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Analysis of the Development of Fashion Trends: A Bibliometric Study

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ABSTRACT - The development of fashion trends reflects social, economic, technological, and environmental changes within the global fashion industry. As these issues become increasingly complex, academic research on fashion trends has shown significant growth and has evolved into a multidisciplinary field. This study aims to map the development of publications, intellectual structure, and dominant themes in fashion trend research using a bibliometric approach. The research data were obtained from the Scopus database covering the period 2016–2025. Through a literature selection process based on PRISMA guidelines, a total of 155 journal articles were analyzed using VOSviewer software. The analysis includes publication trends, co-authorship, keyword co-occurrence, co-citation, and bibliographic coupling. The results indicate a significant increase in the number of publications since 2021, with a peak in 2024. The United States and China were identified as the main contributors, supported by institutions focusing on management, economics, and manufacturing technology. Keyword analysis reveals that sustainability, circular economy, consumer behavior, and digital technology integration are dominant themes. However, collaboration networks and co-citation patterns indicate a relatively fragmented research structure. These findings highlight the importance of strengthening interdisciplinary collaboration and conceptual integration in fashion trend research.

Keywords: Fashion trends, bibliometrics, VOSviewer, Scopus.

INTRODUCTION

The development of fashion trends is a phenomenon that has consistently attracted the attention of scholars across disciplines due to its role in reflecting social, cultural, and technological changes in modern society (Garcia & Resende, 2016; Jung & Lee, 2016). In the academic context, fashion trends are understood as dynamic indicators that demonstrate how consumer preferences, industrial innovation, and social influences interact in shaping patterns of dress over time (Jung & Lee, 2016). Therefore, analyzing the development of fashion trends is essential for comprehensively understanding the transformation of the fashion industry based on empirical and scientific evidence (Garcia & Resende, 2016).

A number of studies highlight that the dynamics of fashion trends are closely related to consumption patterns and the fashion product life cycle. Rapidly changing consumer preferences drive the industry to continuously generate design variations and material innovations to maintain market attractiveness (Chernov & Gura, 2024; Garcia & Resende, 2016).This condition has resulted in increasingly shorter and more complex fashion trend cycles, thereby requiring more systematic analytical approaches to understand their developmental trajectories. Since 2016, research on fashion trends has shown growing attention to consumer behavior factors and social mechanisms influencing trend shifts, including conformity, collective preferences, and market dynamics (Chernov & Gura, 2024; Garcia & Resende, 2016). These studies emphasize that fashion trends are formed through complex interactions among individuals, social groups, and industrial systems that mutually influence one another(Chernov & Gura, 2024).

Subsequent developments in the Scopus-indexed literature indicate that technology has become a key factor in fashion trend analysis, particularly through the integration of wearable technologies, sensor systems, and material innovations that influence both design and functionality of fashion products (Andreoni et al., 2016; Min et al., 2024). These studies confirm that fashion trend development cannot be separated from technological advancements that shape production processes, usage patterns, and consumers' perceptions of fashion value (Andreoni et al., 2016). The role of technology in fashion trends extends beyond design and materials to include production and distribution processes. Andreoni et al. (2016) demonstrate that technological integration in clothing affects how consumers interact with garments in terms of comfort, functionality, and symbolic value. These findings are reinforced by recent research showing that technological innovation contributes to the emergence of functional and performance-oriented fashion trends, particularly within modern lifestyle contexts (Min et al., 2024).

With the advent of the digital era, fashion trend research has increasingly utilized digital data and online content as primary sources for trend analysis. Articles within the Scopus dataset indicate that social media and digital platforms play a crucial role in identifying, predicting, and accelerating the global diffusion of fashion trends (Ma et al., 2019; Nguyen & Ma, 2024). This data-driven approach marks a methodological shift from traditional qualitative analysis toward computational approaches in fashion trend studies (Ma et al., 2019).

In addition to technological advancement and digitalization, sustainability has emerged as a central theme in fashion trend research during the 2016–2025 period. Several studies emphasize that environmental awareness, clothing disposal behavior, and the adoption of eco-friendly technologies shape new directions in contemporary fashion trends (Min et al., 2024; Wai Yee et al., 2016). In this context, fashion trends represent not only aesthetic expressions but also ethical values, social responsibility, and industrial sustainability (Kumpikaitė et al., 2016).

Recent literature also shows that fashion trends are increasingly influenced by cultural and geographical contexts, including local preferences, cultural heritage, and the adaptation of global trends within specific regional settings (Kumpikaitė et al., 2016; Rico Gómez et al., 2024). These findings suggest that fashion trend development is inherently contextual and cannot be separated from the socio-cultural background of the societies that adopt them (Kumpikaitė et al., 2016). Similar conclusions are presented by Rico Gómez et al. (2024), who argue that regional adaptation of fashion trends produces stylistic variations reflecting the interaction between local identities and global flows.

