

# Exploring Nexus of Social Media Algorithms, Content Creators, and Gender Bias: A Systematic Literature Review

Shijun Lou<sup>1</sup>, Nor Azura Adzharuddin<sup>1\*</sup>, Sharifah Sofiah Syed Zainudin<sup>1</sup>,  
Siti Zobidah Omar<sup>2</sup>

<sup>1</sup> Faculty of Modern Languages and Communication University Putra Malaysia, Malaysia

<sup>2</sup> Faculty of Social Sciences and Liberal Arts, UCSI University, Malaysia

\* Corresponding Author: [zurh@upm.edu.my](mailto:zurh@upm.edu.my)

Received: 27 January 2024 | Accepted: 15 March 2024 | Published: 31 March 2024

DOI: <https://doi.org/10.55057/ajress.2024.6.1.39>

**Abstract:** Drawing on the PRISMA framework, this study systematically investigates the dynamics between social media algorithms, content creators, and gender bias. An analysis of 18 quantitative and mixed-method studies from the Web of Science and Scopus databases, spanning 2019 to 2023, uncovers three main research trajectories: algorithms' influence on gender bias, their role in shaping content, and the interactions between algorithms, gender bias, and content creators. The review synthesizes diverse theoretical approaches and models, offering comprehensive insights into the complex nexus of algorithms, gender bias, and content creators. The application of varied research methodologies, including experiments, surveys, and content analyses, facilitates a thorough examination of algorithmic impacts. The chosen studies, focusing on different social media platforms and algorithmic features, reflect the varied interests of researchers. The findings reveal that algorithms perpetuate gender stereotypes by processing and learning content imbued with gender biases and further marginalizing gender minorities, reinforcing binary gender norms. The algorithmic curation of popular content also introduces inequities among content creators. Highlighting the need for equitable and inclusive digital environments, this review advocates for ethical content creation and algorithmic practices to mitigate gender bias and foster equality on social media platforms.

**Keywords:** Social Media, Algorithm, Gender Bias, Gender Stereotype, Content Creators

## 1. Introduction

As social media user bases rapidly expand, cultural products such as news, music, and videos are increasingly embedded into platforms like Twitter, YouTube, and Facebook (Siciliano, 2022). These platforms have become significant arbiters of content visibility and trending topics (Jacobsen, 2021). They also employ inference analytics to predict user preferences, including sensitive attributes like race and gender, often in ways that are opaque and influence marketing strategies while reinforcing biases (Fosch-Villaronga et al., 2021). Therefore, it is increasingly crucial to critically examine the arbitrating power and social impacts of these algorithm-driven platforms, especially regarding recognition and interpersonal interactions (Jacobsen, 2021).

Algorithms influence people's purchasing decisions through visual content, such as reading materials and advertisements. Despite the recognition of gender as fluid and diverse, algorithms

often reinforce traditional binary gender concepts (Schroeder, 2021). Research has identified a clear bias in recommendation systems based on popular content, with this algorithm-driven popularity bias affecting both content consumers and creators (Zhang & Liu, 2021). Gender bias is particularly evident in search results; for example, Otterbacher et al. (2017) found that specific keyword searches resulted in gender-imbalanced image displays. Even algorithms that claim neutrality can perpetuate gender biases (Fabris et al., 2020; Lambrecht & Tucker, 2019). Bozdag (2013) observed that the personalization and filtering by algorithms might reflect the designers' personal biases. Social media algorithms, by pushing content based on user differences, further influence the strategies of content creators (Abul-Fottouh et al., 2020; Glotfelter, 2019).

In recent years, the term content creators has been used to describe individuals who create and share content on social media platforms (Arriagada & Ibáñez, 2020a). Algorithms affect how they create content based on trending topics, requiring an understanding of the logic behind algorithmic curation (Zhang & Liu, 2021). Content creators increasingly rely on an understanding of algorithms to boost the popularity of their content (Siciliano, 2022). As intermediaries, algorithms guide creators in adjusting their content strategies to increase the likelihood of their content being recommended (Glotfelter, 2019). Gender biases caused by algorithms may stem from the biased data designers use (Bozdag, 2013), potentially leading to a lack of diversity in created content and further reinforcing gender biases (Singh et al., 2020).

