

**Talk at Technical Forum of ISRO's Satellite Application Centre, (ISAC), Bangalore
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'COLOR IN EVERYDAY LIFE'
A talk by Prof. G. K. Deshpande

Synopsis of the talk on COLOR

COLOUR	: An experience of visual sensation received through LIGHT VIBRATIONS.	
THREE ESSENTIALS	: LIGHT EYE MIND	The Unfolder The Beholder or Receiver The Interpreter
LIGHT	: Natural and Artificial The Originated or Surface Reflected Intensity of Light. Strong Average Weak	Bright Normal Poor
EYE	: The Beholder or Receiver Retinal Fatigue	Working of Cones and Rods
AFTER IMAGES OF COLOUR	: Visual experience of 'AFTER IMAGES OF COLOUR' through Visual Aids.	
RETINAL FATIGUE	: Causes simultaneous contrasts. Experience regarding "OPTICAL ILLUSIONS' through Visual Aids e.g. Small/Large, Light/Dark, Advancing/Receding etc.	
PSYCHOLOGICAL ASPECTS	: Warm – Cool, Heavy – Light, Fresh – Dull etc.	
UNDERSTANDING COLOUR	<p>Understanding of "COLOUR' for making everyday life a pleasurable one. Examples from surveys showing the use of COLOUR for benefit of common man in day-to-day life in various fields.</p> <ol style="list-style-type: none"> 1. Usage of Color in Classroom Material to make learning a pleasurable experience. 2. Effect of After Image of Color in sale of food products like meat. 3. Increase in output of work in factories with the use of colored dress material, machinery and hand tools etc. 4. Usage of Color as an Identity for bringing efficiency in daily office work. 5. Usage of Color in Automobile Industry for traffic safety and to minimize road accident. 6. Aspect of Optical Illusions and Psychological effect on Human Behavior through usage of Color in Interior Decoration, Clothes we wear and in Consumer Package Designing etc. 	

COLOR IN EVERYDAY LIFE

Dear Friends,

I consider it to be a great pleasure to be amongst you this evening. Through this talk, **COLOR IN EVERYDAY LIFE**, I wish to pass on you whatever little information, I possess about COLOR and its influence in our day to day life. I wish and I hope to make this talk interesting one, by using some visual aids prepared by me. My efforts today will to make this as pleasurable as our COLOR EXPERIENCES.

Imagine the World without Light and Color, and I am sure no one will like to live therein.

LIGHT, that first phenomenon of the World, reveals to us the spirit and living soul of the World through colors. Nothing affects the human mind more dramatically the appearance of gigantic color corona in the heavens. Colors of RAINBOW and soothing Northern Lights elevate our souls. The rainbow, now, has been accepted universally as the symbol of PEACE.

All of us are aware of the existence of nuances of colors all around us ever since our childhood. I am doubtful, if anyone present here, can tell the exact day when he or she has perceived the COLOR for the first time and can recollect his/her experience as to how he/she reacted to color then?

Even today, we see color all around us and we do react to it knowingly or unknowingly. However, a common man in general, in our Country is not that much of WHAT ROLE COLOR PLAYS IN OUR DAY TO DAY LIFE ?, though everyone likes, loves and uses color in abundance and thereby he is deprived of many pleasures in life. On the other hand in Western Countries, there is marked COLOR AWARENESS and color is being used for betterment in everyday life.

This is the main reason, why I feel like passing on whatever little information I have to my fellow countrymen, and to serve the society to which I belong and bring joy and happiness in every house through this MEDIUM OF COLOR.

Only verbal explanations may not communicate and convince a common man about the facts related with color that effectively. Visual Aids with little explanations and experiences about color will help him, to perceive color with greater impact and with everlasting impressions. This will also inspire him to learn more and more about color on his own. With this view in mind, I have prepared some visual aids for this purpose and my experience is that they work effectively.

I have come across many people from wide cross section of society to whom I have casually asked, WHAT IS COLOR? And to my surprise most of them found it rather difficult to explain, they were aware of presence of the color all around them. However, very few of them rightly quoted – COLOR IS AN EXPERIENCE OF VISUAL SENSATIONS felt through light vibrations either from original source LIGHT or from SURFACE REFLECTED LIGHT.

Similarly, I have come across many people who use lots of color in their households without knowing the properties of color and their effects. Many blindly follow their friends or relatives or are copy masters picking up color harmonies from here and there without any thought of effects thereof. Some even hesitate to use certain colors because of certain

misgivings about them passed on from one generation to the other. Thus they are deprived of real pleasure in life obtained through understanding of COLOR USAGE.

In fact, many people have completely neglected the fact that the color plays an important role in our daily living and that the subject is very interesting to study. They just use color as they like. My personal experience about study of color is, THE MORE ONE STUDIES COLOR, THE MORE ONE REALISES, and HOW LITTLE HE KNOWS ABOUT COLOR? Study of Color is a never ending process.