Despite the growing number of studies on fashion trends, existing literature still exhibits thematic fragmentation and methodological diversity. Some studies focus primarily on technological innovation, while others emphasize consumer behavior, sustainability, or cultural contexts in isolation (Chernov & Gura, 2024; Nguyen & Ma, 2024). This condition indicates the absence of a comprehensive synthesis that systematically maps the development of fashion trends within a unified analytical framework.

Based on these conditions, this study analyzes the development of fashion trends using a quantitative bibliometric approach applied to scholarly articles indexed in the Scopus database from 2016 to 2025. The bibliometric approach is selected because it enables objective measurement of literature characteristics through statistical analysis of publication metadata, such as document volume, citation patterns, authorship collaboration, and thematic interconnections among studies. Through bibliometric techniques—including publication trend analysis, co-authorship, keyword co-occurrence, co-citation, and bibliographic coupling—this study provides an empirical mapping of the intellectual structure and dynamic evolution of fashion trend research. This approach also facilitates the systematic, transparent, and data-driven identification of dominant themes, methodological tendencies, and existing research gaps, thereby offering a solid foundation for future fashion trend research (Min et al., 2024; Nguyen & Ma, 2024).

This study makes an important contribution to the literature on fashion trend development by providing a comprehensive mapping of the global fashion trends research landscape. The findings are expected to assist academics in identifying underexplored research areas, facilitate interdisciplinary collaboration, and offer valuable insights for industry practitioners.

LITERATURE REVIEW

Research on fashion trends has shown increasingly significant development in international scientific literature over the past decade. Based on articles indexed in the Scopus database during the 2016–2025 period, early studies tended to focus on design aspects, visual aesthetics, and product characteristics of fashion. Over time, however, the research focus has expanded toward more complex issues, such as sustainability, industrial transformation, and the

integration of digital technologies in fashion trend analysis and forecasting (Branca et al., 2025; Crepax & Liu, 2024). This shift in focus reflects growing academic attention to fashion as an integral component of global social, economic, and environmental systems.

Along with the rapid growth of the fashion industry, academic concern regarding the environmental and social impacts of fashion trends has also intensified. Bibliometric analysis results indicate that sustainability-related topics—including sustainable fashion, circular economy, and ethical fashion—have become dominant themes in contemporary fashion literature (Branca et al., 2025; Tsai & Yuan, 2025). In this context, fashion trends are understood as part of production and consumption dynamics that have direct implications for resource use, textile waste management, and the social responsibility of the fashion industry. These conditions have encouraged the development of more responsible and sustainability-oriented approaches in both academic research and industry practice.

In addition to sustainability issues, consumer behavior has emerged as a key focus in modern fashion trend studies. Several studies demonstrate that consumer preferences, motivations, and purchasing decisions play a central role in the formation and diffusion of fashion trends (Hou & Sirinkraporn, 2024; Wiratama et al., 2022). Increasing consumer awareness of ethical values, brand image, and environmental impacts has driven changes in fashion consumption patterns, indicating that fashion trends are shaped not only by producers and markets but also by consumers' critical attitudes toward industry practices.

The advancement of digital technology has also driven methodological transformations in fashion trend research. Recent studies highlight the use of machine learning, deep learning, and computer vision in image analysis, product classification, and more accurate and systematic fashion trend prediction (C. Chen, 2025; Tsai & Yuan, 2025; Wan et al., 2025). These data-driven approaches enable researchers to process large-scale datasets, identify temporal trend patterns, and better understand the dynamics of fashion trend evolution within an increasingly digitalized global fashion industry.

Despite the continuous growth in publications related to fashion trends, literature mapping reveals the presence of thematic and methodological fragmentation. Fashion trend research is distributed across multiple areas of focus, such as sustainability, technology, consumer behavior, and industrial transformation, employing diverse analytical approaches (Branca et al., 2025; Crepax & Liu, 2024). This fragmentation indicates the need for a more systematic mapping to understand the intellectual structure, interconnections among themes, and overall directions of fashion trend research development in a comprehensive manner.

In this context, bibliometric analysis represents a relevant approach for objectively and data-driven mapping of fashion trend research development. Through bibliometric analysis, dominant themes, conceptual relationships among topics, and research evolution patterns can be systematically identified. Therefore, the development of a conceptual framework summarizing key themes and keywords in fashion trend research serves as an important foundation for supporting the interpretation of analytical results. **TABLE 1** presents a summary of themes and research focuses in fashion trend studies based on selected articles from the Scopus dataset, providing a basis for understanding the knowledge landscape and research dynamics of contemporary fashion trend studies.

TABLE 1. Definition of fashion trends.

