What is colour and light philosophy essay

ASSIGN BUSTER

It is light, the source of of life; it touches and expresses the soul of mankind. There is nowhere that colour does not exist; we are constantly under its influence, wether we knowit or not, and we do not need our eyes open to experience it. The body prosesses colour through the eyes, we often make the mistake of imaging that it is only a matter of appearance. Colour is all about feelings, and is far, far more than a mere visual delight. It is a paradox, in that the scientific definition of colour relates entirely to light-but we see it in the dark, with our eyes closed. We dream in colour, we visualize in colour and imagine in colour.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 12)

Physists explain colour in coldly scientific terms – vibrations of light, the only visible part of the electromagnetic spectrum, occupying a narrow band between microwaves and X-rays. Sir Isaac Newton demonstrated this when he shone a light through a triangular prism, the different wavelengths refreacted at different angles, showing light separated into its component parts – i. e the spectrum, or rainbow.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 12)

All life on earth is determined by the radiation of the sun. A section of this electromagnetic energy is visible light, which is measured by light waves of certain frequencies called a nanometer; a nanometer is a billionth of a meter. We perceive visible light in the wavelength region from approximately 380 nanometers, which is comparable to the colour violet, to

780 nanometers, which is perceived as red. This means that light is colour, because if we pass white light through a prism and break it down into the individual wavelengths that visible light consists of, we have violet (380-436 nm); blue (436-495 nm); green (495-566 nm); yellow (566-589 nm); orange (589-627 nm) and red (627-780 nm).

Mahnke, Frank H., (1947). Color, environment, and human response. New York ; Chichester : Wiley, (c1996). (pp6 – pp7)

For the physicist, red, for example, equals an external stimulus of a light wave that has a frequency of 627-780 nanometers. For psychologist, red suggests internal process that may or may not be associated with a physical event.

Mahnke, Frank H., (1947). Color, environment, and human response. New York ; Chichester : Wiley, (c1996). (pp7)

Close your eyes momentarily, picture in your mind a ripe tomato. Was the tomato red? Probably so. But the input that cuased you to see red was not a light wave between 627-780 nanometers. In other words, no external object, either generating or reflecting colour, was stimulus cuased you to see the tomato as being red. This testifies to the fact that colour is in the brain; it is within us.

How we see Colour and Light

The basic hues of the spectrum are as follows:

Hue – ” the attribute of colour which enables an observer to classify it as red, blue etc (Collins dictionary)

Tint – a hue with white added

Shade – a hue with black added

Tone – a hue with grey added

Value – the lightness or darkness of a colour. Light colours are high value and dark colours are low value

Chroma – the presence of colour

Chromatic intensity – the percentage of colour present – also known as saturation

Monochromatic – containing shades, tones and tints of only one colour

Achromatic – Containing no colour – i, e black, white or pure grey

Complementary Colours – Colours opposite each other on the colour wheel

Complementary colours are:

Red and Green

Blue and Orange

Yellow and violet

In colour psychology the importance of this becomes clearer when we realize that complementary colours, when put together, present perfect balance, as all the pigment primaries are then present:

Red and (blue + Yellow)

Blue and (Red + Yellow)

Yellow and (Red + Blue)

One of the difficulties of working with colour derives from the way the human brian is strtuctured. It is divided into two hemispheres, separated by a strong connection cable, called the CORPUS CALLOUSUM. The right hemisphere governs the left side of the body, and vice versa. Linear skills, language, rationalising and logic are driven by the left brain, while intuition, non-verbal communication – art, music, creativity – and visual information are processed by the right brain. In order to learn and appreciate colour fully the right side of the brain does most of the work, but to establish credibility and communicate it widely one must find a way of translating the knowledge into predominantly left-brain terms.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 23)

The Color Wheel

A color circle, based on red, yellow and blue, is traditional in the field of art. Sir Isaac Newton developed the first circular diagram of colors in 1666. Since then scientists and artists have studied and designed numerous variations of this concept. Differences of opinion about the validity of one format over another continue to provoke debate. In reality, any color circle or color wheel which presents a logically arranged sequence of pure hues has merit.

