

## The social purge of colors: reflections on color preferences in Fashion and chromophobia

*O expurgo social das cores: reflexões sobre as preferências em cores na Moda e a cromofobia*

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**RESUMO:** Este estudo investiga as preferências de cores em diferentes tipos de roupas (casual, íntima, de dormir e social) no Brasil. Através de um questionário online, de abordagem quantitativa, com 501 participantes, descobrimos que o preto é a cor mais preferida dentre todos os segmentos, exceto em roupas de dormir, onde o cinza é preferido. As cores acromáticas em geral dominam as escolhas. Exploramos também a relação entre a preferência pelo preto, a cromofobia e o

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simbolismo sociocultural da cor. O estudo demonstra que as preferências de cores variam de acordo com o tipo de roupa, desafiando generalizações.

**PALAVRAS-CHAVE:** Design de moda. Teoria da cor. Preferências em cores. Linguagem visual. Styling.

**ABSTRACT:** This study investigates color preferences in different types of apparel (casual, intimate, sleeping and social) in Brazil. Through an online questionnaire, with a quantitative approach, with 501 participants, we discovered that black is the most preferred color among all segments, except for sleepwear, where gray is preferred. Achromatic colors generally dominate the choices. We also explore the relationship between the preference for black, chromophobia and the sociocultural symbolism of the color. The study demonstrates that color preferences vary depending on the type of clothing, defying generalizations.

**KEYWORDS:** Fashion design. Color theory. Color preferences. Visual language. Styling.

**1. INTRODUCTION**

In an increasingly fast-paced information environment and based on culture, thinking about innovative marketing and considering effective research strategies for the connectivity of a product or service according to consumers' interests are always necessary (Monteiro, 2022; Irgang; Barth, 2023; Rott; Barth, 2024). Therefore, when design has a holistic notion of what the consumer wants, it can be one of the possible ways to differentiate an artifact in such a competitive market. It tries to guarantee the consumer's immediate attention to that product (Funk; Ndubisi, 2006). Considering that color is one of the main elements that constitute the aesthetic-symbolic dimension of a product, consumers' color preferences play an essential role in this decision-making, as it serves as a means of differentiating between brands (Singh, 2006; Kiliç, 2011). Recent studies, such as those by Liang and Hangeldiyeva (2024) and Su and Wang (2024), reinforce the importance of color as a central element in differentiating products and capturing consumer attention in different markets.

It is understood that color plays essential roles in the consumer's psychological relationship with the product and its environment. It influences the behavior of these observers and can, at the same time, arouse and inhibit certain emotions, considering the strategies of the product developers (Rathee; Rajain, 2019). In fashion, color is considered one of the main elements, as it is in constant contact with the interrelationships of human communication existing in society (Jones, 2005; Dantas et al., 2020). Color directly influences the product-consumer relationship in a clothing

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product purchasing environment, being more specifically responsible for around 95% of the initial purchase perception (Okan Akcay, 2010). Thus, the focus on Fashion is highlighted as a design strategy.

Based on this, it is emphasized that previous research has indicated that color is one of the first elements of visual language in fashion products. With a focus on clothing, which enters a communicative dimension with consumers' cognition and attention (Jones, 2005; Pina, 2009; Treptow, 2013). In addition to all the factors that influence the preference of one color over another, the type of product can also influence these preference trends (Funk; Ndubisi, 2006; Beneke et al., 2015). The focus of research on clothing comes into play when it is understood that current theories do not always explain preferences for specific colors for a given type of product, such as jewelry, footwear, or clothing and its different segments.

Therefore, it was decided to study differences in color preferences focusing on types of clothing, more specifically the main segments that the investigated local fashion industry produces. To define the corpus of clothing products studied, signs of greater consumption by the local target audience that volunteered in this research were considered (SEBRAE, 2011). Based on this principle, as well as the authors mentioned above, the following research question was formulated:

**Research question:** *What are the influences of the main types of fashion segments on clothing color preferences? Furthermore, what influences do the demographic variables of age and gender represent in this process?*

The justification for this study is based on the knowledge of the need to understand the aesthetic-symbolic preferences of future consumers to bring this information as input to the creative/production sector. This ensures that products have a more prominent acceptance in the market (Löbach, 2011). The relevance of investigating information about color preferences for the design process was identified in studies that tested the participation and impact of the tendency to prefer specific colors over others in purchasing decisions, concluding about its validity and importance (Yu; Westland; Liu, 2017; Yu et al., 2018; Luo et al., 2019).

In the scientific sense, the construction of this knowledge can lead to the expansion of a specific area in the universe of color preference research, centered on a formal microuniverse in design, such as Fashion/clothing. This area lacks such studies (Grossman; Wisenblit, 1999). The



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development and consumption of fashion products are considered a living phenomenon in society. Therefore, subject to its laws that generalize, influence and are directly influenced by the environment in which it operates (Lipovetsky, 2009).

Therefore, this research aims to identify clothing color preferences for four specific fashion segments: casual, intimate, sleep, and social. By collecting this information, it is possible to discuss the role that binary genders, as well as age groups, play in clothing color preferences.

**2. FASHION SEGMENTATION: THE TECHNICAL AND INDUSTRIAL SIDE OF FASHION**

The fashion market is quite comprehensive. It is an industry that affects all groups and social strata, which is why it is necessary to segment it. Specifying which target audience, a given fashion product is aimed at makes the market more solid and direct. According to Harriet Posner (2015, p. 9) “The breadth and reach of fashion are enormous, ranging from a haute couture dress with ornate effects made by hand in an atelier in Paris to a simple t-shirt produced on a large scale in China”.

Several aspects can be considered when defining fashion market segments. Segmentation criteria can be defined as geographic, demographic, psychographic or behavioral (Treptow, 2013). Considering (a) geographic segmentation, it will consider the specificities of the country and city, giving relevance to the prevailing climate in the region; while (b) demographic segmentation, which will study consumer dynamics, the market will consider issues such as age, income, religion, ethnicity, among others, since these characteristics are not static and can vary over time. (c) psychographic segmentation will seek to understand how specific groups are formed, whether through habits or psychological traits that influence their consumption habits, and (d) behavioral segmentation will observe the consumer's use of the product (Treptow, 2013).

Some authors define segment, niche and clothing line differently. From this, we created a synthesis of the main concepts covered by reference authors in the field of Fashion, as presented in Table 1.

