



CrossMark

## The psychological impact of color on the recipient through fixed advertising

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### Abstract

Color is a feeling that the eye reflects to us as a result of the analysis of white light. It is a characteristic and effect produced by the retina, which analyzes the trichromatic color of those who see it, whether it is a pigment or light color. It is a factor in appreciating things and adding contrast between them and the formal aesthetics. Choosing colors in designing things is important. This is because colors do not only show appearance, but also have other goals and meanings. Colors cannot be chosen inappropriately because they have a negative or positive effect depending on how well they are chosen. The design will not succeed if inconsistent colors are chosen.

Keywords: psychological impact, color, advertising

### Introduction

#### The importance of research

The use of color in advertising design is an essential element, because of its emotional and psychological role, and it generates a positive or negative reaction in the individual towards colours. The advertising designer must carefully investigate the choice of colors in the advertisement in a way that is compatible with the nature of the good or service and its function, as well as in a way that is compatible with the nature of the audience and those to whom the advertisement is directed, in terms of gender, age, and interests. [1]

#### research aims

The main objective of the study is to measure the effect of colors in fixed electronic advertising on the psychology of the recipient, as they are an important element that contributes to attracting the recipient's attention and arousing his motivations and emotions towards the advertisement. Under this objective falls a group of sub-objectives:

- Measuring the effect of colors as one of the most important visual elements in attracting the recipient's attention to the advertisement.
- Measuring the effect of using cool colors and warm colors in static advertising.

- Measuring the effect of background colors on the recipient's psychology [2]
- Measuring the effect of using text and body colors in static advertising on the psychology of the recipient.

#### Research hypotheses

There is a correlation between the color of the title font in a fixed advertisement and its attention-grabbing.

#### Statistical assumptions

There are no statistical differences between males and females regarding their perception of the background color in static advertisements.

There are no statistical differences between the control and experimental groups regarding the psychological comfort of cool and warm colors in static electronic advertisements.

There are no statistical differences between the control and experimental groups regarding the background color of static advertisements.

#### Firstly

Color is a natural characteristic of things, and it is a scientific element as well as an organizational element. It is part of human life. The influence of colors cannot be denied, and the latent powers that color has have the

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ability to contradict nature in changing the appearance of formations and shapes.

The surrounding colors can also change our perception of time, as each color has psychological effects on mood and behavior.[3]

### **Definition of color**

Color is the physiological effect produced on the retina. Color has no reality except by its association with our eyes, which allow it to be sensed and perceived, provided that light is present. We cannot perceive any color except by the light falling on it and then reflecting back to our eyes

Color is no longer in the same traditional sense as a layer of paint, a material for adornment and decoration, or a means of entertainment. Color has become an influential factor in a person's emotional life and his mood and emotional state as well. [4-10]

The use of colors plays an essential role in the success of advertising, due to the great impact they play in attracting the consumer's attention to the advertisement.

And on the psychological aspects related to the consumer, which leads to his being influenced by the advertising message and increasing the degree of acceptance of the product. Convincing of the importance of the commodity or the announced product or the importance of service to benefit from it, and create a answering impression towards the brand, and the good employment of the color works to highlight the aesthetics of the product or the brand and its relationship to the advertising content of lines, texts and drawings, and therefore the impact that is reflected in the colors is reflected on the sense of sense[11]

### **Color effect**

Colors may affect people and reveal their nature whether they want it or not. The freshness of the eyes thus affects the nervous system. The color red is associated with emotion and symbolizes excitement, while the color blue symbolizes sadness and depression. We find that the introverted person prefers the color blue, while the friendly, peaceful person prefers the color orange. A balanced, wise person chooses the color green, while a conservative person loves blue, and purple is the favorite color of a transcendent person.

It is certain that the use of colors in advertising generates great artistic energy, giving the advertising designer an opportunity to present his ideas in diverse and attractive ways, especially in consumer goods such as household appliances, preserved food, canned food, textiles, and ready-made clothing.[12]

### **The basic functions of color in advertising design**

- There are many functions of color in advertising design, as follows

- Adding realism to the advertised goods or services through their shapes and colors.
- draw attention.
- Product reminder.
- Adding emotional and logical effects to the advertisement.
- Performing symbolic functions.
- Comfort and beauty.

