PIXAR's Colorscripts: Chromatic Analyses of Four Films Using Sens|Org|Int Model

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ABSTRACT

The objective of this study is to make chromatic analyses of the colorscripts of four Pixar films using Sens|Org|Int model. These analyses are intended to understand the use of color and their communicative intentions, as well as discuss communicative relationships between emotion and plot through the use of colors, identifying which aspects of chromatic perception are objective (physiological) and which aspects of chromatic perception are subjective or interpretive. The empirical research was conducted creating first an instrument of analyses for the colorscripts, based on the theoretical review. Results of the analyses indicate not only that Pixar uses color very coherently and effectively in terms of physiological visual perception, but also show which color uses and contrasts are mostly used and with which communication intentions. Also, the analyses convey a broad scope of color associations in films that could be useful for future chromatic projects.

KEYWORDS *colorscripts, emotional associations to color, animation, cinema, color communication*

RECEIVED 28/01/2022; **REVISED** 22/04/2022; **ACCEPTED** 31/07/2022

1. Introduction

The concept of colorscript (FIGURE 1) is a filming tool used in the production of some movies, mainly in animations. It allows us to see the full emotional mood that color brings to a film in a single glance, by arranging scenes side by side in a single plate. This process aims to plan and refine the visual and emotional rhythm of a film, so that it supports its story. (AMIDI, 2011)

According to Amidi (2011), the term colorscript was only recently adopted due to the great amplification, mainly by PIXAR, of its role in the film creation processes. There is some ambiguity about what constitutes a colorscript or at what stage in pre-production it should be done, there are several versions of the process, just as there are several artists to create them.

In this research, the objective was to analyze the associations of colors and emotions present in animation colorscripts, mapping objective (physiological) and subjective (interpretative) factors used for these associations.

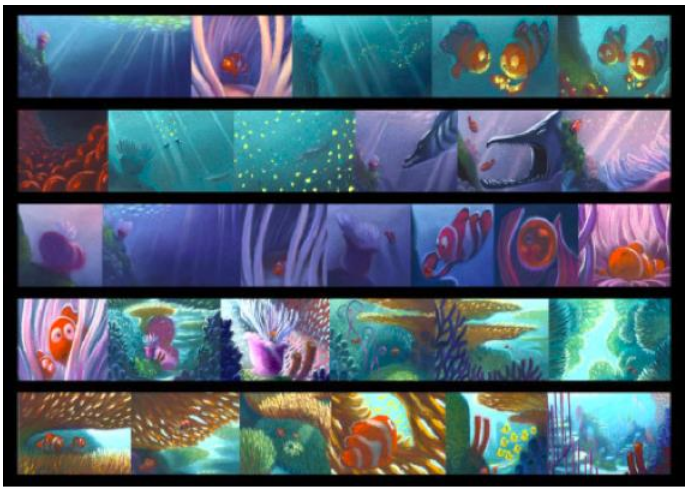

Fig. 1. Colorscript of the film "Finding Nemo" Source: The art of Pixar (2011)

2. Color in Cinema

To review the origin of color in cinema, the following authors were used: Barbosa (2007); Misek (2010); Costa (2005); Neale (1985); Reis (2016); Bordwell, Staiger, Thompson (1985); Sagen (2015); Braga (2000, 2011) and Hercules (2012), referring to the painting methods used, companies that stood out and the importance of color in narratives. The methods used include the non-photographic ones — hand painting, stencils, dyes, turnings and the Handschiegl process — and the photographic ones — Kinemacolor, Kinekrom, GaumontChronochrome, Cinecolorgraph, Kodachrome, Prizmacolor, Lumicolor, Dufaycolor, Gasparcolor and Technicolor.

2.1. *Colorscript*

This topic addresses the origin of the color-to-emotion mapping method used today by PIXAR's animated films. Its origins date back more than seventy years, and its first versions began as soon as color made its presence felt in the cinematographic world. According to Amidi (2011), in the mid-1930s, an initial colorscript process was created and employed in Hollywood live-action films by Natalie Kalmus, supervisor of Technicolor's color control department. Soon, the concept of colorscript came to Disney animated films in the 40s.

The idea of presenting the colors of an entire animated film, in a single piece of art, as they are done today, didn't fully materialize until the films made by United Productions of America, founded in the 1940s. Inspired in Disney's processes and with a team of artists who had already worked there, the UPA created "continuous color sketches" for their films in the mid-40s. (AMIDI, 2011) The modern resurgence of colorscript was brought on by Disney, more specifically, by artist Richard Vander Wende who painted scenes from the entire Aladdin movie. (AMIDI, 2011) According to Amidi (2011), the term colorscript was only recently adopted due to the great amplification, mainly by PIXAR, of its role in the film creation processes.