**Table 1** – Delimitations of segments, niches and clothing lines by the main fashion authors

Authors	Fashion segment	Fashion niche	Clothing lines
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<p>Herriet Posner (2015)<sup>18</sup></p>	<p>Haute couture, luxury, intermediate market, or low-price product market</p>	<p>It is the subdivisions of segments, examples: eveningwear, formalwear, wedding, and parties.</p>	-
<p>Sue Jekyn Jones (2005)<sup>7</sup></p>	<p>Women's fashion, men's fashion, and children's fashion</p>	<p><b>Women's fashion:</b> haute couture, designer stores, classic, best stores, and shopping centers, middle-class market, economical prices, luxury stores, designer stores, youth fashion, advanced fashion, bridge fashion, new trends, own label, high-priced stores, medium prices, economical prices, and mass-market</p> <p><b>Men's fashion:</b> Tailored tailoring, designer stores, sportswear, couple fashion, best stores and shopping centers, economical prices, bridge fashion, side dishes (shirts and ties), sportswear, medium prices, popular, supermarkets</p> <p><b>Children's fashion:</b> Newborn, baby, first steps, girls, boys, and teenagers</p>	-
<p>Doris Treptow (2013)<sup>9</sup></p>	<p>Men's, women's and accessories, Vanguard, fashion, and traditional or segmentation following the use that the consumer will give to the product (beachwear, party clothes, or professional uniforms)</p>	-	-
<p>SEBRAE (2016)<sup>11</sup></p>	<p>Clothing, socks and accessories, home line, and others (not specified)</p>	-	<p>Casualwear, promotional, professional and uniforms, underwear, jeanswear, beachwear, school, sportswear, socialwear, and sleepwear</p>
<p>Elinor Renfrew e Colin Renfrew (2010)<sup>60</sup></p>	<p>Children's fashion, footwear and accessories, knitwear, jewelry, and business uniforms</p>	-	-





Richard Sorger e Jenny Udale (2006) <sup>19</sup>	-	Womenswear, menswear, and childrenswear	Casualwear, Jeanswear, Sportswear, Swimwear, Underwear, Eveningwear, Showpieces, Tailoring, and Knitwear
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Source: Prepared by the authors according with researchers in the field

Therefore, it was possible to understand the definitions and differences between fashion segment, fashion niche and clothing line through the elaborated table. Thus, the definitions of fashion segments are based on the gender or age of the target audience, such as man, woman, or child. However, the concepts found within the clothing line are more interesting for the context of this research, as it specifies its delimitations based on the shape of the product or its use. Therefore, this research focused on clothing lines, and it was decided to change the name from ‘clothing line’ to ‘fashion segment’ to have a more assertive holistic communication.

It was identified that the clothing line with the highest revenue in the region studied – Seridó, Rio Grande do Norte, Brazil – is casual, followed by clothing with a promotional focus (SEBRAE, 2016).

Keeping in mind the authors consulted, it was observed that the SEBRAE<sup>6</sup> report (2016) was the most cohesive regarding the studied environment; Therefore, we chose to define the fashion segmentations investigated in the context of this article with a focus on casual, intimate, sleep and social, corroborated as valid in fashion research by Richard Rorger and Jenny Udale (2009). The justifications for this choice are based on the results found in the SEBRAE report (2016) that these are the main types of clothing consumed in the region. This way, the public can provide more assertive and honest responses when purchasing these products.

From the selection of segments, it is possible to exclude all those whose chromatic design construction does not allow selections, as their colors are limited to an environment that has a

<sup>6</sup> Sebrae is the “Brazilian Support Service for Micro and Small Businesses”, a Brazilian private non-profit social service entity, created in 1972, which aims to form and promote the economic development and competitiveness of micro and small businesses, stimulating entrepreneurship in the country.



specific dress code. Therefore, it does not follow a free choice, such as promotional, professional, uniforms, and school segment. Afterwards, the central hypothesis of this research revolves around:

***Hypothesis 1.** Apparel color preferences between fashion segments differ significantly when compared to each other.*

### 3. BRIEF THEORETICAL BASIS ON COLOR PREFERENCES AND THEIR RELATION TO FASHION

Color is part of everyone's daily life, but the individual perception of a given object is different (Holtzschue, 2011; Chung; Yip, Ng, 2021). Color is a sensation understood by the human brain through light stimuli received by the eyes, deciphering them (Silveira, 2015). Therefore, color is present in all everyday situations. In Fashion, this relationship would be no different, as colors are also associated with changes in trends (Scully; Cobb, 2012).

Preferences for specific colors over others in fashion products are sometimes related to personal taste or different design choices, with a focus on transmitting some feelings to the human being's cognition when purchasing a certain product (Pina, 2009). According to Modesto Farina (2006), an important Brazilian color researcher, color has a triple action: to impress, to express and to construct; color is first seen, then felt, causing some sensation, and then constructive because it has its value and language for the recipient (Farina; Perez, Bastos, 2006).

The colors are very distinct and can vary in tone depending on the light that falls on the observed object. As for the term "hue", it can be defined as "pure" color without adding black or white. Color saturation can be defined based on its degree of purity, how much the color mixes with gray, thus obtaining variations of the same color. As for the color clarity dimension, we can define it as the color's ability to reflect light (Holtzschue, 2011; Sherin, 2012).

Although several authors affirm the relativity of hot and cold colors depending on adjacency and interactions (Albers, 2013), other authors designate divisions for these categories, as shown in Table 2, in which colors are divided into warm, neutral and cold (Sherin, 2012). Warm colors are more vibrant, ranging from red, orange, and yellow. Neutral colors are grayish tones, as well as white and black. Cold colors convey a feeling of comfort, there are lighter colors such as blue, green, and purple (Holtzschue, 2011; Sherin, 2012).

Research in color preferences, in general, is reasonably new, having been just over 100 years old since its inception (Yu; Westland; Li, 2020). The first evidence came through the studies of J.



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Cohn, more specifically in 1894, where the author discussed the tendency to prefer color because of a subjective and individual taste with which subjects were born. Cohn argued that it was possible to identify, at that time, that the most saturated colors were the most pleasant for the groups of interviewees (Taylor; Clifford; Franklin, 2013).

**Table 2** – Classification of colors into warm, neutral and cold

Warm	Neutral	Cool
Pink, Red, Red-orange, Orange, Orange-yellow, Yellow and Yellow-green, brown	Black, Gray, and White	Green, Green-blue, Blue, Blue-purple, and Purple

Source: Expanded from Rathee and Rajain (2019)

Later, in research that delimited a considerable advance in color preferences, Eysenck (1941) discussed the role of gender differences in these preferences. Their considerations revolved around the lack of significant difference in perception between genders, concluding that, to a certain extent, men, and women tend to prefer colors equally. The first group demonstrated a greater preference for orange, while the second he preferred yellow more (Eysenck, 1941). In subsequent studies, it was identified that female children tended to prefer pink, females preferred reddish tones, while male children and male adults preferred lighter blues (Burkitt; Barrett; Davis, 2003; Ling; Hurlbert; Robinson, 2006).