### **The effectiveness of colors in advertising is evident in the following areas**

#### ***Increase attention to advertising***

Or to part of it when playing at the level of color gradation. Just as the ability of different colors to attract colors varies, warm colors such as yellow, red and their derivatives are more capable of attracting attention than cool colors such as blue, green and their derivatives. This reality may not be inevitable all the time, but it may change with a change in mood. And ways of thinking where a non-colored ad can be more attractive within a set of colorful ads

#### ***Colors add realism to the advertisement***

This is because the goods appear in their true form, but this matter has also become a thing of the past because the topic of playing with colors has recently begun through modern applications in the world of programming, where colors have become an important part of the revolution taking place in the field of printing.

#### ***Emotional effects***

The use of colors in advertising creates an emotional impact on readers and these emotional responses create a vivid impact of the advertisement. [6]

#### ***Colors symbolize certain ideas***

This is what some experts express as the function of communicating with readers on the basis of symbols or suggestions, because one of the basic effects of colors is the ideas it raises, and this is what we see in many advertisements in which the connotations of colors give the meanings that the advertising designer wants to convey without wanting to indicate them explicitly. For example, The green color gives connotations of growth, giving, creativity, and renewal, for example

#### ***The effect of color on memory***

The association of colors with ideas leads to a kind of effect on memory, because the realism of color and its effect creates a kind of psychological effect that helps in the process of remembering and recalling.

However, we must be aware that the use of colors in advertising must be an abstract process and not subject to considerations of the quantity of colors used,

but rather on the basis of its intended purpose. There must also be a careful study of the technical and psychological foundations that characterize colors so that the effectiveness of the use of color can increase. In the ad

#### ***The use of colors in advertising design:***

Color is defined as the value that is determined in an element or material through the light reflected from it, and it is the physiological effect resulting from the effect that occurs in the retina of the eye, from the reception of light reflected from the surface of a specific element, which was the result of a colored dye substance or colored light, so color. Therefore, it is a feeling and it does not exist outside the nervous system of living beings, in addition to the fact that color does not have any reality except by its connection with the eye, which allows it to be perceived provided that light exists.[13]

#### **Color types**

Colors are divided into several groups, which are as follows:

- Primary primary colours.
- Dual secondary colours.
- Tricolors.
- Compatible and harmonious colors.
- Cool colors and warm colors.
- Contrasting colors.

#### ***First: Primary colors and secondary colors***

These are the three colors from which all the secondary colors can be obtained. These three colors are divided into:

- Printing colors "red - yellow - blue".
- Light colors "red - green - blue"

It is known that mixing primary colors will give us a group of secondary colors:

- Cyan is a mixture of blue and green.
- Yellow is a mixture of red and green.
- Magenta is a mixture of blue and red.

There is a relationship between primary colors and secondary colors, as each secondary color has a primary color called its complementary color, for example:

- The color cyan is complementary to the color red.
- The yellow color complements the blue color, creating advertising ideas.
- Purple color complements green color.

#### ***Second: Tricolors***

They are the colors that we get from mixing three primary colors in different proportions and forming

ambiguous colors that are close to black and are placed in the middle of the color circle

#### ***Compatible colors***

Compatible colors in design create a kind of symmetrical balance that has a psychological and functional impact when used. Perhaps the natural order of the color spectrum is the best example of color compatibility, as when choosing two adjacent colors from the color circle because they are close and have a common element, this is the meaning of color compatibility. It can be defined Compatible colors It is a group of colors that affect the eye and the soul in a pleasant, good or enjoyable way and is characterized by unity.

- Putting the green color between yellow and blue.
- Place the orange color between yellow and red.
- Place the color violet between red and blue.

#### ***Cool and warm colors***

Warm "hot" colors, which are red, orange, yellow, and their different shades. This characteristic was derived from the manifestations of hot nature, such as the colors of the sun, volcanoes, fire..., and warm colors are advanced to the front due to their high alerting effect and long wave frequency. Therefore, these colors are used in the fold as signals. Traffic...etc.

As for the cold colors: they are green and blue and their shades are bluish green and blue-green "turquoise". They are derived from the colorful aspects of nature such as the sky, water, trees, green spaces...etc. These colors are characterized by the characteristic of receding backwards because their wave frequency is short and they are always used in artistic paintings.

#### **Harmony and contrast**

Color harmony is defined as the use of suitable colors to enhance the unity of the composition.

