

Colour Psychology

Special Project

By

Gautam Satalkar

Guide : Prof.Ravi Hazra

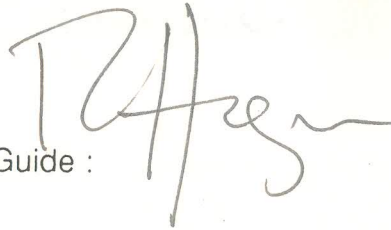
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Indian Institute of Technology
Powai Bombay 400076.

Approval Sheet

The special project titled 'Colour Psychology' by Gautam Satalkar, submitted in partial fulfillment of the Master's Degree in Industrial Design is approved.

Guide :

A handwritten signature in black ink, appearing to be 'T. H. S.', written over the 'Guide :' text.

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I sincerely thank my guide **Prof. Ravi Hazra** for his valuable help and guidance which helped me to understand the subject better.

Gautam Satalkar

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Introduction

An Indian Industrial designer was asked to suggest a new colour shade for the newly launched Maruti Zen. The colours popular for the similar car by Maruti, the 800 were Maroon Red, Dark Blue Grey and dark Green Grey. Now the company wanted a new shade which would cater to the female market.

Study of the psychological setup of mind of the typical Indian women played key role in this problem. The new colour chosen by the designer was Lemon yellow which the company officers were reluctant to introduce. The designer somehow convinced them and in reality the colour shade proved to be very popular, especially amongst the women.

Colour and light play key role though generally unrecognized, in our lives. The above example shows the same. It is an example of proper use of colour for the product. But many a times the colours are used without giving a proper thought to the psychological and physiological effects of the colours. This leads to bad colour design which can cause anxiety, stress, visual disorder and be host to many other problems.

There have been numerous attempts by people all over the globe to understand the role of colours in human life. There are many experiments done in history, to detect the influence of colours on human mind, both scientific and mystic. The main

hinderance toward creating a set of identified rules or an elaborate theory on behaviour of human mind with respect to colour is that the results of all such experiments are subjective. Now the days have changed and science has emerged with new tools for research. today, thanks to sophisticated techniques of research and analysis, we know that colour affects cortical activation (brain waves), functions of the autonomic nervous system (which regulates the body's internal environment), and hormonal activity, and that colour arouses definite emotional and aesthetic associations. In short, our response to colour is total; it influences us both psychologically and physiologically

Psychological responses

The human brain and the spinal cord forms the central nervous system (CNS) which controls the human body and also the emotional status of the person. The research in neurology has found that every impulse transmitted by afferent nerves that reaches the higher centres of the CNS first activates part of the brain stem, the reticular formation which then activates the entire nervous system. The reticular formation seems to affect the entire nervous system's state of preparedness. This has been designated the ascending reticular activation system (ARAS).

Man is subjected to many kinds of stimulation, including information from the visual field, and all of it affects the ARAS. As Kuller has explained (1981), "The ARAS might be regarded as a clearing station for all kinds of stimulation ranging from sensory deprivation at one extreme to sensory overload at the other." Much of the information from the visual field (or visual stimulation) lies in the hands of the designer who therefore must understand the activation theory.

We will try to understand some of the principles which are the outcome of years of research in this field.

Red versus Blue and Green

Since the 1949 study by Moruzzi and Magoun, there have been

numerous investigations of the effects of the visual stimulation upon the ARAS.

R.Gerard found in 1957 that red had more arousing effects than did blue on visual cortical activity and functions of the autonomic nervous system. M.R. Ali in 1972, using EEG analysis, demonstrated that red was more arousing than green, and green more arousing than blue or yellow. Together these studies seem to indicate that colours richer in longer wavelengths are more arousing than those of short wavelengths.

So we can put the seven colours in the order as follows, Red being the most exciting and Violet the least as the wavelength of light decreases from red to violet.

Red-Orange-Yellow-Green-Blue-Indigo-Violet

Partly because of these findings, it is expectable that exposure to a red room, will have a continuously higher arousal effect, which is not so. In fact exposure to any strong hue will cause an immediate reaction that can be measured, but the duration of the effect is not continuous.

Unity, Complexity and Balance.

The Designer creates Visual environment. By putting colour on his creation he creates visual stimulation. Now this visual information can be homogenous or heterogenous. It is called as unity and complexity respectively. Unity involves various parts and components fitting together in to a coherent unit.

Complexity involves more variations.

Extreme unity (monotony or sensory deprivation) can lead to understimulation and extreme complexity to overstimulation. Exposure to overstimulation can cause changes in the rate of breathing, pulse rate and blood pressure; increase in muscle tension ; psychiatric reactions of various types; and probably compounded consequences such as increased susceptibility to infection, coronary disease, and ulcers.

Persons subjected to understimulation showed symptoms of restlessness, excessive emotional response, difficulty in concentration, irritation and in some cases variety of other extreme reaction.

Designer should take care that he does not create an environment which causes overstimulation or understimulation. While putting colour on the product, the colour of the product should create just enough stimulation.

It is interesting to know that brain activity was lower in colourful room than in the grey room and heart response was slower in the colourful room. Therefore, we may conclude that a dull environment tends to prod brain activity, which may induce anxiety, fear and distress. Hence colour variety is psychologically most beneficial.

