

Module 7: "Color Perception"

Lecture 19: "Color Illusion"

The Lecture Contains:

- Visual Perception Theory
- Color Illusion

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Visual Perception Theory

Visual Perception is based on one of our sensory organs- Visual Organ (eyes). These sensory organs are - visual, olfactory; touch, auditory and taste help us in transmitting information to our brain for our survival. Each sense organ is part of a sensory system which receives sensory inputs and transmits sensory information to the brain.

Psychologists debate on the reliability of perception and experience. "A major theoretical issue on which psychologists are divided is the extent to which perception relies directly on the information present in the stimulus." In this regard of the scientists believe that perceptual processes are not direct, but depend on the perceiver's expectations and previous knowledge as well as the information available in the stimulus itself.

(Read more: <http://www.simplypsychology.org/perception-theories.html> ; June 6, 2012

Visual Illusion is a subject that has raised lot of interests among psychologists. The first book is authored by Matthew Luckiesh in 1922 on optical illusions book entitled - Visual Illusions: Their Causes, Characteristics and Applications. Luckiesh applied his theory in practical while designing camouflage gears during the WWI. He could use the technique of Optical Illusion while designing the uniform that would merge in nature.

(Ref. <http://www.visualillusion.net/> ; & <http://psychology.about.com/od/sensationandperception/f/trichrom.htm> ; June 6, 2012)

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Color Illusion

There are numerous optical illusions that are not being answered yet. Optically human eyes may perceive things that are physically different from the reality. It is also known as Optical Illusion. Eyes see and the brain perceives. Often we find that what eyes see not necessarily matches with our perception. The information processed by brain does not tally with the physical appearance. Color Illusion is among those illusions that frequently we experience. However, we need to discuss in general the aspects of Optical Illusion before discussion on specific 'Color Illusion'. Following are the three main aspects:

1. Literal optical illusions that create images that are different from the objects that make them,
2. Physiological ones that are the effects on the eyes and brain of excessive stimulation of a specific type (brightness, colour, size, position, tilt, movement),
3. Cognitive illusions, the result of unconscious inferences

(Read more: http://en.wikipedia.org/wiki/Optical_illusion ; June 5, 2012)

An illusion is not a contradiction between perception and physical reality; it is a contradiction between two or more perceptions.

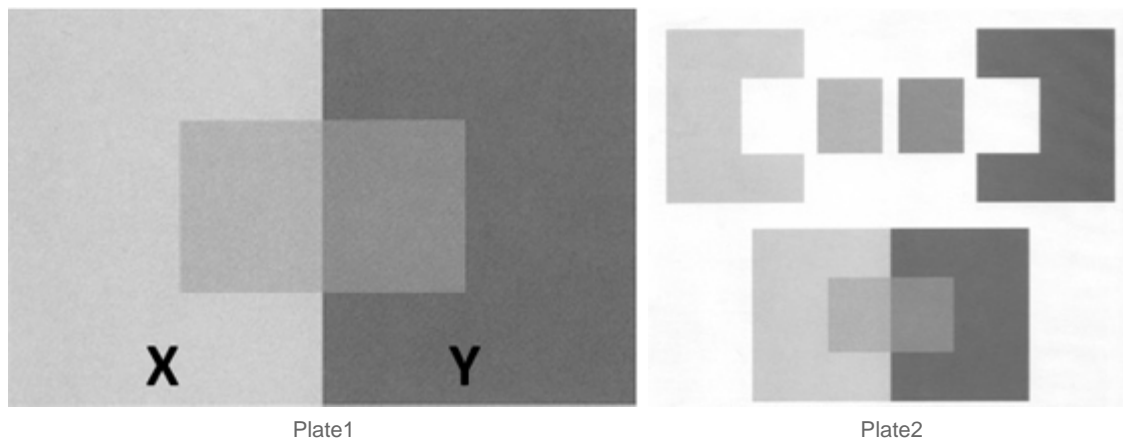
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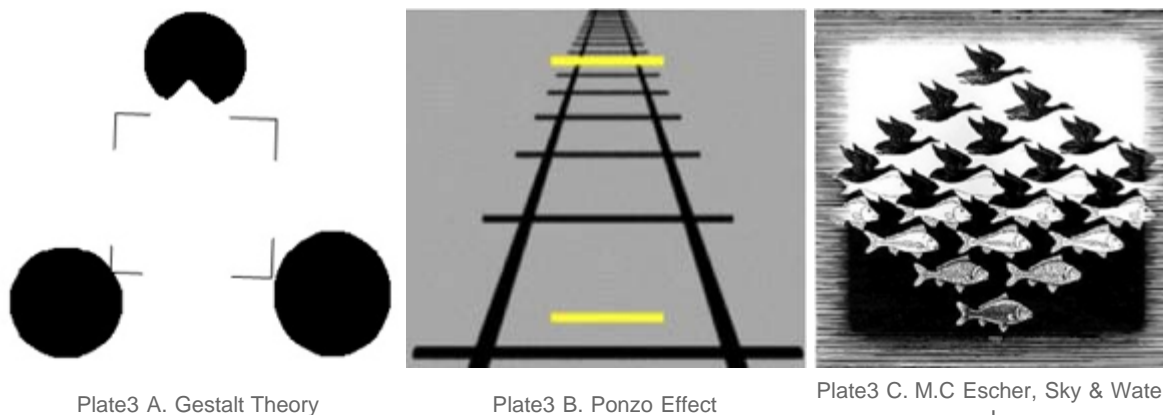
Graham 1965: Illusions are effects of contrasting experiences.

