



# Through the eyes of the viewer: colour, emotion, and genre recognition in movie marketing

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## Abstract

This study investigates how colour influences audience perception in film advertising, particularly through movie posters. Integrating theoretical insights from colour psychology and cultural semiotics, the research addresses a gap in the literature regarding the empirical association between colour palettes, film genres, and emotional responses. Using biometric eye-tracking technology, two experimental within-subjects studies were conducted with 41 participants aged 18 to 40. One study examined colour associations with five film genres (action, animation, romantic comedy, science fiction, and horror), while the other explored emotional responses to monochrome posters based on Plutchik's wheel of emotions. Results reveal both alignment and divergence from traditional colour-genre conventions, such as the unexpected association of green with sadness and orange with trust, highlighting the role of context and design composition in visual interpretation. Findings also confirm central fixation bias, underscoring the influence of spatial placement on visual attention. The study makes a theoretical contribution to chromatic semiotics in film promotion and offers practical insights for designers and marketers seeking to optimize audience engagement.

**Keywords:** colour psychology, emotions, film marketing, eye-tracking analysis, genre association.

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## 1 Introduction

According to Bytyçi (2020), colour is a valuable tool and an integral element of communication, design, and marketing. Advertising does not work without stimulating vision. A



well-crafted visual identity creates positive emotions, trust, and reassurance for consumers. A well-chosen colour can captivate, relax, or irritate; it sends a powerful message to consumers and enhances the success of marketing, product, and business communication. (Bytçi, 2020).

There are several layers to colour perception. Age, culture, geography, and political ideology all play a role in how people interpret specific colours. In Asian countries, brides typically wear red on their wedding day, whereas in the Western world, white is the most common choice, symbolizing purity and innocence. Therefore, it is essential to consider these factors when designing a movie poster intended for worldwide display. (Fagerholm, 2009). Considering the above and the existing literature, the main goal of this research is to identify the public's perception of the colour choices used by the film industry in promotional movie posters. To explore the topic further, the goal is to understand the associations with certain colours and to analyze the relationships between colours and film genres.

Although several studies and reports have explored the meanings and feelings associated with colours, a significant gap remains in understanding the correlation between colours and film genres. This research aims to contribute to theoretical understanding by broadening our understanding of colour perception. The study also seeks to gather as much theoretical and empirical information as possible to address the gap in the literature on the subject.

## 2 Literature Review

This literature review is organized into three sections: perceptions and meanings of colours and colour palettes; the study of colour use in design; and the application of colour in the film industry.

### 2.1 Meaning of colours

According to Morton (1997), nature serves as a crucial starting point for colour symbolism. Natural elements, such as fire and water, significantly influence the symbolic meanings of colours. The author also notes that these meanings can evolve over time, relating to politics, fashion, religion, myths, and geography.

Fagerholm (2009) notes that colour can be used in many different ways and for various purposes in projects. When understood and used correctly, colour, a visual language, can be an

incredibly useful tool. A designer can use it to draw the viewer's attention to the intended messages in their work (Fagerholm, 2009). They should also be aware of the diverse messages and meanings that colours convey, to maximize their effectiveness. Cerrato (2012) believes that colour can provoke different physiological reactions in humans, linking them with various feelings, emotions, and meanings. Cerrato (2012) states that the eyes and the skin are responsible for interpreting different colours, prompting the body and mind to respond both physically and emotionally.

Like Cerrato (2012), other authors approach the meanings associated with colours through a scientific prism. Ramos (2014), for example, states that colour is the most powerful sign that nature possesses, becoming the first memory to which human memory has access. This statement suggests that, early in life, human beings immediately associate colours with objects, meanings, and sensations. The author goes on to explain that magnetic waves (light) reach the human eye in different directions. In the retina, these waves are transformed into electrical impulses that are transmitted to the hypothalamus, the part of the brain that governs hormones and the endocrine system, including the pineal gland (Ramos, 2014). Silveira (2015) reinforces Ramos's (2014) point, indicating that colour is not observed in isolation but is linked to objects. These objects have a history of constructing meanings tied to their respective colours. These meanings are learned through individuals' repertoires of experiences, stored in their memories. These meanings, therefore, differ between people and cultures (Silveira, 2015). Consequently, Silveira (2015) argues that each colour has its history marked by habits, meanings, and objects. Colours thus become active instruments of a given culture. In Western culture, colours are culturally associated with specific interpretations (Silveira, 2015). The author explains that the meanings of colours have been and continue to be constructed collectively and socially through the understanding of various objects (e.g., films, clothes, road signs, medicine boxes, make-up).

Table 1 presents the meanings attributed to different colours, as derived from the studies referenced in the literature review.