In short, throughout the history of color preferences, divergences have been identified not only regarding genders, as mentioned above, but also regarding ages and geographic locations. So, it can be concluded that your age, gender, and place of birth and growth of individuals play an essential role in defining their color preferences. This directly influences choices (Childt; Iwao, 1969; Dittmar, 2001; Lee; Gong; Leung, 2009; Mikellides, 2012; Ou et al., 2012; Bonnardel et al., 2018; Nemcsicsic; Takács, 2019). The most recent research found a difference in the responses of male and female people but failed to find a difference in the responses of people in the UK compared to China (Yu; Westland; Li, 2020).

The most accepted theory today revolves around that color preferences exist due to the interaction between humans and the colors of everyday objects and products/artifacts. Called ecological valence theory (EVT), this theory explains both color preferences from a more individualized and collective perspective (Palmer; Schloss, 2010). As an example, it is possible to deal with people's relationship with spoiled food and the refusal of colors such as green, yellow,





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and brown in specific contexts, that is, negative. Furthermore, the preference for bluish tones and the relationship with the sky and clean water, positive relationship (Taylor; Franklin, 2012). More recently, this theory has been applied in Arabia, as seen in the research of Al-Rasheed, Franklin and Maule (2022). In the study, participants associated colors with objects and concepts, classifying the affective valence of these terms and evaluating the degree of correspondence between colors and terms. According to the authors, Saudi color preferences were similar to those of other cultures, with a minimum in dark yellow and a peak in bluer tones. Therefore, they concluded that EVT explained a substantial amount of the variance in Saudi color preferences, with object associations being a stronger predictor than conceptual associations.

In design, Wagner, Kilincsoy, and Vink (2018) investigated color preferences for car interiors. As a result, the researchers identified brown and beige as the preferred colors for the main components of automobiles, except for the belt, where black is preferred. Still, they observed that there was no significant difference in color preferences between genders (Wagner; Kilincsoy; Vink, 2018). In similar research, Jiang et al. (2020) sought to verify the color preferences of teenage children in relation to bedroom furniture. In this context, the authors found light blue, light red and white as the preferred colors, while dark yellow, dark red and black were the least liked colors. Furthermore, unlike the research by Wagner, Kilincsoy, and Vink (2018), Jiang et al. (2020) identified a significant difference in color preferences between genders for teenage children.

Although these results were found for products and environments, they cannot be extended to fashion, where there is still a minimum number of studies. One of the most recent studies was research carried out in different regions of China, testing the relationship between personality and color preferences in clothing (Xing; Gu; Liu, 2018). According to the results, researchers identified that consumers in the Beijing, Tianjin and Hebei area, as well as those in the Cheng-Yu area, preferred yellow and magenta colors. In comparison, consumers in the Pearl River Delta region showed preferences for all colors classified as warm and blue. However, consumers in the Yangtze River Delta region prefer a stronger color combination style. Overall, the authors commented that those in Western countries have different preferences in clothing tones than consumers in China, who prefer warmer colors (Xing; Gu; Liu, 2018).

More directly within the theoretical scope of this research, in works published in 2020 and 2021, the researchers sought to identify the traces of preferences in colors intended exclusively for

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fashion products of a group of consumers with investment in a city in the interior of Brazil (Dantas et al., 2020a; Dantas et al., 2020b; However, its limitations were identified because it did not delve into specific segments of the existing triad in the production area of the fashion industry, which are characterized as clothing/clothing, accessories and footwear (Jones, 2005; Treptow, 2013). The authors, then, simply dealt with color preferences for “fashion products” and did not specify in which artifacts this preference projection was found (Dantas et al., 2020a; Dantas et al., 2020b; Dantas et al., 2021).

As a result of this applied methodology, the results determined that black is the color of general preference between genders when it comes specifically to fashion products (Dantas et al., 2020a; Dantas et al., 2020b; Dantas et al., 2021). In agreement with this research, Jian Feng Zhang (2013) in the world of fashion/clothing, defines the color black should also be more accepted in the Chinese environment. The author mentioned above concluded that “Style and color research shows that black suits all styles and is accepted by 90% of men and women” (Zhang, 2013, p. 476). When looking at hue groups and comparing genders, women tended to prefer the pink and violet hue types to a greater extent and men the bluish ones (Dantas et al., 2021). It was possible to open a discussion about genders preferring fashion colors in different ways, based on the current sociocultural thinking of the analyzed society, which indicates blue for men and pink for women. High refusal to greenish colors was also found from the perspective of both sexes (Dantas et al., 2020b; Dantas et al., 2021).

Based on this work, the study carried out in this research translates as the continuation of an already existing line of research. This study expands the group of consumers surveyed and tests a new methodological vision of data collection, which is virtual, mainly due to the COVID-19 pandemic. It was also decided to define the groups of clothing products in which these color preferences would be searched, employing the appropriate visual aids. These decisions were taken based on the idea of transforming this topic into an even more in-depth approach, as it becomes increasingly possible to generalize and debate its results. This made them the starting point for the existence of these color preference trends in apparel.

The other two hypotheses explored in this research in relation to this part of the literature review are the following:



***Hypothesis 2a.** Color preferences between fashion segments and binary genders have a significant difference.*

***Hypothesis 2b.** Color preferences in fashion segments for age groups have a significant difference.*

## 4. METHODOLOGY

### 4.1 PARTICIPANTS

The participants in this research were made up of men and women with ages ranging from less than 18 years old to more than 50 years old. The virtual survey obtained a total of 501 responses from just one mesoregion in the Brazilian state of Rio Grande do Norte, called Seridó, located in the Northeast region of Brazil. The goal was to have better control of the universe for future research. The Seridó region has 310,067 inhabitants and, for data collection, non-probabilistic convenience sampling was used (Malhotra, 2006; Hu; Qin, 2018). From this context, 313 female respondents and 188 male respondents were collected. Table 3 presents a summary of basic demographic data based on the respondents' profile, showing the relationship between participation levels between genders and their different age groups.