PRIMARY COLORS

Red, yellow and blue

In traditional color theory, these are the 3 pigment colors that can not be mixed or formed by any combination of other colors. All other colors are derived from these 3 hues

SECONDARY COLORS

Green, orange and purple

These are the colors formed by mixing the primary colors.

TERTIARY COLORS

Yellow-orange, red-orange, red-purple, blue-purple, blue-green and yellow-green.

These are the colors formed by mixing a primary and a secondary color. That’s why the hue is a two word name, such as blue-green, red-violet, and yellow-orange.

COLOR HARMONY

Harmony can be defined as a pleasing arrangement of parts, whether it be music, poetry, color, or even an ice cream sundae.

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. At one extreme is a visual experience that is so bland that the viewer is not engaged. The human brain will reject under-stimulating information. At the other extreme is a visual experience that is so overdone,

so chaotic that the viewer can’t stand to look at it. The human brain rejects what it can not organize, what it can not understand. The visual task requires that we present a logical structure. Color harmony delivers visual interest and a sense of order.

Some Formulas for Color Harmony

There are many theories for harmony. The following illustrations and descriptions present some basic formulas .

A color scheme based on analogous colors

Analogous colors are any three colors which are side by side on a 12 part color wheel, such as yellow-green, yellow, and yellow-orange. Usually one of the three colors predominates.

A color scheme based on complementary colors

Complementary colors are any two colors which are directly opposite each other, such as red and green and red-purple and yellow-green. In the illustration above, there are several variations of yellow-green in the leaves and several variations of red-purple in the orchid. These opposing colors create maximum contrast and maximum stability.

A color scheme based on nature

Nature provides a perfect departure point for color harmony. In the illustration above, red yellow and green create a harmonious design, regardless of whether this combination fits into a technical formula for color harmony.

http://www. colormatters. com/colortheory. html

While we often take our perception of colour for granted, it takes a highly complex visual mechanism to make it possible. The system is still not fully understood and as yet there exists no single scientific theory to account for all of it. Richard Gregory observed as recently as 2005 that over 50 theories were put forward by 50 scientists at a meeting on the subject “ We do know certain basic facts, however, which are the result of decades of scientific investigation by physicists, biochemists, psychologists and physiologists. Colour is a subjective sensation caused by light and is not properly a quality inherent in the object itself.

In General terms, Colour does not exist without light, which is a radiant energy that manifests itself in the form of the visible spectrum of sunlight. Without the eye and brain of an observer, these rays do not in themselves constitute colour. As Sir Issac Newton explained in his Optics (1704) In them there is nothing else than a power to stir up a sensation of this or that colour

The perception of colour is governed by three essential factors

the spectral energy distribution of the light (including the conditions under which the colour is perceived)

the spectral characteristics of the object, with respect to absorption, reflection and transmission of light

the activity and sensitivity of the eye and brain

In physical terms, light is simply the name given to a narrow band of the energy constantly radiating from the sun. Newton, by placing a glass prism in the path of a beam of sunlight, observed how the beam divided itself into

the band of colours he called the spectrum. We know that the colours of the spectrum vary in wavelength (the distance between the crest of one energy wave and the next) and that the visible range of wavelengths extends from about 400 to 750 nanometres (billionth of a meter)

Using a second prism, in 1665, Newton had demonstrated that white light is obtained when all the colours of the spectrum are recombined into a single beam. Observers such as Thomas Young (1807) later that white light could be obtained by mixing red, green and blue beams only, and that all other colours could be obtained by mixing these three lights in different proportions. This became the basis of the theory of vision proposed by Young and later developed by Helmholtz (1856) that there are only three kinds of colour receptors in the human eye, corresponding to the dominant wavelengths of red, green and blue, and that all other colours can be sensed by them; the sensation of yellow, for example, occurs when both red and green sets of retinal cells are stimulated. This is the celebrated Trichomatic theory of colour vision.