**Table 1**

*Summary of colour meanings*

| Color         | Morton (1997)  | Fagerholm (2009) | Cerrato (2012) | Ramos (2014)   | Silveira (2015) |
|---------------|----------------|------------------|----------------|----------------|-----------------|
| <b>Red</b>    | Energy         |                  |                |                |                 |
|               | Heat           | Passion          | Excitement     | Courage        | Excellence      |
|               | Impulse        | Aggressive       | Go             | Go             | Danger          |
|               | Courage        | Dominance        | Sex            | Energy         | Prohibition     |
|               | Excitement     | Attention        | Passion        | Masculinity    | Love            |
|               | Love           | Sex              | Speed          | Excitement     | Eroticism       |
|               | Passion        | Politics         | Danger         | Aggressiveness | Materialism     |
|               | Violence       |                  |                | Danger         |                 |
| <b>Orange</b> | Sexuality      |                  |                |                |                 |
|               | Energy         | Heat             | Just kidding   | Comfort        |                 |
|               | Joy            | Extrovert        | Heat           | Heat           |                 |
|               | Excitement     | Just kidding     | Vibrant        | Security       | -               |
| <b>Yellow</b> | Heat           |                  | Determination  | Passion        |                 |
|               |                |                  |                | Abundance      |                 |
|               |                |                  |                | Fun            |                 |
|               | Hope           | Clarity          | Heat           | Optimism       | Light           |
|               | Vitality       | Happiness        | Light          | Confidence     | Heat            |
|               | Light          | Joy              | Joy            | Emotion        | Joy             |
|               | Communication  | Energy           | Happiness      | Friendship     | Energy          |
|               | Optimism       | Attraction       | Energy         | Creativity     |                 |
| <b>Green</b>  | Selfishness    |                  |                |                |                 |
|               | Betrayal       |                  |                |                |                 |
|               | Nature         |                  |                |                |                 |
|               | Growth         |                  |                |                |                 |
|               | Renewal        | Nature           | Nature         | Harmony        | Fortune         |
|               | Tranquility    | Harmony          | Freshness      | Stability      | Hope            |
|               | Hope           | Money            | Growth         | Freshness      | Youth           |
|               | Youth          | Envy             | Abundance      | Rest           | Freedom         |
| <b>Blue</b>   | Health         |                  | Harmony        | Peace          | Nature          |
|               | Luck           |                  |                |                |                 |
|               | Envy           |                  |                |                |                 |
|               | Spirituality   |                  |                |                |                 |
|               | Truth          |                  |                | Intelligence   |                 |
|               | Confidence     | Calm down        | Confidence     | Communication  | Dreams          |
|               | Tranquility    | Serenity         | Rehabilitation | Veracity       | Loyalty         |
|               | Understanding  | Sadness          | Stability      | Confidence     | Faith           |
| <b>Purple</b> | Security       | Depression       | Truth          | Serenity       | Coldness        |
|               | Masculinity    | Confidence       | Freshness      | Duty           | Freshness       |
|               | Coldness       |                  | Faith          | Logic          | Reality         |
|               | Melancholy     |                  |                | Coldness       |                 |
|               | Spirituality   |                  |                |                |                 |
|               | Magic          |                  | Altruism       | Spirituality   |                 |
|               | Dignity        | Royalty          | Power          | Contentment    |                 |
|               | Mystery        | Prosperity       | Luxury         | Luxury         | -               |
| <b>Black</b>  | Creativity     | Arrogance        | Magic          | Truth          |                 |
|               | Imagination    |                  | Mystery        | Quality        |                 |
|               | Royalty        |                  | Creativity     |                |                 |
|               | Presumption    |                  |                |                |                 |
| <b>Black</b>  | Power          | Sophistication   | Sophistication | Glamour        | Death           |
|               | Sophistication | Power            | Prestige       | Security       | Sadness         |

| Color | Morton (1997)  | Fagerholm (2009) | Cerrato (2012) | Ramos (2014)   | Silveira (2015) |
|-------|----------------|------------------|----------------|----------------|-----------------|
| White | Sexuality      | Sensuality       | Elegance       | Sophistication | Loneliness      |
|       | Unknown        | Elegance         | Seduction      | Efficiency     | Melancholy      |
|       | Death          | Dear             | Mystery        | Substance      | Elegance        |
|       | Corruption     |                  | Unknown        | Threats        | Modernity       |
|       | Depression     |                  |                |                |                 |
|       | Purity         |                  |                |                | Purity          |
|       | Cleaning       |                  | Purity         | Hygiene        | Innocence       |
|       | Truth          | Health           | Clean          | Clarity        | Hygiene         |
|       | Innocence      | Hygiene          | Young          | Purity         | Cleaning        |
|       | Chastity       | Purity           | Innocence      | Simplicity     | Sterile         |
|       | Refinement     |                  | Softness       | Sophistication | Simplicity      |
|       | Serenity       |                  |                |                | Peace           |
|       | Death          |                  |                |                |                 |
|       | Neutrality     |                  | Intellectual   |                |                 |
|       | Intelligence   |                  | Knowledge      |                |                 |
| Grey  | Futurism       | Confusion        | Wisdom         | Neutrality     |                 |
|       | Modesty        | Intelligence     | Security       | Psychology     | -               |
|       | Technology     | Technology       | Professional   | Presumption    |                 |
|       | Tranquility    | Age              | Class          | Depression     |                 |
|       | Indifference   | Shadows          | Melancholy     |                |                 |
|       | Sadness        |                  | Boredom        |                |                 |
|       | Melancholy     |                  | Rigidity       |                |                 |
|       |                |                  | Subtlety       |                |                 |
|       | Nature         |                  |                |                |                 |
|       | Durability     |                  |                |                |                 |
| Brown | Rehabilitation | Stability        | Go             | Serenity       |                 |
|       | Realism        | Dirt             | Realism        | Comfort        |                 |
|       | Comfort        | Boredom          | Durability     | Nature         | -               |
|       | Familiarity    |                  | Practicality   | Rehabilitation |                 |
|       | Boredom        |                  |                | Support        |                 |

## 2.2 Ideology, Culture and Geographical Location

Silveira (2015) distinguishes between the concepts of "perception" and "sensation" of colour, stating that colour perception is a complex phenomenon that involves sociocultural, symbolic, psychological, mental, and rational aspects. Thus, the process of "colour sensation" covers only the stages of light reflection (the physical aspects of colours) and the physiological coding of the retina (the physiological aspects of colours and the apparatus used to analyze them). "Colour perception" adds to the previous stage the cultural, symbolic, and psychological aspects of colour that have the power to substantially alter what is seen physiologically (Silveira, 2015).

