

Emotions And Effects Of Color And Their Importance In Storytelling.

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Figure 1: Posters of 3 persona games, a series famous for its use of colors in storytelling

ABSTRACT

This paper is about colors, the emotions they elicit and how to use this to strengthen narratives. It will talk briefly about the science behind colors and their effects so that you can better understand how and why they are happening. It will showcase the 6 major colors of the spectrum and will explain their linked emotions. The paper will also go over some famous examples to showcase how this is already being used in visual media and will go over some

applications outside of visual media that can benefit from this use of colors as well.

CCS CONCEPTS

• **Visual media** → Storytelling.

KEYWORDS

Color, Storytelling, Emotion, Games, Movies, Visual media, psychology

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1 INTRODUCTION

Ever since the first color television back in 1944, colors are synonymous with visual media. Important questions to ask however are,

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117 how much do people really think about them? And are they just
 118 there to look pretty or do they serve a deeper purpose? Research
 119 shows that they indeed do serve a purpose beyond aesthetics, and a
 120 pretty important one at that; influencing ones emotions [Bellantoni
 121 2012]. It turns out colors have emotions linked to them subcon-
 122 sciously and because of this, colors have the power to influence
 123 your emotions. This is by far not the only underlying effect that
 124 colors can have on people. It can also influence general behaviour,
 125 sleeping patterns, aggression and how energised we feel [Berens
 126 2014]. Besides all these effects there is something else interesting
 127 happening with these colors, the way we perceive them is not the
 128 same for everyone. The difference are caused by culture, age and
 129 gender [Jaint et al. 2010] [Berens 2014]. This information can serve
 130 many purposes, the one this paper will be looking into is strength-
 131 ening the impact of narratives with these colors, most specifically
 132 by use of the emotions they elicit.

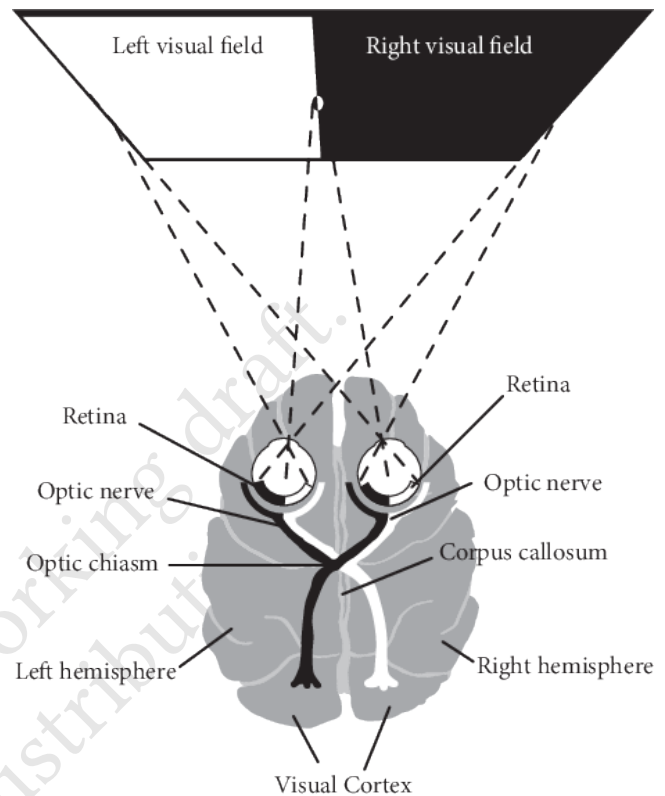
134 2 UNDERSTANDING THE HOW AND WHY 135 OF THE EFFECTS OF COLORS

136 To make good use of colors and their capabilities to strengthen your
 137 visual storytelling, it is important that we first understand how and
 138 why colors affect people. To find out why colors have these effects
 139 on people, it is first important to realise that colors are perceived
 140 differently based on many factors. For example, males and females
 141 see colors differently. Research shows that men need slightly longer
 142 wavelengths than females to perceive the same hue [Abramov et al.
 143 2012]. Neuroscientist Sam Berens (from the University of Sussex),
 144 says that we perceive colors through memory and language. These
 145 two things are very important to understanding why colors have
 146 the effects they do.

