

The impact of textile coloration technologies on fashion design

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Suggested Citation:

Sanad, R.A. (2024). The impact of textile coloration technologies on fashion design. *Global Journal of Arts Education*. 14(1), 1-11. <https://doi.org/10.18844/gjae.v14i1.9278>

Received from May 12, 2023; revised from December 15, 2023; accepted from February 15, 2024.

Selection and peer review under the responsibility of Prof. Dr.Ayşe Cakir İlhan, Ankara University, Turkey.

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Abstract

This study aimed to investigate the role of textiles' coloration technological aspects adopted by fashion designers in their jobs. This study's objectives are to analyze and describe the nature of fashion designers' adoption of textile coloration techniques to develop significant designs and brand identity. Five Famous high-end fashion design brands were studied to test the research hypothesis that coloration technology would form unique fashion design trends or brand identities. Images, Data, and information relevant to these fashion designers were analyzed and compared. This study found that several prominent, high-end fashion designers have employed the tie-dye coloring process frequently and differently. Some designers have depended on this method to establish a strong sense of identity for their brands. Since the term Tie-dye has been applied to all of its patterns, the process itself may be effectively used to sell the product. These findings suggest that tie-dye, as a coloring method, is a flexible method in the field of fashion design. It is recommended to build on this research by looking at further textile coloring techniques and their effects on the apparel and fashion industries.

Keywords: Consumer; dye; fashion; print; textiles; tie-dye; trend

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1. Introduction

Fashion design is a kind of art focused on developing creative clothing and accessories. The principal items that fashion and clothing designers use are textile or non-textile materials or fabrics which can be obtained from natural or artificial sources (Shuvo, 2020). Production of materials especially in the coloration process produces a high level of environmental pollution and should be managed optimally in eco-friendly conditions (Zeitoun & Selem 2023). Fabrics used in fashion design play a pivotal role in shaping and forming these designs. The initial analysis of these designs, with a focus on the materials used in the development, would highlight the aesthetical and visual attributes, including design elements (i.e., color, texture, value, shape, line, point), and design principles (i.e., balance, rhythm, similarity, emphasis, contrast, and variety). Although these factors are essential to developing new creative designs, and also creating awareness in promoting cultural or older designs (An & Jang 2023; Liu et al., 2021). In the case of fashion design, the production technique used in creating these materials would be the dominant aspect affecting the design's appearance and attributes, including design elements and principles and sustainability (Sharma & Narula 2020; Rehman et al., 2022).

These techniques are the production methods used in the making process of yarns, textiles, or non-textile materials, which are the spinning, weaving, printing, dyeing, or finishing processes. Hence, all these technologies used in the making process affect the physical and aesthetic appearance of a piece of fabric and, consequently, the clothing or fashion design product. Since color is one of the most important features affecting consumer attitude and purchase behavior towards textiles, clothing, and fashion design products, this research focuses on textile coloration techniques, namely dyeing and/or printing, that have a significant visual identity and have been found used in producing and naming clothing and fashion products, i.e., taking part in fashion marketing.

1.1. Purpose of study

This research aims to investigate the role of textiles' coloration technological aspects adopted by fashion designers in their jobs. This study's objectives are to analyze and describe the nature of fashion designers' adoption of textile coloration techniques to develop significant designs and brand identity. Famous top fashion design brands are studied to test the research hypothesis that coloration technology would form unique fashion design trends or brand identities. Another hypothesis is that fashion designers would exploit technological terms in marketing their products. One more hypothesis is that they could distinctively employ similar coloration techniques.

The originality and value of this research lie in being a reference for textile designers and students to consider the design aspects employed by fashion designers. Textile designers would use the findings of this study to reconsider the application of textile techniques in the fashion and clothing industries. Textile and fashion designers would benefit from this research to develop alternative designs with appropriate implementation techniques. Besides, this study will support fashion students and designers to be aware of the available alternative fabrics to be used uniquely in creating their designs. Furthermore, this research provides fashion and clothing designers with sources for inspiration.

2. Methods and materials

Based on the research question, aim, and objectives, this study employed qualitative methods to analyze the employment of coloration techniques used by several famous fashion designers. These methods are applied by exploring and analyzing the obtained images, data, and information covering fashion design trends formed using special, significant coloration techniques.

