Quadrant II – Transcript and Related Materials

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Color Theory

Color theory is both the science and art of using color. It explains how humans perceive color; and the visual effects of how colors mix, match or contrast with each other. Color theory also involves the messages colors communicate; and the methods used to replicate color. Color theories create a logical structure for color.

Color is perception. Objects reflect light in different combinations of wavelengths. Our brains pick up on those wavelength combinations and translate them into the phenomenon we call color.
For e.g. People decide whether or not they like a product in 90 seconds or less. 90% of that decision is based solely on color.
Different Colors tend to communicate different messages.

Color Harmony

Harmony can be defined as a pleasing arrangement of parts, whether it be music, poetry, color etc.
In visual experiences, harmony is something that is pleasing to the eye. It engages the viewer and it creates an inner sense of order, a balance in the visual experience.

When something is not harmonious, it's either boring or chaotic. The human brain rejects what it cannot organize, what it cannot understand.The visual task requires to present a logical structure. Color harmony delivers visual interest and a sense of order. In summary, Harmony is a dynamic equilibrium.

Color Context

How color behaves in relation to other colors and shapes is a complex area of color theory. Observing the effects colors have on each other is the starting point for understanding the relativity of color.

The relationship of values, saturations and the warmth or coolness of respective hues can cause noticeable differences in our perception of color.

Color Basics

Color is the perceptual characteristic of light described by a color name. Color is light, and light is composed of many colors. Objects absorb certain wavelengths and reflect others back to the viewer. We perceive these wavelengths as color.

A color is described in three ways: by its name, how pure or desaturated it is, and its value or lightness. Although pink, crimson, and brick are all variations of the color red, each hue is distinct and differentiated by its chroma, saturation, intensity, and value.

HSV (Hue, Saturation, Value)

Designers use the HSV color model when selecting colors for paint or ink because HSV better represents how people relate to colors than the RGB color model does. The HSV color wheel also contributes to high-quality graphics. This approach is available in many high-end image editing software programs.

Selecting an HSV color begins with picking one of the available hues and then adjusting the shade and brightness values.

1. Hue

Any particular spot on the wheel from 0 to 360 degrees is referred to as a hue, which specifies the specific tone of color.

2. Saturation

Saturation describes the amount of Grey in a particular color from 0 to 100%. Reducing this component towards 0 introduce more Grey and produces faded effect. Sometimes saturation appears in range from 0 to 1 where 0 is Grey and 1 is primary color

3. Value or Brightness

Works in conjunction with saturation and describes the brightness or intensity of the color from 0 to 100. Also called as lightness. Where 0 is completely black and 100 is brightest and reveals the most color.

Color Variation

Variations of colors, whether they are viewed on a computer monitor or on a printed page, can be created from any color. Tint is the variation of color when mixed with white. CMYK and RGB colors can be made lighter by adding white. It does not change the color from the original; it changes the amount of light. Shade is the variation of color when mixed with black. It also does not change the color from the original, but it changes the amount of darkness.

Color Systems

1. Additive Colors

One of the reasons that accurate color is difficult to manage is that each device produces color in a different way. Color Additive Theory is defined as how colors are made by mixing the primary colors red, green, and blue, and how those mixed colors are perceived.

In Actual, the primary colors are red, blue, and yellow. but in color additive theory, the primary colors are red, blue, and green because those colors are found in the color photo receptors of the human eye.

A computer monitor creates color by mixing red, green, and blue (RGB) spots of color in different concentrations in order to produce an image and spectrum of colors. White light is the combination of red, blue, and green wavelengths. When equal parts of red, blue, and green bands are added to one another, white light is created. This color is projected using light known as an additive color. When each color is added to basic black, the image becomes lighter.

The primary purpose of the RGB color model is for display of images in electronic system such as on television screen and computer monitors. It is also used in digital photography. Because the image seen on a computer monitor is actually a light and the image seen on paper is a variation of black, it is difficult to produce identical images.

RGB Model

RGB colors are based on a scale ranging from 0 to 255, with the higher number representing the purest color.
For example, if red and green are set to 0 and blue is set to 255, the result will be a blue. Because there are no other colors diluting “blue,” this is called a pure color. In the same way, pure red and green are created by assigning 255 to each of the colors and 0 to the other two.
This method of projecting colors is used by computer monitors.

2. Subtractive color

Subtractive color mixing begins with white and ends with black as one adds color, the result gets darker and tends to black. Primarily used in printing, the subtractive color model works by partially or completely masking color on a white background. Printing presses produce color documents using cyan, magenta, yellow, and black (CMYK). CMYK colors are called subtractive color.

In order to produce white, the percentage of color is set to 0% or subtracted from the color black. When equal parts of cyan, magenta, and yellow colors are added to one another, Black Color is created. Usually the base of this color starts with light color i.e. white. The more color is added, the darker shade is received as output.

CMYK Model

CMYK colors are measured as percentages up to 100 where the highest color means the darkest shade. If the user knows the exact color required in the final product in print, selecting the CMYK mode before beginning ensures that the colors you see will match the final output.

This step is important because it is possible to create colors in RGB that cannot be matched in CMYK and are out of gamut. There are some software which allows the designer to check whether the color that they want to use in design can be printed or not.

In simple words, Additive colors is created by combination or focusing of light, i.e red, blue and green light. Whereas Subtractive colors are created by combination of different colors i.e. cyan, magenta and yellow colors.