148 2.1 Differences in color perception

149 The brain can be split up into a left and right hemisphere as seen
 150 in Figure 2. The right hemisphere does not identify colors within
 151 linguistic categories such as the words green or blue. The left side
 152 of the brain however does associate the linguistic categories with
 153 colors. Because of these associations with words, colors can appear
 154 very different from each other, even when their hues are very close.
 155 "The Whorfian hypothesis" [Regier and Kay 2009] explains this
 156 by suggesting that color categories, which are constructed from
 157 language, and learned color names change how we perceive colors.
 158 In term this means that color naming is dependent on culture which
 159 further means that color perception is not universal and does indeed
 160 differ from language to language. Because of these differences, the
 161 point at which one color begins and stops differs. However, the
 162 Whorfian hypothesis clashes with another popular theory called
 163 the "universalist" theory. This theory suggest that color perception
 164 is biologically hardwired and as such is universally the same. A lot
 165 of debates have gone back and forth between these two theories
 166 but recently it has been shown that both of these theories are half
 167 correct [Regier and Kay 2009]. As stated earlier, the brain can be split
 168 up into a left and right hemisphere. The same is true for our vision,
 169 it can be split up into a left and a right visual field that are controlled
 170 by the right and left hemispheres respectively. This means that the
 171 right side of our vision perceives colors in a linguistic sense and
 172 the left side does not. This in term means we see colors differently
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174 depending on what side of our vision they are. All of this teaches
 175 us to understand that colors will be perceived differently based on
 176 culture which we can then use to our benefit in visual media.
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222 2.2 How do colors affect you?

223 When light passes through your eyes, it transforms them into elec-
 224 trical impulses. These impulses affect your visual areas but they
 225 also travel to nerve and hormone centers in the brain which affects
 226 your hormone balance and psychological state [Küller 1986]. To ex-
 227 plain it in finer detail, the nerves are connected to the pineal gland
 228 which by reacting to light and darkness, controls a person's diurnal
 229 rhythm (day/night rhythm). The hypothalamus and the pituitary
 230 gland, which handle your hormone levels, your melatonin levels,
 231 and many other important functions are also affected which is why
 232 light can indirectly affect your hormone levels and psychological
 233 state.

234 3 COLORS AND THEIR LINKED EMOTIONS

235 Patti Bellantoni, a big authority on the influence of colors on behav-
 236 ior and emotions, famously did an experiment with her class. The
 237 students were asked to bring items that they linked with a color. The
 238 first time the students were asked to bring red items. The students
 239 brought all kinds of objects, most students wore red clothes, there
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were a lot of red objects like pieces of fabric and wrapping paper, there were also spicy peppers and muscle balm that made the skin feel hot. They also brought red lights and turned on rock and roll music. After some time in this red classroom, something interesting started happening. Students started talking louder, turned up the music, impulsively ate the spicy foods, the male students especially became more sweaty and agitated, and at one of these experiments a fight even broke out [Bellantoni 2012]. Bellantoni concluded that this was red behavior. Many more experiments were carried out with different colors, each color caused a different behavior in the class. Many more experiments with similar setups have been done, proving that what we learned before is indeed true in practise. To properly make use of this in our storytelling, we have to know which emotions are linked to which colors. It is possible to go into insane amounts of depths when describing the emotions that are linked to colors, [Bellantoni 2012] does this in her book for example. For the sake of keeping this paper short and easy to use, we will keep the descriptions simple but concise. all the six major colors in the spectrum will be covered.

3.1 Red

Red is the color of power, lust, energy, rebellion, anger and passion, as seen in Figure 3. It can give energy, make something appear faster, but can also overwhelm you. Bright red can increase your heart rate and anxiety levels, it is aggression and power. Warmer reds tend to be more sensual and lusty. Rose (light red tinted with blue) is associated more with romance. Darker reds are seen as more regal, mature, and elegant. [Bellantoni 2012] / [Kaya and Epps 2004]