In Science too, color finds an important place. Everyday emerges with some new findings in Color Research, making the existing ideas outdated. Perhaps there is no other study that gives such thrilling results as that of Color. Practical knowledge of color is therefore very essential and important in various vocations and nice discrimination of it, is a great source of pleasure to the mind.

Possession of keen sense of color increases the intellectual and even literary capacities of a person. Color has definite effect on our emotions and it influences the attitude and health of an individual to a marked degree.

Color not only affects the aesthetic and emotional inclinations of people but in broader sense its greater use in benefits that it offers through the medium of its application in everyday life. Here, I may even venture to say that almost everything that man consumes, wears or enjoys is brought to his attention through the medium of color.

As one advances from this point, where enjoyment of color was limited to a state of simple visual stimulation and response, old habits of thought are broken and one becomes aware of the fuller application of fine discrimination of harmoniously balanced color tones, symmetrically arranged hues and subtle color textures.

Let us, therefore, try to understand HOW WE PERCEIVE COLOR SENSATIONS that make our day to day life much more lively, happy and meaningful. To perceive color there are essentials that enter the phenomenon called SEEING COLOR, namely – the LIGHT, an EYE and the MIND.

All of us are aware that **LIGHT** is the source of Color. Light itself has been the most intense and dramatic experience of the man. One of the basic factors of color Perception is the presence of Light either Natural or Artificial.

Even variations in the intensities of light, i.e. strong, average or poor (weak) result in perceiving the same color differently e.g. A flower in bright sunlight appears different when it is taken inside a room, indoors having subdued light and when it is taken inside a dark room, we don't see it all because of absence of light. Thus we realize that light unfolds to us the beauty of Color panorama around us.

EYE is the second essential requisite for perception. Eye is the beholder of light. When eye receives light or say when light enters the eye and gets translated into sight, something happens which affects the greater part of the consciousness of man. It creates for him universe of color and form. And that becomes the very foundation of his physical as well as spiritual experience. There are two types of nerves within the human eye commonly known as 'Cones and Rods'. Cone nerves respond to HUE or Chromatic sensations and Rod nerves respond to Bright and Dull, White and Black or light and Dark i.e. Achromatic Sensations.

Due to strain on these nerves, many a time RETINAL FATIGUE is caused resulting in formation of AFTER IMAGES OF COLOR. Many a times these after images lead to creation of simultaneous contrast i.e. simultaneously we see the same color differently, when juxtaposed with two or more colors.

Last but not the least; the MIND also plays an important role in Color Perception. When vision rests upon an object, Eye receives certain light vibrations and transmits them to the brain. When the brain responds to these vibrations, mind begins to analyze the messages received and transmitted by eye. That is, it begins to interpret what the eye sees. If mind fails to analyze, the response to light vibrations too fails. Thus Light, Eye and Mind are very essential and important factors to experience the COLOR PERCEPTION.

They must coordinate perfectly and synchronize in right order. When this uninterrupted sequence takes place in one's life, one becomes overwhelmed with infinite consciousness filled with visions such as seas, mountains, skies, flowers and what not. One is able to register ones impressions, to analyze them and utilize the same in different ways to make his life comfortable and pleasurable.

Many poets and authors are stimulated to write delightful write-ups having observed action of colors in nature's ever changing character. The perception of colors is a Neuro-physiological process which means it involves both the Nervous System as well as Physiological Apparatus for seeing i.e. EYE.

Like these essential factors and their role in Color Perception, there are three systems of COLOR STUDY i.e. Physical, Pigment and Psychological.

PHYSICAL SYSTEM which is primarily concerned with the study of light as source of Color i.e. Spectrum and Wavelengths of different Hues.

PIGMENT SYSTEM pertaining to manipulation of color pigments, dyes, inks etc. and

PSYCHOLOGICAL SYSTEM leading to Color as intriguing sensations in human experience. The Psychological aspect because of its importance in human behavior and experience in all walks of life should be considered with TOP PRIORITY. Many problems that we come across in our daily life are now being solved through this system in Western Countries by Color Specialist known as COLORIST or COLOR STYLIST.

In United States of America, COLORIST/COLOR STYLIST has come up as flourishing career on its own merit and rights.

The Colorist develops color schemes for anything from Subways to Chapels and maintains counseling Service for Industrial Plants, Business Houses, Window Displays, Residential Schools, Educational Institutions, Homes and so on. His services are based on thorough knowledge of Color and its relationship with people and their behavior.

Various interesting facts have come into focus through the experiments carried out by these Colorists.

The emotional and mental reactions of individuals to color have been capitalized with remarkable effect in certain Industries and other fields as well. According to colorist's findings spatial properties of color appear to change; Colors float or grow heavy, they shrink or tend to expand, advance or recede, look static or pulsating, faded or intense; according to their placement.

