International Journal of Enhanced Research in Educational Development (IJERED) ISSN: 2320-8708, Vol. 11 Issue 1, Jan-Feb, 2023, Impact Factor: 7.326

Impacts and Associations of the Color Red

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ABSTRACT

Colors lie on the visual spectrum of the electromagnetic waves originating from the sun. On striking the human eye, the light waves are then converted into impulses and are sent to the hypothalamus in the brain, which thereafter sends signals to the nervous system. In particular, the color red impacts our cognitive processes to a great extent. Red, the strongest and most powerful color, is the color of passion, courage, strength, and also danger, and aggression. It is more commonly known as the devil's color. Red sits between violet and orange on the color wheel. The hex code for the color red is #FF0000. It is associated with emergency fires, sirens, and warning signals. Red color is not only profoundly associated with danger and warning signals but also heightens feelings of competition and urgency.

Keywords: Cognitive processes, danger, aggression, warning signals, competition, urgency.

Subject: color psychology

INTRODUCTION

"Colors, like features, follow the changes of the emotions," the artist Pablo Picasso once remarked. Color perception is a common sensation in daily life, not only as an esthetic awareness but also in terms of its wider impact on human psychology and behaviors. Our emotional connection to color is a lot deeper than we're currently aware of. 89% of the time, we are implicitly intimidated by black uniforms, green rooms tend to promote innovation and creativity, and wearing red clothes conveys confidence and empowerment. Research across different fields of psychology has reported the effects of color cues on a variety of cognitive processes. Perceiving certain colors can also lead to increased blood pressure, increased metabolism, and eyestrain (Cherry, 2020).

There are three psychological primary colors - yellow, blue, and red - with each having a profound and distinct impact on humans and non-humans alike. Yellow, the color of sunshine, is linked to laughter, hope, and happiness. It is often used to brighten up our moods and attract us in a comforting manner. Blue, the earth's color, stimulates feelings of calmness and serenity. It is closely linked to tranquility and peace. In direct contrast to blue, red evokes stark feelings of violence, danger, and aggression.

LITERATURE REVIEW

Theories about color and psychological functioning have been proposed since the early 19th century (Goethe, 1975, p.115), but only in the last decade, an increasing body of empirical research began to document the influence of color on human consciousness and conduct. Research papers that divulge deep into the field of color psychology, specifically the physiological and psychological impact the red color has on us are listed below:

1. Visual performance of painting colors based on psychological factors (Yao and Tian, 2022).
2. Psychology: red enhances human performance in contests (Hill and Barton, 2005).
3. Differential binding of colors to objects in memory: red and yellow stick better than blue and green (Kuhbandner & Spitzer, 2015).
4. Psychological Properties of Colors (Wright, 2004).
5. Exploring the Effect of Red and Blue on Cognitive Task Performance (Xia & Song, 2016).
6. The effect of red on psychological functioning as cognitive performance (Mehta & Zhu, 2009).

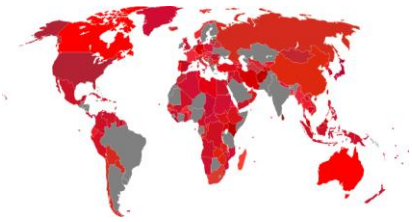
Context

Like radio and television waves, microwaves, x-rays, and other electromagnetic waves, color is light coming from the sun as electromagnetic waves. When this light strikes a colored object, the object only absorbs the wavelength that precisely matches the color of its own atomic structure and reflects the remaining light- which is what we see. When the different wavelengths of light strike the human eye, it influences our perceptions. The light waves are converted into electrical impulses in the retina and are thereafter sent to the hypothalamus, the part of the brain that governs our hormones and endocrine system. The hypothalamus sends signals for physiological changes through the autonomic nervous system and through the release of hormones via the pituitary gland. The color red affects our bodies most both psychologically and physiologically. Red increases the pulse rate by stimulating the posterior region of the hypothalamus causing dilation of blood vessels, and an increase in heart rate and blood pressure (Wright, 2008).