In the fields of humanities, social sciences, and communication studies, especially in quantitative and mixed-methods research, there is a lack of thorough examination and comprehensive summary of how algorithms in social or digital media influence gender bias, as well as their interactions with content creators. This study aims to systematically review and summarize the themes, theories, models, frameworks, and research designs used and to identify the chosen social media and algorithm features. Through an in-depth analysis of existing literature, this paper distills vital findings and conclusions about the impact of social media algorithms on content creators and gender bias. The goal is to provide the academic community with a comprehensive perspective on how quantitative and mixed-methods research can be applied in this field.

Therefore, this study focuses on the following five core research questions:

- i. What are the main areas and topics studied regarding how social media algorithms affect content creators and gender bias?
- ii. What theories, models, or frameworks have been employed in these studies?
- iii. What types of research designs have been used in these studies?
- iv. Which specific algorithm features and platforms have been selected in those articles?
- v. What conclusions have been drawn from these studies?

By addressing these research questions, this study aims to delve into how algorithms on internet platforms influence gender bias and the interplay with content creators, thereby providing valuable research materials and insights for related academic fields.

## **2. Methodology**

The data collection procedure for this research adhered strictly to the latest PRISMA 2020 guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure the accuracy and validity of the entire data collection process (Tang et al., 2021). PRISMA's strengths lie in its transparency and precision in the review process, which is utilized in various

systematic reviews related to algorithmic research, thereby providing assurance (Hall & Ellis, 2023).

## 2.1 Study Screening

The electronic databases primarily searched were Web of Science and Scopus, covering the period from January 1, 2019, to August 30, 2023, for quantitative and mixed-methods research papers. The search strategy employed Boolean operators with keywords such as "social media algorithm," "AI gender bias," "algorithm," "recommendation systems," "media gender content," "media content creators," "gender bias," and "gender stereotypes" (see Table 1).

**Table 1: Keywords and information search strategy**

| Database       | Keywords  |
|----------------|---|
| Web of Science | (((((TS= (social media algorithm)) OR TS= (AI gender bias)) OR TS= (algorithm)) OR TS= (recommender system)) AND TS= (media content creators)) OR TS= (media gender content)) AND TS= (gender bias)) OR TS= (gender stereotype)   |
| Scopus         | TITLE-ABS-KEY ( "social media" ) AND ( "algorithm" OR "ai" OR "recommend system" OR "AI gender bias" ) AND ( "content creator" ) AND ( "gender stereotypes" OR "gender bias" ) AND ( LIMIT-TO ( DOCTYPE, "ar" ) ) AND ( LIMIT-TO ( SUBJAREA, "SOCI" ) OR LIMIT-TO ( SUBJAREA, "PSYC" ) ) AND ( LIMIT-TO ( PUB YEAR, 2023 ) OR LIMIT-TO ( PUB YEAR, 2022 ) OR LIMIT-TO ( PUB YEAR, 2021 ) OR LIMIT-TO ( PUB YEAR, 2020 ) OR LIMIT-TO ( PUB YEAR, 2019 ) ) AND ( LIMIT-TO ( LANGUAGE, "ENGLISH" ) ) |

The literature was retrieved from two high-quality databases, Web of Science and SCOPUS, with 6 criteria for filtering studies: 1) the study must be quantitative or mixed-methods; 2) the study must include data findings; 3) the research needed to be related to social media, algorithmic, gender biases, gender stereotypes, and content creators; 4) studies focused on engineering and computer science were excluded; 5) the research language had to be in English; 6) the timeframe was from January 2019 to August 31, 2023 (see table 2).

