue, green and purple. (Artut, 2004).

Black, White and grey are neutral colours. Neutral colours are the combination of all main colours, which leads to colourlessness (Kalmık, 1964). Warm colours usually have the effect of liveliness, joy, excitement and action. Cold colours lead more to calmness, comfort and relaxation (Altınçekiç, 1994).

## **CHARACTERISTICS OF COLOURS, PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS**

Colours are not only used to express emotions but they are also used to activate (Zelanski, Fisher, 2003).

As Zelanski and Fisher (2003) suggest, it is worldwide accepted that colours do have an impact on our emotions. While blue and green make us feel in peace, bright red, orange and yellow tend to have a stimulating effect.

### **RED**

#### **Psychological and Physiological Effect:**

According to Martel (1995), red is the colour of passion and liveliness. It has the effects of increasing alertness, attracting attention, activation, brain stimulating, excitement, courage and power.

Chiazari (1998) relates the red colour to liveliness, power, warmth, sensuality, assertion, anger and impatience.

Vodvarka (2008) claims that red accelerates the heart beat and respiration. Engelbrecht (2003) suggests that red increases the sense of smell and affects appetite. That's is why a lot of brands in food sector all over the world

use the colour red. Coca Cola, Nestlé, KFC, Wendy's, Arby's and McDonald's are some of the most famous examples. Because of its physiological effect, items that target teenagers also use red in their logo. It is highly probable that companies such as Levi's, Ray Ban, H&M, New Balance and even Netflix use red in their logos because it creates excitement in the individual. According to a study investigating the effect of multi-coloured lights on physiology, red waves do not only stimulate heart, circulatory system and suprarenal glands but also increase stamina and life force (Zelanski, Fisher, 2003)

#### **Use in interior:**

Red, when used in interior, can be said to cause excitement and negatively affect time perception and lead to disturbance in sleep. Thus, it explains why casinos and night clubs commonly refer to this colour. Baring in mind its psychological and physiological effects, it can be claimed that red, when used on walls or ceiling, may lead to disturbances related to time or lack of anger management on the side of the individual. On the other hand, as red is associated with warmth, an interior dominant in the red colour can be perceived as warmer than it actually is. As we all know from examples from traffic, red also has a warning effect. As such, it is reasonable to use red in interior, especially if warning is needed in floor covering and height difference.

### **YELLOW**

#### **Psychological and Physiological Effect**

Pile (1997) states that yellow, when compared to red, is less aggressive. It is interpreted as sunny and joyful, which suggests that yellow is the happiest colour in the spectrum. Yellow is the colour of creativity (Morton, 1998). Chiazzari (1998) claims that yellow is associated with happiness, rational stimulation, optimism and fear. In addition, the colour of gold is combined with wisdom, wealth and idealism. Martel (1995) believes that yellow, among all others, is the only colour that increases the power of muscles. Zelanski, Fisher (2003) thinks that yellow light waves act as stimulants to the brain and neural system, trigger rational alertness and activate the nerves in the muscles.

#### **Use in interior:**

It would be wise to suggest that yellow would make people using the interior more active as it is associated with daylight and the colour of the sun itself and people tend to be more active during the day when compared to night time. Apart from this, an interior that looks bright will be perceived as being more spacious than it really is. Furthermore, as yellow is a warm colour and it is associated with the sun, people will perceive the place as warmer than it normally is.

### **GREEN**

#### **Psychological and Physiological Effect**

Chiazzari (1998) relates green to harmony, relaxation, peace, silence, sincerity, honesty, contentment and generosity. According to Martel (1995), green is associated with silence, productivity, life, growth, nature, wisdom and belief. The results of a questionnaire conducted in Europe and US suggest that green is mostly associated with nature, life, health, youth, spring, hope and desire (Heller, 2009). Pile (1997) claims that green is more preferred by people who are intelligent, social, fluently speaking and fond of food. Moreover, the colour has a calming, relaxing and refreshing effect. Zelanski, Fisher (2003) state that green light waves regulate the heart and circulatory system, contribute to relaxation and cure illnesses such as hay fever and liver problems.