According to their findings Blue, Green and Red colors are favored of people. But even then women in general prefer Red, while men prefer Blue. Red is known to quicken pulse. It stimulates and excites. Blue, Green and Violet are known to be cool and restive colors. Yellow, Orange and Red are known to be warm and energetic colors.

Certain optical illusions can also obtained by judicious use of certain colors. Objects with light & warm colors appear larger than those of dark and cool colors. Objects of dark color appear heavier than those of light colors.

How color plays its role effectively can be seen from following examples:

In general warm colors stimulate and cool colors make you relaxed. Green and Blue can actually make people feel cold. Office workers have been known to have chills when they were working in an air conditioned office painted with Blue Color. With room temperature at same level, chill receded, when the walls were painted with Yellow & Beige color.

The San Fernando Heights Orange Growers' Association, California, USA carried out an experiment to remove the weariness of their healthy employees. The Manager of the Association, while looking for the remedy, concluded that if drab interiors of packaging plant were brightened up, it might cut down fatigue & nerve strain.

A colorist was then consulted for this problem. Colorist agreed to transform the plant both in productive output and employee's comfort, if given a free hand. The results were amazing. To quote from Los Angeles Time: – "VIOLET Machinery! Yes Sir, I said VIOLET machinery. Oranges trickling down to MUSTARD YELLOW grading tables – rolling on PEACOCK BLUE conveyor belts – girls in two tone TAN uniforms piped with PERSIAN ORANGE – picking oranges off ORANGE table – divided by upright partitions of MUSTARD YELLOW. All this sounds like an Artist's wild dream of ART IN INDUSTRY. Never the less, it is the latest development in Color Treatment of an Industrial Plant and workers liked it. They freely admit that they do feel tired now as in the past".

Kante Rockney, a former Football Coach confessed that he had the dressing rooms of his home team painted with LIGHT RED, a warm color, and that of Visitor's dressing rooms with BLUE, a cool color. This kept his own team keyed up during half time break, while the visitor relaxed. The result was, home team always scored well in second half of the game.

It was also observed that the race horses taken to their stables after completion of the race, showed marked difference in coming down to their normal breeding. They took more time to return to normalcy when taken to stables painted with warm colors than when taken to those with cool colors.

Even in medical treatments the use of color has proved its merit. Patients of Hypertensions felt relaxed when kept in chambers with Blue or Green colors. Patients with Mental Depressions, when kept in chambers painted in warm colors showed faster progress in getting rid of their problems.

YELLOW is a cheerful color. It makes people more sociable and alert – both mentally and emotionally. For a classroom of Mentally Challenged children, YELLOW is ideal wall color. But it cannot be recommended for Nursery classroom as is not conducive to nap taking.

In West Germany, Traffic Control Authorities conducted a survey of Auto Car accidents. Their findings were most accidents took place either in early morning hours or dusk hour of the day. Second finding was most of the cars hit were of dark or dull color.

The reason arrived at was Poor visibility at these hours did not give sufficient time to the drivers of cars that hit the cars ahead, to control the speed as they could notice the car ahead from sufficiently safe distance.

On the basis of these findings, Auto Car Manufacturers were asked to paint the cars in LIGHT and BRIGHT colors. Result – The number of auto accidents reduced drastically, since then.

Students, of Kansas University, U.S.A., were feeling tired and lethargic in during post lunch sessions. Authorities tried solve the problem by changing their time table with increased coffee breaks. They even tried by providing nutritious snacks during coffee and lunch breaks, but to no avail. When the matter was taken to a Colorist, he solved the problem in no time. The reason for the fatigue was constant exposure to high contrast Black & White on the blackboards and absence of Chromatic sensation throughout the day. Thus only the Rod nerves were active and Cone nerves were inactive. This brought strain on optical nerves causing fatigue and yawning in the post lunch sessions. Remedy suggested was to replace blackboards to GREENBOARDS and use CREAM colored chalks, thus reducing contrast. Cone nerves started functioning effectively reducing the strain on the Rod nerves.

The Meat Shop Management in New York consulted a Colorist when their sales dropped drastically after changing the interior color scheme without consulting anyone. They had changed walls color from original OFF WHITE to BRIGHT YELLOW. Result was the same quality of meat started looking stale thus discouraging the buyers. On consulting the Colorist, Yellow color of the walls was replaced with GREEN. The sale of meat increased. Reason - The after image Yellow (Violet) on red meat, made it look violetish i.e. Stale. Whereas the after image of Green (Red) on red meat made it look redder i.e. Fresh.

Coloring machines, carrying buckets, trolleys in different colors in large factories have helped to increase the output as well as reduce fatigue of worker.

THUS, IF COLORS ARE USED WITH UNDERSTANDING, WE AN MAKE OUR LIVING MORE LIVELY AND PLEASUREABLE.

I sincerely thank office bearers of the Association for giving me this opportunity to share my views on Color with this august assembly.

Thank You.