**Table 2: Inclusion and exclusion criteria**

| Criterion          | Included   | Excluded   |
|--------------------|--|--|
| Timeline           | January 2019- August 2023  | After September 2023   |
| Literature type    | Journals (research articles)   | Journals (review papers), books, preprints, book chapters, series, theses, and conference proceedings                |
| Language           | English  | Non-English  |
| Research direction | Communication, Social Science, and Psychology  | non-Communication, non-Social Science and, non-Psychology  |
| Research object    | Social media, Digital media, Algorithms, Gender bias, Gender stereotypes, Content Creators | non-Social media, non-Digital media, non-Algorithms, non-Gender bias, non- Gender stereotypes, non- Content creators |
| Research method    | Quantitative, Mixed Methods  | Qualitative  |

## 2.2 Data Extraction

In the first round of searching, following the PRISMA flowchart guidelines, 8098 relevant articles were initially identified from Scopus and Web of Science. Using EndNote 20 for document management, 123 articles were found to be duplicates and thus removed. An additional 7410 articles were excluded for not being within the domains of communication studies, psychology, or sociology. Of the remaining 522 articles screened based on the keywords listed in Table 1, 464 did not meet the inclusion criteria. A final round of screening

on the methodology of the remaining 58 studies resulted in the exclusion of 40 qualitative studies, leaving 18 studies that met the criteria for inclusion (figure 1).

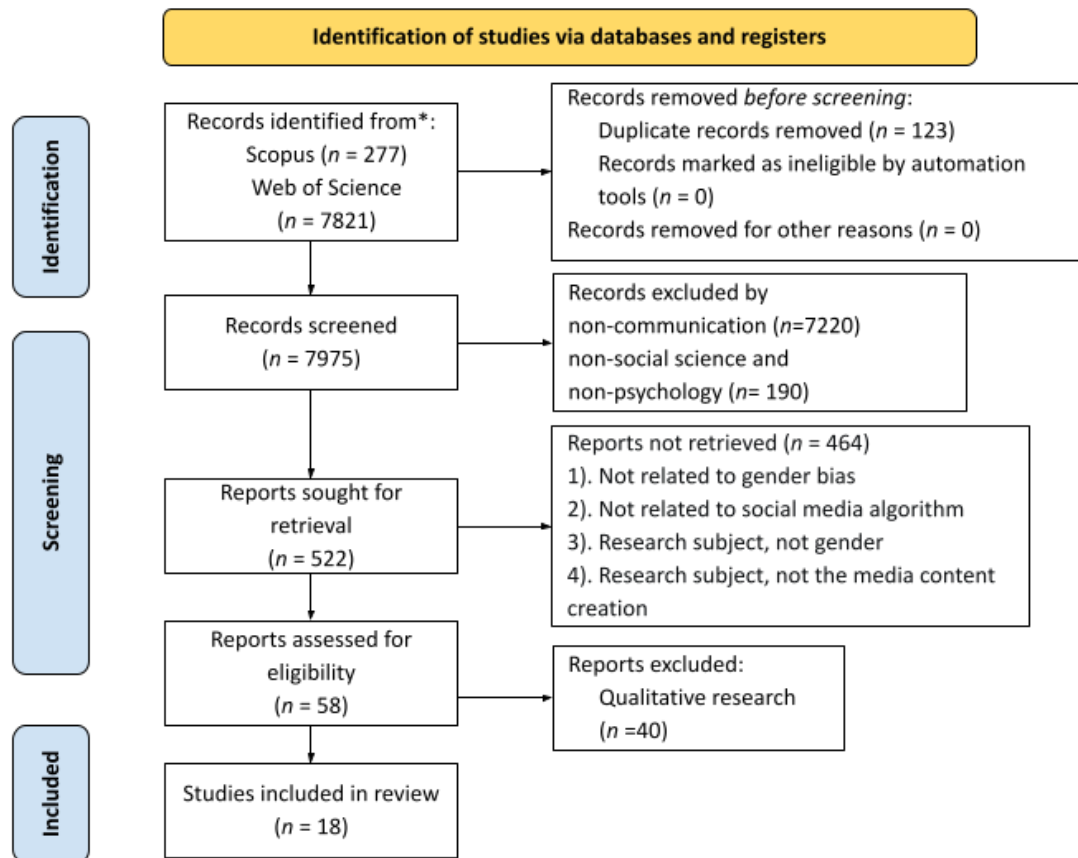


Figure 1: PRISMA flow diagram for results of systematic review

### 3. Results

#### 3.1 Research Areas and Topics

In a review of 18 studies, it is notable that in 6 of the studies, the subjects of investigation were female images representations in social media and search algorithms; 4 studies examined gender bias in algorithm-driven advertisements, and 2 studies focused the impact of social media algorithms on popularity biases; another 2 studies looked at how algorithms learning gender-related user content. The remaining 6 studies explored various themes, such as the use of social media functions by transgender individuals, gender characteristics of artificial intelligence robots, content allocation based on gender interests, and gender biases in AI-generated professional images (see Table 3).