#### **Use in interior:**

Considering the psychological and physiological effects of green, when used in interior, it can be claimed that it will have a relaxing, calming and even refreshing effect on people who associate green with nature and nature with calmness. Thus it is logical to use green in bed rooms; for example, a place that is used for relaxation. Considering this relationship, health institutions that use green seem to have an appropriate approach to their choice.

### **BLUE**

#### **Psychological and Physiological Effect**

As for Chiazzari (1998), blue is associated with tranquility, width, spaciousness, hope, belief, flexibility, faith and acceptance. Dark blue is related to seriousness and thinking broadly (Martel, 1995). Studies conducted in Europe and US suggest that blue is mostly associated with harmony, loyalty, trust, distance, eternity, imagination, coldness and sometimes sadness. In a poll done in Europe and US, half of both male and female participants chose blue as their favourite colour, making it the most popular colour (Heller, 2009).

Verghese (2001) states that blue is a tranquilizing, relaxing and comforting colour. Zelanski, Fisher (2003) claims that blue light waves affect thyroid glands and throat in a refreshing and calming way, and lower blood

pressure. Deep blue reduces pain. Bluish green light, on the other hand, lessens infections, calms down nervous breakdown and regulates weaknesses in the immune system. Hepatitis seen in premature birth is also cured with exposure to blue light (Zelanski, Fisher, 2003).

#### **Use in interior:**

Blue is the colour that people are used to seeing around them quite frequently during the day; may be they are not aware of it but it is the most frequent colour. For people who associate blue with the eternity of the sky, its use in interior will give the impression of spaciousness in the place. As the association comes from the colour of sky, this effect can be created when used on the walls and ceiling, rather than floor covering.

When the psychological and physiological effects of blue are considered, it can be said that interior which is dominant in blue would give its user a much more calming and relaxing effect when compared to the colour of red. It is well-known that blue is considered a cold colour and as such, is associated with coldness. Likewise, the effect that it will give its user is that of coldness in. It is likely that the user will perceive the place as colder than it actually is.

### **ORANGE**

#### **Psychological and Physiological Effect**

According to Chiazzari (1998) orange is related to joy, security, creativity, stimulation and activation. In a study conducted in Europe and US by Heller (2009), orange is mostly associated with entertainment, being extraordinary, extrovertness, warmth, fire, action, danger, taste-aroma and autumn. Seybert (2007) believes that orange implies happiness, and increases courage, attention and the amount of oxygen that reaches the brain.

Martel (1995) states that orange, which is the symbol of balanced power, intuition and pure happiness, spreads optimism. Zelanski, Fisher (2003) claims that orange light waves have a positive effect on the Solar plexus (the neural network in the abdominal cavity), the immune system, the lungs, the pancreas and the digestive system.

#### **Use in interior:**

As orange is the result of the combination of yellow and red, its effects in interior is also a combination of the two. Taking the stimulant influence of red and the optimism of yellow, it can be said that orange will create an atmosphere of curiosity and restlessness. Another feature similar to yellow is that it will make the place look brighter when used on the walls and ceiling. As with the colour red, when used in interior, orange will have the effect of stimulation. As a matter of fact, multivitamins used as stimulants are usually produced in orange.

### **PURPLE**

#### **Psychological and Physiological Effect**

Pile (1997) believes that purple is the colour of sensitivity and artistic nature. While the light shades of the colour define magic and joy, dark shades represent nobility and mysteriousness. Violet stands for authority, chaos, death, dedication, and holy love (Martel, 1995). According to Chiazzari (1998), indigo and violet are related to spirituality, intuition, inspiration, deep thought and innocence. Heller (2009), in a study done in Europe and US, points out that the colour purple is mostly associated with kingdom, magic, mysteriousness and religion. Pink, on the other hand, is the colour of eroticism, charm, womanish behaviour and temptation.

Questionnaire results from Europe and US suggest that purple symbolizes arrogance, extravagancy and individualism. Furthermore, among the seven fatal sins, purple stands for arrogance (Heller, 2009). Moreover, purple is the colour that is unconventional, artificial and rarely found in nature. The first colour synthesized is purple as well. Zelanski, Fisher (2003) claim that indigo light waves fight against high fever and skin diseases. Violet light waves, impact the brain, purify and have a refreshing and disinfectant effect. It also regulates the metabolism and suppresses hunger.