2.1. Data Collection and Analysis

In this study, images, data, and information were collected through fashion search engines and websites (such as Tagwalk, Fashionista, or Fibre2fashion), online shops (such as Dior.com and Channel.com), and magazines (such as Vogue). The search procedure focused on fashion designers' employment of coloration techniques in terms of design attributes and the style of implementing these techniques. Frequent and unique design styles for implementing coloration techniques are studied. The historical research method is employed to track the impact of using these techniques in their designs and to explore the significance of these techniques for the determined designers and their value throughout history.

2.2. Limitations of the study

This study is limited to a colouration technique for a group of fashion designers at a defined time of investigation and analysis. This is as follows:

2.2.1. Colouration Technique

This study obviated solid or halftone textile prints made by traditional printing techniques, such as silk screen (Flat-Rotary), block, roller, and heat transfer printing, because these prints could not be easily identified or distinguished in digital images which are part of this research resources. Colouration techniques found that could be significantly distinguished include tie-dye. Therefore, this research is limited to the "tie-dye" technique because it is a traditional colouration technique used by several cultures. It has a significant appearance and is used in textiles, clothing, and fashion design for several seasons. Therefore, in this study, the tie-dye technique is discussed and investigated in the context of fashion design.

2.2.2. Fashion Designers

This research is limited to five fashion designers as follows: Coco Chanel, Christian Dior, Yves Saint Laurent, Gianni & Donatella Versace, and Hubert de Givenchy. These designers have been found listed on the top fashion designers list in several fashion design search engines (Sherrard, 2023).

2.2.3. Time Limits

A decade was found sufficient to study the development of the identified designers for the determined colouration technique, i.e., tie-dye. Therefore, investigations and analyses are conducted over a period of time, starting in 2012 and lasting until 2023.

3. Results

Fashion design is the creation of apparel, clothing, and clothing complements employing design elements and principles. Fashion designers would show uniqueness based on the items used, including materials, fabrics, and textiles. One of the main aspects affecting the material used is the coloration technique, such as tie-dye. In this section, the employment and adoption of tie-dye coloration techniques by fashion designers are discussed and analyzed.

Tie-dye is a traditional technique used in various cultures for a long time. It is implemented by tying a fabric to definite spaces and areas and then dyeing it. The type of material used or the object used inside the folded fabric could develop several effects and textures while tying around it. The created designs are bright colors with free outlines, making each fabric a significant design. Although it is a traditional method

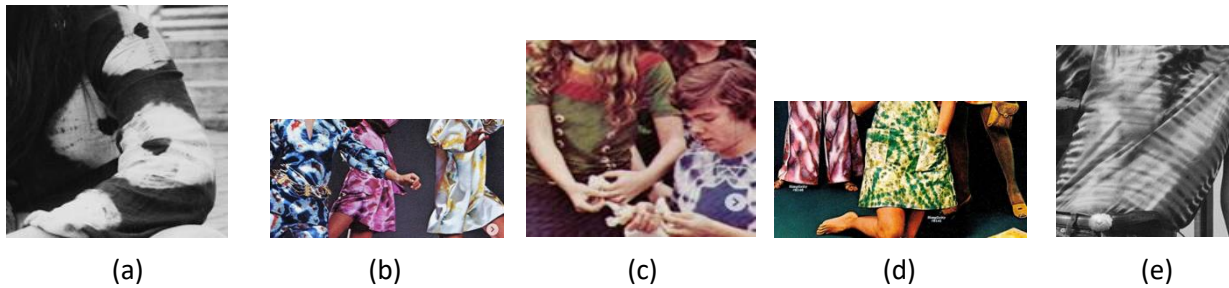
of coloring yarns and textiles, it is employed in contemporary markets. Several factors affect the occurrence of this technique in the modern era, including economic and social ones.

In the 1920s, the economic and social circumstances of limited consumers' budgets pushed them to use the tie-dye technique to overcome their current conditions of frustration in making their homeware (Belair, 2018; Reddy, 2019). In the mid-twentieth century (the late 1960s and early 1970s), tie-dye clothing became viral, especially in the United States. This was for the first time in the contemporary era, symbolizing radical leftism (Group, 2023). This time was signified by the hippie aesthetic, which was characterized by a free clothing style and non-matched clothing pieces. Thus, tie-dye clothing was spread, indicating individualism and freedom (Acosta, 2021). At that period, tie-dye was considered one of the Psychedelic fashion features affected by hippie culture and look (the 1960s) during which consumers were aware of and inclined to individualism and the use of color (see Figure 1).