**Table 3: Research Areas and Topics of Selected Articles**

| Research areas  | Research topics   | Reference   |
|---|---|---|
| Algorithms reinforce gender biases towards Females in image search and picture display.                           | <ul style="list-style-type: none"> <li>- The impact of image searches on the portrayal of women driving.</li> <li>- Comparing how pregnancy images are displayed by algorithms across various digital media platforms.</li> <li>- Examining how algorithms present stereotypical images of women's body aesthetics and the impact of these portrayals on beauty standards.</li> <li>- Analyzing the complex interactions between the Instagram platform and content creators, noting that while authentic content is popular, idealized content often achieves success more easily.</li> <li>- Discussing the representation of gender and racial biases in professions within mainstream content controlled by algorithms.</li> <li>- Comparing biases in the display of images describing different genders by various search engine algorithms.</li> </ul> | <ul style="list-style-type: none"> <li>- Albawardi &amp; Jones (2023)</li> <li>- Bogers et al. (2020)</li> <li>- de Freitas &amp; Moura Filho (2022)</li> <li>- Sokolova et al. (2022)</li> <li>- Metaxa et al. (2021)</li> <li>- Ulloa et al. (2022).</li> </ul> |
| Social media algorithms analyze users' gender privacy and push content, reinforcing binary gender classification. | <ul style="list-style-type: none"> <li>- How Google utilizes algorithms to recommend advertisements based on gender assumptions about users.</li> <li>- Exploring how Twitter employs algorithms to infer users' gender settings.</li> <li>- Investigating the prevalence and impact of gender discrimination on Twitter.</li> <li>- Analyzing the manifestation of gender bias in Facebook's algorithmic advertising targeting specific groups.</li> </ul>   | <ul style="list-style-type: none"> <li>- Shekhawat et al. (2019a)</li> <li>- Fosch-Villaronga et al. (2021a)</li> <li>- Fosch-Villaronga et al. (2021b)</li> <li>- Bol et al. (2020)</li> </ul>   |
| The impact of social media algorithms on popularity biases, thereby influencing the content created by users.     | <ul style="list-style-type: none"> <li>- Exploring the impact of various recommendation algorithms on the preference for popular content across different fields and scenarios.</li> <li>- Delving into the trending algorithms for educational content on YouTube and providing corresponding creative guidance for content creators.</li> </ul>   | <ul style="list-style-type: none"> <li>- Elahi et al. (2021)</li> <li>- Saurabh &amp; Gautam (2019)</li> </ul>  |
| Algorithmic learning of gendered content created by users in social media.  | <ul style="list-style-type: none"> <li>- The content created by users on various digital platforms can influence algorithms' ability to recognize gender stereotypes.</li> <li>- Analyzing the differences and impacts of mainstream and professional media coverage of female athletes on Twitter.</li> </ul>  | <ul style="list-style-type: none"> <li>- Singh et al. (2020)</li> <li>- Adá Lameiras &amp; Rodríguez-Castro (2021)</li> </ul>   |
| The impact of social media features on different gender groups.   | <ul style="list-style-type: none"> <li>- Examining the effects of the rainbow filter feature on Facebook for heterosexual women and female LGBTQ+ groups who support LGBTQ+ causes.</li> </ul>  | <ul style="list-style-type: none"> <li>- Matsick et al. (2020)</li> </ul>   |
| Constructing male characteristics in feminized AI robots.   | <ul style="list-style-type: none"> <li>- Investigating how chatbots programmed by women shape masculine traits and the implications for robot ethics.</li> </ul>  | <ul style="list-style-type: none"> <li>- Koh (2023)</li> </ul>  |
| The differential impact of social media algorithms on interests across genders                                    | <ul style="list-style-type: none"> <li>- How the Reddit algorithm recommends activities based on gender interest analysis.</li> </ul>   | <ul style="list-style-type: none"> <li>- Thelwall &amp; Stuart (2019)</li> </ul>  |
| The manifestation and impact of gender stereotypes in the field of AI   | <ul style="list-style-type: none"> <li>- Representation of gender stereotypes by DALL-E 2 in generating images of different professions.</li> </ul>   | <ul style="list-style-type: none"> <li>- García-Ull &amp; Melero-Lázaro (2023)</li> </ul>   |