In compliance with ethical principles, all participants filled out a TALE (Free and Informed Assent Form), for minors, duly accompanied by the email address of those responsible, with subsequent contact for authorization and validation of responses; as well as a TCLE (Free and Informed Consent Form), for volunteers who were already of legal age.

All participants who had their responses validated completed the Ishihara test to demonstrate that they were not deficient in color visualization (Ishihara, 1987). Consequently, there were no inconsistent influences on the outcome of this research.

**Table 3** – Participants profile

Category	N = 501
Gender	62,5% = Female 37,5% = Male



Age

13,8% = Under 18  
55,7% = 18 to 29 years old  
19% = 30 to 39 years old  
8,4% = 40 to 49 years old  
3,2% = Above 50 years old

Source: Prepared by the authors

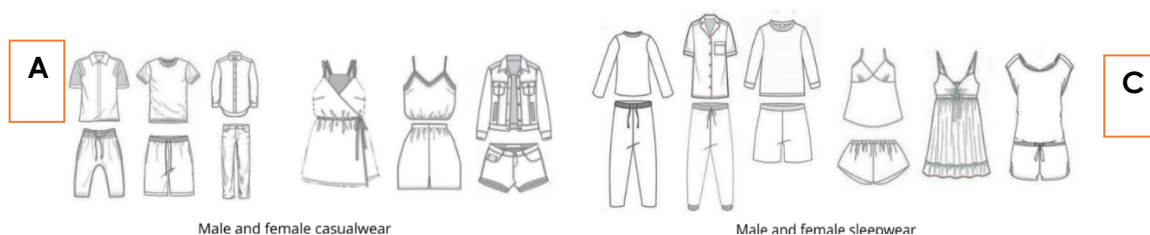
## 4.2 APPAREL SAMPLES

Based on the literature review previously carried out on fashion segments, it was decided that the types of products that would be implemented in the research to be analyzed on color preferences. This would follow justifications based on the local scenario of textile-clothing production, as well as aspects of the geographic environment. Which is reflected in the characteristics of the clothes used in the region.

Given these propositions, the climate of the Seridó region, in the state of Rio Grande do Norte, Brazil, is known for having high temperatures. Therefore, including cold types of clothing or segments focused on bulky clothing would become inconsistent with the region. In summary, the segments defined were casual (A), intimate (B), sleeping (C) and social (D), that is, those most common fashion segments. It should be noted that the sports and beach segments were also investigated, but this article focuses on the four mentioned above.

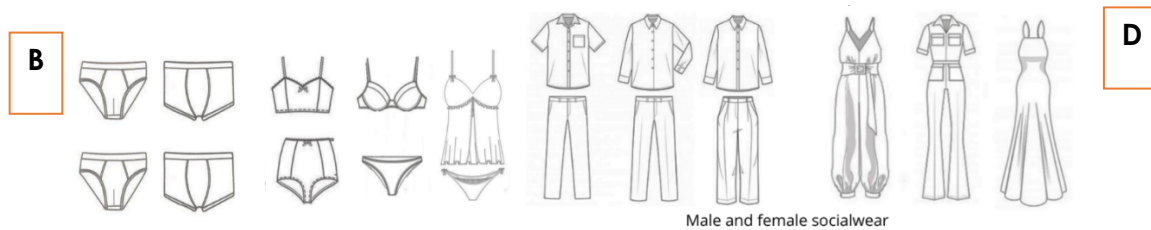
The research used technical drawings of clothing products available on the internet and drawn only with a gray line and a completely white background, shown in Figure 2 to create a better immersion. This choice makes it clear to volunteers which types of fashion segments were mentioned at the time of the research. To this end, we chose to select three types of models for each gender within each segment. The chosen models followed the most popular styles in the fashion world and, in turn, were able to effectively identify the segment studied (Figure 1).

**Figure 1** – Technical drawings used in the research as an example of the Fashion segments



Male and female casualwear

Male and female sleepwear



Male and female underwear

Male and female socialwear

Source: technical drawings prepared by the authors according to images available on the internet

#### 4.3 COLOR SAMPLES

The color sample used in the research contained a total of 16 color types. Three primary colors were selected (yellow, magenta, and blue), three secondary colors (green, yellow, and purple) and six tertiary colors (blue-purple, blue-green, yellow-green, yellow-orange, red-orange, red - violet) (Berlin; Kay, 1991; Barros, 2011). Furthermore, the achromatic colors black, white, gray, and brown were added, brought as basic and essential hues for design in the research by Carla Pereira (2011). Therefore, the sample presented to respondents can be seen in Table 4.

**Table 4** – Color samples used in the research

N	Hex	Sample	Name	L*	a*	b*
1	#3d66fe		Blue	49.06	38.00	-79.50
2	#ff1616		Red	53.92	78.48	61.57
3	#fff15d		Yellow	93.86	-12.19	70.62
4	#4cbb17		Green	67.38	-57.58	64.11
5	#ff771c		Orange	65.39	47.48	67.60
6	#78226b		Purple	29.91	45.56	-23.03
7	#5445a0		Blue-purple	35.35	30.34	-47.51
8	#5ce1e6		Green-blue	82.82	-34.50	-13.31
9	#d9df03		Yellow-green	85.77	-21.96	84.56
10	#ffbd59		Yellow-orange	80.95	13.97	58.43
11	#ff5757		Red-orange	60.57	63.54	35.80
12	#ff66c4		Pink	65.55	67.52	-19.60
13	#82441e		Brown	35.93	23.49	33.82
14	#000000		Black	-90.23	7.18	3.24



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15	#ffffff	White	100	0.01	-0.01
16	#d9d9d9	Gray	80.6	- 0.19	1.61

Source: Prepared by the authors

The variation of colors that comprise the sample of this work focused on the study of different hues, therefore, specific issues related to the saturation and clarity of colors were not considered within the scope of this investigation. It is understood that, in Fashion, the possibilities for color choices by the consumer tend to be broader, however, as this is an exploratory and initial study, for now, we tried not to delve into these issues in depth.

It is essential to remember that this is a questionnaire administered virtually. Therefore, the identified responses were influenced by external factors of color conversion and screen calibration of each user, which results in don't be possible to guarantee the fidelity of the planned colors (Cheung; Westland; Thomson, 2004; Yu; Westland; Li, 2020).

