

## Module 2: "Color Theory"

### Lecture 5: "Color Illusion"

The Lecture Contains:

- ☰ Color Illusion
- ☰ Bezold effect
- ☰ Color Transparency
- ☰ Equiluminant (ambiguous) colors

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## Color Illusion

Color perceived by normal human eyes may not visualize correctly. It is often shows that human eyes may see illusionistic images that can create dimension. Following are some of the examples that would illustrate the illusionistic images-

- The Bezold effect is an optical illusion, named after a German professor of meteorology, Wilhelm von Bezold (1837-1907), who discovered that a color may appear different depending on its relation to adjacent colors. The eyes play a variety of tricks on the brain that are common to most human experience. Some of them are useful to the artist/ designer or problems for the artist/ designer. Designer while creating 2-D design may take advantage of the illusionistic expression.

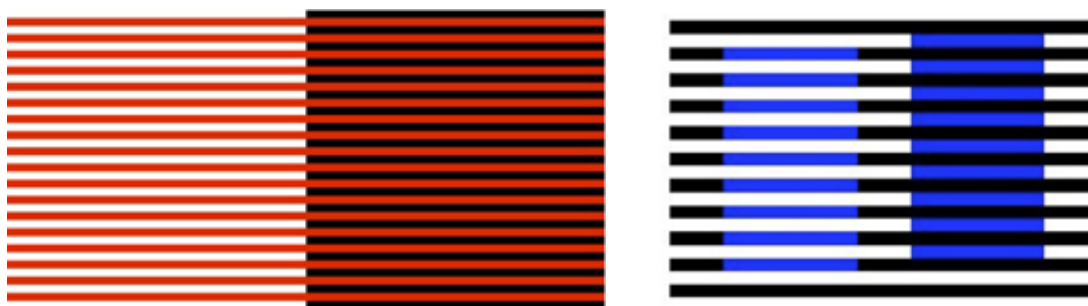


Plate 18 A &amp; B Color Illusion

Source: [http://www.google.co.in/search?](http://www.google.co.in/search?hl=en&q=Color%20illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=qXHAT7eaFMjsrAelz7HHQCQ)

[hl=en&q=Color%20illusion&bav=on.2.or.r\\_gc.r\\_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=qXHAT7eaFMjsrAelz7HHQCQ](http://www.google.co.in/search?hl=en&q=Color%20illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=qXHAT7eaFMjsrAelz7HHQCQ) ; May 26, 2012

Illusion is an optical illusion illustrating the fact that the same target luminance can elicit different perceptions of brightness in different color combinations. Note, that although the blue and gray rectangles are all of equal luminance, the ones seen in the context with the dark stripes appear brighter than the ones seen in the context with the bright stripes. Piet Mondrian in his theory of *Pure Plastic Art* demonstrated the quality of such dimensions (Plate19) without using the conventional light and shade. Thus, he produced the elasticity of colors by combining them against *Pure Colors* (Yellow, Blue, Red and Black and White). He demonstrated that the same color may create different dimensional effect against another color.

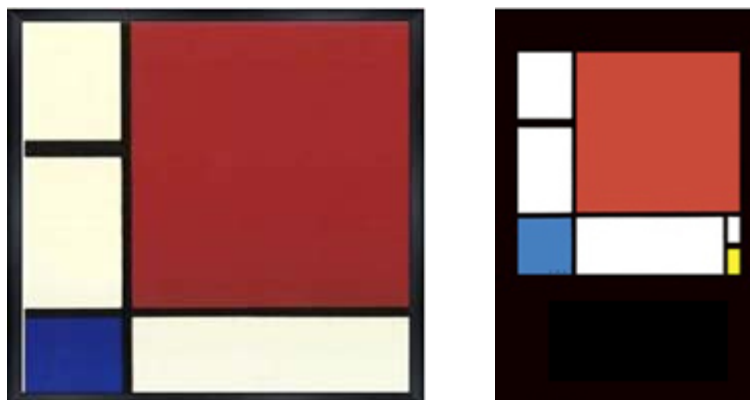


Plate19. A &amp; B Piet Mondrian

Source: [http://www.google.co.in/search?](http://www.google.co.in/search?hl=en&q=Color%20illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=qXHAT7eaFMjsrAelz7HHQCQ)