According to Yu (2014), colours were already an essential part of the lives of ancient civilizations. In nature, colours served as symbols of visual communication and were strongly associated with traditions, deities, elements, and directions. Black and white represent duality and antithesis. However, in some traditions, black is the colour of death and mourning; in others, it is

white. Red, the colour of blood, is usually associated with life, but represents death in Celtic culture (Yu, 2014). The primary colours were often associated with the cardinal points in ancient civilizations of Central America and China.

### 2.3 The Use of Colour in Design

A crucial element in poster design is the effective use of colour. Colour is one of the best design tools and offers a multitude of possibilities for conveying messages to viewers (Fagerholm, 2009). Fagerholm (2009) states that if a film poster were devoid of colour, it would be unable to convey its message powerfully and cohesively to viewers. Colour is therefore used to reinforce the poster's message subjectively.

Over the years, colour has played a vital role in creating advertising stimuli and promotional materials for the film industry. For many years, posters were a tool for showcasing the creativity of artistic and cultural styles and movements (*such as art nouveau, lithography, painting, collage, etc.*). Later, with technological advances and the growth of *Hollywood*, these images became informative and valuable, praising movie stars and becoming a privileged means of reaching viewers and disseminating useful information about films (Zijlstra, 2015).

Nowadays, the choice of colours and graphic elements is deliberately made by artists, designers, and promotional teams at film studios to convey the essence and relevant information about a film to viewers without compromising the film's narrative. That's the main aim of a poster: to reach the widest possible audience (Fagerholm, 2009). Once the movie has been seen, this mystery is revealed, and the posters become, forever, a reminder of the experience and the sensations felt during the viewing.

Ivasic-Kos et al. (2014) state that a person can understand and interpret the genre of a movie (e.g., drama, comedy, cartoon, etc.) from a poster, regardless of the observation time, the design's complexity, or the variety of details used. This understanding and perception of information can occur in various situations. Highlights include seeing a billboard while driving through the city and seeing one in a shopping mall or cinema. Fagerholm (2009) points out that the viewer must be able to look at a billboard and, through it, create a relationship with the object depicted. The poster needs to convey the film's identity, which inevitably attracts the attention of those who might be considered fans of the genre (Fagerholm, 2009). In the same vein, Chu & Guo (2017) propose that movie posters are designed to attract people willing to spend time and money to watch movies in

theatres. As such, posters should concisely present the film's genre through visual elements, characteristic objects, and the name of the main actor (Chu & Guo, 2017). The information on a poster can and should be both eye-catching to attract potential viewers and descriptive to provide a preview of the plot without unravelling the mystery of the story.

## 2.4 Colours and Film Genres

According to Chen et al. (2012), the discussion and analysis of studies on films are mostly based on the editing of sequences, cuts, and scenes, and the debate on the use of colour in cinema is scarce. Some historical factors explain the intellectual apathy of film critics when analyzing colour in films. The ways of making films were firmly established before colour became significant (Chen et al., 2012).

Heider (1972) proposes that the disregard for chromatic aspects in films can be attributed to cognitive factors, since colour is considered the most subjective and private quality of visual experience. For all visual characteristics, such as the size, shape, and texture of an object, it is possible to cross-reference sensations with other sensory modalities. Colour, however, resides only in the eye of the beholder (Heider, 1972): *"we can easily appreciate the blue quality of the sky, but we find it impossible to describe the preceptive experience of it to a blind person"* according to Chen et al. (2012, p. 40).

While watching a film, there is not enough vocabulary to classify and store all the colours presented. All these factors contribute to the difficulty of conducting a content analysis of the colours used in a film (Chen et al., 2012). Although the use of colours in posters of certain genres is not an exact science, some trends and preferences can be important in the design and distinction of genres (Fagerholm, 2009).

Given the limited information available on the topic, the studies by Fagerholm (2009), Chen et al. (2012), Ammer (2020), Redfern (2021), and Dewitri & Marantika (2023) were thoroughly analyzed to gather as much information as possible. By collectively analyzing the results obtained from the studies mentioned above, we can draw the following conclusions regarding the association of colours with film genres:

- **Action** - This genre uses very dark colours, though not as many as science fiction films (Fagerholm, 2009). This genre frequently incorporates fire and sparks as graphic design

elements, adding small contrasting highlights to the posters. According to Chen et al. (2012) Action films are characterized by their use of green, which makes this genre weak in warm colours, resulting in limited contrast and saturation. A surprising finding is that action films score lowest in contrast variations due to their fast pace and mostly turbulent plots.