Harmonious colors are those that work well together and provide an attractive color scheme. The Color Wheel is used as a tool to evaluate harmonious colors. Contrasting colors are the colors whose luster increases when different colors are crossed over each other. When two different colors are crossed, the contrast is the increase in degree The difference between them, i.e. the light color becomes lighter than it was before)[14]

#### ***Colors used in the advertisement background***

Design experts advise against using bright-colored backgrounds that cannot be clearly classified, such as grey. Many study results show that visible colors such as blue, green, and yellow have achieved more effectiveness than white, black, and red. Also, placing

a blue frame around the ad increases the click-through rate on the ad.

The functional and psychological goals of colors in advertising:

***Advertising experts agreed that the use of colors in design achieves a set of psychological, functional and aesthetic goals, which are as follows:***

Creating a strong and quick impression regarding electronic advertising, regardless of its type, on the consumer's psych

- Increasing the degree of attention-grabbing advertising and encouraging browsers to view and view it.
- Arousing interest in the advertising message to motivate people to click on the ad to discover more details.
- Creating a suitable atmosphere for the product or service, which leads to creating the desired psychological effects and creating a specific response to the advertisement .
- Show the product or service in its realistic colors and shapes.

Creating visual impressions that increase the viewer's ability to recall and remember the ad.

Creating symbolic effects as a result of the emotional and sentimental connotations that colors convey, such as telecommunications companies relying on colors that are distinctive for their company and the service they provide, such as using red for Vodafone, orange for Mobinil Orange, and green for Etisalat.

## **Color connotations**

### ***Red color***

It expresses passion, strength, love, speed, energy, and excitement. Some telecommunications companies use it to emphasize the speed of communication between their customers.

### ***Orange color***

It expresses enthusiasm, heat, creativity, warmth, and excitement, and also gives the impression of the product's low prices compared to its competitors

### ***Blue colour***

Confidence, depth, wisdom, stability, calm, and relaxation. It resembles the color of the sea and sky, as it brings calm and comfort and helps to relax. It also gives a feeling of confidence and security.

For example, it can be used in banks to give an impression of trust and security in that place, and some airlines also use it in airplane seats to help one feel comfortable and relaxed.

### ***Yellow color***

Energy, happiness, interest, understanding, warmth, joy, fun, and creativity, because it brings fun and happiness. It is used by some restaurants, which many children love, as it creates a spirit of fun.

### ***Violet***

Power, magic, wealth, wisdom, calmness, and creativity. Some companies use it to give a sense of uniqueness and creativity, or it is offered to a specific segment of wealthy people.

### ***Green color***

It expresses nature, growth and progress, harmony, safety, tranquility, health, and fresh things. We find many advertisements for food products, as well as skin and hair care products, in green.

### ***White color***

It expresses purity, light, sterilization, and gives a feeling of spaciousness and comfort. For example, we often find it in detergent advertisements.

Whether floor or clothes cleaners, in order to emphasize purity, sterilization and cleanliness

### ***Black Color***

It expresses strength, mystery, elegance, confidence, and stability, and is used by some fashion companies as it indicates elegance. It is also used by some car companies as it gives a sense of luxury[15]

**The psychological effect of colors in fixed advertisements such as** newspapers and others. The use of colors in the press is considered one of the most important topics for psychological study. It has been proven that their psychological effect reduces the attention of readers and creates an attractive effect at first sight.

It is distinguished from newspapers in its use of colors according to many environmental differences between them, in terms of the nature of each, the quality of paper, the graphic and typographic elements used, and the capabilities of each. Colors are used in magazines, especially in printing covers, as a service intended to give a psychological significance that serves the magazine's policy on the one hand, and the nature of The cover topic on the other hand. Although magazines excel in color, psychological and journalistic studies conducted in this field have proven that black spots and white spaces have a psychological effect on the reader that is similar to the effect of color.

The journalist director must use colors with caution and accuracy, taking into account some considerations, including that readers' eyes are accustomed to black ink (which is the most readable color), even if some colors outperform it in attracting attention. The use of colors in newspapers (newspapers and magazines) has increased dramatically in recent years to the point that

it has become The rule in magazines is to use color in pictures and in the text. The exception has become the issuance of non-color magazines or black and white photos only

As magazines now constitute the primary market for marketing color images, color also begins to appear. It appears significantly in images published in newspapers that are printed in relief, as well as those that use the smooth printing method, especially on pages devoted to images or in the weekly supplements that they issue. The increased use of color in newspapers in general and color images in particular is due to [16]

### **Many factors, the most important of which are:**

#### ***Firstly***

The main role that colors play in human life

Every phenomenon that surrounds a person, whether natural or artificial, has its own distinct colors, to the point that colors have become an integral part in creating the images and shapes that a person sees throughout his day, and they have also become a basis for distinguishing and differentiating between different elements and shapes.