3. SENS|ORG|INT Model

Sens|Org|Int Model (Csillag, 2013; 2015) differentiates three processes that occur in human perception: sensory impressions, organizing processes, and interpretive processes of visual perception. The model was devised in an attempt to differentiate which principles of design tend to be common to all human beings with normal eyesight from the concepts that don't. Those that are not common therefore are learned or otherwise acquired. Therefore, this model unites the synthetic approach (Hering, 1964[1878]; Gibson, 1979), and the analytical approaches (Berkeley, 1709; Helmholtz, 1925; Bruce, Green & Georgeson, 2003), neuroscientific explanations (Chalupa & Werner, 2004; Knoblauch & Shevell, 2004; Pinna & Spillman, 2001; Shimojo, Kamitani & Nishida, 2001; Spillman & Levine, 1971; Zeki, 2000) on how the brain works, and relates them to design principles. With this framework, we are then able to tell, from the classical design "laws," which ones can truly be considered a principle that tend to be valid for all human beings from those that don't.

Sens variable (sensory impressions) is related to the sensory information received through the pupil in our visual sensory organ. This aspect of perception is a phenomenon that occurs in the eye only, still in the form of light, before it becomes neural signs in the retina.

Org variable (organizing processes) is related to organizing aspects of perception that occur starting in the retina, including what is considered the primary visual cortex, mostly in area V1 of the striate cortex. Org is related to the bottom-up approaches of visual perception in psychology. The phenomena of perception that occur as Org are what tend to be considered as principles of design.

Int variable (interpretive processes) refers to the elaboration of Org in the extrastriate visual cortex, including approximately areas V2, V3, V4 and V5 of the brain, and moving on to other areas of the brain. This variable refers to the top-down approaches to visual perception in psychology. It is in this moment of perception, that neural cascades occur, which undergo the interference of motivation, emotion, personality, culture, knowledge, etc. This aspect of perception causes variation and interpretation in design and in the proposed model, is called interpretive processes.

Figure 2 illustrates SENS|ORG|INT mode with the three variables.

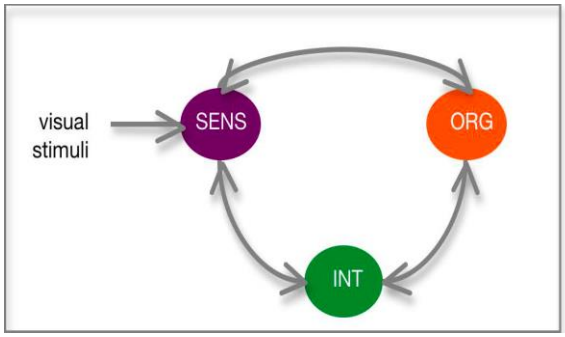

Fig. 2. Illutration of SENS|ORG|INT Model

4. Methodology and Empirical Research

The empirical research consisted primarily on the analyses of colorscripts, based on SENS|ORG|INT model. Thus, four PIXAR films were selected: *Finding Nemo, UP, Cars and Wall-e*. These were specifically selected as they represent some of the studio's early films and feature a wide variety of color usage. Following SENS|ORG|INT model, each colorscript was analyzed, in terms of objective percepts (ORG) and subjective percepts (INT). Due to space limitations, in this paper, only one example is illustrated below.

An important scene of the film "Finding Nemo", its colorscript indicates the moment when the character Marlin finds the only survivor egg after a shark attack to his nest full of eggs. The colors used in the real film feature a very important characteristic, observed using SENS|ORG|INT model. In terms of ORG variable (objective percepts), it is noted that the contrast of the egg color and its surroundings is a contrast that indicates a more saturated and thus brighter orange for the egg. And Marlin, when holding the egg on his fin, is featured with a desaturated orange (mixed with grey), indicating an orange with less brightness.

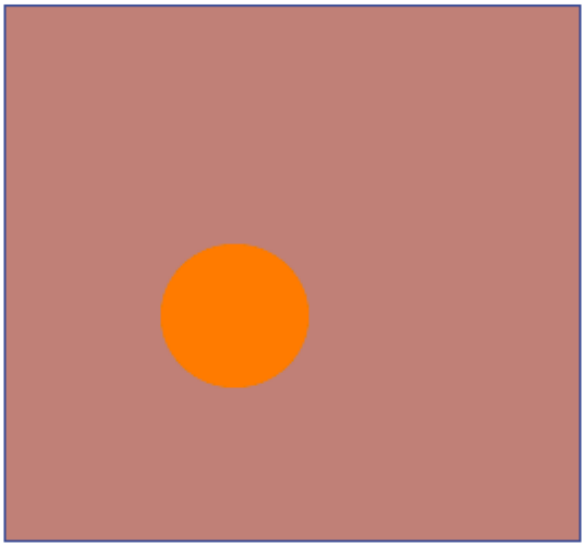

Fig. 3. Colors used in the egg scene of "Finding Nemo".

Figure 3 illustrates this use of color. Marlin's fin was featured in the film with a desaturated orange, the same color as the background of figure 3. The egg, which is the only survivor, and will become Nemo, is featured in saturated orange, as the circle in figure 3. Analyzing this scene in terms of INT variable, it is noted that the usage of a desaturated orange for the father is associated with his stressful feeling at this moment, and the saturated orange used in the egg is associated with brightness, life and hope. The real image of the film is not featured here due to copyright permissions. So, in terms of ORG, the perception of brightness of the orange is used for the egg, featuring vibrancy. This use of color only could connote several emotions, but here SENS||ORG|INT model helps understanding the use of color, thus in terms of INT, the symbolism the pure hue connotes joviality, hope, and llfe. The desaturated fin, in terms of ORG, is

perceived as less vibrant, and in terms of INT, the symbolism of the desaturated fin relates to how the father is stressed and living a terrible moment.