Da Pos 1995: An experience which is conflicting with other experiences, usually with remembered experiences. Only one experience is not enough to be considered an illusion because it does not produce a perceptive mismatch. This mismatch, which is a consequence of two contrasting experiences, is according to me the main factor attracting our curiosity and exciting our aesthetic pleasure.

Colin y Blakemore 1973: A visual illusion is a discrepancy between two independent detector systems in the brain.



The above images (plate1) shows that the hue of two colors (X&Y) when is overlapped by another transparent hue it changes its dimension (depth of field). While overlapping area X it tends to recede back and on the area Y it comes forward. Physically it is the same hue that is covering X & Y but optically it changes the dimension. In Plate2 when the same image is separated it shows different dimensions.



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"Gestalt Theory can be used to explain the illusory contours in the Kanizsa Triangle (in this case square). A floating white triangle (square/ diamond), which does not exist, is seen. The brain has a need to see familiar simple objects and has a tendency to create a "whole" image from individual elements." Brain can derive conclusion because of earlier experience.

"In the Ponzo illusion the converging parallel lines tell the brain that the image higher in the visual field is farther away therefore the brain perceives the image to be larger, although the two images hitting the retina are the same size. The Optical illusion seen in a diorama/falls also exploits assumptions based on monocular cues of depth perception."

(Ref. http://en.wikipedia.org/wiki/Optical_illusion ; June 5, 2012)

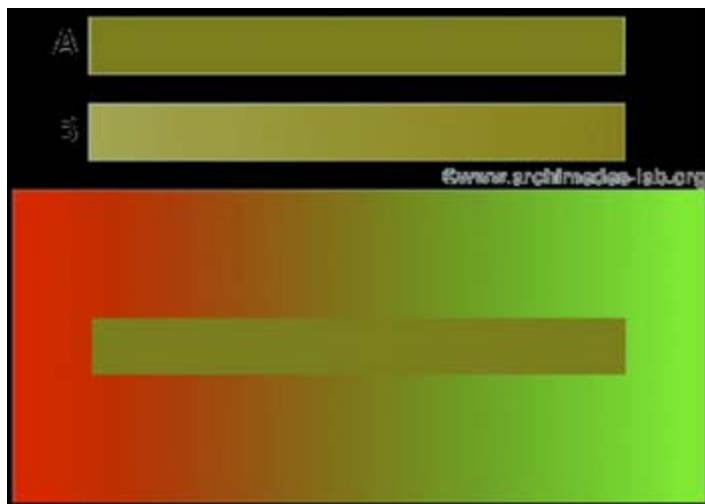


Plate4 A. Optical Illusion

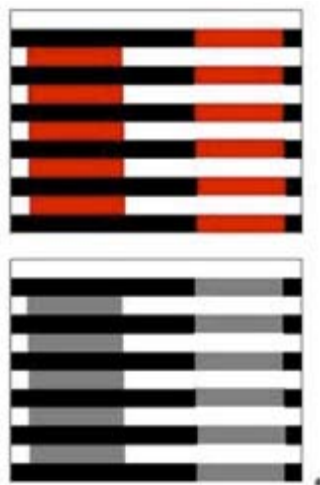


Plate4 B. Optical Illusion

Source: [http://www.google.co.in/search?](http://www.google.co.in/search?hl=en&cp=8&gs_id=g8&xhr=t&q=color+illusions&bav=on.2.or.r_gc.r_pw.r_qf..cf.osb&biw=1350&bih=555&um=1&ie=UTF8&tbn=isch&source=og&sa=N&tab=wi&ei=Th3OT8vuG4jlrAfdpOj0Cw)