<http://en.wikipedia.org/wiki/Piet Mondrian> ; May 26, 2012

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The Blue against the strip of black (thickness is also considered) and against white would produce different dimension. Red against white and blue with a border of black would have different dimensional effect. There by it is proved that the eyes may read different elasticity effect because of the contrast of colors.

Bellow are examples of a few common illusion that human beings experience-

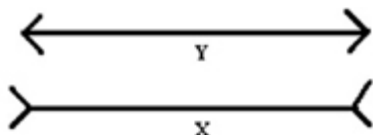


Fig. 2 A

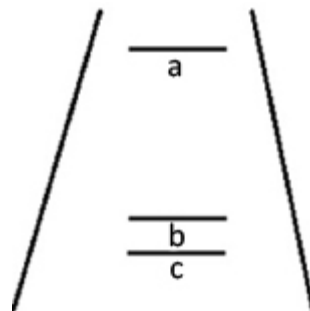


Fig. B

In Fig. 2 A both the arrows (X & Y) are of the same length. However the 'X' seems longer than 'Y'. In the Fig. 2 B all the three parallel lines- a, b & c are of the same length. However, it appears 'a' is longer compared to 'b' and 'c'. Therefore, it seems we cannot trust our own eyes. Artist and design have utilized the deficiency of human eyes and applied in their creative work to achieve certain effect.

Following are further more examples that are popularly shown to illustrate human illusionistic views-

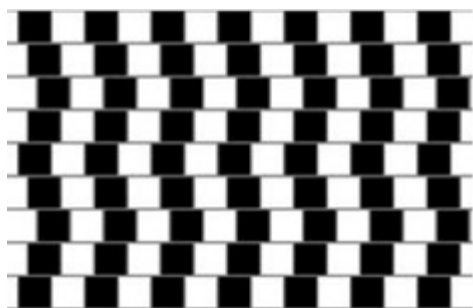


Fig. 3A

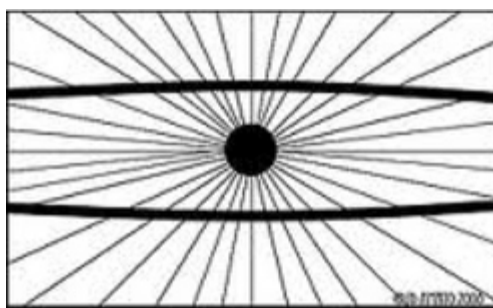


Fig. 3B

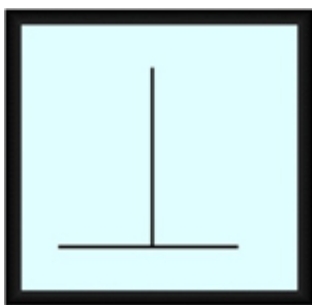


Fig. 4 A

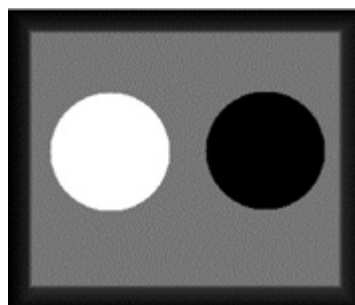


Fig. 4 B

Height-Width Illusion- an upright line segment appears longer nearby equal horizontal line segments (Fig 4. A)

Illusion of Contour- An open or empty figure appears to have greater area or capacity than an equal closed or filled figure (Fig. 4. B).