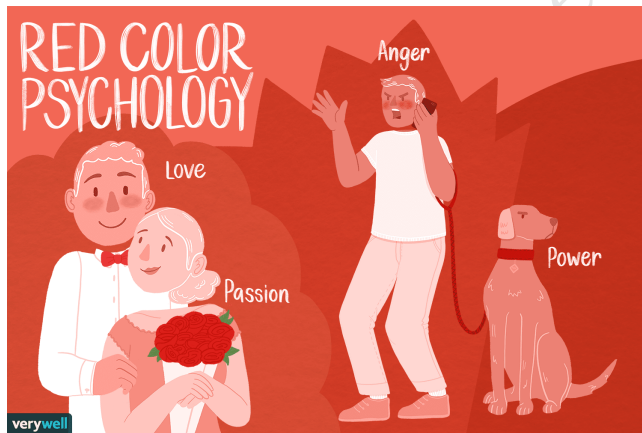


Figure 3: An illustration showing some of the emotions linked to red ([Verywell and Chung 2020]).

3.2 Yellow

Yellow is the color of caution and warning, venomous animals are often yellow to warn off their predators. it is also the color we link to the sun and as such also with energy. Yellow however is also linked to obsessiveness. In Bellantoni's experiments, a yellow environment even produced anxiety, thought to be mostly because its association with warnings. [Bellantoni 2012]

3.3 Blue

Blue is the color of calm and sadness. In Bellantoni's experiments, a blue environment made people more passive and introspective. It makes you think and can make you feel powerless. More darker blues are associated with intellect. Blue can elicit melancholic feelings. Lighter blue is associated more with acceptance and peace. [Kaya and Epps 2004]

3.4 Orange

Orange is a nice color, it is warm, welcoming, upbeat, and exotic. because of its association to a sunset, orange is linked to romance as well. However, orange light in the sky during daytime can represent pollution and poison in the air. Orange is close to the colors of the earth and as such we respond positively and familiar to it. [Bellantoni 2012]

3.5 Green

Green is a color of nature but can have two opposite meanings. Because of its links to nature and plants, it is associated with freshness, food, health, vitality and life. On the other hand, it is also associated with poison, spoiled food and disease. Green can also mean danger or evil, think of snakes and alligators and even how we made dragons look. Because of the duality of green, it is important that the use of the color is well thought through and potentially even tested to make sure it does not give the opposite effect of what you want. [Bellantoni 2012]

3.6 Purple

Purple is the color of spirituality, illusion, mystique, and magic. With her research and experiments, Bellantoni found that "purple is a color that inspires associations with the non physical. It sends a signal that someone or something is going to be transformed." This transformation in most cases is a death, this death however does not need to be literal and can also mean the death of something symbolic like a child growing up and leaving behind his childhood. [Bellantoni 2012] [Berens 2014]

4 EXAMPLES IN VISUAL MEDIA

To be able to use the contents of this paper yourself, it is important to look at some of the examples in visual media. In this part of the paper, we will go over some examples, the colors that are used and what they symbolise.

4.1 The Persona series

The game series persona is well loved by many. They are known for their great stories, game play and their unique looks and style. The games all have a very strong color palette that differs for all games in the series.

4.1.1 Persona 3 ([Atlus U.S.A., Inc. [n.d.].])

Persona 3 uses a color palette dominated by blues as seen in Figure 1. Persona 3 is a game all about sadness, death and powerlessness. It keeps repeating the same same phrase, "memento mori", which roughly translates from Latin to remember your mortality. The game deals with many heavy subjects and trough all of this the color blue is very present. the main character, who is destined to

die from the beginning even has blue hair. The presence of blue during all of this makes the impact of the story much greater, it also subconsciously forces you to become introspective and think about the games subjects. During the end of the game lighter blues are used and with this the second meaning of the game comes to light, acceptance and peace. The main character accepts his fate and is thankful to have lived a full life. With these lighter blue colors the game seems to be telling you that even though death is unavoidable and you will certainly experience sadness, you have to accept this and live your live to the fullest.

4.1.2 *Persona 5* ([Atlas U.S.A., Inc. [n.d.]b].)

Persona 5 (also seen in Figure 1) however, has a color pallet that is dominated by reds. It is a game all about rebellion and breaking free of corruption and oppression. The red gives us energy and gets our blood pumping. The game is paced much faster than the previous persona games, something that is strengthened by the use of red. The strong use of colors makes you personally angry at the corruption and crimes that are seen throughout the game and seem to scream at you to take action.