No.	Conceptual Definition	References
1	Patterns of development in aesthetics, design, and fashion preferences influenced by affective, digital, and social aspects.	Crepax & Liu (2024)
2	A fashion approach that integrates environmental and social responsibility into branding strategies and consumption practices.	Branca et al. (2025)
3	A fashion business model based on rapid production and market responsiveness that influences consumer purchasing behavior.	Wang et al. (2025)
4	Motivational and preference-related factors that influence consumer decision-making in fashion purchases.	Hou & Sirinkraporn (2024)
5	Consumer tendencies toward technology and garment functionality in supporting sustainable consumption.	Min et al. (2024)

6	An industrial system that integrates detection technologies, textile quality, and production efficiency.	Jerusha & Agees Kumar (2025)
7	A textile industry emphasizing environmentally friendly practices and social responsibility.	Warwas et al. (2021)
8	A sustainable production and consumption approach through optimized resource use and waste minimization.	Tsai & Yuan (2025)
9	Data-driven fashion trend forecasting methods to support industrial decision-making.	Koren & Shnaiderman, (2023)
10	A branch of artificial intelligence used for visual analysis of fashion products and textiles.	Chen & Zhuang, (2024)
11	The consumer decision-making process involved in purchasing fashion products.	Wiratama et al. (2022)
12	Intelligent technologies applied to trend analysis, product recommendations, and fashion innovation.	Manzo et al. (2025)
13	Supply chain information openness as a key factor in building consumer trust in fashion.	García-Bardón & Arroyo-Vázquez (2024)
14	Consumer-oriented practices emphasizing reduced environmental impact and ethical responsibility in fashion purchasing decisions.	Komalasari et al. (2023)
15	The application of digital technologies to fashion design, marketing, and consumer engagement processes.	Lee & Suh (2025)
16	Integration of technological innovations such as smart textiles and digital tools within the fashion production system.	Zhang & Yim (2023)
17	Fashion practices that prioritize labor rights, fair trade, and ethical sourcing across the supply chain.	Nguyen & Ma (2024)

METHOD

This study employs a bibliometric approach to map and analyze the development of research on fashion trends in a quantitative and systematic manner. Bibliometric analysis was selected because it enables the identification of publication patterns, research growth dynamics, authorship collaboration, and the evolution of research themes within a scientific field based on indexed scholarly publication data (Donthu et al., 2021). The literature search was conducted using the Scopus database, covering publications from 2016 to 2025. This time frame was chosen to capture recent research developments relevant to the dynamics and transformations of fashion trends within the global fashion industry over the past decade. Scopus was selected as the primary data source because it is one of the largest and most comprehensive academic citation databases, encompassing high-quality peer-reviewed journals across multiple disciplines and providing data formats compatible with bibliometric analysis software (Moral-Muñoz et al., 2020). In addition, Scopus offers data formats compatible with VOSviewer, facilitating analyses such as co-authorship, citation, keyword co-occurrence, co-citation, and bibliographic coupling. The use of VOSviewer enables clear and measurable visualization of the intellectual structure and thematic dynamics of fashion trend research (van Eck & Waltman, 2010).

The literature search was conducted in the Scopus database for publications issued between 2016 and 2025. The search string applied in this study was aligned with the focus on fashion trend research and included the following keywords: “fashion trend” OR “fashion” OR “fashion industry” OR “textile.” In addition to the publication time frame, the inclusion criteria comprised journal articles published in English. The exclusion criteria consisted of conference papers, book chapters, review articles, books, conference reviews, notes, editorials, retracted articles, short surveys, errata, and publications written in languages other than English. The literature selection process followed the PRISMA

(Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility of data selection procedures (Page et al., 2021). The selection process consisted of four stages: identification, screening, eligibility assessment, and final inclusion.

The stages of literature collection and selection in this study were conducted systematically in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. During the identification phase, a comprehensive search was performed using the Scopus database, resulting in a total of 1,543 documents. Subsequently, a publication year filter was applied by setting the time span from 2016 to 2025, leading to the exclusion of 700 documents published outside this period. After this step, 843 articles met the temporal inclusion criteria.

In the screening phase, further selection was carried out based on document type. At this stage, 350 documents were excluded because they did not fall within the category of journal articles relevant to the research objectives. The excluded document types comprised conference papers (209), book chapters (79), review articles (37), books (12), conference reviews (4), notes (3), editorials (3), retracted articles (2), short surveys (2), and errata (1). As a result, 493 articles were retained for full-text assessment.

During the eligibility phase, the fully accessible articles were evaluated based on language and accessibility criteria. The results indicated that only 218 articles met the requirements, namely being written in English and available in open-access format. The remaining articles were excluded due to language limitations—Russian (2), Spanish (2), and Turkish (1)—as well as failure to meet open-access criteria, including Gold (110), Green (71), Hybrid (26), and Bronze (8) access types. After completing all selection stages sequentially, a total of 155 articles satisfied all inclusion criteria. These articles were subsequently designated as the final dataset for bibliometric analysis and were used to identify publication patterns, research trends, and the thematic evolution of the field in line with the study's focus.