Furthermore, political issues supported the trend of tie-dye because of the population's willingness to face that time of war. Moreover, this technique's spread counted for commercial and economic reasons; the RIT company promoted its dyes by promoting the idea of home-dyeing. Thus, as many people as possible would be able to develop their own designs for their home clothes, after these days, this trend faded out.

Figure 1

Tie-dye designs in the 60s, (e) 80s



Sources: Acosta, 2021; Alexander, 2019

Designers, including Yves Saint Laurent, exploited this trend to make creative designs. But, this trend declined in the 1970s and returned in the 1980s (Sterlacci & Arbuckle, 2009). During this period, tie-dye design was shown at significant festivals and events as a fashionable style (Flores, 2020).

This widespread of tie-dye designs was paused until the first decades of the twenty-first century; in 2010, tie-dye was back all over the world. Later, by 2019–2020, there was an increase in consumer interest in tie-dye products. It has been adopted on the runways and in haute couture collections by different fashion designers. In 2021, clothing collections were created employing the tie-dye technique. Therefore, it is noteworthy that fashion designers have used tie-dye fabrics to make various designs from time to time that boldly stand out in the market (Acosta, 2021). The five fashion designers- assigned according to this research limits- were discussed in terms of design nature and specifications at the time limits identified in this study from 2012 to 2023. Therefore, the designs created by these designers are analyzed in terms of color, texture, and shapes used.

The following subsections discuss and analyze the application and development of the tie-dye technique in fashion designers' work. Then, a comparison between designers was conducted to study the significance of each designer using a similar coloring technique, i.e., tie-dye. This discussion and analysis are based on data and information obtained from secondary sources—reports on fashion design.

Table 1

Years in which the Tie-dye technique used by fashion designers discussed

Fashion Designer \ Year	2012	2018	2020	2021	2023
Coco Chanel		x	x		
Christian Dior	x	x	x	x	x
Yves Saint Laurent				x	
Gianni & Donatella Versace	x		x		
Hubert de Givenchy					x

3.1. Coco Chanel case

Chanel was found to adopt tie-dye fabrics in its designs, specifically in the 2018 and 2019/20 collections (see Table 1). Figure 2 shows a dress designed by Chanel in 2018. The tie-dye effect is used in making this dress using a two-color combination of Pearl River and Prussian, making dashed horizontal lines/stripes. Later, in 2019/20, Chanel showed pre-fall 2020 tie-dye designs on tweed jackets in hues of purple, blue, and black inspired by Gabrielle Chanel's '60s archives (KIA, 2019). This Métiers d'Art show included tie-dye maxi dresses and t-shirts. This collection was signified by classical tailoring introduced with a twist using tie-dye coloring with a painterly effect, making horizontal, wide lines and spaces (MENKES, 2019) (see Figure 3). These tie-dye designs used overlapping colors for a painterly effect. It is noteworthy that throughout the investigated time limit, two collections were found for Chanel employing tie-dye (see Table 1). This means that tie-dye is one of the techniques used by Chanel in this period, 2012–2023. In a comparison of 2018 and 2020 designs, it was found that 2019 showed the development of tie-dye applications in terms of design capacity and style. In 2018 designs, there was one tie-dye design, although, in 2019, there were three alternative designs. In 2019/20, the tie-dye designs were of smooth, overlapping colors. Two designs of the three used a two-color scheme indicating smooth overlapping compared to the 2018 design, and the third design is based on a multi-color scheme inspired by the color spectrum.

It is concluded that Chanel has contributed to fashion design by employing tie-dye in the past ten years, and the latest application of tie-dye is highly developed and applied in different pieces, including tops, dresses, and jackets. Moreover, all these products were named by the technique "tie-dye" which means that this technique significantly describes the products.

Figure 2

Coco Chanel 2018



Source: Fashionista, 2017

Figure 3

Tie-dye shades for 2019-2020 from Chanel Métiers



(Source:(KIA, 2019)

3.2. Christian Dior case

Christian Dior’s design analysis from 2012 to 2023 indicates that Dior is the most frequent designer who created distinct tie-dye designs among the analyzed designers. In 2012, tie-dye was used to create stripy

designs that presented borderlines and painterly effects. Dresses found were mainly black, with red in one dress and green (lime) in another. Therefore, it is evident that psychedelic hues were used in this form (see Figure 4). Later, in 2018, distinct stripy and circular tie-dye designs employing circular elements were produced, resulting in border patterns and radial designs (see Figure 5). These circular design elements are unique because they were only created during 2012–2023 by Dior. These designs are made of grey shades and black. The pre-fall 2020 ready-to-wear collection showed distinctive dress designs of mainly black supported by blue (navy) or green (khaki) with highlights of white, making longitudinal border designs (see Figure 6).