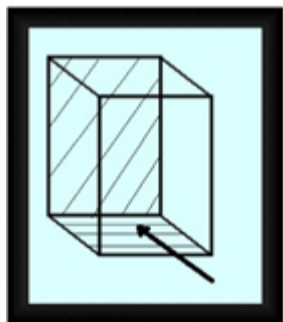


Fig. 5 A Illusion in Depth  
(Ant's Eye View/ Bird's Eye View)

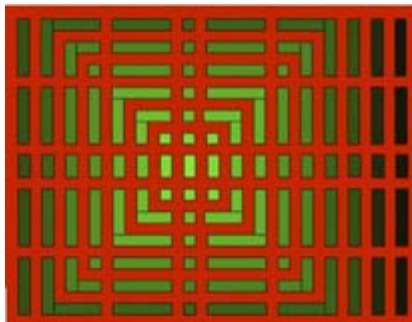


Fig. B. Illusion in Color Contrast  
(Primary- Secondary Color)

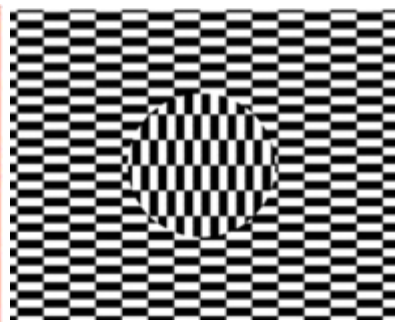


Fig. C Illusion flat & convex surface

Source; [http://www.google.co.in/search?](http://www.google.co.in/search?hl=en&q=illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbm=isch&source=og&sa=N&tab=wi&ei=b3fAT42OB4OurAegpMzpCQ)

[hl=en&q=illusion&bav=on.2.or.r\\_gc.r\\_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-](http://www.google.co.in/search?hl=en&q=illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbm=isch&source=og&sa=N&tab=wi&ei=b3fAT42OB4OurAegpMzpCQ)

[8&tbm=isch&source=og&sa=N&tab=wi&ei=b3fAT42OB4OurAegpMzpCQ](http://www.google.co.in/search?hl=en&q=illusion&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbm=isch&source=og&sa=N&tab=wi&ei=b3fAT42OB4OurAegpMzpCQ) ; May 26, 2012

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## Color Transparency

The interaction with light creates the transparency or opaque quality of a color. Opaque color surface is more reflective (not to be confused with "shiny"). They cover and hide what's under them. On the other hand transparent (or translucent) surface paint allows more light to pass through them. They appear to 'see through'. Learning about and observing the opacity or transparency of paints enables artists to have greater command over techniques like glazing, layering, optical color mixing, or avoiding *reappearance of earlier paint/ color*, a bothersome effect where paint becomes more transparent as it dries, revealing what's underneath. Many of Monet's impressionist paintings shows the layer below the because of aging the upper surface color's transparency. The 18th C Ad English Water color paintings had achieved the



Plate 20 A. Minimalist Design



Plate 20. B



Plate 20. C Paul Cezanne

The interior of the room design (plate 20A) uses the transparency technique to achieve the desired environment, "Ingenious design, this bathroom the minimalist spirit of transparency and plays of light. A large window separating it from the bedroom while linking it intimately. This allows him to enjoy the natural light that lands on the room lighting flattering. Intimacy is preserved or screened behind blinds suggests." Ref. 20 A. <http://tubreglazingx.com/a-bathroom-color> ; May 26, 2012

Similarly the Plate 20 B illustrates the transparency technique to create sublime effect of colors in a 2D presentation. Paul Cezanne's self portrait (20 C) shows the use of transparent color creating freshness and soft tonal color scheme.

