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Colour: Family, Relations, and Harmony

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Abstract

Aristotle's Colour theory (322 BCE) and Forsius' Wheel (1619) and its latter adaptations provide essential principles of painting that involve observing and exploiting the properties and relationships between colours. Colours have spiritual connotations and classificatory value for traditional artists in Sub-Saharan Africa. The application of those values is especially significant for colour values, tones, and the appraisal of the aesthetics of painting. This work is an exploratory survey of the contributions of theorists and painters to the evolution of colour aesthetics over time and their impact on evaluating the painting genre. The insights provided have practical value for artists on the need to adhere to colour theory principles, values, tones, and how the relationships between colours can harness to create a balance and better aesthetics.

Introduction

Colour is one of the principal elements of the visual arts. It is practical and proper for artists to understand how colours are formed, how they are perceived, and their impact on viewers. Colour theory is a human invention of how colour can be best used, and it is both the science and art of using colour. It entails rules and guidelines that designers or artists use to communicate and produce effective painting designs and colour schemes. Objects reflect light to our eyes in different wavelengths. According to Isaac Newton's science of light, our brains pick up on these wavelength combinations and translate them into what we call colour. These colour theories guide artists in producing an acceptable colour wheel, circle, or triangle of colours for effective painting.

Colours are organised and grouped into primary, secondary, and tertiary categories. The colour wheel's applications refer to extensive colour knowledge about human optic ability, psychology, culture, and interaction with nature. The colour wheel becomes a practical guide in the visual arts to mixing and selecting colours to achieve harmony and balance in their use and application. The choice of colour is at the artist's discretion, depending on the colours available, which could be the source of inspiration. Colour could be an inspiration to the audience he is painting for or the intended scheme of choice that suits the theme of the painting. The artist's colour theory is the relationship between colours in creating good harmony.

Traditional African Concepts of Colour

There is a spiritual context to colour selection in traditional sub-Saharan arts which has significant implications for colour classification, and the creation of harmony for ceremonial and spiritual symbolism (Emama, 2020). This African harmony can be seen in body painting, and in masks and masquerades. The in the Izon culture of the Niger Delta, Nigeria, colours grouped according to spiritual height, in this order: white (Pena-pena), red (Que-que), and black (Dirimo). White is the colour with the most significant spiritual significance, and the colours classified under it are all very light tones: yellow and white. Red, the second colour in the spiritual hierarchy, comprises what is considered hot colours like red and orange. Black is the lowest-rated colour in the colour classification of the Izon people; it is comprised of all dark colours, including dark brown and all shade of black-related tertiary colours. In painting, using these three Izon "primary" colours creates harmony for the Izon culture audience's understanding of artworks.

Aristotle 322 BCE

Aristotle, an ancient Greek philosopher and mystic who lived in 322 BCE, developed the first known theory of colour. He identifies colours as corresponding to the four elements: red for air, yellow for

water, black for earth, and white for fire. His proclamation of colours stated that "God sent down colour from the heavens as celestial rays."

Figure 1: Aristotle 322 BCE, Proclamation of Natural Colours
http//www.huevaluechroma.co

Like most African cultures, Aristotle classified all colours into four major categories: black, red, yellow, and white. He tried to create colour theory by classifying colours into nature's creative processes to achieve harmony.

Sigfrid Forsius 1611

The roots of the colour wheel can be traced back to the early 1600s, primarily to Aron Sigfrid Forsius (1611), who created the first colour wheel. This colour wheel shows a different consideration for hue. His study concluded that colours could be arranged in a different order. He proposed that to properly observe the relationship between colours, the artist should begin with the five primary colours: red, yellow, green-blue, and grey. Grey is a mixture of black and white. Red, yellow, blue, and green should be used between black and white. The preceding was his fundamental thought about his idea of colours.

Figure 2: Aron Sigfrid Forsius (Public Domain)

This was his fundamental classification of colours, although the present-day colour wheel is rooted in the arrangement of colours, starting with primary colours and progressing to secondary and tertiary colours. A good study of the colour wheel does reveal the combinations of colours; the colours in the wheel are grouped according to the relationship.

Leonard da Vinci 1490

Leonardo da Vinci, (1490), was the first to suggest an alternative colour theory in "Treatise on Painting." According to him, philosophers see white as "the cause, or the receiver," and black as the absence of all colours; both are very important to the painter. He also notes that white represents

light, while black represents darkness, and listed six colours in the following order: "white, yellow (earth), green (water), blue (air), red (fire), and black." His experimentation with available media marked Leonardo da Vinci's 1510; he used black and occasionally used red, white, and earth colour. The Western sense of creating harmony with the colour wheel was created, which formed the basis of colour theory.

Isaac Newton's Spectrum of Colours

Isaac Newton (1642–1726) provided a better understanding of what light and colour are and their composition. He was the first to understand the composition of the rainbow colours: red, yellow, green, violet, blue, and orange. In his crucial experiment in 1666–72 and Optics in 1704, he concluded that black and white were compositions of many colours. A Newton disc or circle could be described as an arrangement of colours on a circle and how these colours are arranged and are related to one another. This arrangement falls between primary, secondary, and tertiary colours.