5. Results and Final Considerations

Through the analysis made in the colorscripts of some PIXAR films, it was possible to draw conclusions about their uses of color. First, in a general context, there is a very precise use of both objective and subjective factors in PIXAR cinematographic works. The studio knows and uses its knowledge in order to always add meaning to its productions from the initial stage (colorscript) to the film.

In the analyses, in relation to objective factors (ORG variable), it was possible to observe a greater use of communication of spatiality through hot and cold or light and dark contrast. Then comes the communication of smoothness through contrasting pastels and saturation. Both stimulation and calm communication through hot and cold contrast and high vibration communication through complementarity contrast were equally used. Next, there is the communication of vibration through contrast of pure hues, and finally there is the communication of chromatic mutation through simultaneous contrast.

The greater occurrence of objective spatiality communication factors is due to the fact that the studio prioritizes, for the most part, highlights of the character or object in relation to its background or vice versa to attract the attention of the audience. In *Finding Nemo*, it is possible to observe a constant use of communication to highlight the fish in relation to the bottom. In the other films, however, there is a rotation, some scenes prioritize the characters while others, the setting. This power of choice between what should attract the most attention shows that PIXAR knows what it's doing and explores what best contributes to the understanding of its scene.

There is also a higher occurrence of smoothness communication through saturation contrast than through pastel tones. This choice shows a preference of the studio to bring softness, but also to create focuses of attention, which occurs in the saturation contrast, since in places where pure hue was used, these focuses are created. In the analysis of the film *Wall-e*, there was a choice to predominantly use the saturation contrast, while in the other productions the two cases happened - saturation contrast and pastel tones -, again showing that the studio has the knowledge to recognize which case is ideal for each type of communication.

In the communication of stimulation and calmness, it is possible to observe that in the films *Nemo* and *Wall-e* the intention of calmness is very present due to the existence of cooler tones in the analyzed scenes. In the films *Cars* and *UP – Altas Aventuras* there was a greater balance, in some cases there is a communication of calmness through the contrast between cool colors and in others communication of stimulation through the contrast between warm colors. This choice is mainly in line with the intention that the studio wants to convey at a certain point in the film.

The communication of chromatic mutation occurred once, in *Cars*, and is a little more complex as it requires the artist who creates the colorscripts to have knowledge of the change in the color of an image due to the color used in the neighboring image. This factor was very well explored in the film, with sunlight interfering with the color of the truck's shadow.

High vibration communication through complementarity contrast occurs in all analyzed films, as well as vibration communication through pure hue contrast. Vibration plays an important role in animations as it attracts the eye and generates vibration and dynamism, suitable for a child audience.

As for the subjective factors, it is observed that, based on the authors analyzed, PIXAR knew how to use colors well in the context of communication, allowing interpretations that enrich its plots. Subjective communication was widely used to confirm, mainly, the feelings of the characters in the scenes, which occurs in all the investigated films, in addition to also giving evidence of personality, which was again used in all productions. The subjective factors of colors were also used to accompany decision-making, as analyzed in the scenes of *UP – High Adventures* and *Cars*, in moments when the colorscript color is aligned with a certain decision that determines the direction of the film.

Finally, subjective communication (INT) is applied to reaffirm the role of a place or a character, as it happens in *Nemo*, *Carros* and *Wall-e*, in moments such as when there is a feeling of danger with jellyfish (*Nemo* movie), the trophy that must be overshadowed (Movie *Cars*) and the planet Earth that must represent neglect (film *Wall-e*). These and more examples show how subjective communication has been very well studied and constructed to allow a wide variety of emotions to enrich the film's plots.

The analyses carried out on the objective (ORG) and subjective (INT) factors only show how PIXAR masters the language of colors and methodically uses them to enhance its characters and stories with emotions, creating layers of interpretations and perceptions for its films.

In addition to mastering the objective factors, they also explore the subjective part of color well by contextualizing it in colorscript and film scenes in a way that enhances the communication of the story. It is hoped with this research that these studies and analyses can contribute to those interested in the area of film and animation production or even to other trainings such as design, serving as a guide for a conscious and expressive use of color.

6. Conflict of interest declaration

The authors declare that there is no conflict of interest regarding the publication of this paper.

7. Funding source declaration

This research was financially supported by ESPM College, by the Iniciação Científica Program (PIC). The financial support allowed full study dedication.

8. Short biography of the author(s)

Paula Csillag – Professor Doctor at ESPM College, since 1999, lecturing in the Design Department. Research interests are related to color communication, visual language, color perception and color trends.

Amanda Saibão – Graduate in Design at ESPM College.

Licensing terms

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