Source:

Plate 20B [http://www.google.co.in/search?](http://www.google.co.in/search?hl=en&q=Color%20transparency%20in%20design&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=P3nAT_yVL4bKrAeQ2YmuCQ)

[hl=en&q=Color%20transparency%20in%20design&bav=on.2.or.r\\_gc.r\\_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=P3nAT\\_yVL4bKrAeQ2YmuCQ](http://www.google.co.in/search?hl=en&q=Color%20transparency%20in%20design&bav=on.2.or.r_gc.r_pw..cf.osb&biw=1272&bih=577&um=1&ie=UTF-8&tbn=isch&source=og&sa=N&tab=wi&ei=P3nAT_yVL4bKrAeQ2YmuCQ) ; May 26, 2012

Plate 20C [http://www.google.co.in/search?](http://www.google.co.in/search?um=1&hl=en&tbn=isch&sa=X&ei=pnzAT9bMMoXLrQfzq8TCCQ&ved=0CAYQBSgA&q=paul+cezanne+watercolor+self+portrait&spell=1&biw=1272&bih=577)

[um=1&hl=en&tbn=isch&sa=X&ei=pnzAT9bMMoXLrQfzq8TCCQ&ved=0CAYQBSgA&q=paul+cezanne+watercolor+self+portrait&spell=1&biw=1272&bih=577](http://www.google.co.in/search?um=1&hl=en&tbn=isch&sa=X&ei=pnzAT9bMMoXLrQfzq8TCCQ&ved=0CAYQBSgA&q=paul+cezanne+watercolor+self+portrait&spell=1&biw=1272&bih=577) ; May 26, 2012

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## Equiluminant (ambiguous) colors

In 2-D design the technique of "equiluminance" to blur outlines and suggest motion is widely used (Plate21). We cannot perceive the edges of objects where object and background have the same luminance. If parts of a painting are equiluminant, their positions become ambiguous. They may seem to shift position or to float. The 'blur' edge creates an impression of dynamism instead of static condition. 2-D artist and designers have successfully applied such technique to generate dynamism. The combination of colors such as, blue and orange, violet and yellow, red and green, etc can create such impression of dynamism based on the size and area. Human eyes are sensitive to such combination of colors. Equiluminant colors have long been recognized by artists as being special because they can generate a sense of vibration, motion or sometimes an eerie quality. This strange quality arises because of a particular system can see something that the other system cannot; with only a particular system activation in isolation we can identify a particular object, but its position and motion (or lack of motion) are undetermined.

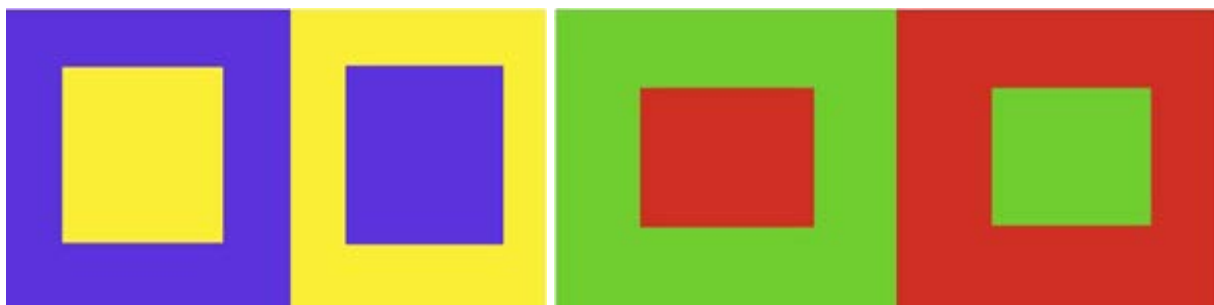


Plate 21 Equiluminant (ambiguous) colors



Plate 22 Impressionism (Claude Monet)

The contrasting colors produce the invisible strength of line which slowly merges with another (background) while blurring the colors by mixing. Impressionist painters have created such color pallets where colors have merged with each other (Plate22).

The above paintings typically express the Equiluminant Colors that are self contrasting because of the combination of primary and secondary (complementary) colors. Impressionist painters frequently applied equiluminant colors that created higher luminosity in the color scheme.