#### **Use in interior:**

Purple is one of the oldest colours used in interior. According to the research done by Varichon (2000), somewhere between 1600 BC and 2500 BC, purple was used to draw human hand and animal figures with the help of hematite and manganese sticks in Pech Merle cave located in France, in an area called Midi-Pyrénées. This is one of the oldest known man-made interior design examples to change colour.

The use of dark shades of purple may lead to a depressive atmosphere. The use of light shades result in a womanish effect on the interior. This influence comes from the fact purple stands for the colour of flowers and woman attraction. When used in combination with black, it creates a cosmic effect. When used with white, the connotation is nobility.

## **BROWN**

### **Psychological and Physiological Effect**

According to Chiazzari (1998), brown is associated with physical and emotional satisfaction, earthiness, reclusion and narrow mindedness. Heller's study (2009) conducted with participants in Europe and US suggests that people relate brown mostly with modesty, rurality and poverty. According to the questionnaire results, brown is the least liked colour.

### **Use in interior:**

Pile (1997) believes that brown has a more positive effect on home comfort. If combined with warm colour shades, it displays comfort. However, when used alone, it creates a depressive atmosphere.

In fact, people are used to seeing brown; it is the colour of earth, the colour of most tree trunks and mammals. Its different shades are commonly used in furniture and interior/exterior walls. In the use of brown, the determining factor is not the colour itself but the type of material that is chosen. The use of wood, which is a natural material, can create a warm atmosphere. However, if brown is used dominantly, it may have a detractive effect. Fast food restaurants are a good example for brown interior walls where customers are expected to eat quickly and leave rather than spend hours.

## **BLACK, WHITE AND GREY**

### **Psychological and Physiological Effect**

Rather than being a colour, black is the state of "lightlessness". Ladu (1989) claims that black symbolizes seriousness and prestige. Dark grey and blue are considered in a similar manner and may reflect similar features. Chiazzari (1998) believes that black is associated with femininity and protection. The questionnaire results in Heller's study (2009) suggest that in Europe and US, black is mainly associated with mourning, end, secrecy, power, magic, violence, malice, and elegancy. Martel (1995) indicates that white is comprised of all existing colours. It is the symbol for unity and purity. Rather than being a colour, white is the state of being "the brightest". Chiazzari (1998) points out that white represents peace, innocence, loneliness and spaciousness. Ladu (1989) states that white is the brightest shade and it symbolizes emptiness, simplicity, cleanliness and purity. Birren (1988) believes that grey, when used in its darker shades can be quite depressive; however when used in lighter shades and in combination with warm colours, it can form a convenient background. Chiazzari (1998) related grey with independence, separation, loneliness and self-criticism.

### **Use in interior:**

When black is used on all walls and ceiling, it tends to create a depressing feeling because it is known to absorb all the light it receives. When used as floor covering, it may give the impression of depth.

White, on the other hand, when used both on walls and the ceiling, may make decrease the user's ability to perceive and lose the perception of depth. The reason why this colour is frequently used in mental hospitals is to prevent patients from subconsciously perceiving different things.

The use of grey may lead to an industrialized feeling in the interior. Grey, which is the colour of machines and devices in factories, may create a metallic atmosphere in place.

## **RESULT**

Colour plays a vital role in the world of design, and because it is related to so many different places, it may influence human life enormously. Knowing the psychological effects of colours is a must to people working in various areas of design (interior architecture, graphic design, advertising).

Starting from birth up to the time of death, the concept of colour is evident in all phases of life; and as such the use and choice of colour is quite significant. It has great effects on the places people live in, the clothing they choose, the emotions they experience, their physiological well-being, interpersonal relationships and their state of happiness. Colours are an indispensable part of our lives; they create energy and affect us as long as we are alive. The colour choice of the individual determines whether the psychological, physiological and social effects will be positive or not.

If the aim is a more peaceful and calm state of mind, the appropriate colours to be chosen in homes and in clothes would be blue and green. However, if the tendency is towards energy, excitement and creativity, the correct colours are yellow, orange and red.

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