Introversion and Extroversion

There is a fallacious tradition among designers to prescribe passive environments for the extroverted temperaments in

order to calm them down, and active environments for the subdued or introverted personalities to draw them out of their introspection and boost their spirits. Quite opposite will occur; neither will be happier in the surroundings contrary to his personality..

In general, extroverted personality needs intensive stimulation and enjoys more colourful surroundings and objects with warmer hues. In fact incorrect environmental conditions for the extroverted personality can lead to lack of interest, boredom and an exploratory mode of behavior. On the other hand, because introverts are very sensitive to stimulation and have a great need for privacy and calm, they manage best with cool hues, and less contrasting colours for their objects with low degree of stimulation.

Colour has been used therapeutically in treating emotionally and mentally ill people, in the belief that manic and aggressive patients need cool colours to calm them down, while depressive and suicidal patients need warm and exciting colours to compensate their melancholic inner state.

Characteristics and effects of Major Hues.

It would be interesting to understand whether cultural heritage influences the effects of colours which would mean that it is meaningless to study the psychological effects of colours. In reality, it does not render our study useless. Culture does affect the choice and effect to some extent, as each culture has its own colour and pattern traditions and of course there are economic geographical and religious factors as well as fluctuations of taste and educational and exposure level. But all human beings, irrespective of their origin respond to colour in a basic similar way. Studies of colour connotations in various parts of the world have given us some conclusions about the characteristics and effects of major hues.

We will have a look at Characteristics of red.

Red

Hue effect : Exciting (bright red), stimulating (red).

Impressions or Associations : Positive- passionate, fervid, active, strong, warm. Negative-aggressive, raging, intense, fierce, bloody.

Character : Red is perhaps the most dominant and dynamic of all colours. It grabs the attention and overrules all other hues.

The lense of the eye has to adjust to focus the red light wavelengths; their natural focal point lies behind the retina.

Thus red advances, creating the illusion that red objects are closer than they are.

Symbolically : Red means fire, life and strength. It's aggressive nature is also linked with combat dominance war and rebellion.

Designers know it well that the mood or atmosphere of a space or character of an object can be manipulated to confirm with the function of that object/space. The degree of mood creation depends on the particular colour usage. Warm and luminous colours with high levels of light produce a centrifugal action, directing attention outward and toward the environment. Such environments are conducive to cheerfulness, action, and muscular effort. A general office space, where no one performs tasks that demand high concentration, should not have the same surroundings as a recreational area although both spaces may want to appear cheerful, warm, and friendly. Softer surroundings, cooler colours and lower levels of illumination produce centripetal action. Such environment furthers inward orientation and enhances the ability to concentrate. This fact can be put to good use in areas where employees are required to perform difficult visual and mental tasks.

Perception affected by Colour

Perception of Volume

Lightness is one of the most important factors in the perception of openness in the interior space. Light or pale colour recede and increase the apparent size of the room. Dark and saturated hues protrude and decrease the apparent size of the room.

Perception of weight and size.

Darker colours appear heavier whereas lighter and less saturated ones seem less dense. If the hues are of the same value and intensity, the tendency is to perceive the warmer hues as heavier.

Bases for machinery and equipment will appear steadier and more solid if they are painted darker than the equipment itself. Heavy objects designed to be moved, carried, or thrown by human effort may be made to appear less heavy with lighter and cooler colours. Cool colours will also make the things appear shorter and smaller, warm colours make them appear longer and larger.

Estimation of time

With the help of number of experiments under different conditions it was concluded that in environments with warm colours time is overestimated.

With cool colours on the other hand, time is underestimated.

Under green and blue light, the judgement of time is in opposite direction.

Perception of temperature

In his book *The Elements of Color*, Johannes Itten tells of experiments that demonstrated a difference of five to seven degrees in subjective feeling of heat or cold between a work room painted Blue-Green and one painted Red-Orange. Occupants of the Blue-Green room felt that 59 F was cold, whereas the temperature had to fall to 52 F to 54 F in the Red-Orange room before the subjects felt cold.

Perception of noise and Sound

Loud noises and strong odours and tastes make the eye more sensitive to green and less sensitive to red. Stimulation of senses, brightness and loudness are associated with the most active effect of warm colours, the reverse being true for the cool colours. People easily connect a loud red with one of high saturation. Rarely does anyone of a loud green or blue.

A noisy environment will be experienced subjectively more noisier if painted with glaring yellows or reds. Shrill and high-pitched sounds may be offset by olive green. Muffled sounds appear more so in darker-hued surroundings.

Associations with odour and taste

Colours that hold pleasant associations with smell are pink, lavender pale yellow and green. Tints of coral peach soft yellow and green, flamingo have pleasant associations with taste.

Conclusion

The preceding analysis of the general effects of colour stimulus, mostly based on psychological studies, should be helpful in evaluating a particular environment and conducive to improving the function, performance of tasks, and elimination of or decrease in problems of volume, temperature, noise within individual spaces.

It must be reemphasized strongly that the environment in its entirety-whether it be a hospital, school, or industrial plant-must have a variety of colour. The psychological power of one colour will never satisfy all the needs of an environment. It would be a great error to conclude that the psychological reason to a particular hue-even if it varies somewhat in hue position, chroma, and value-is sufficient justification to use it in all the spaces within an environment. A psychiatric hospital will not be 'relaxing' all in greens just because that is an inherent characteristic of that colour. The principle of unity and complexity balance must be satisfied at all times, and various colour effects are an aid in achieving that balance.

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