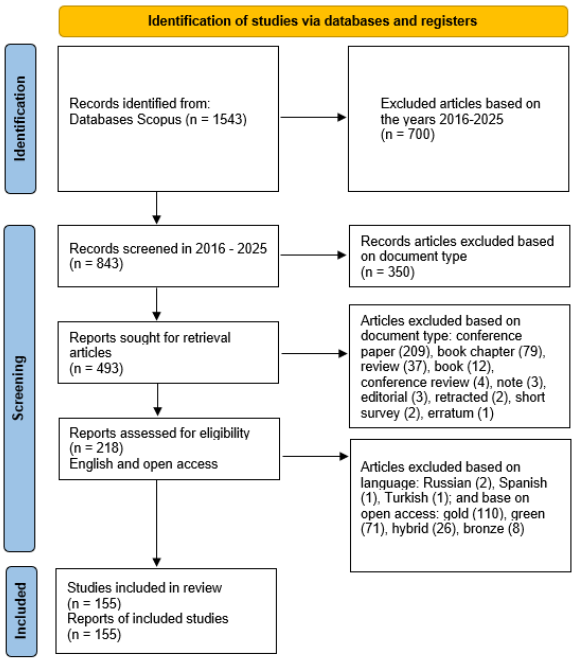

FIGURE 1. PRISMA diagram of fashion trend research development from 2016 to 2025.

The analytical framework of this study consisted of several key stages. First, publication trend analysis was conducted to identify growth patterns in research related to fashion trends over time, particularly within the 2016–2025 period. This analysis involved calculating the number of articles published each year based on publication-year metadata obtained from the Scopus database. Second, co-authorship analysis was employed to map research collaboration patterns among authors, institutions, and countries in the field of fashion trends. This mapping was carried out using VOSviewer software, relying on authorship relationships within the analyzed publications. Third,

keyword co-occurrence analysis aimed to identify dominant research themes and conceptual relationships among topics in fashion trend literature by calculating the frequency with which author-assigned keywords appeared together across articles.

Furthermore, co-citation analysis was conducted to identify the intellectual structure of fashion trend research. Two documents, authors, or journals were considered to have a co-citation relationship when they were frequently cited together within the same articles. In addition, bibliographic coupling analysis was used to measure the degree of relatedness among documents based on shared references, whereby two articles were considered strongly connected if they cited the same sources. To ensure the validity and reliability of the findings, several measures were implemented, including the use of the internationally indexed and verified Scopus database, transparent application of search and selection criteria, comprehensive documentation of the PRISMA process, and cross-checking of anomalous or outlier data. Moreover, the interpretation of analytical results was conducted with reference to the contextual background and findings of relevant literature.

The exported data were subsequently analyzed and visualized using VOSviewer version 1.6.20. VOSviewer was selected due to its superior visualization capabilities, user-friendly interface, and robust clustering algorithms, which effectively minimize discrepancies between association strength and the distance among term pairs (van Eck & Waltman, 2010). This software enables the construction of various types of bibliometric networks based on citation, bibliographic coupling, co-citation, co-authorship, and co-occurrence relationships.

Despite its strengths, this study is subject to several methodological limitations, including reliance on a single database without incorporating additional sources such as Web of Science or Google Scholar, language bias resulting from the inclusion of English-language articles only, limitations of VOSviewer in handling synonymy and spelling variations in keywords, and potential time lag between publication and indexing in Scopus. Nevertheless, the methodology applied in this study has been demonstrated to be robust and is widely accepted in bibliometric research (Martins et al., 2024; Zupic & Cater, 2013).

RESULTS AND DISCUSSION

The bibliometric analysis produced a dataset comprising 155 journal articles relevant to fashion trends published between 2016 and 2025. This dataset reflects contributions from a wide range of countries, institutions, and authors, indicating a strong global interest in sustainability-related issues within the fashion industry.

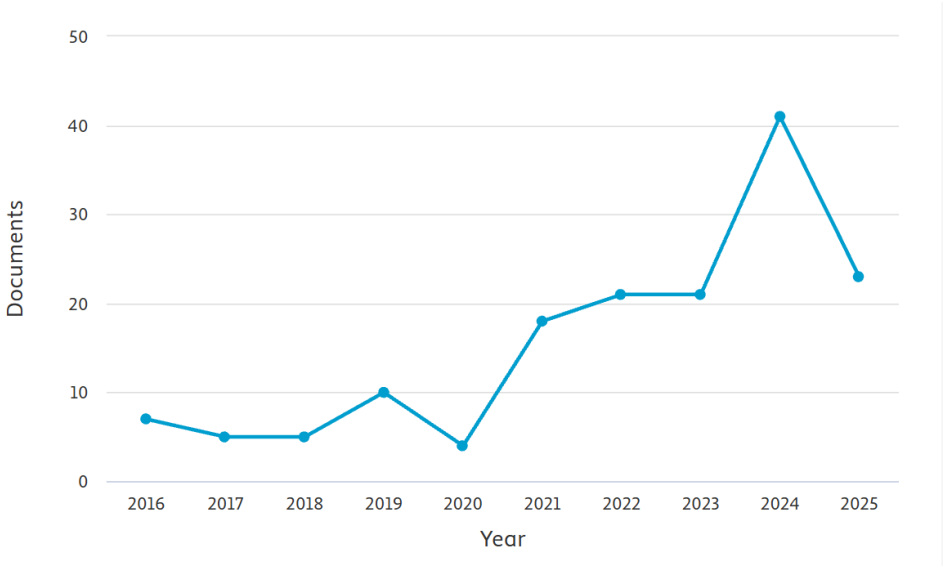

FIGURE 2. Publication trends in fashion trend research, 2016–2025.