Figure 3: Isaac Newton's Optics

He experimented to prove the relationship between colours. He used a prism to create a spectrum of colours from red to purple, which proves that white light has many colours.

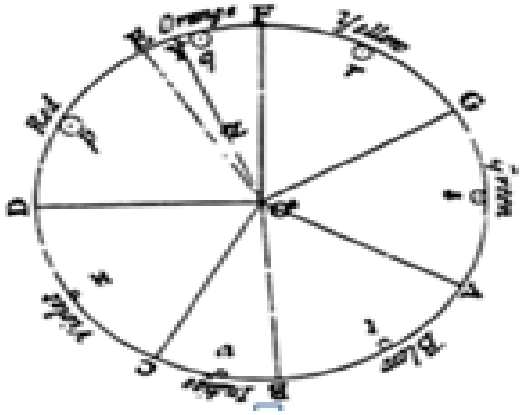

Figure 4: Isaac Newton's colour circle theory

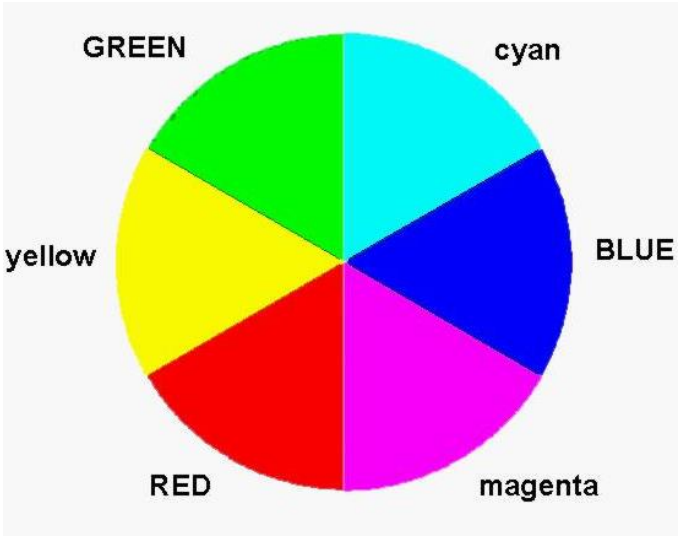

Figure 5: Isaac Newton's colour circle

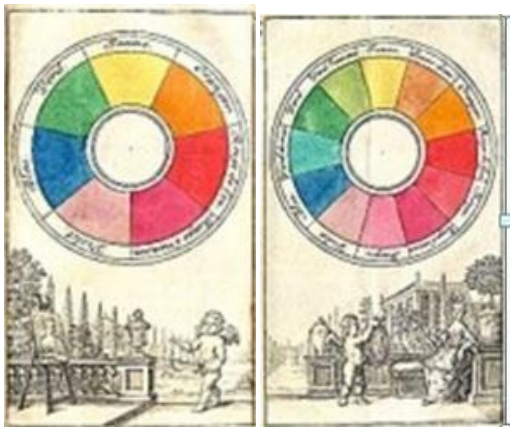

Figure 6: Seven and Twelve developed Newton disc or circle

Newton decided to connect the violet end of his colour spectrum to the red end, creating the first analysis of the colour circle known to the academic world.

Figure 7: Twelve Colour Wheel

The colour wheel comprises three primary colours: red, yellow, and blue, and three secondary colours that are created when primary colours are mixed. They include green, orange, and purple. There are also six tertiary colours, made from primary and secondary colours, such as blue-green or red-violet. The arrangement of the colours reflects the chromatic arrangement of the colours on the wheel. Colour wheels are sometimes called colour circles. This is as a result of the circular arrangement of the colours.

Colour Pyramid

Tobias Mayer, a German mathematician and astronomer, devised a colour triangle that conforms to the Izon colour harmony. His classification consists of three primary colours of red (Que-que), blue (Dirimo), and white (Pena-pena) in the eighteenth century in pursuit of identifying the number of colours the eye can see.

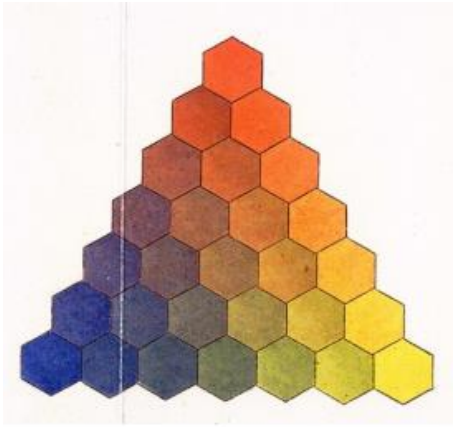

Figure 8: Painters Triangle Colour Harmony of Red, Blue and Yellow

Related colours could be created in a pyramid if the primary colours are placed in a triangle and the colours are graduated in a triangle to achieve secondary and tertiary colours between the secondary colours. Colour categories, properties, and physical specifications could be that of colour being absorbed, reflected, and emitted; this could also depend on the health of the individual's sight due to the spectral sensitivity of the cone cells in the retina of the eye, his religion, culture, environment, and encounter with nature, and how each brain interprets the colour. The painters' colour triangle is an arrangement of colours in a triangular shape on the colour wheel. This arranges one primary colour with its secondary and tertiary colours. This allows the painter to choose colours based on mood. The nine parts of harmony in Goethe's theory are believed to be a triangle of colours in the human structure, depicting different colours of emotion so that the artist can choose colours and create harmony depending on their emotion.