- **3D animation** - Most posters in this genre feature the main characters and use very bright, vibrant colours. Highly saturated primary and secondary colours are preferred by schoolchildren over neutral colour (Drew & Meyer, 2005). According to Fagerholm (2009), Most of these posters feature a cool colour, typically blue or green, to highlight the film's natural elements. However, all posters also include a warm, contrasting colour, usually applied to the prominent written elements.
- **Romantic comedy** - This genre uses large amounts of white in advertising posters. White often serves as a base colour, over which other colours and images are applied, giving these posters a cleaner, more cohesive appearance. Although these posters include black and other dark colours, they are used in written elements rather than as the main focal point (Fagerholm, 2009). Many of these posters also feature colours that are more feminine and symbolise love and passion, such as pink and its various shades. According to Chen et al. (2012) and Redfern (20, Romance and comedy films feature scenes and images with greater contrast, using warm colours (e.g., yellows and reds) that are cheerful and light, thereby distinguishing them from other genres.
- **Science Fiction** - This genre primarily uses a darker colour palette in its advertising content. Dark colours represent the unknown and the unexplored, elements that have always intrigued advertisers. (Fagerholm, 2009). The colour blue and its variations are often favoured in this kind of advertising poster. This choice may seem a bit peculiar, given that blue tends to symbolise tranquillity and stability, qualities not very common in science fiction films. Chen et al. (2012) corroborate Fagerholm's (2009) indications that science fiction films primarily consist of images and scenes featuring cool colours, particularly blue, green, and their variations, with low contrast. This choice emphasises the themes of mystery and the unknown.
- **Horror** - Ammer (2020) proposes that the director of photography determines the tone of a film through the choice of colours and lighting palettes. The author suggests that the colours most commonly used in horror film lighting are: blue, cyan, and blue-green—indicators of weakness, melancholy, negativity, and despair; orange—an indicator of toxicity and

discomfort; and red—an indicator of violence and fear. The horror posters analysed by Dewitri & Marantika (2023) confirm this trend through the use of red, black, and white as prominent colours, which convey denotative and connotative meanings of strength (red), evil (black), chastity, and protection (white).

### 3 Methodology

This research aims to identify the public's perception of the colour choices made by the film industry in movie posters. To explore this topic further, we intend to analyse the relationships between colours and film genres to understand the connections and emotions associated with colours.

#### 3.1 Equipment and procedures

To achieve the desired results, two within-subjects experiments were conducted using an Eye Tracking device (Gazepoint GP3 HD Eye Tracker, 150Hz).

The use of this equipment enables the creation of Heatmaps and Fixation Sequences, allowing us to identify the elements that captured the participants' attention the most through a graphic and chromatic representation. (Farnsworth, 2022). The graphic representations are converted into metric data by creating areas of interest (AOIs) that define the zones from which the most important data will be collected. This data is then categorised as:

- a) Time to first fixation (TPF) - the amount of time it takes for the participant to look at a specific area of interest.
- b) Viewing time (TV) - the amount of time a participant spends looking at a particular area of interest.
- c) Fixations (FX) - the number of times a participant fixates on an area of interest.
- d) Revisits (RV) - number of times a participant revisits an area of interest.

#### 3.2 Data collection process

Before data collection, four pre-tests were conducted with volunteers who did not participate in the final data collection. These sessions enabled the creation and organisation of the

stimuli, clarified the functionality of the Eye Tracking equipment, identified the limitations and shortcomings of the images prepared for the tests, and allowed necessary adjustments, such as viewing time and graphic elements, ensuring the reliability of the data. The results of these pre-tests were excluded from analysis.

The tests were conducted over three sessions in a calm and controlled environment. During these sessions, each participant was required to read and sign an informed consent form that explained the research and ensured the anonymity of the data. Afterward, each participant answered some basic demographic questions: name, age, gender, and whether they had colour blindness. Next, a brief presentation was given to each participant to reiterate the research's purpose and provide examples of the tests, aiming to familiarise them and alleviate any anxiety or apprehension about the procedure. This presentation was added in response to the doubts raised by participants during the pre-test phase.

Finally, the eye-tracking device was calibrated. Participants were instructed to remain in the same position, keeping their heads still and following the image only with their eyes. After successful calibration, the data were collected. Only calibrations with a 100% success rate, that is, 9 out of 9 points, were considered valid. This initial phase lasted approximately 5 minutes.

### 3.2.1 Study 1 - Chromatic Palettes and Cinematic Genres

To analyse the connections between colours and film genres on screen, participants were shown a film genre alongside two colour palettes, each taken from two posters related to the genre under study. They had 15 seconds to evaluate both palettes and select the one they most associated with the presented film genre. This test was conducted 5 times across the chosen genres: action, 3D animation, romantic comedy, science fiction, and horror. The genres and palettes were selected based on the review of literature and conclusions from previous studies. The test lasted 1 minute and 40 seconds, with each stimulus displayed for 15 seconds, followed by a 5-second pause. This pause appeared as a black screen to prepare participants for the next stimulus.

### 3.2.2 Study 2 - Colours and Feelings

The second study aimed to understand the connections and feelings associated with certain colours. To this end, seven monochrome movie posters or posters featuring a prominent colour

were displayed on a screen. Participants had 30 seconds to analyse each image and select the emotion they associated with the poster from a list on the screen. The emotions presented included joy, sadness, anger, fear, trust, disgust, surprise, and anticipation. The eight emotions used were sourced from the "Plutchik Wheel of Emotions," developed by Robert Plutchik in 1980.

This test lasted a total of 2 minutes and 20 seconds. Each of the 7 stimuli was presented for 20 seconds.