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"Simultaneous Contrast Illusion (plate4 A&B)- The background is a colour gradient and progresses from dark grey to light grey. The horizontal bar appears to progress from light grey to dark grey, but is in fact just one colour." (Source: http://en.wikipedia.org/wiki/Optical_illusion ; June 5, 2012)

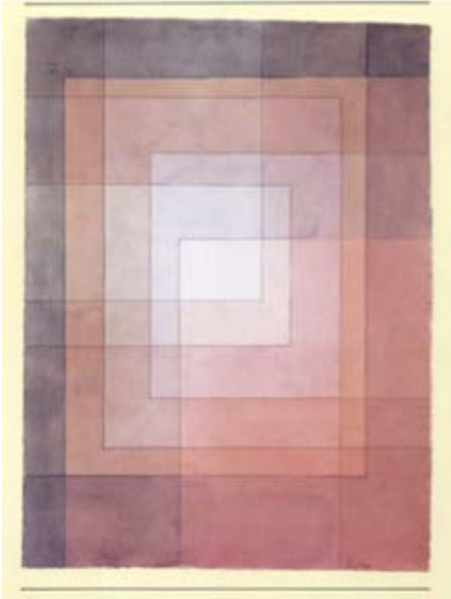


Plate5 Paul Klee,
Polyphonic White, 1930



Plate6 Color Intensity increase the dimension

Plate 5 A&B illustrates the depth of field based on color intensity and transparency of the color.

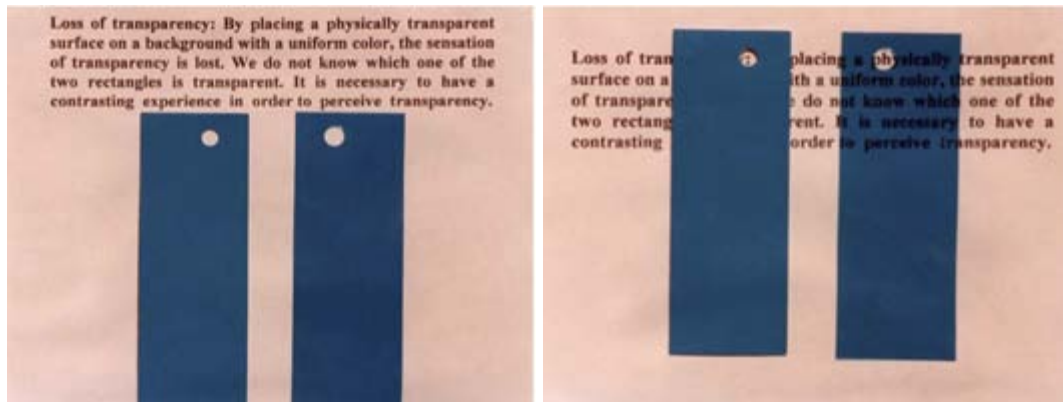


Plate6 A & B Color transparency and color illusion

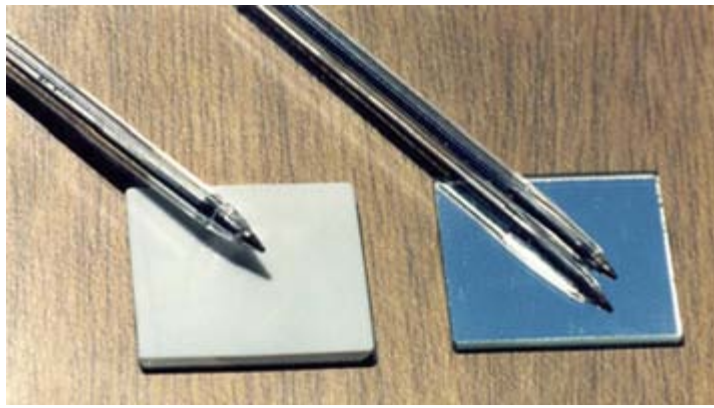


Plate7 Material Transparency & color

Human eyes may experience illusion due to the material transparency against color. The white opaque color reduces the depth of field while the ice-blue transparent color increases the dimension.

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