RQ1. How have fashion trends research developed from 2016 to 2025?

The results of the bibliometric analysis of scientific publications addressing fashion trends during the 2016–2025 period reveal fluctuations in the number of documents, with an overall tendency toward growth in recent years. The annual distribution of publications illustrates the evolving dynamics of academic attention to fashion trend studies over time.

In the early observation phase, between 2016 and 2018, the number of publications was relatively limited and remained at a stable level. In 2016, seven documents were recorded, followed by a decline in 2017 and 2018, with five documents each year. These findings suggest that research on fashion trends during this period had not yet developed intensively within the academic domain. An increase in publications began to emerge in 2019, with a total of ten documents. However, in 2020, a sharp decline occurred, with only four publications recorded. This decrease coincided with the COVID-19 pandemic, which broadly affected research activities and the scientific publication process.

Since 2021, the number of publications has increased substantially, reaching eighteen documents. This positive trend continued in 2022 and 2023, with twenty-one documents published in each year. This growth reflects a rising scholarly interest in fashion trends in response to industrial transformations and post-pandemic dynamics. The highest number of publications was recorded in 2024, with more than forty documents. This peak indicates that research on fashion trends has become increasingly intensive, alongside growing attention to issues such as sustainable fashion, the circular economy, and the application of digital technologies within the fashion industry. In 2025, the number of publications declined to approximately twenty-three documents, a trend that is likely influenced by incomplete publication data for that year.

Overall, this bibliometric analysis demonstrates that research on fashion trends has experienced rapid development, particularly since 2021, marking a significant increase in academic attention toward transformation processes and sustainability in the global fashion industry.

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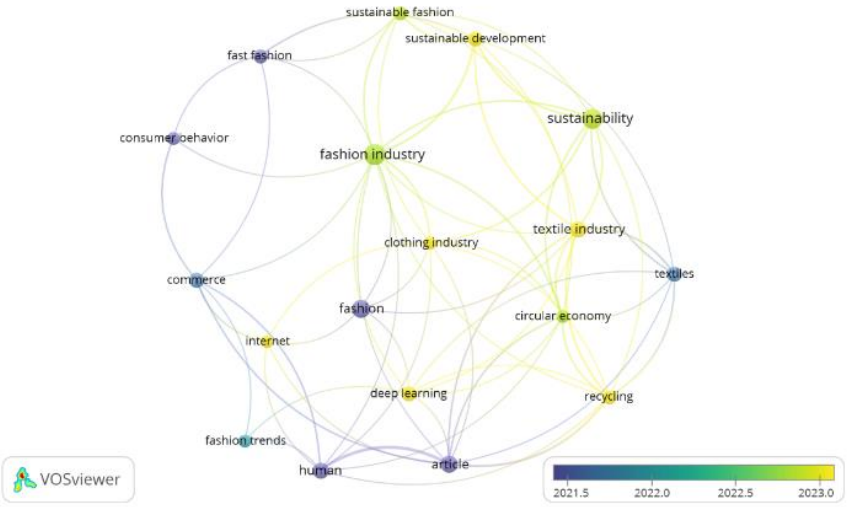

FIGURE 3. Development of fashion trends (2016–2025).

RQ2. Which countries, institutions, and authors are the most influential in fashion trend research?

Based on the overlay visualization of keywords and thematic relationships, the development of fashion trends research during the 2016–2025 period demonstrates a clear paradigm shift. In the early phase (approximately 2016–2018), fashion trend studies were predominantly dominated by conventional issues, such as fashion, consumer

behavior, commerce, and fast fashion. Research during this period primarily focused on consumer behavior, mass consumption patterns, and the dynamics of the fashion industry within the context of the global economy and trade.

Entering the intermediate period (2019–2021), a conceptual transition toward sustainability-related issues became increasingly evident. Keywords such as sustainability, sustainable fashion, and fashion industry began to show stronger and more interconnected relationships. This shift reflects a growing academic awareness of the environmental and social impacts of the fashion industry, particularly in response to mounting criticism of fast fashion practices.

In the most recent period (2022–2025), fashion trends research has further evolved toward a multidisciplinary approach. Topics such as circular economy, recycling, textile industry, as well as the integration of digital technologies—including deep learning, machine learning, classification, and 3D printing—have become increasingly prominent. This development indicates that fashion trends research is no longer confined to aesthetics or consumer behavior, but increasingly encompasses technological innovation, production efficiency, and the transformation toward a sustainable and technology-driven fashion industry. Overall, the evolution of fashion trends research from 2016 to 2025 reflects a shift from mass-consumption-oriented perspectives toward sustainability, circularity, and digitalization within the fashion industry.