Porter. T, & Mikellides, B. (2009). Colour for Architecture Today. Taylor and Francis Ltd. (oxon). (pp. 13)

In a strict sense, objects have no intrinsic colour because we only see them if they rflect light; only light sources are able to emit their own light. We do, however, take into consideration changes in natural and artificial illumination during daytime and seasonal cycles and have learnt to compensate for these changes through what pstchologists call “ colour constancy”

Porter. T, & Mikellides, B. (2009). Colour for Architecture Today. Taylor and Francis Ltd. (oxon). (pp. 15)

When we take changing light for granted, we generally consider colour as a property as a property of objects in so far as it is the physical and chemical composition of the objects which determaine how much light they absorb, reflect or transmit.

Most of the colours we see around us in our daily lives occur by a process of selective absorption. A red object looks red because it has the property of absorbing or subtracting from the white light it receives everything exept primarily for the colour component it refelects.

In sunlight a bright red table wil absorb most wavelebngths except for those in the 650 nm region of the spectrum, for example. A white object will reflect roughly the same amounts of all wavelengths which our visual system ingenously mixes together to give a single sensation of white. A black object, on the other hand, will absorb all wavelengths and hence appear black

Porter. T, & Mikellides, B. (2009). Colour for Architecture Today. Taylor and Francis Ltd. (oxon). (pp. 13)

The eye and brian

The retina posses two sets of sensing cells, the rods and cones. Whereas the cones sense full colour in daylight, the rods operate only at low levels of illumination and are effectively ‘ colour blind’. Hence, no colour appears by moonlight, as there is a threshold of illumination below which colour cannot be seen, though there may there maybe enough light to allow the perception

of shape, movement and the size of objects. This can be demonstrated if we imagine red lettering painted on a black building. The lettering is ellegiable by moonlight but, as night turns into day, we are gradually able to read the letters, though the daylight has to increase considerably before the letters are fully perceived as red. Correct colour rendering requires the right balance of light-preferably daylight, which contains the full solar spectrum.

Porter. T, & Mikellides, B. (2009). Colour for Architecture Today. Taylor and Francis Ltd. (oxon). (pp. 13)

We may well experience colour in our dreams and it can even be induced conciosly with our eyes closed by pressing on the eyeball. Colour responses can also be induced from black-and-white patterns, as when viewing Benhams top-a white disc pattern with irregular black shapes which, when spun fast, elcits sensation of colour.

Porter. T, & Mikellides, B. (2009). Colour for Architecture Today. Taylor and Francis Ltd. (oxon). (pp. 13)

Colour psychology

The psychology of colours works as follow: When light strikes the eye, each wavelength does so slightly different, Red, the longest wavelength, requires, the most adjustment to look at it, and therefore appears to be nearer than it is, while green requires no adjustment whatever, and is therefore restful. In the retina, these vibrations of light are converted into electrical impulses which pass to the brain – eventually to the HYPOTHALAMUS , which governs ENDROCINE GLANDS, which in turn produce and secret our HORMONES. In simple terms each colour (wavelength) focuses on a particular part of the

body, EVOKING A PSYCHOLOGICAL RESPONSE, which in turn produces a psychological reaction.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 23)

Another difficulty with applying colour psychology has always been that, like everything else in the universe, there are no absolutes, only relative perceptions – there is no such thing asa a good colour or bad colour. You may understand exactly which is the hue for a particular proposition, but its all to easy to communicate its negative its negative perceptions. For example, red may be stimulating and exciting or it could come across stressfull and aggressive; blue can be perceived as cold and aloof, yellow might be emotionally demanding and green may make you feel physically ill. The key to protecting positive perceptions and effective influence of any colour lies in the way it is used.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 27)

Research on the psychological aspects of colour is difficult for the mere reason that human emotions are none to srable and the psychic make up of human beings varies from person to person.