**4.4 SURVEY PROCESS**

In this work, a virtual questionnaire was developed on the Google Forms platform. This decision was based on what was discussed in the recent study by Yu, Westland and Li (2020), which aimed to study the most effective research methods on color preferences, “The similarity between the results obtained from these two experiments provides some validation for the online protocol. It suggests that online experiments can be used more frequently (despite the relative lack of control)” (Yu; Westland; Li, 2020, p. 10, our translation). According to the literature, it is understood that the method of applying a virtual questionnaire for research on color preferences has not changed significantly compared to in-person (Yu; Westland; Li, 2020). In fact, this methodological choice allows mapping a more significant number of respondents – for example, n = 501 in the present research, compared to n = 170, obtained in previous research, carried out in person – justifying the choice of the virtual study method.

As for the structure of the questionnaire, it followed a simple logic divided into fundamental steps: free and informed consent form (TCLE – adults) or free and informed consent form (TALE – minors), to meet ethical criteria; demographic research; initial recognition;



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delimitation of color preferences; and Ishihara test. The first part presented the research content exploring these steps more specifically, where respondents were sent to the next step after clicking “I agree to participate”. Next, the demographic survey aimed to identify the gender, age group, hometown and current age of the respondents, as well as how many years they had lived in this final location. Thus, being able to exclude questionnaires from people who did not fit into the pre-determined location — Seridó region, Rio Grande do Norte, Brazil.

A condition was implemented in the questionnaire, where respondents who identified as male would be taken to a part that would only present designs of male clothing, and this also happened with female clothing. This decision was made so that volunteers would be confronted with visual stimuli of clothing products that they could potentially use. In the next part of the research, they were asked to express whether they consume the type of fashion segment presented, exposing them currently with images of technical drawings for identification. This enabled people to respond only about the types of clothing they make use – those who answered no were asked to express the reason for not consuming and were sent directly to the following type of segment.

The central part of the questionnaire, that is, preferences, was subdivided into two parts when classifying color preferences in clothing products. (a) It was asked whether the respondent consumed the type of segment presented or not. (b) Then, the respondent was asked that, considering that fashion segment that is being exposed, the respondent selected 3 of the 16 colors presented considering the ones he liked the most.

After the central part of the questionnaire, (c) respondents were asked to perform an Ishihara color test. At this stage, it was possible to identify people with color deficiency so that data from volunteers who were unable to visualize colors properly could be excluded, with no impact on the results. Even people with difficulty visualizing chromatic elements were able to complete the questionnaire, but their answers were considered invalid and transferred from the central database to a second part, to be disregarded. The data were processed using basic descriptive analysis, correspondence analysis and chi-square (p-value) identification, using the R and XLSTAT software.

To ensure the validity of the questionnaire used in this study, a content validation process was carried out, involving experts in the field of fashion and design. These experts reviewed all questionnaire questions to ensure they were relevant, understandable, and appropriate to the study

context. Additionally, a pilot test was conducted with a small sample of participants, allowing adjustments to questions to eliminate ambiguities and improve clarity.

## 5. RESULTS

### 5.1 APPAREL COLOR PREFERENCES FOR CASUALWEAR

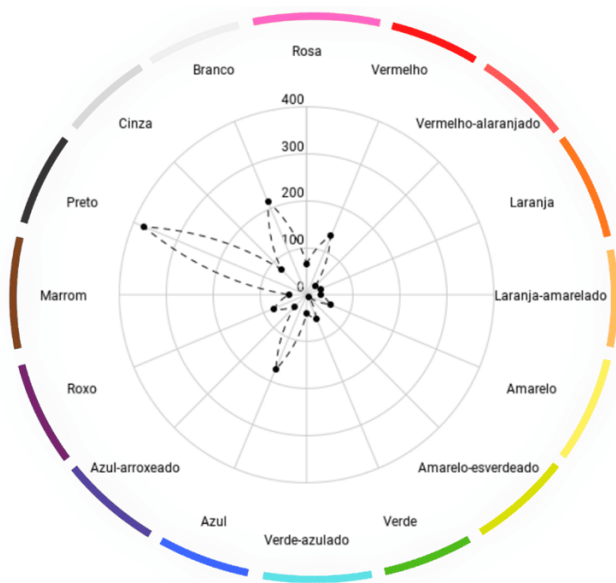
Among the 501 individuals who responded to the general survey, 480 people (95.81%) indicated that they consume casual fashion clothing products so that there were 1440 mentions of color preferences for this segment – 3 mentions from each participant (Figure 2). In relation to people who reported not consuming, the motivations were found in the lack of occasions that would allow this daily use, in physical discomfort, and in the uncontrollable factors of clothing choices being guided by medical prescriptions. So, there are no individual choices in this sense.

At this stage of the research, 297 of the respondents were female and 183 were male, with distribution across all age groups. The results strongly suggested that black has the majority preference (26.11%), with a significant difference for the other colors that appear next, such as white (15%), another shade with a neutral and achromatic characteristic. Regarding the chromatic tones that come next on the preference scale, those that could identify the greatest highlights were the colors blue (12.01%) and red (9.44%). The other colors showed low participation.

Figure 2 – Apparel color preferences result in casualwear

Casualwear	Female (n = 297)				
+	26,37%	15,38%	9,20%	9,09%	6,51%
-	0,56%	2,36%	2,47%		
Casualwear	Male (n = 183)				
+	25,68%	10,58%	14,39%	10,02%	9,29%





Source: Prepared by the authors. Note: “+” symbol = most favorite colors; “-” symbol = least favorite colors

Regarding differences and convergence between genders, it was identified that the results showed a significant difference in preference relationships ( $x^2 = 87.334$ ,  $df = 15$ ,  $p\text{-value} < 0.001$ ). Therefore, men and women prefer colors in different ways in casual fashion. Interpreting the graph, it can be seen from Figure 2 that the only difference between the most mentioned colors was gray – more preferred by men and less preferred by women – and pink – more preferred by women and less preferred by men. The other four colors that presented the highest selection index were common to both groups, although at different levels, mainly in the hues considered basic, both chromatic (red and blue) and achromatic (black, white, and gray). Regarding age, it was found that there is a significant difference in color preferences between the age groups studied in the casual segment ( $x^2 = 127.41$ ,  $df = 60$ ,  $p\text{-value} < 0.001$ ).