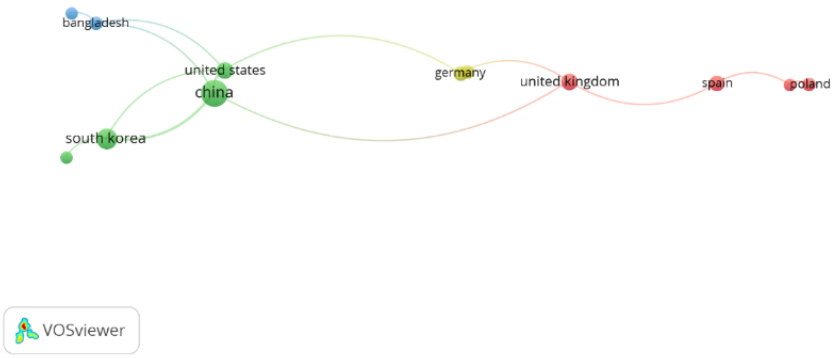

FIGURE 4. Most influential countries in fashion trend research.

Based on the country collaboration network, the United States and China emerge as the most central and influential actors in fashion trend research. Both countries display large node sizes and high connectivity, indicating strong publication output and extensive international research collaboration.

In addition, the United Kingdom, Germany, and South Korea also play important roles, particularly as research bridges between Asia and Europe. Bangladesh appears as a particularly relevant country, reflecting its role as a manufacturing hub and its association with labor-related issues in the global fashion industry. European countries such as Spain and Poland demonstrate more specialized yet still significant contributions.

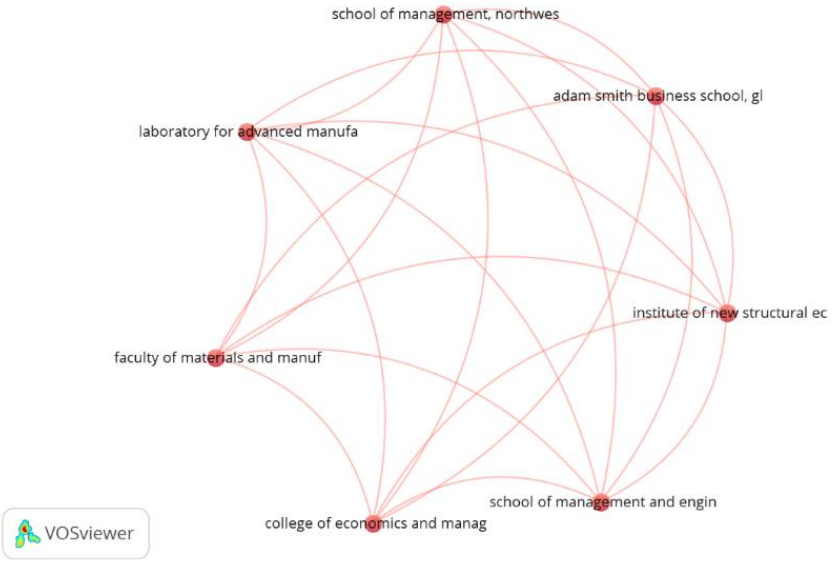

FIGURE 5. Most influential institutions in fashion trend research.

The institutional visualization indicates the dominance of academic institutions in the fields of management, economics, and engineering/manufacturing. Institutions such as the School of Management, Adam Smith Business School, the Institute of New Structural Economics, as well as faculties focusing on materials and manufacturing, demonstrate strong collaborative networks. This suggests that fashion trend research is largely examined from the perspectives of industrial management, sustainable economics, and material and production innovation, rather than solely from a design-oriented viewpoint.

FIGURE 6. Most influential authors in fashion trend research.

The author network map reveals that there is no single overwhelmingly dominant author; instead, several author clusters with specific contributions are evident. Authors such as Park, Minjung and An, Hyosun form a strong collaborative cluster, while other authors, including Zlatev, Zlatin Dimitrov; Indrie, Liliana; and Gurau, Dana Florentina, contribute to more specialized thematic areas. This structure indicates that fashion trend research is fragmented yet collaborative in nature, characterized by cross-disciplinary and cross-regional contributions.

