

# Using Color

By Neil Tarvin

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There's so much to say about color, it's hard to figure out where to start!

Let's start with the uses of color in ebooks and on the web. There are numerous reasons and ways to use color - the trick is using it effectively.

Here are some of the reasons to use color in your ebooks.

Primary, number one reason to use color is - people like it! Simple statement - complicated explanation! There is a huge field of study dedicated to color psychology. Color affects your emotions, and can even create physical reactions. We'll be getting into this more deeply a little later, but for now, just believe that people like color because they react to it on a primal, even subconscious level.

We can also use color to highlight and emphasize particular points of importance. This one's pretty easy to figure out. You have something important to say, so you use color to make your point.

We can use color to aid in scanning documents. This very much relates to the previous point. By coloring a series of items, you can concentrate your reader's attention.

How about using color to reflect relationships? In most of the ebooks I design, for example, I use a single main color for the overall ebook, and then "highlight" with secondary colors. Is the reader going to notice it? Perhaps not enough to mention it out loud - but, at some level it will register. You can even arrange it so that the reader can use the colors as guides to where he is in the ebook, perhaps by using a different color for each chapter.

We can also use color as a code. This is very obvious in things like charts and graphs, and in lists. Charts can get pretty confusing if everything is a single color! Even black and white charts use shades of gray, or patterns to help distinguish the different parts of the chart.

These are the basic uses of color.

## Color and Light

The appearance of color relies on light. No matter what the source, whether candle light, electric light, or daylight, the source will have different properties that affect the appearance of colors. In

other words, colors will look different when viewed in different light. Many paint stores now have daylight bulbs or an area where chips of paint can be viewed under daylight conditions. Conversely, all colors are dimmed or eliminated in reduced light. The next time you're out driving at night, look around. It will look like all color has been drained from everything - except those items that are individually lighted!

Humans have limited vision when it comes to color. The eye can detect the range of light spectrum from about 400 nanometers (violet) to about 700 nanometers (red). We see this as a smoothly varying rainbow of colors. Is there color we can't see? Yes - ever heard of infrared, or ultraviolet? Infrared is positioned before the red area on the spectrum - ultraviolet is positioned at the end of the spectrum. (Are there others? Probably - we just haven't been able to detect them yet.)

Physically, the retinas of our eyes contain rods and cones. Rods are basically used for black and white vision, and peripheral vision. Cones have the ability to separately sense three major parts of the spectrum - red, green and blue - the primary colors. Cones are sensitive to red, green, OR blue, but not all three colors. When we see purple, for example, we're exciting the red and blue cones. Aqua - the blue and green cones, and so on. Our perception color is determined by which combination of cones are excited, and by how much.

(The theory of color and vision is a very complex subject. Some experts believe color is dependent strictly on the cones of the eye - others believe that color is determined by the brain's interpretation. We're not going to get too deep into this, so if you want more info on light and vision, you can go here - <http://lils.stcc.mass.edu/tamarkin/ap/AP2pages/vision.htm> )

## Perception

Now, on top of lighting conditions, there's also the variations of perception between individuals. Perception is the brain's interpretation of what is being seen. (Did you ever argue with someone about whether a color is blue or purple?)

When we look at a color, we can only relate to our own experience with it. Other people perceive the color differently, so what looks good to you, may not look the same to others.

If you now put that in context with rods and cones, perhaps you have more blue sensitivity, and they have more red sensitivity. Perhaps your eyes are responding differently to the light available. Perception is very unique to each individual.

Here are some good examples of the effect of perception.

## Color Blindness

Now perhaps you can see why some people are color blind. Color blindness results from a deficiency, or weakness, or one or more of the cone types.

Color blindness is not always simply being totally blind to a color. People have varying degrees of color blindness, and also varying colors that they cannot perceive. While most color vision deficiency is a result of genetics, there are instances where a disease or illness has caused color deficiency. Montel Williams, for example, is color blind because of Multiple Sclerosis.

There is a set of cards called the Ishihara Test, which test for the various types of color blindness. (Take the test yourself here - <http://www.toledo-bend.com/colorblind/Ishihara.html>)

Chances are you've seen some of these cards before - they are generally a shape -like a circle, filled with multicolored dots. Some specifically colored dots form a shape, a letter, or a number. The ability to see that specific letter or number gauges your color-blindness level.

## Synesthesia

Here's something about perception that's very unique. One of the most fascinating subjects relating to color is synesthesia. It is a very rare condition in which people can taste shapes, hear colors, see sounds, and other sense crossovers.

Sounds strange, doesn't it? Kind of like an LSD flashback from the 60's! What would a color sound like, or taste like? Would yellow taste like a lemon? What if you saw sounds in color? Would you like to find out? Try this link (and his links page) <http://web.mit.edu/synesthesia/www/synesthesia.html>

## Optical Illusions

Optical illusions are also a part of perception. Put two blocks of the same color next to each other, and put a white border around one, and a black border around the other. Although you know that the 2 blocks are exactly the same color, the border color will influence what your eye sees - the black border will make the color look richer. The white border will make the color look washed out.

Here's a great page with many optical illusions.

<http://www.optillusions.com/>

## Cultural Differences

What about cultural difference in how color is interpreted? Different cultures have different meanings for various colors. Here's a simple example with black and white. Here in the US, black is the color of mourning, but in the Far East, white is the color of mourning. The point here is that whatever emotional response you're trying to convey using color could be completely lost, or misinterpreted because of cultural differences.

Now you may be asking yourself, why in the world are we reading about color blindness, optical illusions, synesthesia, and cultures?

I simply want to point out to you that part of color perception is awareness and that for some people color is limited, or very different from what you might expect! It also shows you how you can use it to your advantage, for example, in optical illusions, or how it can work to your disadvantage because of cultural differences.

And, that brings us to ...

## Color Psychology

Color Psychology is the use of color to create reactions in the viewer. We use a lot of color references in our language - green with envy, seeing red, blue blood, feeling blue, red carpet, and so on. These phrases are generally connected with the "meanings" of the colors they refer to. You can manipulate people's reactions by choosing colors that evoke the response you want.

## Warm and Cool Colors

The first general division is warm colors versus cool colors.

Warm colors create excitement, and warmth and stimulate creativity and activity. Warm colors include Reds, Oranges and Yellows.

Cool colors have calming qualities. These qualities aid concentration and create peacefulness and tranquility. Cool colors include Violets and Blues. (Green can be either warm or cool. When it's influenced by yellow, it becomes warm and when it's influenced by blue, it becomes cool.) When choosing colors, you must also consider the effect of the lightness and darkness (value) of the color. (Lighter colors tend to be more active, and deeper colors tend to be passive.)

Just this little bit of knowledge should get you thinking - what kind of reaction do you want from your readers? Will they react better to warm or cool colors? What about your subject matter? Is it warm or cool in nature? (You may need to "go with your gut" on this one!)

Although there is much more about color psychology and the meanings of individual colors, I don't believe you should go much beyond this point in determining a basic color to use for your ebook or website.

Why? Well, if you don't know, maybe you should re-read this article... (smile)

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