1950, Faber Birren

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 28)

Recognizable patterns in the psychic make up of human beings have been identified, and it is not true that they vary totally from person to person ; more recently , recongizable patterns of colour have also been identified. It is therefore now possible to establish a precise relationship between the subject and the stimulus, which enables us to predict specific response, and answer the eternal question: why does one variation of a hue have such a different effect from another? Zelnski and Fisher referred to this in their book colour as recently as 1989:

Lest we hasten to repent everything in attemps at behaviour modification, we should note that physiological colour responses are complex. The precise variation of a hue has a major impact, but one that is rarely addressed by psychological research.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 28)

Colour Association

Orange is associated with secondary survival consideration, warmth, shelter, food.

Yellow (which eastern philosophy associates with the pancreas) is about emotions, self esteem and creativity.

Green Refelects the concept of love, in the universal rather than the sexual sense; being at the centre of the spectrum, it also provides perfect balance.

Blue encourages intellectual activity – sweet reason and calm, logical thought.

Indigo has similar properties to blue but is deeper and more introverting,

Violet takes the mind to a higher level, towards spiritual awarness

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 24)

There are only eleven basic coilour terms in the English language. A computer of colours will show us up to sixteen million colours, but we only have names for eleven – Black, White, Red, Orange, Yellow, Green, Blue, Purple, Pink, Brown and Grey. Confusingly, we borrow terms from many walks of life – from nature, from food and drink and so on – to describe colours such as peacock blue, burgundy, peach, cream, tan.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 24)

Colour is nature’s own form of pure communication – a much more reliable form, a language which every single one of us was born understanding clearly, and we all use every day, with varying degrees of conscious awareness, regardless of cultural division and conditioning.

In order to start developing this wonderful language, we must first revert to basic scientific thinking

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 25)

Science recognizes four psychological primary colours – Red, Green, Blue and Yellow.

Red and its derivatives relate to the phisycal; its often said that it has been proved that sourrounding people with red will raise blood pressure, but there is little academic record of any experiments confirming this; the only one I have found is described by Faber Birren, the great twentieth century American colourist, in his book color psychology and color therapy, in which he referes to Robert Gerards thesis for the university of California at Los Angeles. Birren describes experiments where Gereard used Red, Blue and White lights, Transmitted on a diffusing screen. It seems to make sense; Red certainly seems to be physically stimulating. Because it requires such an adjustment in the eye, it appears to be nearer than it is, whicvh is why it is often used when visual impacts is important. The most obvious example of our recognition that red catches the eye is its use the world over for traffic signals. Mqany football teams have red in there colours and thus creates the impression of physical strength, even aggression – other of the same coin.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 25 & 26)

Blue is the colour ofr the intellect. In the same evidence about raising blood pressure with red, so blue is deemed to lower the blood pressure. Certainly it is a soothing, calming colour, encouraging reflection. Nature uses it lavishly – in the sky and sea – but this is in a reflective sense, as neither air nor water contains any colour.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 26)

Yellow focuses on the emotions. Having learned that the third chakra relates to the pancreas, I could not at first understand the link, but then I realized – if we are nervous, where do we feel it? We have ‘ butterflies in our stomach.

Green is at the centre of the spectrum and represents perfect balance. It strikes the eye at the point requiring no adjustment, thereby presenting no strain. The pigment which reflects green – chlorophyll – is vital to life, and when our environment contains plenty of green we are reassured.

Wright. A, (1998). The Beginner’s Guide to Colour Psychology. Colour Affects LTD (London) (pp. 27)

Colour Psychology – FOOD

Of all the colors in the spectrum, blue is an appetite suppressant. Weight loss plans suggest putting your food on a blue plate. Or even better than that, put a blue light in your refrigerator and watch your munchies disappear. Or here’s another tip: Dye your food blue! A little black will make it a double whammy.

What you see above is a delicacy prepared for the annual food party held at the end of the author’s color course at the University of Hawaii. It’s “ musubi”, consisting of rice, a filling and “ nori” a seaweed wrapper. Traditionally it’s Japanese but very popular in Hawaii in it’s natural state. In case you’re wondering what the pink stuff is, it’s spam. If you want to create your own dyed food, use only natural “ food coloring” purchased in a grocery store. Other coloring agents are toxic.