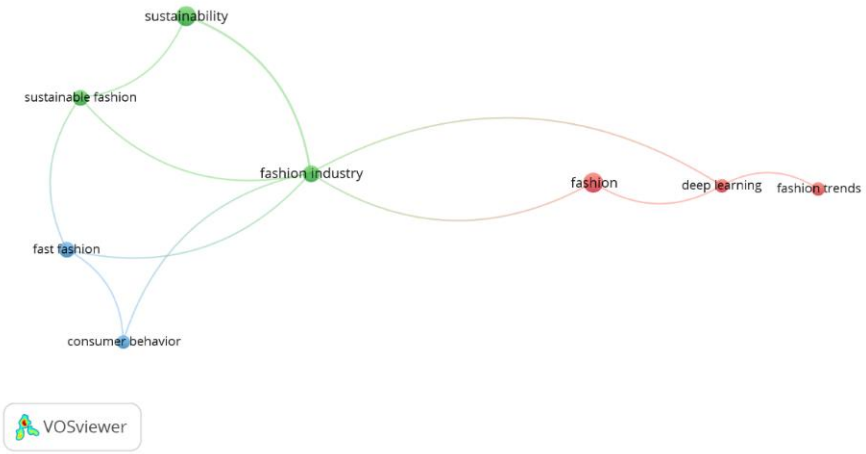

FIGURE 7. Dominant themes and keywords in fashion trend literature.

RQ3. What dominant themes and keywords emerge in the fashion trend literature?

The results of the keyword co-occurrence and overlay analysis reveal several major themes dominating the fashion trend research literature. Sustainability and the circular economy occupy the most central positions, as indicated by the strong interconnections among keywords such as sustainability, sustainable fashion, circular economy, and recycling. The dominance of these themes reflects a shift in fashion trend research toward more environmentally friendly and sustainability-oriented industrial practices.

In addition, themes related to the fashion industry and supply chains also emerge prominently through keywords such as fashion industry, clothing industry, textile industry, and textiles. This highlights researchers' growing attention to industrial structures, production processes, and supply chain management within the context of global dynamics.

On the other hand, themes related to consumer behavior and fast fashion continue to play an important role in the literature, as reflected by the presence of keywords such as consumer behavior and fast fashion. However, these themes are more frequently positioned as critical contexts within sustainability-oriented discussions, particularly in examining the environmental and social impacts of rapid and mass consumption patterns.

Furthermore, the overlay analysis reveals the growing prominence of technology and artificial intelligence–related themes in more recent publication periods. The emergence of keywords such as deep learning, machine learning, classification, and 3D printing indicates increasing integration of digital technologies in fashion trend research, including trend analysis, demand forecasting, product design, and manufacturing process innovation. Overall, fashion trends remain the central focus of the literature, but are now understood within a broader framework that integrates technological advancement, sustainability, and the transformation of the fashion industry.

FIGURE 8. Author collaboration network in fashion trend research.

RQ4. How do research collaboration patterns and co-citation networks evolve within the fashion trends field?

The author collaboration network in fashion trend research indicates that research collaboration patterns remain relatively limited and fragmented. The co-authorship visualization reveals several small clusters representing groups of authors who collaborate closely, but with low levels of inter-cluster connectivity. This suggests that most studies are conducted within narrow collaborative scopes, both at the individual and institutional levels.

Some authors, such as Park, Minjung and An, Hyosun, form relatively strong collaborative clusters, as indicated by intensive direct connections within the network. However, these clusters are not significantly connected to other clusters, highlighting the limited extent of cross-group collaboration. In addition, several authors, including Zhou, Jin; Hassan, S. H.; Gurau, Dana Florentina; and Tian, Yang, appear in relatively isolated positions within the network, reflecting research contributions that are largely individual or involve minimal collaboration.

Overall, the structure of this collaboration network suggests that fashion trend research is still developing, with collaboration predominantly confined to limited networks and not yet forming a broad and integrated research ecosystem. These findings point to substantial opportunities for enhancing collaboration across authors, institutions, and countries to enrich perspectives, expand research scope, and foster more comprehensive and multidisciplinary fashion trend studies.

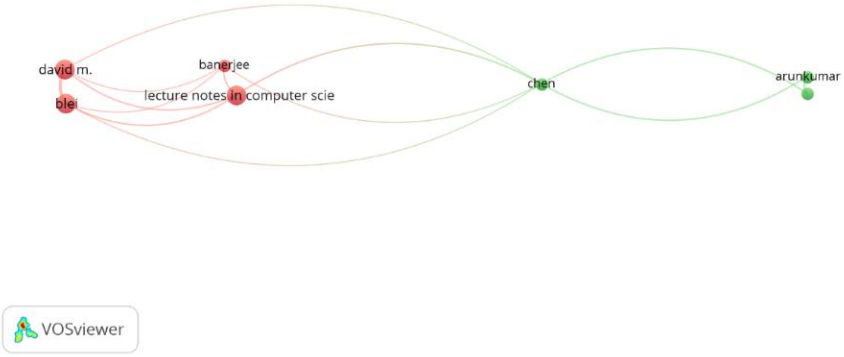

FIGURE 9. Co-citation network in fashion trend literature.

The co-citation network in fashion trend literature illustrates the intellectual structure and conceptual interconnections among key documents and authors that serve as foundational references in this field. The visualization reveals several clusters formed based on frequently co-cited references, indicating that fashion trend research is built upon relatively clustered bodies of literature with specific thematic foci, such as the fashion industry, sustainability, and technology-driven approaches.