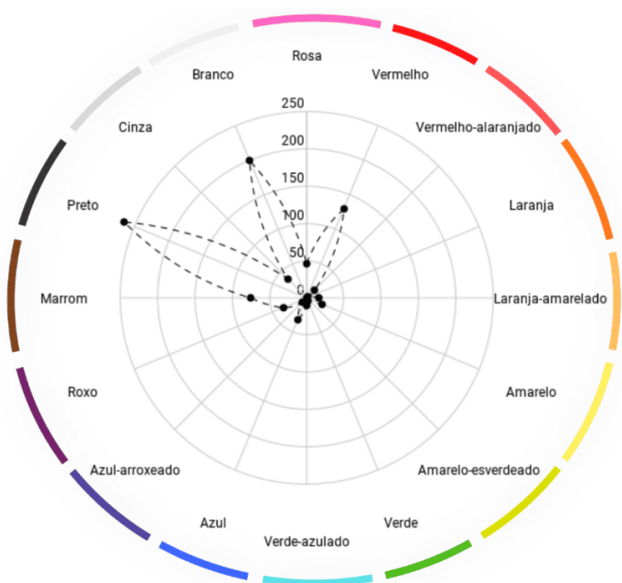
Regarding color clarity, clothing with neutral/achromatic tones showed the greatest preference (46.39%), followed by warm tones (27.08%) and only then cold tones (26.53%). Both genders agreed on their preference for neutrals, but females tended to prefer warm tones to a greater extent, and males showed a greater focus on cold tones.

## 5.2 APPAREL COLOR PREFERENCES FOR UNDERWEAR

Among the 501 volunteers who participated in the general survey, a sample of 484 people expressed consumption of products in the underwear segment, with a total of 1452 mentions of color preferences that were cataloged for this segment (Figure 3). In the case of those who indicated that they did not consume this type of clothing, their motivations were found in their personal conceptions of not using underwear, due to the physical discomfort caused in the user-product interaction. Furthermore, others stated that they do not consume products for their aesthetic aspects, but for technical convenience, even though this treaty is not the focus of this research.

This fashion segment received responses from 299 people who declared themselves females and 185 males. The responses again point to the color black (29.06%) as having the greatest trend in the fashion world, followed by another achromatic shade, white (21.21%). Only then was a characteristic chromatic tone mentioned, red (12.95%). Furthermore, a significant difference in color preferences was identified between genders for this segment ( $\chi^2 = 163.17$ ,  $df = 15$ ,  $p\text{-value} < 0.001$ ), as well as a significant difference between age groups was also identified ( $\chi^2 = 79,538$ ,  $df = 60$ ,  $p\text{-value} = 0.04653$ ) (Figure 3).

Figure 3 – Apparel color preferences result in underwear



Underwear	Female ( $n = 299$ )				
+	29,54%	22,30%	9,20%	9,09%	5,13%
-	0,00%	0,22%	0,56%		
Underwear	Male ( $n = 185$ )				
+	28,98%	19,46%	16,04%	11,53%	10,45%
-	0,18%	0,18%	0,36%	0,72%	

Source: Prepared by the authors. Note: “+” symbol = most favorite colors; “-” symbol = least favorite colors

In relation to the level of color clarity, products with neutral colors had the highest selection, 58.88%, followed by warm colors (27.96%) and only lastly, a preference for clothing with cold colors (13.15%). Again, both genders agree on the tendency to prefer a set of neutral colors. In addition to the preference for neutral, females tended to give greater preference to warm tones, and males showed a greater focus on cold tones.

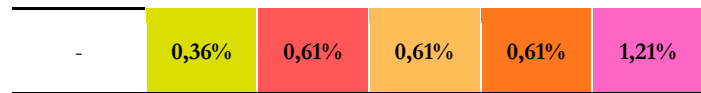
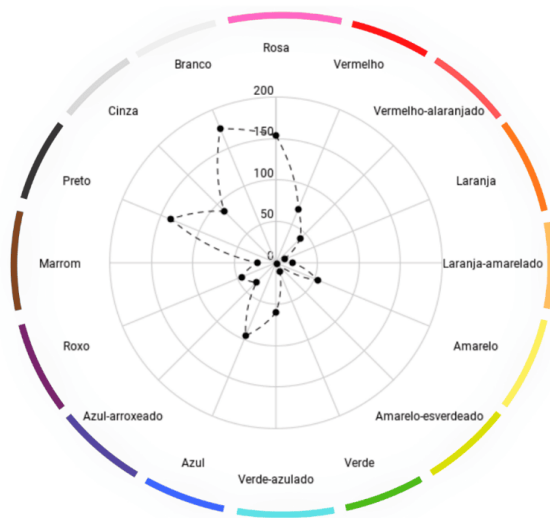
### 5.3 APPAREL COLOR PREFERENCES FOR SLEEPWEAR

Among the 501 volunteers who participated in the virtual survey, 340 indicated that they consumed products from the sleepwear segment, which comprises a total of 1,020 color selections to be counted (Figure 4). In relation to those who indicated that they do not consume, the motivations are centered on the use of old or worn-out clothes from another fashion segment that has been reformulated to become sleepwear. On the other hand, some explained that they prefer to sleep without clothes, mainly due to the high climatic conditions that affect the studied scenario, so that the consumption of the pajama's product is not a necessary reality.

A total of 285 female responses and 55 male responses were collected. Unlike the other segments presented so far, sleepwear products were the only ones in which black did not show an excessive degree of preference, appearing just below the first selections. The preference trends in this segment revolved around the colors white (17.16%) and pink (15.10%), only then being black (13.43%) mentioned.

Figure 4 – Apparel color preferences result in sleepwear

Sleepwear	Female (n = 285)				
+	17,78%	16,61%	13,33%	8,30%	7,49%
-	0,23%	0,82%		1,17%	
Sleepwear	Male (n = 55)				
+	20,61%	20%	14,55%	13,94%	7,88%



Source: Prepared by the authors. Note: “+” symbol = most favorite colors; “-” symbol = least favorite colors

Still in this segment, a significant difference was identified in color preferences between genders for the pajamas segment ( $\chi^2 = 87.23$ ,  $df = 15$ ,  $p\text{-value} < 0.001$ ). However, it has become clear that men tend much more positively towards blue-based tones, while women prefer warmer hues such as pink and red. It being a kind of intrinsic social construct that blue is for men and pink for women. In relation to age groups, it was possible to map a significant difference in color preferences ( $\chi^2 = 94.026$ ,  $df = 60$ ,  $p\text{-value} = 0.001$ ).

The questions regarding the sensations of color luminosity identified that, again, neutral tones tend to be more preferred (39.22%), followed by warm luminosity (36.37%) and only then cold ones (24.12%). Females preferred warm tone colors, followed by neutral ones, while men kept their majority of neutral choices, resulting in a set of cold colors.