Dramatic results can also be achieved by using a blue light bulb for your dining area.

Blue food is a rare occurrence in nature. There are no leafy blue vegetables (blue lettuce?), no blue meats (blueburger, well-done please), and aside from blueberries and a few blue-purple potatoes from remote spots on the globe, blue just doesn’t exist in any significant quantity as a natural food color.

http://www. colormatters. com/appmatters. html

A food professional has this to say:

Color and the appeal of various foods is also closely related. Just the sight of food fires neurons in the hypothalamus. Subjects presented food to eat in the dark reported a critically missing element for enjoying any cuisine: the appearance of food. For the sighted, the eyes are the first place that must be convinced before a food is even tried. This means that some food products fail in the marketplace not because of bad taste, texture, or smell but because the consumer never got that far. Colors are significant and almost universally it is difficult to get a consumer to try a blue-colored food — though more are being marketed for children these days. Greens, browns, reds, and several other colors are more generally acceptable, though they can vary by culture. The Japanese are renowned for their elaborate use of food colorings, some that would have difficulty getting approval by the Food and Drug Administration in the United States.

Gary Blumenthal International Food Strategies

http://www. colormatters. com/appmatters. html

Why Is McDonald's Yellow? The Role Of Environment On Eating Behavior

November 4th, 2008 by drval in Health Tips, True Stories

I'm grateful to the Happy Hospitalist for pointing out that color matters when it comes to food consumption. As it turns out, blue light can be an appetite suppressant. And I actually know about this first hand.

I helped to design a research study in connection with Architectural Digest and the Parsons School of Design several years ago. I was a volunteer instructor for a hospital design course in NYC, and wanted to show the students that lighting could influence eating patterns. As it happened, there was a big gala event at a local convention center, and so I worked with my friend Shashi Caan to set up three identical rooms bathed in three different colored lights (yellow, blue, and red).

We had all the gala attendees dress up in white bunny suits (you know, the kind you let patients wear in the OR) and shuttled them through the 3 rooms at regular intervals. The rooms could each hold about 40 guests and copious identical hors d'oeurves were offered.

Guess what we found? The most food was consumed in the yellow room, followed by red, and then a distant third was blue. About 33% fewer snacks were consumed in the blue room during the event (and yes we controlled the number of people in each room so they'd be equal). I found this quite fascinating, but unfortunately never published the results. You see, I didn't receive IRB approval for any of it.

But the experiment did leave an indelible impression on my mind. As I thought about it, I realized that most fast food restaurants have yellowish interiors. From the golden arches to the lighting – companies like McDonald’s probably recognized (long before I did) that color influences purchasing and eating behavior.

Yep, I’m late to this party – and I’m not painting my kitchen yellow.

http://www. getbetterhealth. com/tag/appetite-suppressant

Colour Marketing and Branding

Color and Marketing

1. Research conducted by the secretariat of the Seoul International Color Expo 2004 documented the following relationships between color and marketing:

92. 6 percent said that they put most importance on visual factors when purchasing products. Only 5. 6 percent said that the physical feel via the sense of touch was most important. Hearing and smell each drew 0. 9 percent.

When asked to approximate the importance of color when buying products, 84. 7 percent of the total respondents think that color accounts for more than half among the various factors important for choosing products. Source

2. Research reveals people make a subconscious judgment about a person, environment, or product within 90 seconds of initial viewing and that between 62% and 90% of that assessment is based on color alone.

Source: CCICOLOR – Institute for Color Research

3. Research by the Henley Centre suggests 73% of purchasing decisions are now made in-store. Consequently, catching the shopper’s eye and conveying information effectively are critical to successful sales.

Color and Brand Identity

1. Color increases brand recognition by up to 80 percent

University of Loyola, Maryland study

2. Heinz

Color influences brand identity in a variety of ways. Consider the phenomenal success Heinz EZ Squirt Blastin’ Green ketchup has had in the marketplace. More than 10 million bottles were sold in the first seven months following its introduction, with Heinz factories working 24 hours a day, seven days a week to keep up with demand. The result: $23 million in sales attributable to Heinz green ketchup [the highest sales increase in the brand’s history]. All because of a simple color change.