In 2021, Dior created two tie-dye collections. The first is the Spring/Summer 2021 collection (Figure 7), which presents a rich tie-dye collection used in designing a variety of clothing items, namely tops, and skirts, using shades of greens, reds, and blues, which was considered a renovation of classical designs using stripes (Ross, 2020). The second collection is the 2021 “Cruise” collection. In this collection, Dior introduced stripy tie-dye designs that vary in the new color range used, namely beige, indigo, and pink (Figure 8). Moreover, it encompasses various products, including tote bags, scarves, dresses, and jackets. Christian Dior considered issuing this collection as an appreciation of the highly skilled technique valued by the creative director. Besides, Dior declared that this collection was developed due to continuous investigations creating irreplaceable pieces, making this production signifying Dior. Moreover, Dior’s creation of a jewelry collection named Tie & Dior in 2021, which was inspired by the tie and dye technique, is considered to be a regard and respect for this unique technique (Dior, 2021c).

In 2023, the tie-dye technique was found used by Christian Dior in an item displayed on its website, i.e., kids' swim shorts in green and blue colors (Figure 9). From the analysis, Dior considered the versatility of this technique for developing creative designs. Besides, Dior has valued this technique, as in 2021, two collections were introduced using tie-dye, and this year would be considered the peak exploitation of this technique's features in making unique designs. Furthermore, Dior has developed its style of using tie-dye from 2012 until 2023. The design elements used were lines and stripes (horizontal and vertical) and circular. The design principles adopted were symmetry, balance (symmetrical and asymmetrical), and repetition. The colors used were red (maroon), green (lime), blue (indigo), grey, black, and highlights of these colors. Significant tie-dye design styles were found in each collection or season. The jewelry collection inspired by this technique would symbolize Dior’s appreciation of tie-dye.

Figure 4 Christian Dior. Fall 2012
Tie-Dye Logo Top



Source: Giannoni, 2012



Figure 5 Christian Dior design 2018



Source: left Jaime King in a Dior tie-dye gown in November 2018 (Alexander, 2019), Right:(BBC, 2018)

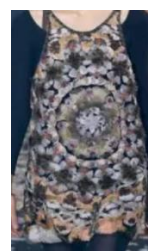


Figure 6 Christian Dior Pre-Fall 2020 Top Fashion Show Collection
(dye)



Source: Ross, 2020

Figure 7
CHRISTIAN DIOR SPRING/SUMMER
Ready-to-Wear collection 2021



Sources: a (Dior, 2020), b (Acosta, 2021), c (Comil, 2021),d (Dior, 2021a).

Figure 8
Dior Cruise Collection 2021



Source: Dior, 2021b; Dior, 2021c

Figure 9
Christian Dior 2023



Source: Dior, 2023

3.3. Yves Saint Laurent case

Yves Saint Laurent used the tie-dye technique in limited products and with less frequency (see Figure 10 and Figure 11). In 2021 and 2023, the tie-dye technique was used in developing men's products such as sweatshirts, shirts, and varsity jackets. This shows the absence of clothing items traditionally applied tie-dye by other designers. In 2021, YSL introduced a varsity jacket in bright bold colors made of vertical, thick lines. In this design, various overlapping colors are used, namely red (maroon), green (olive), yellow (ochre), violet, and Prussian (Figure 10). In 2023, monochromatic/binary random overlapping color schemes were used, including black and grey, light salmon, and brown (Figure 11). Therefore, YSL developed limited tie-dye designs in terms of scale, capacity, design elements, and principles.

Figure 10
YSL Spring Summer 2021 Runway Trends: Tie Dye



Source: YSL, 2021

Figure 11
YSL tie-dye 2023



Sources: a: (YSL, 2023b), b:(YSL, 2023a)

3.4. Gianni & Donatella Versace case

In 2012, although Versace designs employing tie-dye were a shock as it was not expected that Versace would join the hippies' concept in fashion design, Versace took part in that season trend by linking animal and floral patterns using overlapping monochromatic colors and employing Medusa's head to indicate the brand (Versace, 2012). (See Figure 12) Later, in 2020, the Versace collection was designed for more flexible men and tough women. These designs indicated gender flexibility in how men and women express themselves, i.e., they symbolized and challenged gender stereotypes. That year, designs included patterns

on white that looked like fine porcelain to tie-dye prints. The color groups used are dashing neon green, neon-bright, violet, and pink.