Creating Harmonies Using Colour Theory

Albert H. Munsell introduced the *Atlas of the Munsell Colour System* in 1931. It is a colour system consisting of several hundred colours arranged according to hue, value, and chromatic characteristics. After he died in 1918, a reversed version of his book, *Munsell Book of Colour*, was published in 1929 and is sometimes referred to as the "*Munsell colour tree*."

Colours are in harmony when used in painting or designs, create unity or form a unifying balance for the viewer, or create cultural harmony. Colour harmony occurs when the group of colours used in a painting produces a pleasing effect for the intended purpose of the painting. The theory of colours proposed by scientists and philosophers tried to set up a basic colour theory for creating colour harmony. The artist's first theory included colours different in chroma or lightness of value. However, today, cultural objectives and traditional symbols could influence the choice of the artist's colour.

For a better interpretation of the value of colours for the use of colours in the 20th century, Wilhelm Ostwald, Albert Munsell, and Johannes Itten introduced more understanding to the use of colour in creating harmony.

Munsell discovered that colours could make better harmony when we create relationships between them; he further stated that the strength of a colour is defined in its lightness (value) and its chroma and that two types of colour harmony are the colour mood, which is the colour attraction, and the trend. The similarity between the colours and the order of arrangement, hue, area, entropy, and power spectrum of the colours is essential. There is also a need to understand colour harmony from the perspective of art and design principles.

Analogous Colour Harmony

Analogous colours sit next to one another on the colour wheel—red, orange, and yellow, for example. When creating an analogous colour scheme, one colour will dominate, one will support, and another will accent. In business, analogous colour schemes are pleasing to the eye and can effectively instruct the consumer where and how to take action.

Figure 9: An Illustration of Analogous Colour

Complementary colour Harmony

These are colours that are opposite each other on the colour wheel. These colours are far from each other on the colour wheel, so they cannot be used side by side; one colour should dominate the other to create balance and harmony.

Figure 10: Illustration of Complementary colour

Split-complementary Colour Harmony

Split-complementary colours are colours that are opposite each other on the colour wheel with one of the complement split into two nearby analogous colours. This maintains the advantage of complementary colours while simultaneously introducing more visual interest with more variety.

Figure 11: Illustration of Split-complementary Colours

Triads Colour Harmony

Like the split-complementary colours mentioned above, triadic colours involve three colours in a geometric relationship. Unlike split-complementary colours, all three colours are equidistant from one

another on the colour wheel in an equilateral triangle. The most common triad colours are the primary colours. The secondary colours are derived from the primary colours.

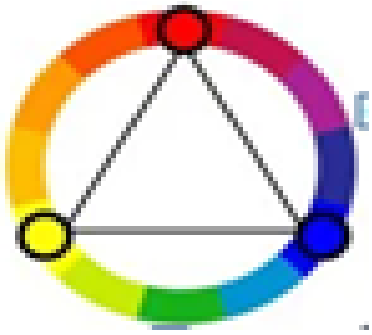

Figure 12: Illustration of Triads colours

Tetradic Colour Harmony

This is the use of four colours: one primary colour and three other colours on the colour wheel that are all equally distant from the primary colour. This colour harmony on the wheel is double-complementary in one design or painting. This will result in a rich, vibrant palette for painting. The balance between cool and warm colours will guide the choice of colours.

Figure 13: Tetradic Colours

Square colour Harmony

This colour harmony is like tetrad colour harmony. However, instead of a rectangular colour harmony, it is a square colour harmony painting with different colours evenly spaced on the colour wheel. Square colours aid in the selection of colours for a limited palette. One of the colours can dominate and balance the colour temperature to make a square colour scheme work better for a painting when it results in an in-harmony.

Figure 13: Square colour

Monochromatic Colours Harmony

Monochrome is the use of a single colour in painting. Different tones and shades of one particular colour express forms and depth. The tones of colour could be extended by using different shades, tones, and tints of other colours. In most cases, monochromatic paintings are dull and lifeless, so other shades, tints, and tones should be extended to other shades of the same shade.

Figure 14: Monochromatic Colours

Conclusion

Colour harmony entails creating harmony and aesthetics with combinations of colours based on geometric relationships on the colour wheel. The choice of colour scheme that interests the artist is created using the arrangement of the colours on the colour wheel. The artist can make a colour scheme by placing geometric shapes of colour harmony on the colour wheel and adjusting the harmony, saturation, and brightness of colours as needed in a painting. This paper discusses the role of colour in creating harmony in design and painting and various colour harmony schemes and their applications. Years of development in colour theory have chosen a path toward the practical use of colours, leading to a greater understanding and appreciation of aesthetics.

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