### 3.3 Material selection

In Study 1, the palettes were collected according to the guidelines outlined in the literature review. The chosen palettes were drawn from movie posters of the same genre, regardless of whether they conformed to the criteria of previous studies, thereby facilitating analysis and comparison. For example, for the "action" genre, a darker-colour poster was selected, in line with Fagerholm's (2009) findings, whereas a warm-colour poster was chosen, contrary to Chen et al.'s (2012) findings.

The posters were selected from IMDb (The Internet Movie Database) based on its categorisation of film genres, which combines story, plot, characters, and context (IMDb, 2023). The palettes were extracted using the Adobe Colour tool ([color.adobe.com/en/create/image](https://color.adobe.com/en/create/image)), which allows users to upload images, extract colours, and create colour palettes (see Appendix).

For Study 2, the images were selected for their graphic content. Initially, seven colours were chosen—red, orange, yellow, green, blue, indigo, and purple—based on the indications in the reviewed studies. Subsequently, monochrome posters or posters with the aforementioned colours emphasised were selected. To avoid possible bias, the posters were edited to highlight only the chromatic aspects.

### 3.4 Sample

Forty-two individuals aged 18 to 40, selected for convenience from friends, colleagues, students, and employees of the University of Beira Interior, participated in the research. To encourage participation, a brief explanation was provided without excessive details to prevent bias. Before participating in this study, participants were required to confirm that they were not colourblind, as this condition could skew the results.

Of the 42 participants, only 41 were validated: 27 females and 14 males (Table 2). Participant #36, who took both tests, was eliminated, but due to technical issues, his participation could not be recorded.

**Table 2**

*Profile of the participants*

| Code | Age | Gender |
|------|-----|--------|
| P1   | 23  | F      |
| P2   | 23  | M      |
| P3   | 23  | F      |
| P4   | 23  | F      |
| P5   | 24  | M      |
| P6   | 23  | M      |
| P7   | 23  | F      |
| P8   | 24  | F      |
| P9   | 25  | F      |
| P10  | 24  | F      |
| P11  | 23  | F      |
| P12  | 24  | F      |
| P13  | 20  | F      |
| P14  | 27  | F      |
| P15  | 25  | F      |
| P16  | 20  | M      |
| P17  | 21  | M      |
| P18  | 21  | M      |
| P19  | 20  | M      |
| P20  | 18  | M      |
| P21  | 18  | M      |
| P22  | 19  | M      |
| P23  | 21  | M      |
| P24  | 18  | M      |
| P25  | 20  | F      |
| P26  | 22  | M      |

| Code | Age | Gender |
|------|-----|--------|
| P27  | 24  | F      |
| P28  | 32  | F      |
| P29  | 18  | F      |
| P30  | 40  | F      |
| P31  | 22  | M      |
| P32  | 23  | F      |
| P33  | 23  | F      |
| P34  | 22  | F      |
| P35  | 21  | F      |
| P37  | 33  | F      |
| P38  | 34  | F      |
| P39  | 21  | F      |
| P40  | 24  | F      |
| P41  | 23  | F      |
| P42  | 33  | F      |

## 4 Analysis and Discussion of Results

This section analyses the data and results obtained using the eye-tracking software (GazePoint Analysis) and compares them with the participants' answers in each test. The results were analysed using Microsoft Excel.

### 4.1 Study 1

Initially, an analysis was conducted of participants' responses regarding their choice of palette—palette 1 or palette 2. Considering the most popular option (for example, Action - Palette 2), the palette colour analysis was performed exclusively for the selected palette and the participants who chose it. Participants who selected Palette 1 were deliberately excluded from this analysis. The aim is to understand which colour participants most associate with a film genre and what influenced their decision between the palettes, which is why the responses from those who chose the other palette were not included.

#### 4.1.1 Action

**Figure 1**

*Palettes: Action*



Of the 40 participants, 27 (67.5%) identified Palette 2 (Figure 1) as belonging to the Action genre. It is important to note that participant #4 (P4) was unable to respond within the allotted time, rendering his response invalid for the Action genre.

Time to first fixation (TPF) and viewing time (TV) were higher in palette 2, averaging 1.652 and 3.990 seconds, respectively. However, the number of fixations (FX) and revisits (RV) were greater in palette 1, reaching averages of 17.171 and 8.220, respectively. This irregularity may indicate that participants had difficulty choosing a palette, necessitating more revisits to palette 1. The selected palette links the action genre with saturated warm colours (oranges and browns). This choice contradicts the findings of Chen et al. (2012), who found that this genre is characterised by cool colours (green), low saturation, and minimal contrast.

In the selected palette, colour 1 (black) had the highest TPF at 8.840 seconds. Colour 3 (orange) had the highest number of FX at 5.778. Colour 5 (dark orange) recorded the highest TV at 1.280 seconds and the highest RV number at 4.556. These figures indicate that, in the selected palette, the colour orange, represented by colours 3 and 5 with varying levels of saturation, might be the colour participants most associate with the action genre.

#### 4.1.2 3d animation

**Figure 2**

*Palettes: 3d animation*



Of the 41 participants, 28 (68.29%) associated Palette 1 (Figure 2) with the 3D animation genre. The TPF was higher for Palette 2, averaging 1.509 seconds; this indicates that participants took longer to look at Palette 2 after settling on Palette 1. The other parameters were higher for Palette 1. TV was 4.625 seconds, and FX and VR had averages of 19.610 and 8.220 seconds, respectively.