- Increased use of color in various advertising media
- Which depends on images, such as cinema and television
- And the influential functions performed by color

#### ***The typographical functions of color can be defined in the following aspects***

Color attracts attention, and attracting attention is the basic function of color, and it is based on contrast. Adding color to a picture or plate printed in black increases the degree of attracting attention to it. Psychological tests have shown that the number of people who pay attention to a printed communication increases by using colors, and when we say attract Foreshadowing, we refer to a situation that involves two separate reactions from the reader or viewer

The first: He was attracted

The second: His interest has been aroused if what attracted him has captured his interest. As we said, attracting attention is based on exploiting contrast: one light color with black gives great contrast, and it is possible to use cool colors such as blue, violet and green in contrast to warm or hot colors such as red or orange. [17]

#### ***Color has psychological effects***

Psychologists, after experimental psychological experiments and tests, have developed several assumptions about the psychological impact of some

colors, the psychological connotations they carry, and the explanation for that. Their point of view was that colors are associated with people with connotations, metals, or special meaning. For example, because red, orange, and yellow are associated with fire and the sun, they are called hot colors.

Because blue-violet and green are associated with the sea, sky, and greens, they are said to be cold colors

Some psychology experts express this function of color as communicating with readers on the basis of symbols and suggestions, because one of the basic evils of colors is the ideas they raise.

Each color expresses the idea of a group of ideas based on the previous experiences and experiences of individuals. Some of the research carried out by scientists and researchers does not completely agree on the psychological effects of colors or the associations it arouses.

Every color. Despite this, we find agreement on some of the special values or borrowings that some colors raise, on which a large number of psychologists, artists, and market students agree, especially in the field of advertising.

#### ***Colors certainly have a great impact in the world of marketing because of the degrees of access they have to the customer***

*For example,*

- 93% of customers focus on the visual appearance of the product and whether it is comfortable for them or not
- 80% of customers believe that color is primarily responsible for determining the personality of a product
- 52% of customers won't buy from you again if they don't like the layout
- 90% Some customers say that colors are the main factor in attracting and attracting the customer's attention

#### **Important colors in the psychology of colors in advertising**

##### ***Red colour***

Red is a color that plays on the client's feelings and passion. It increases the heart rate and affects the nerves greatly

It is certainly the common color that indicates love and affection, and when you use it, it will create emotion from the customer towards your product

The red color creates a feeling of necessity for the customer, meaning that he needs that product urgently and it is important

Red is one of the most important colors in color psychology in advertising

Because the color red indicates necessity and emotion, you can use it in restaurants, cafes, and products related to emotion

### **Blue colour**

Blue is a color that suggests peace, security, secrecy, and privacy. It gives the highest sense of trust, and some consider it a color that indicates maturity.

The color blue is used in products that need marketing and analysis, and when creating a sense of confidence in your product for the customer

One of the most famous international brands in this color is Facebook, of course

### **Green color**

It is a color that indicates nature and balance in life. It gives a feeling of inner peace and connection to nature

When presenting any product made from natural elements or something related to health, it is used in products that care about the environment, products that make you feel relaxed and comfortable

### **Yellow and orange**

They both indicate optimism, joy, thoughtfulness, and enthusiasm, but be careful not to use them excessively in the psychology of colors in advertising, as they may cause a feeling of anxiety to many.

These colors have a somewhat negative effect on children

### **Purple color**

It is used in products that need to be associated with sophistication and products that address a high segment of people. It indicates respect, wisdom, high status, and dignity.

### **Black colour**

A color that denotes power, strength, influence, control, might, and everything that is great

It is used in products that address the intelligent segment of the population due to its sense of intelligence. Be careful not to use it in abundance, as it is one of the colors in the psychology of colors in advertising, which indicate oppression, helplessness, and weakness when they are abundant.

### **White colour**

It is used in products that want to convey the idea of transparency, purity, and sophistication. It is associated with purity, childhood, and security. It is also used when mentioning creativity and greatness.