3. Apple Computer

Apple brought color into a marketplace where color had not been seen before. By introducing the colorful iMacs, Apple was the first to say, “ It doesn’t have to be beige”. The iMacs reinvigorated a brand that had suffered $1. 8 billion of losses in two years. (And now we have the colorful iPods.)

Color Increases Memory

If a picture is worth a thousand words, a picture with natural colors may be worth a million, memory-wise. Psychologists have documented that “ living color” does more than appeal to the senses. It also boosts memory for scenes in the natural world.

By hanging an extra “ tag” of data on visual scenes, color helps us to process and store images more efficiently than colorless (black and white) scenes, and as a result to remember them better, too.&

Source: The findings were reported in the May 2002 issue of the Journal of Experimental Psychology: Learning, Memory and Cognition, published by the American Psychological Association (APA)

http://www. colormatters. com/market_whycolor. html

“ The Contributions of Color to Recognition Memory for Natural Scenes,” Felix A. Wichmann, Max-Planck Institut für Biologische Kybernetik and Oxford University; Lindsay T. Sharpe, Universität Tübingen and University of Newcastle; and Karl R. Gegenfurtner, Max-Plank Institut für Biologische Kybernetik and Justus-Liebig-Universität Giessen; Journal of Experimental Psychology – Learning, Memory and Cognition, Vol 28. No. 3., 5-May-2002

Color Engages and Increases participation

Ads in color are read up to 42% more often than the same ads in black and white (as shown in study on phone directory ads).

Source: White, Jan V., Color for Impact, Strathmoor Press, April, 1997

Color Informs

Color can improve readership by 40 percent 1, learning from 55 to 78 percent 2, and comprehension by 73 percent 3.

(1)" Business Papers in Color. Just a Shade Better", Modern Office Technology, July 1989, Vol. 34, No. 7, pp. 98-102

(2) Embry, David, " The Persuasive Properties of Color", Marketing Communications, October 1984.

(3) Johnson, Virginia, " The Power of Color", Successful Meetings, June 1992, Vol 41, No. 7, pp. 87, 90.

Color Attracts Attention

Frequently Cited " Facts"

Tests indicate that a black and white image may sustain interest for less than two-thirds a second, whereas a colored image may hold the attention for two seconds or more. (A product has one-twentieth of a second to halt the customer's attention on a shelf or display.)

People cannot process every object within view at one time. Therefore, color can be used as a tool to emphasize or de-emphasize areas.

A Midwestern insurance company used color to highlight key information on their invoices. As a result, they began receiving customer payments an average of 14 days earlier.

Other Research

92% Believe color presents an image of impressive quality

90% Feel color can assist in attracting new customers

90% Believe customers remember presentations and documents better when color is used

83% Believe color makes them appear more successful

81% Think color gives them a competitive edge

76% Believe that the use of color makes their business appear larger to clients

Source: Conducted by Xerox Corporation and International Communications Research from February 19, 2003 to March 7, 2003, margin of error of +/- 3. 1%.

http://www. colormatters. com/market_whycolor. html

Color and the Senses

General facts about sensory input and human beings:

Although the olfactory sense was a human being’s most important source of input in the pre-historic era, sight became our most important means of survival. Furthermore, as hunters and gatherers in the early days of our evolution, we experienced a variety of colors and forms in the landscape. This has become part of our genetic code.

In our current state of evolution, vision is the primary source for all our experiences. (Current marketing research has reported that approximately 80% of what we assimilate through the senses, is visual.)

Our nervous system requires input and stimulation. (Consider the effects of solitary confinement in jails.) With respect to visual input, we become bored in the absence of a variety of colors and shapes. Consequently, color addresses one of our basic neurological needs for stimulation.

Color and Visual Experiences

“ It is probably the expressive qualities (primarily of color but also of shape) that spontaneously affect the passively receiving mind, whereas the tectonic structure of pattern (characteristic of shape, but found also in color) engages the actively organizing mi