The selected palette combines various colours associated with nature and vegetation. This choice aligns with Fagerholm (2009), who suggests that 3D animation posters typically depict outdoor scenes, emphasising natural elements. In the chosen palette, the third colour (light green) had the longest TV at 1.287 seconds and the highest number of FX and VR at 7.071 and 5.036, respectively. Colour 1 (pink) had the highest TPF at 6.781 seconds. These values suggest that, within the chosen palette, the light green colour—represented by colour 3—may be the one participants most associate with the 3D animation genre. This choice supports the literature.

#### 4.1.3 Romantic comedy

**Figure 3**

*Palettes: Romantic Comedy*



Twenty-eight participants (68.29%) associated Palette 2 (Figure 3) with the Romantic Comedy genre. TPF and TV were higher in Palette 2, averaging 2.077 and 3.594 seconds, respectively. However, the numbers of FX and VR were higher in Palette 1, with averages of 16.073 and 7.049, respectively. The trend continued in the areas of interest in the action genre, with results split between the two palettes. These findings suggest a certain difficulty in making a choice.

The chosen palette contains "cheerful", bold, and high-contrast colours. This result aligns with Che et al. (2012) and Redfern (2021), who note that films of this genre employ this colouring to differentiate romantic films from those with darker themes. However, the colour that captured participants' attention most was blue-green, which, according to Ammer (2020), is often used in horror film lighting.

In the chosen palette, the third colour (blue-green) had the highest TV at 0.973 seconds, along with the highest number of FX and RV at 4.607 and 2.571, respectively. Colour 4 (yellow)

recorded the highest TPF at 5.978 seconds. These results indicate that within the selected palette, the colour blue-green (colour 3) is the shade most closely associated with the romantic comedy genre by participants.

#### 4.1.4 Science fiction

**Figure 4**

*Palettes: Science Fiction*



Twenty-seven participants (65.85%) associated Palette 1 (Figure 4) with the science fiction genre. TPF was higher in Palette 2, with an average of 1.476 seconds. The other parameters were higher in Palette 1. TV was 4.709 seconds, and FX and VR had an average of 19.024 and 7.415, respectively. The chosen palette contains several dark and low-light colours. This group also includes the colours of the flag of the United States of America (blue and red), which, according to Fagerholm (2009), are often used in science fiction posters due to adaptations of comic book superheroes.

In the chosen palette, the third colour (dark blue/black) had the highest TV - 1.135 seconds - and the highest number of FX and RV - 5.704 and 4.037, respectively. Colour 1 (red) had the

highest TPF - 4.557 seconds. These results suggest that dark blue/black is the colour that participants most associate with the science fiction genre.

#### 4.1.5 Terror

**Figure 5**

*Palettes: Terror*



Among the 41 participants, 24 (58.53%) associated Palette 1 (Figure 5) with the horror genre. TPF was higher for Palette 2, with an average of 1.238 seconds. The other parameters were greater for Palette 1, with TV at 4.019 seconds, and FX and RV averaging 17.439 and 7.024 seconds, respectively.

The chosen palette features several dark, low-light colours, linking this sombre identity to horror films. The colours blue and magenta are also included in the palette. According to Ammer (2020), these colours are utilised to illuminate projects of this nature, aiming to convey feelings of negativity, despair, violence, and fear. In the selected palette, the second colour (black) had the longest TV duration (1.030 seconds) and the highest numbers of FX and VR occurrences (5.208

and 3.625, respectively). Colour 1 (magenta) had the highest TPF at 3.971 seconds. These results indicate that black is the colour most strongly associated with the horror genre among participants.

#### 4.1.6 General Results

In this test, only 5 participants (P12, P23, P26, P27, and P40) (12.19%) selected the most popular palettes from the 5 movie genres. Among the 5 genres, 3—animation, romantic comedy, and science fiction—received the third-most TV, FX, and VR colours. This may be explained by the fact that colour 3 is in the centre of the palette/screen. Of the 5 genres, 4—action, 3D animation, sci-fi, and horror—received the first colour with the longest duration in the TPF.

From these results, it can be concluded that participants' gaze was primarily fixed on the centre of the palette or the screen. This phenomenon is called "central fixation bias." According to Tatler (2007), this often occurs in studies involving the human gaze. The author explains that the centre of the screen is the optimal location for extracting the essence of the image and the global characteristics of the analysed scene.

## 4.2 Study 2

The aim of Study 2 was to investigate the emotional aspect of the posters. To this end, an analysis was conducted of the emotion most associated with each image. Considering the most frequently chosen option (e.g., red: fear), the results were analysed solely for the most chosen emotion and for the participants who selected it. This approach seeks to understand which emotion participants most associate with a particular colour, which is why responses from participants who chose other emotions were excluded.

#### 4.2.1 Red

### Figure 6

*Red Stimulus - As Above, So Bellow (2014)*



Eighteen participants (43.90%) associated red (Figure 6) with the emotion of fear. In this stimulus, TPF and TV were higher on the emotion list, with averages of 0.818 and 6.167 seconds, respectively. The other parameters were higher in the image. FX and VR had averages of 21.944 and 7.444 seconds, respectively. These results align with studies by Cerrato (2012) and Ramos (2014) regarding the meaning of colours. The authors associate red with danger and aggression, elements typically conveyed through storytelling in horror films.