4.2 The Dark Knight ([Lombardi 2008])

Christopher Nolan's *The Dark Knight* is an incredibly popular and well renowned movie. It is praised for its great writing, directing, action, and acting. Heath ledgers famous rendition of the Joker is regarded as some of the best acting showcased in Hollywood movies. But good acting is not the only thing that happens when the Joker is on screen. The Joker's outfit (as seen in Figure 4) has a very distinct color palette to it, he wears a purple suit, has green hair and wears white makeup with a red streak representing a smile. The unnatural green hair makes him feel less human (something his ghostly white makeup also contributes to), it tells us that he is a poison to Gotham and Batman, slowly corrupting them both. His red streak of makeup (a big vocal point during aggressive and intensive scenes) make him feel very intense, aggressive and unpredictable. The most important part of his outfit however comes in the form of his purple suit. The Jokers only really has two goals, to cause chaos and destruction and, most importantly to break the Batman's ideals. As learned before the color purple can signify the death of something and this movie has a beautiful example of this. The Joker slowly corrupts Harvey Dent, Gotham's big symbol of hope, and the person who Batman wanted to take over his fight against crime. During the climax of the movie, the Joker has completely destroyed Harvey Dent's morals to the point where he himself turns into one of the criminals he so valiantly fought against before. Batman, to save the hope Harvey Dent brought before, has to sacrifice his own ideals and takes the blame for the death of Harvey Dent, becoming a wanted criminal. In the end, even though he got stopped, the Joker won and caused the death of both Harvey Dent and his ideals and ultimately destroyed the symbol of hope that was Batman. All of this is beautifully foreshadowed and strengthened in the color of the Jokers suit.

5 USES OUTSIDE VISUAL MEDIA

Colors do not only serve a purpose in visual media. The effects of colors are felt in any context. [Bellantoni 2012] cites a story about Knute Rockne, a football coach that painted his visitor room blue



Figure 4: Heath Ledgers in his iconic role as the Joker ([Warner Bros 2018])

and his own teams room red and won every match season after season. The theory is that with the use of these colors he spaced out his opponents and fired up his own team.

5.1 Color use in physical storytelling

[Downey and Kamel 2016] showcases another way to use colors. It describes a system that helps with psychical storytelling. It is specifically aimed at children and helps them concentrate and absorb more information. The system in essence is a controller that is placed on the side of a book. The controller enables the storyteller to change the color of connected lights to match the story. There are some themes to choose from that have color palettes that are provided but they can be modified to fit and enhance the atmosphere of whichever story you are telling.

5.2 Color use in suicide/crime prevention

Another interesting use of colors is happening over in Japan. Railway suicide is a big problem all over the world, compromising travel safety and inflicting big economic and off course, emotional losses. Railway companies are employing multiple prevention strategies like psychological barriers to the track. In Japan however, railway companies have tried a new cost effective strategy, installing blue lights[Matsubayashi et al. 2013]. These lights are there to calm suicidal people and make them rethink their actions in the hopes that they will not go through with their attempt. Before this Japan had also installed blue street lights in some cities and villages to reduce crime. The effects of these blue lights have not been scientifically proven yet, however research done by [Matsubayashi et al. 2013] shows that the suicide rate has indeed dropped by 84% after the installation of blue lights at stations.

5.3 Color use in marketing

Another use of color can be found in marketing. For example, red is often used in fast food restaurants, because it increases your appetite which is caused by the effects it has on your metabolism,

together with yellow which grabs your attention towards the restaurant. A more formal restaurant will tend to use colors like blue to calm and relax their customers. [Singh 2006]

6 CONCLUSION

Colors, in whatever context, have effects on you. They can fire you up, calm you down and so much more. These effects can be utilised in many ways. They can make the impact of your stories bigger, increase atmosphere, better immersion, grab your attention, sell products, and potentially even reduce crime and suicide rates. Color is something we don't often think about but we should, because when used right it can make all the difference. The next time you are doing something within the visual media sector, or even outside it, stand still for a moment and examine the colors you are using. Do however take care to avoid one of the biggest pitfalls in working with colors, trust your feelings over facts or common knowledge, test the effects on people because a wrong color or hue can backfire and change the whole atmosphere of your product.

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