Therefore, Versace adopted tie-dye designs in two seasons, but in 2020, a wide range of designs were created making various products. Moreover, a significant concept highlighted in 2020 tie-dye designs is eliminating clothing gender stereotyping. This gave tie-dye deep meaning and exploitation.

Figure 12 Versace 2012



Source: Versace, 2012

Figure 13 Versace 2020



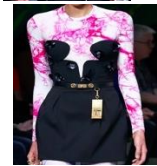
(a)



(c)



(d)



(e)



(g)



(h)



(j)



(k)

Source: a (Silva, 2020),c(Flores, 2020), D to J (Runway, 2020))

3.5. Hubert de Givenchy case

From 2012 to 2023, the tie-dye designs found for Givenchy are the most unique, showing significant personality to the brand when using this technique. Products found applying this technique are almost short-sleeved and sweatshirts. Shapes used were raffle and heart-shaped designs using pastel light colors (see Figure 14). Although the Givenchy designs are limited in terms of the types of clothing products made, colors, and shapes, these designs are significantly different from the other designers' products discussed.

Figure 14

Givenchy 2023 Tie dye designs



(a)



(b)



(e)

Sources: a: Givenchy, 2023c; b: Givenchy, 2023a; e: Givenchy, 2023b

4. Discussion

In this study, “tie-dye” fashion design products made by five high-end fashion designers, i.e., Coco Chanel, Christian Dior, Yves Saint Laurent, Gianni & Donatella Versace, and Hubert de Givenchy, were investigated and compared over years from 2012 to 2023. This is in terms of their design personality, including design elements, i.e., shapes and colors, concepts reflected through these designs, and types of clothing products implemented. The years investigated were 2012, 2018, 2020, 2021, and 2023 because these are the years in which the mentioned designers created tie-dye designs (according to the research resources).

Dior used the tie-dye technique frequently in its designs. Moreover, it does value Tie & Dye to the extent that it was the inspiration source for its jewelry collection issued in 2021 under the name. “Tie and Dior”. Distinctively, Dior created various significant shapes in different seasons, mainly straight lines and circular shapes, to make various products, including night and casual dresses, skirts and shirts, and pants, all for women's wear. Although Givenchy has made unique tie-dye designs, these are limited to a few products and visual design elements. Moreover, it was recently used significantly in 2023, produced using light pastel colors, making heart and raffle shapes. Clothing products made were short-sleeved shirts and sweatshirts. In 2020, Versace had the most diverse range of tie-dye, which implies significant concepts. As usual, the Medusa head signifies Versace designs. A traditional tie-dye effect of bright, bold colors on a white background was employed. Another significant feature of Versace's design in this collection is the consideration of men’s wear. Clothing items created were dresses, suits, and short- and long-sleeved shirts. The colors used are violet, purple, greens (neon and other shades), and black on different backgrounds, either white or grey. Yves Saint Laurent tie-dye designs were employed in limited products, namely men’s shirts and varsity jackets, giving them significant visual personality. Although, in 2023, clothing items were created using two-color monochromatic schemes; on the other hand, multi-color designs represented YSL production previously in 2021. Coco Chanel showed tie-dye designs representing overlapping colors (making vertical or longitudinal spaces or lines). The colors used were violet and multi-color (greens, pink, violet, purple, and yellow) indicating bold bright colors in two designs and pastel light colors in one design.

5. Conclusions

This study concluded that the tie-dye coloration technique has been used extensively and distinctively by several top high-end fashion designers. Some designers have relied on this technique for several seasons and collections, namely Christian Dior and Versace. This is achieved by creating a large collection consisting of various items with significant visual personalities. Social concepts are highlighted by employing this technique, like what is done by Versace. This technique’s name, “Tie-dye,” has been used in naming all its designs, which means that the technique itself could be used effectively in marketing its product. It has been found to add visual character to each fashion designer's collection whenever tie-dye is used.

These results indicate that tie-dye (as a coloring technique) is a versatile technique in the fashion design world. This study results would provide textiles and fashion design students and specialists with alternative insights into tie-dye designs and their applications to exploit them effectively. It is recommended to extend

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this study into further research work to investigate other textile coloration techniques to find out their impacts on the clothing and fashion fields.

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