#### 4.2.2 Orange

**Figure 7**

*Orange stimulus - Logan (2017)*



Eighteen participants (45%) associated the colour orange (Figure 7) with the emotion of trust. The results indicate that the TPF was higher among the list of emotions ( $M=1.010$  seconds). The other parameters showed higher values in the image; TV averaged 9.629 seconds, while FX and VR had averages of 26.944 and 5.611 seconds, respectively.

These results do not align with previous studies, which attribute meanings of energy, joy, comfort, and security to the colour orange. It is possible to compare this outcome with study 1, where most participants associated palette 2, consisting of various shades of orange, with the action genre.

#### 4.2.3 Yellow

### Figure 8

*Yellow stimulus - Little Miss Sunshine (2006)*



Forty participants (97.56%) associated yellow (Figure 8) with the emotion of joy. In this stimulus, the TPF was higher on the list of emotions ( $M=1.573$  seconds). The other parameters were elevated in the image. The TV was 9.899 seconds, and the FX and RV averaged 32.175 and 6.300 seconds, respectively. This stimulus elicited the highest number of identical responses, facilitating the identification of agreement with previous studies, in which all authors associate yellow with joy or emotions within that spectrum, including happiness and optimism.

#### 4.2.4 Green

**Figure 9**

*Green Stimulus - Boyhood (2014)*



Twenty-four participants (60%) associated green (Figure 9) with the emotion of sadness. In this stimulus, the TPF was greater in the emotion list ( $M=1.279$  seconds). The other parameters were higher in the image. TV was 10.289 seconds, while FX and RV had averages of 28.750 and 5.917 seconds, respectively.

The use of green in this poster suggests growth, as the film was shot over 12 years, during which the characters can be observed growing and ageing in real time. However, the outcomes obtained contradict the meanings of nature and harmony indicated by the available studies. It is possible that the participants were more focused on the boy's sad, concerned facial expression.

#### 4.2.5 Blue and Indigo

### Figure 10

*Blue stimulus - Don't Worry Darling (2022)*



Sixteen participants (39.02%) associated blue (Figure 10) with the emotion of surprise. The analysis reveals that the TPF was higher among the list of emotions ( $M=2.113$  seconds). The other parameters were higher in the image: TV was 10.144 seconds, while FX and VR had averages of 32.000 and 6.688, respectively.

**Figure 11**

*Indigo stimulus - Life of Pi (2012)*



Seventeen participants (58.53%) associated indigo (Figure 11) with the emotion of surprise. The results indicate that the TPF was higher among the list of emotions ( $M=1.446$  seconds). The other parameters were greater in the image; TV was 9.998 seconds, while FX and RV averaged 30.176 and 5.412 seconds, respectively. Both images were linked to the same emotion, suggesting that the colour blue and its more saturated variant (indigo) convey the same feeling. However, the literature review indicates that blue is often associated with confidence and other sensations related to tranquillity.

#### 4.2.6 Purple

**Figure 12**

*Purple stimulus - La La Land (2016)*



Seventeen participants (42.5%) associate purple (Figure 12) with the emotion of joy. In this stimulus, the TPF was higher for the emotions listed ( $M=1.538$  seconds). The other parameters were higher in the image. TV was 8.533 seconds, and FX and RV had averages of 28.882 and 6.412 seconds, respectively. The participants' choice contradicts previous indications associating this colour with the macabre, mysticism, and spirituality. The emotion selected was previously linked to yellow, which is interesting.

#### 4.2.7 Global analysis

In this test, no participant selected a combination of the seven most chosen emotions. Only two emotions—joy and surprise—were chosen repeatedly. Anger, disgust, and anticipation were the least chosen emotions, with no clear majority. Only the first stimulus (red) produced different results, yielding a longer average time on TV. The remaining stimuli showed the same pattern: the TPF was higher in the emotion list, while the other parameters were higher in the images. This

irregularity may have resulted from the red stimulus being first and the participants needing to revisit the list of emotions.

All stimuli took longer in the TPF within the list of emotions. This indicates that the participants first fixated on the image on the right side of the screen.

## 5 Conclusions

This study examined the relationship between colour schemes in film posters and audience perception of both genre and emotional resonance. Using eye-tracking technology and a two-part experimental design, we identified perceptual patterns and emotional associations associated with specific colour palettes. The findings provide empirical support for the claim that colour serves as a powerful semiotic and affective tool in promotional material, reinforcing genre cues and eliciting targeted emotional responses.

### 5.1 Theoretical Implications

Theoretically, this study addresses a significant gap in the literature regarding the chromatic semiotics of film marketing. While previous research has highlighted the symbolic meanings of colour in cultural or psychological contexts (e.g., Cerrato, 2012; Silveira, 2015), few have empirically examined the perceptual and emotional effects of colour in genre-specific film advertising using biometric tools. This research advances the field by integrating cognitive psychology, cultural semiotics, and visual marketing within the underexplored area of audiovisual promotional design.

Notably, our study empirically demonstrates that colours traditionally associated with specific genres (e.g., blue for science fiction, red for horror) may not align consistently with audience perceptions. For instance, participants associated orange (often linked with energy and playfulness) with trust when shown in the context of an action film, contradicting prior associations. This challenges the linearity of colour-meaning models, suggesting that genre context, composition, and cultural conditioning significantly influence colour interpretation.

This research advances colour-genre emotional congruence theory by proposing that affective reactions to colour are influenced not only by chromatic attributes but also by genre expectations and narrative cues in visual design. This nuanced perspective directly addresses Chen

et al.'s (2012) observation that the field lacks vocabulary and frameworks for assessing chromatic content, thereby offering a step toward methodological innovation.