### **Yellow color**

Indicates cheerfulness, dishonesty, hatred, gene, cheerfulness, optimism, spring, radiance, brilliance

### **Red color**

Associated with movement, life, blood, fire, hate, passion, danger, strength, loyalty, courage, anger - excitement.

### **Blue colour**

coldness, serenity, calm, tranquility, repression, constriction truth, purity, formality

### **Orange color**

Symbolizes harvest, fall, middle of life, Abundance, fire, attention, movement

### **Green color**

It may indicate sincerity, youth, spring, nature. Purple: "Purple" is associated with dignity, loyalty.

### **White color**

It may symbolize cleanliness, fear, pity, illness. Black color: has mystery, strength, solace, and transportation depth, restriction [18]

### **This suggestive or symbolic connection or communication created by the use of colors is linked to another point:**

The preferences of readers of different levels for colors, as the highly educated classes, for example she prefers calm colors, while classes with poor rhyming preferences prefer colors

### **Flashy or flashy**

Also, every person and every group prefers certain colors, and has their own colours

**Children:** prefer blue, then red, then yellow, then green, then white

**Boys:** They prefer red, followed by blue, white, green and brown

**As for adults:** they prefer blue, red, green and violet and orange

**College students:** They prefer Jordan, followed by red and green and yellow and orange

### **Color develops associations with certain things**

As a result of the psychological change in color, it becomes natural for some people to associate certain colors with products, goods, services, personalities, or brands. There are some unclear associations that may give an unobvious effect.

Which requires research before choosing the color and personal judgement, and in this case it should not be trusted. An advertisement for a certain type of cigarette is green, for example, and the pink color may be preferred over blue in an advertisement for cosmetics, "face powder, for example," and mistakes may occur. Because there is no concrete basis for testing

**Color creates a state of remembrance**

Many people, in their description of something, tend to refer to its color. This is because color has a high memorial value. Therefore, the color should be controlled and chosen in advance, because it helps the reader remember what he saw according to the psychological influence. Advertisers, of course, are practically interested in retrieving the reader, and he hates colors. Certain colors, and the association of this with specific products, to create a type of recognition. The association of color with ideas and specific things leads to a type of effect on memory.

**The effect of colors on human psychology**

Since ancient times, man has used the colors that were extracted from the extract of some plants in artistic and plastic works, monuments, and buildings, which in turn depicted the inner and psychological life of man.

It expresses his feelings, values, affiliations, and inclinations, which made colors acquire symbolic connotations of life, death, happiness, mercy, cruelty, and others. However, in the current era, many recent studies have proven

Colors have a great effect on human cells. As each color has a special light wave that has a specific length that varies from one color to another, and each wave has its effect that appears on the nervous system and psychological state.

The positive or negative impact is due to many reasons, including psychological physiological, geographical and social environmental, in addition to the difference in tastes between individuals.

**The psychology of colors has been proven by psychological studies**

Psychologists believe that colors are not just light waves and vibrations; Rather, it has a great influence that reaches the depths of the human soul. Some of them are positive, expressing comfort, love, joy, and delight

Negativity, which raises feelings of anxiety, turmoil, sadness, and hatred, in addition to its clear impact on mood and health; Colors have been used for treatment since ancient times and civilizations such as the Pharaohs, India, and China, in addition to both Greek and Greek civilizations.

Recently, some non-governmental centers specializing in color therapy have emerged and found many differences in establishing a basic rule for the psychological connotations of colors. Where some contradictions appeared in the interpretation of the meanings of one color between one period of time and the next,

In addition to the different psychological effects that colors leave across human civilizations throughout the ages, there were many classifications that explain the psychological dimension of some colors.

There are those who divided colors in general into four main colors: (red, blue, green, and yellow). Where the blue color expressed the mind, intellect, intelligence, and wisdom, the yellow color expressed emotions, feelings, creativity, confidence, and self-esteem, the red color expressed physical dimensions, strength, courage, and boldness, and the green color expressed the interaction and balance between all the previous colors, comfort, renewal, and others. Many classifications and theories[19]

**The effect of colors on the human psyche: psychological effect**

Colors affect the psyche with different feelings, some directly and others indirectly, in a way that changes depending on the person himself. The source of this is due to previous experiences and impressions generated from the effect of color.

- Feeling hot or cold

It is a psychological feeling of heat when seeing the colors red, orange, and yellow, and a feeling of cold when seeing blue and green.