Colour is energy and the fact that it has an effect on us has been proved repeatedly in experiments. One color which seems to have particular relevance is the color red. In animals, red serves as a signal that another animal or object is of importance (Khan et al., 2011). Depending on the circumstances, red can serve as an appetitive signal (fertility or fruit ripeness) or as a warning signal (general aposematic color)(Kuhbandner & Spitzer, 2015).

Color-in-context theory is a broad model of color and psychological functioning that explains and predicts relations between color and the effect it has on cognition and behavior (Elliot & Maier, 2007). It states that in a competitive context, red-headed birds were found to be more likely to win than black-headed or yellow-headed birds (Pryke & Griffith, 2006). In addition, red in a male mandrill or baboon's face and genitalia is a symbol of status: the brighter the red is, the stronger the male's attack power will be (Setchell & Wickings, 2005; Bergman et al., 2009). The color-in-context theory of human beings, their closest primate relative, is similar to that of animals.

This can be further exemplified by the following study. Red has been studied for its effect on social perceptions of dominance and aggression in competitive circumstances also. Referees assessing the same taekwondo fight, in which the color of the opponent's t-shirt was changed, assigned approximately 13% more points to the red sportsman than to the blue one (Hagemann et al., 2008). The color of the T-shirts influences the sportsman's bravery and aggression. The advantage conferred by red uniforms may be because of an evolutionary, engrained, and social learning association of red with dominance and aggression.



As red is associated with aggression, it is the most frequently used color in national flags across the world. The color of blood can better reflect the nationalist spirit of competitiveness and courage of the country. 148 out of 192 countries have red flags (Wright, 2015). 77% of all countries use red in their flags.

Red also works as an appetite stimulant. A lot of fast-food restaurants embrace red in their campaign logos as it aids in recalling, attention, and remembering words. Humans and animals alike tend to eat more from red plates and utensils than any other color. Red is a prominent marketing color because it is eye-catching and can elicit significant psychological responses. Red is the color of power, energy, and urgency. This is why fast-food restaurants and brands incorporate color in their logos (Nivethika, 2022).

Since red light has the longest wavelength (620 to 750 nm), it is used as a warning sign as the light can travel a considerable distance through fog, rain, and storms. This also is one of the reasons why red is the first color an infant can see. An infant cannot focus farther than 12 inches, red is the only color that can get into the circle of its vision, and thus, can easily be processed by the developing receptors and nerves in the baby's eyes. Traffic signals and stop signs are also red owing to this physical property. Stop signs would not have the same immediate and stark effect if they were differently colored.

Across all cultures, the metaphors and phrases such as seeing red -really angry- or raising a red flag to warn someone- all have indicated negative and extreme stances. The perception of red faces in an angry situation further strengthens the association between red and anger. There is yet another example of a negative connotation of the usage of the color red

in our day-to-day lives. Teachers, more often than not, mark incorrect answers with a red pen. Naturally, from a young age, red is associated with incorrect answers and warnings. Shi et al. (2015) indicated that viewing red can impair participants' performance during a challenging cognitive task.

CONCLUSION

Therefore, we can clearly infer that colors - especially red - do impact our day-to-day decisions and perceptions. As stated by the color-in-context theory, red-headed birds were more likely to win. Similarly, wearing red colored clothes can increase competition and perceived aggression by at least 13%. 148 out of 192 countries have red flags. Since red has the longest wavelength out of all the colors present in the visible spectrum, it is known for its ability to grab our attention. Therefore, it is commonly used as a warning signal and in traffic lights. The use of the color red can heighten levels of urgency and stimulate our flight or fight response. Many fast-food restaurants and brands extensively make use of the color red as it acts as an appetite stimulant and effectively grabs our attention.

All colors, not just red, play a vital role in shaping our choices and decisions. They may not be the cause for a particular decision, but colors have definitely had a significant influence on the outcome.

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