## 5.2 Managerial and Practical Implications

From a practical standpoint, the findings hold immediate relevance for marketing professionals, film producers, and graphic designers involved in promoting cinematic content. Eye-tracking data revealed a central fixation bias (Calderón-Fajardo et al., 2024; Tatler, 2007), confirming that the spatial positioning of colours influences attention, regardless of hue or saturation. Therefore, the placement of key colours and symbols should be strategically considered in poster design, particularly for conveying genre cues within the first few seconds of exposure.

Furthermore, our results show that emotional associations with colours are not fixed but fluid, context-dependent, and subject to narrative framing. For example, the association of green with sadness (rather than freshness or harmony) in the *Boyhood* poster indicates that surrounding visual and facial cues may override culturally conditioned chromatic meanings. This suggests that designers must align chromatic choices not only with traditional genre palettes but also with the film's narrative mood. Marketers can also refine segmentation strategies by considering demographic and perceptual differences in colour-emotion mappings. As younger audiences may exhibit more dynamic or contradictory colour associations, adapting posters to specific regions or platforms could enhance engagement and conversion rates.

Ultimately, this study highlights the semiotic and emotional complexity of colour in film advertising. It confirms colour's essential communicative role but warns against universalising its meaning. By integrating biometric analytics with cultural and psychological frameworks, this research fills a significant gap in marketing, communication, and film studies, laying a foundation for future inquiries into how viewers interpret visual messages in promotional contexts.

## 5.3 Limitations and Suggestions

The primary limitation stems from the research design and methodology, which are constrained by the significant lack of information on the relationship between colour and film genre in the existing literature. This absence complicated both the research process and the

development of the studies, as prior research was not relevant to this investigation. Furthermore, convenience sampling poses a limitation that can be addressed in future studies.

To enhance understanding of the perception and impact of colours on individuals, it would be beneficial to replicate the studies in this research across different areas and products, specifically by employing more diverse palettes and altering the colour order for each participant. This would help to verify whether the choices and fixations made by the participants are, in fact, influenced by the "central fixation bias."

### Authors' notes

**Data Availability Statement:** The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. Due to privacy and ethical restrictions, raw survey data containing potentially identifiable information cannot be made publicly available.

**Ethical Approval and Informed Consent:** This study was conducted in accordance with the Declaration of Helsinki and institutional ethical guidelines. Formal ethical committee approval was not required at our institutions for anonymous, voluntary survey research. All participants provided informed consent before participating and were informed of their right to withdraw at any time. Participant anonymity was maintained throughout, and no personally identifiable information was collected. The privacy rights of all human subjects were strictly observed.

### Authors' Contribution

| Contribution               | Duarte, P. | Pais, H. | Filipe, S. |
|----------------------------|------------|----------|------------|
| Conceptualization          | X          | X        | X          |
| Methodology                | X          | X        | X          |
| Software                   | X          | ----     | ----       |
| Validation                 | X          | X        | X          |
| Formal analysis            | X          | X        | ----       |
| Investigation              | X          | X        | X          |
| Resources                  | X          | ----     | ----       |
| Data Curation              | ----       | X        | ----       |
| Writing - Original Draft   | X          | X        | ----       |
| Writing - Review & Editing | X          | X        | X          |
| Visualization              | X          | X        | X          |
| Supervision                | X          | X        | ----       |
| Project administration     | X          | X        | ----       |
| Funding acquisition        | X          | ----     | ----       |

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## Appendix - Palette Extraction

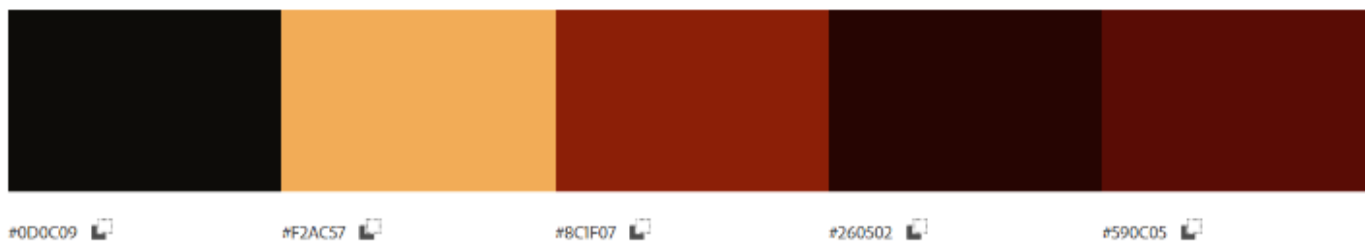
**Figure 1**

*Palette extracted from The Dark Knight (2008)*



**Figure 2**

*Palette extracted from Batman (2022)*



**Figure 3**

*Palette extracted from Tangled (2010)*



**Figure 4**

*Palette extracted from Luca (2021)*



**Figure 5**

*Palette extracted from Sweet Home Alabama (2002)*



**Figure 6**

*Palette extracted from Crazy Rich Asians (2018)*



**Figure 7**

*Palette extracted from The Avengers (2012)*



**Figure 8**

*Palette extracted from Dune (2020)*



**Figure 9**

*Palette extracted from Insidious (2010)*



**Figure 10**

*Palette extracted from Pearl (2022)*