- A feeling of joy or sadness

Dark colors usually cause boredom and sadness, unlike bright, cheerful, more dynamic colors

- Each color has its effect on the soul

The effect of colors differs from one color to another. Blue and green are colors that bring calm, while yellow is cheerful and attracts attention, red is exciting, purple gives a feeling of sadness and is not preferable to be used in large surfaces, while orange is warm and exciting.

- The weighted effect of colors

Surfaces with cool, light colors appear lighter to the eye than hot, cool colors

- The spatial effect of colors

Cold colors appear as if they are bouncing together, giving the feeling of widening space, while hot colors appear to move forward and give the effect of shortening the distance and thus the feeling of narrowing of space.

Colors affect the soul, causing feelings that result in vibrations, some of which suggest thoughts that comfort and reassure us, and others that make us disturbed. Thus, colors can give us joy and joy or sadness and depression.[20]

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### **References**

1. Bourouj, F., Moufarrej, Gamal for the symbolic use of colours, *Constantine 3 University, Saleh Boubenider, Faculty of Applied Arts*, (2019).
2. mousa, s. Psychological studies, *Hindawi Foundation for Education and Culture*, (2012).
3. simunovic, m.p. Survey of ophthalmology, (2016).
4. Abd El-Aziz, E., abdelraouff, A., El-Desoky, S.S., El-Bahrawy, G.A., Ezat, H.A., Abd El-Rahman, R. and Hassabo, A.G. Psychological color and texture in marketing and textile printing design, *J. Text. Color. Polym. Sci.*, **20**(2) 265-275 (2023).
5. Mohamed, A.L., Khattab, T.A. and Hassabo, A.G. Color-tunable encapsulated perylene-labeled silica fluorescent hybrid nanoparticles, *Results in Chemistry*, **5** 100769 (2023).
6. Awad, Z.A., Eida, M.A., Soliman, H.S., Alkaramani, M.A., Elbadwy, I.G. and Hassabo, A.G. The psychological effect of choosing colors in advertisements on stimulating human interaction, *J. Text. Color. Polym. Sci.*, - (2024).
7. Elhawary, D.M., Maghraby, T.M., Elhag, A.E., Romeh, R.M. and Hassabo, A.G. The psychology of color in psychotherapy in psychiatric rehabilitation hospitals, *J. Text. Color. Polym. Sci.*, **21**(2) 443-448 (2024).
8. Elhefnawy, H.I., Saada, M.A., Abdelkareem, S.T., Elemam, Y.A., Subaih, R.A. and Hassabo, A.G. Color theory and semiotics: Exploring the relationship between visual semiotics and color, *J. Text. Color. Polym. Sci.*, - (2024).
9. Maghraby, T.M., Elhag, A.E., Romeh, R.M., Elhawary, D.M. and Hassabo, A.G. The psychology of color and its effect on branding, *J. Text. Color. Polym. Sci.*, **21**(2) 355-363 (2024).
10. Romeh, R.M., Elhawary, D.M., Maghraby, T.M., Elhag, A.E. and Hassabo, A.G. Psychology of the color of advertising in marketing and consumer psychology, *J. Text. Color. Polym. Sci.*, **21**(2) 427-434 (2024).
11. sansone, D. *Classical philology* 91, (1996).
12. Patricia valdez, A.M. Effects of color on emotions, *experimental psychology*, (1994).
13. Wei-Tao You, L.-Y.S., Zhi-YuanYang. Automatic advertising image color design incorporating a visual color analyzer, *computer languages* 55, (2019).
14. Keller, W. Inheritance of some major color types in, *Agricultural research* 52,27, (1936).
15. Andrew J Elliot, M.A.M. Color psychological functioning *Annual review of psychology*, 95-120 (2014).
16. Mahmoud Ramdan Ahmed, M. Frames and their design relationships in newspapers, *Scientific Journal of Journalism Research*, (2016).
17. Karthik Kumar, H.D., Ravi S Hegde, Samuel CW Koh, Jennifer N Wei, Joel KW Yang Printing color at the optical diffraction limit, *Nature nanotechnology* 7, 557-561 (2012).
18. Lichtle, M.C. The effect of an advertisements colour, *international journal of advertising*, 37-62 (2007).
19. Ahmed Amar, M.H., Safwat The creative role of special effects, the psychology of color, and its impact on the recipient, *Journal of Architecture, Arts and Humanities*, (2022).
20. Jerelyn J Plack, J.S. The effects of color on human, *Association for the study of perception*, (1974).