#### 5.4 APPAREL COLOR PREFERENCES FOR SOCIALWEAR

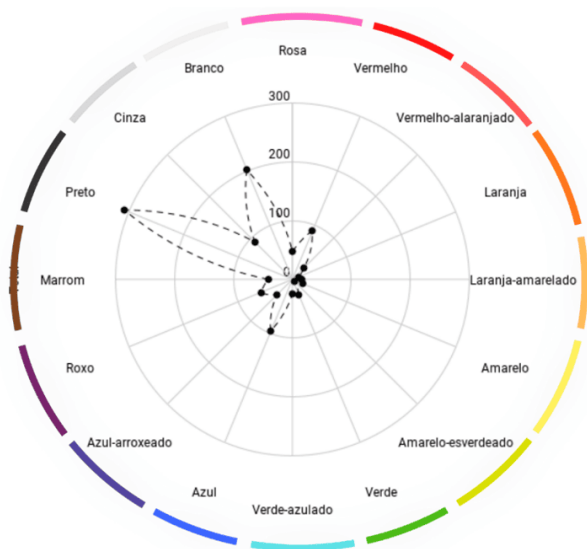
In the universe of 501 respondents to the general survey, 367 volunteers indicated that they consume social clothing products, so that a total of 1101 mentions of colors were collected in this part of the survey (Figure 5). People who responded that they did not consume defined, as motivation, the constant non-attendance of events that require this type of clothing.

This part of the research involved the participation of 237 women and 130 male volunteers. It was possible to identify a preference trend in this segment, which became predominantly black

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(28.07%) and white (18.35%). Other colors mentioned as medium to high were gray (8.17%), blue (8.63%) and red (8.08%), with little difference between them. This result comes close to the aesthetic possibilities that social clothing products present in the Brazilian scenario. It is common sense, in the local reality in which this research takes place, that the use of neutral colors is mainly centered on the triad of white, black, and gray. For attire that includes social events, such as business meetings, wedding parties, graduation, among other occasions, it is almost always a basic rule. In this segment, a significant difference was identified in color preferences between genders ( $\chi^2 = 83.55$ ,  $df = 15$ ,  $p\text{-value} < 0.001$ ), however, it was not possible to notice a significant difference between age groups ( $\chi^2 = 63.153$ ,  $df = 60$ ,  $p\text{-value} = 0.3656$ ).

**Figure 5 – Apparel color preferences result in socialwear**



Socialwear	Female ( <i>n</i> = 237)				
+	28,97%	16,03%	10,55%	7,17%	5,91%
-	0,70%	1,27%	1,83%		
Socialwear	Masle ( <i>n</i> = 130)				
+	26,41%	22,56%	15,38%	11,28%	4,10%
-	0,00%	0,51%	0,51%	1,54%	1,54%

Source: Prepared by the authors. Note: “+” symbol = most favorite colors; “-” symbol = least favorite colors

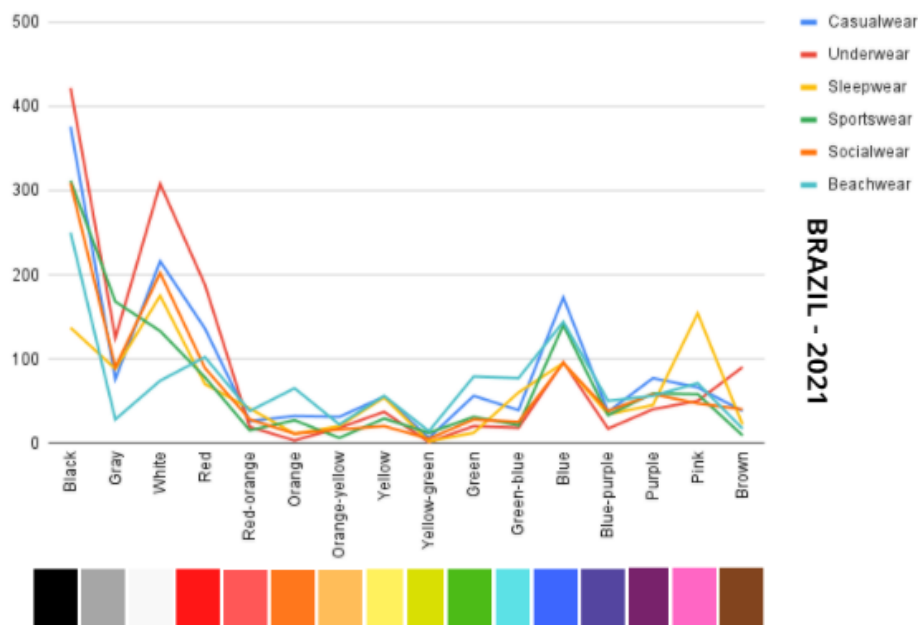
Regarding preferences regarding color luminosity, in the social fashion segment, the preferred set of neutral colors (54.59%) was, respectively, followed by cold colors (22.16%) and then colors hot (23.25%). Both women and men have a common tendency to prefer the neutral color set, but they diverge when the first group prefers warm colors and the second group tends, again, to prefer cold colors.

## 6. DISCUSSION: CHROMOPHOBIA AND SOCIOCULTURAL BEHAVIOR IN COLOR PREFERENCES IN CLOTHING

Considering the first hypothesis of this research, the idea was established and explored that there could be a significant difference in clothing color preferences between different fashion segments. The results indicated to accept this hypothesis. The data demonstrated a low, but statistically significant, difference in color preferences when comparing the four fashion segments investigated in this work. Therefore, it can be concluded that there are different ways to prefer color considering the type of clothing to be consumed – be it for social events, casual, intimate or when the individual goes to sleep.

Thus, it was also possible to find a solid point in common in all segments analyzed: the tendency to prefer the colors black, gray and white – the achromatic hues (Figure 6).

Figure 6 – Results of clothing color preferences by type of segment



Source: Prepared by the authors

Bringing as a focus of discussion the tendency towards preference for achromatic colors, especially in the current post-modern context, a very pertinent concept is presented by David Batchelor, the idea of chromophobia. This concept was popularized by the research and essays of the author when he states that “chromophobia manifests itself in the many and varied attempts to

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purify color from culture, devalue color, diminish its meaning, deny its complexity” (Batchelor, 2000, p. 23). In this sense, in Western culture, throughout the history of the production and application of chromatic pigments. This attempt to purify color from everyday contexts is centered on the valorization of black as a symbol of seriousness. Luxury, and elegance in fashion. This is enhanced for use by people from high social classes, as well as nobles and royalty (Pastoureau, 2008).