Several nodes occupy more central positions within the network, suggesting that these documents or authors are frequently cited together across multiple studies. This highlights their significant role in shaping the theoretical and methodological frameworks of fashion trend research. Meanwhile, the connections among clusters indicate shared perspectives or conceptual approaches, even though the studies are conducted by different groups of authors. This reflects the presence of intellectual consensus around key issues within the fashion trend field.

Nevertheless, the co-citation network also shows that inter-cluster integration remains incomplete. Some clusters remain relatively isolated, pointing to fragmentation in theoretical development and research approaches. These findings suggest opportunities for future research to bridge existing streams of literature, enabling more comprehensive conceptual synthesis and strengthening the overall intellectual structure of fashion trend studies.

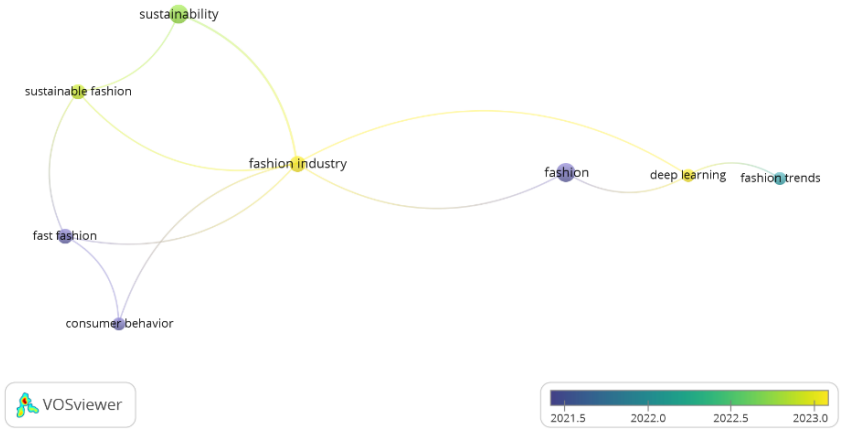

FIGURE 10. Research gap.

RQ5. What research gaps and future research opportunities exist in fashion trend studies?

Based on bibliometric analysis using VOSviewer through keyword co-occurrence mapping with an overlay visualization approach, the research structure on fashion trends reveals an uneven thematic pattern. The visualization indicates that the keyword fashion industry occupies a central position, characterized by a relatively large node size and a yellow color, signifying a high frequency of occurrence and dominance in the most recent publication period. This finding confirms that studies on fashion trends remain largely concentrated on industry-oriented contextual approaches and well-established general issues.

In contrast, keywords representing technological approaches, such as deep learning and fashion trends, appear as smaller nodes with low link strength and display the lightest colors on the temporal scale. From a bibliometric perspective, these characteristics indicate that such topics are relatively new or emerging themes, yet they have not been strongly integrated into the main clusters, including consumer behavior, sustainability, and fast fashion. This condition reflects a methodological gap in which fashion trend research is still dominated by descriptive and conceptual approaches, while predictive methods based on artificial intelligence and big data analytics remain highly limited.

Furthermore, the *consumer behavior* and *fast fashion* clusters are marked by bluish-purple hues, indicating earlier publication periods, and show weak connectivity with technology-based keywords. This pattern points to an integrative gap, namely the scarcity of studies that link consumer behavior with the application of intelligent technologies in predicting and shaping fashion trends. Such cross-cluster integration is, however, a key indicator of the development of an interdisciplinary research field.

From a bibliometric standpoint, the fragmentation of clusters and the weak interconnections among themes open up substantial opportunities for future research. Subsequent studies may focus on developing fashion trend prediction models based on machine learning or deep learning by integrating consumer behavior data, social media analytics, and sustainability principles. This approach would not only address the methodological limitations present in the current literature but also enhance both theoretical and practical contributions to strategic decision-making in the fashion industry. Accordingly, the results of this bibliometric analysis underscore that the future of fashion trend research should be oriented toward interdisciplinary, data-driven, and predictive approaches to bridge the gap between established research themes and emerging topics.

CONCLUSION

This study demonstrates that research on fashion trends has developed significantly during the 2016–2025 period, particularly since 2021, alongside increasing attention to sustainability, digitalization, and post-pandemic changes in consumer behavior. The United States and China emerge as the most influential countries in fashion trend research, although collaboration among researchers and institutions remains limited, resulting in a fragmented research landscape. Thematically, the focus of research has shifted from fast fashion and mass consumption toward sustainability, the circular economy, and the application of digital technologies such as machine learning and computer vision. This shift indicates that fashion trends are no longer understood solely as aesthetic phenomena, but as complex systems shaped by technological, industrial, environmental, and behavioral factors. Therefore, future research is encouraged to strengthen cross-disciplinary and cross-regional collaboration and to combine bibliometric approaches with empirical analyses in order to make stronger contributions to theory development, policy formulation, and sustainable fashion industry practices.

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