With this popular thought, anyone who wears clothing that contains a wider range of colors and, therefore, deviates from this pattern of using solely achromatic hues could be interpreted as infantilizing semantics. Or approaching the circus, running away from what it brings. Guimarães (2000), the idea that people who have a higher socioeconomic status tend to use fewer colors. That is, figures from the collective imagination known for their great use of colors, informal and not taken seriously, which is precisely opposed to the semantics of black in fashion. Based on these thoughts, Daniel Miller (2013, emphasis added, p. 54-55) asks in his essay, “Why can all other colors only aspire to be a substitute for black? Where and when did this happen?”, then adds: “Black may have some association with the chromophobia that seems to have possessed modernity occasionally.” It is explored that this is why we see this socially constructed collectivity also diffusely reflected in clothing color preferences, even in contemporary times, pointing to achromatic.

In the context of the sleepwear segment, it was observed that it was the only time in which the color black did not show a considerably significant preference among interviewees. The authors attribute this possibility to the sensorial sensation that black causes in the users' minds, which can bring them closer to something negative (Heller, 2013), and people do not want this proximity at bedtime, in a moment of possible vulnerability.

It was noticed that social construction has a strong influence on the establishment and popularization of a semantic thinking about color. In this case, essentially surrounding the color black in products in Brazil, found in several design products, such as packaging (Silva et al., 2019; Silva; Clementino; Gonçalves, 2021), not just in clothing, reaching the peak of preference for several reasons.

Therefore, color preferences in fashion products are directly related to the way people understand that color in a sociocultural way, about the image that the use of that color means to others within a specific culture (Dantas et al., 2020a). It can be seen and speculated, through

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empirical observation by researchers, that the symbolic, and not entirely intentional, use of black in Brazilian society is in line with socially disseminated semantic ideas, such as: “black provides a visual perception/ slimmer silhouette for those who use it”, or even that: “the color black is easily combinable with all other colors, with no concerns about errors in color harmonies”. Thus, it is observed that people tend to prefer the color black in fashion for a sense of functionality, being considered a key color in clothing. Regardless of the social context. However, studies are needed to validate these speculations.

**7. FINAL CONSIDERATIONS**

The orientation of consumption towards specific categories of products, especially in fashion, is conditioned by elements considered subjective to individual human cognition, since they are configured as a desire for possession. However, influenced by the social and cultural environment in which they live, these consumption guidelines have certain traits that come precisely from a collective meaning constructed in a historical and everyday way, based on the advancement of society. Meanwhile, colors, as an element used to transmit visual messages and assist in the aesthetic constructions of a product, have symbolic meanings that influence their perception and preference. Therefore, this research aimed to identify color preferences in clothing products, using virtual research methods to answer the central research question, and then understand whether gender, like age, impacts this set of preferences.

Starting from a general hypothesis that discussed the existence of a difference in color preferences when observing four main fashion segments. Through the data collected, it was concluded, that, in the Brazilian scenario, there is a significant difference between the color preferences of fashion segments. Still, when looking at this data in a general context, it was clear that black has a very high preference trend among all segments, except for sleepwear. The authors attribute this result to a possible symbolic thought established under the color black socially in the Brazilian context, from its power to convey the message of elegance to its user, through seriousness and the idea of effortless harmony. As well as to the thought increasingly more contemporary of chromophobia, also called fear of the use of colors.

Furthermore, it was also possible to identify that there is a significant difference in color preferences in fashion products between binary genders, such that men tend to prefer a certain



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group of colors, while women prefer others. These results are in line with the findings of authors in the context of color preferences in furniture (Jiang et al., 2020). However, at the same time, it was shown to be contrary to other research, such as in car interiors, where there was no significant difference between genders (Wagner; Kilincsoy; Vink, 2018). These results indicate that the sociocultural and semantic influences of colors are diffused between men and women in different ways. This relationship can be influenced by the socially constructed idea of pink for women and blue for men (Fortamann-Roe, 2011; Bonnardel et al., 2012; Heller, 2013; Ben-Zeey; Dennehy, 2014; Ihi; Numazaki; Tado'oka, 2019).

The same scenario could be confirmed for the age groups, in which there was a significant difference in all segments studied, except in the set of clothes in the social segment, in which this difference was not significant. In this context, it was mainly observed that those under 18 and those over 50 tend to prefer colors in diametrically opposite ways.

Considering such results, it is worth reflecting on the possible reasons underlying the identified color preference patterns which, as we suggest, may be predominantly cultural and social. Therefore, Fashion, as a social phenomenon, not only reflects but also shapes cultural perceptions and aesthetic tastes. Fashion trends, in many cases, are influenced by market logic and economic interests, where consumer preferences are, in part, driven by marketing strategies and the fashion industry. These dynamic highlights the complexity of generalizing such preferences, since they not only emerge from individual tastes, but are also constructed and modulated by a broader sociocultural and economic context. Furthermore, it is important to recognize the limitations of scientific fashion research when trying to uncover color preferences without considering the economic interests that often drive trends. Therefore, we also understand that fashion industries sometimes shape these preferences according to market strategies and commercial objectives, reflecting a logic of capital.

It should be noted that, in this research, we sought to identify the different color preferences in clothing in relation solely to the color hue dimension. Therefore, variations in saturation and color lightness were not applied to each of them in the samples. However, it is understood that the color sample worked on, composed solely of sixteen possibilities, mostly chromatic and saturated, does not represent the entire range of colors available in the clothing

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industry. Therefore, this fact is exposed as a research limitation and a plausible path for future research.

Although we have provided a perspective into how color preferences in different fashion segments operate in the Brazilian context, some limitations must be considered. The sample, although comprehensive, may not completely represent all regions and demographic groups in the country, limiting the generalization of the results. The use of self-report questionnaires can introduce biases, such as socially desirable responses, as well as limitations inherent to the color study process itself, such as variation in hue or saturation resulting from the different screens on which the questionnaires were answered. Furthermore, uncontrolled external factors, such as influences from global fashion trends, may have impacted participants' preferences. Finally, color preferences may vary over time, which suggests the need for longitudinal studies to capture these dynamic changes.

Still for future research, the researchers of this work indicate four possibilities: (1) replication of the method in other countries, to compare whether it presents a significant difference; (2) study whether the aesthetic aspects of the images (technical drawings) presented during the research influenced the responses obtained; (3) focus on the study of the symbolic discourses that the color black presence in the Brazilian fashion consumption scenario, in an attempt to test the hypothesis about the core of this preference trend; and, (4) conduct ethnographic research in the urban setting that this research investigated, to discover whether the subjective color preferences identified in this work reflect what is actually used in the environments researched.

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