### 3.2 Theoretical and Framework

This section succinctly outlines the theories and frameworks utilized in the studies reviewed, as detailed in Table 4. Of the 18 papers examined, 6 did not specifically adhere to any particular theory or framework. The other 12 papers employed a variety of theories and frameworks.



Generally, a range of theoretical frameworks and models were applied to establish the logical underpinnings of the research concerning the impact of algorithms on content and gender bias. These theories and models primarily originate from disciplines such as psychology, communication studies, sociology, linguistics, visual communication, gender studies, management, computer science, and other interdisciplinary areas. This variety underscores the multidisciplinary approach prevalent in research on algorithmic media, characterized by the integration of theories and models from various fields.

**Table 4: Theories and Frameworks of Selected Articles**

| Theories And Frameworks   | Theories And Frameworks Fields   | References  |
|---|--|---|
| - Parasocial Contact Theory<br>- E-Contact Theory                             | - Communication studies<br>- Psychology                                  | - Matsick, et al. (2020)  |
| - Cultural theory<br>- Heteronormativity Theory                               | - Multidisciplinary theories<br>- Gender Studies and Queer Theory Field  | - Bogers et al. (2020)  |
| - Algorithmic Fairness Framework  | - Computer model   | - Metaxa et al. (2021)  |
| - Cartwright's theory of Informational and Pressure Vulnerabilities framework | - Multidisciplinary theories   | - Bol et al. (2020)   |
| - Sociotechnical Systems Theory   | - Management theory.   | - Singh et al. (2020)   |
| - Objectification Theory  | - Psychology and Gender Studies  | - Adá Lameiras & Rodríguez-Castro (2021)<br>- Sokolova et al., 2022   |
| - Visual Representation Framework   | - Communication Studies, Media Studies, Cultural Studies, and Art Theory | - Albawardi & Jones (2023)  |
| - Social Role Theory  | - Social Psychology  | - de Freitas & Moura Filho (2022)   |
| - Gender as Performance<br>Kiesling's discussion of desire and alignment      | - Performance Theory and Gender Studies in Linguistics                   | - Koh (2023)  |
| - Topic Modelling   | - Computer model.  | - Thelwall & Stuart (2019)  |
| - Systematic auditing approach  | - Interdisciplinary Framework  | - Ulloa et al. (2022)   |
| None  |  | - Shekhawat et al. (2019a)<br>- Fosch-Villaronga et al. (2021a)<br>- Elahi et al. (2021)<br>- Fosch-Villaronga et al. (2021b)<br>- Saurabh & Gautam (2019)<br>- García-Ull & Melero-Lázaro (2023) |

### 3.3 Use of Research Methods

The research methods and analytical approaches employed in these 18 studies are diverse and include experiment design, cross-platform analysis, audit methodology, empirical study, online tracking, self-reported survey data, comparative study of platforms, multi-method approach (quantitative/qualitative), experimental design, survey questionnaire, data analysis, content analysis. For a detailed application of these methods across the studies, refer to Table 5.

**Table 5: Summary of The Research Methods in Articles Selected for Analysis.**

| Research Methods                                 | Apply   | Sample Size |
|--|---|-------------|
| Multi-Method Approach (Quantitative/Qualitative) | Analyzing images and metadata with quantitative tools and interpreting them qualitatively through multimodal representation, social semiotics, and mediated discourse analysis (Albawardi & Jones, 2023)<br><br>Revealing a quantitative scarcity in representation and qualitative biases in the content (Adá Lameiras & Rodríguez-Castro, 2021). Utilizing stratified probability sampling and a 3-point Likert scale to analyze workplace images generated by DALL-E 2 (García-Ull & Melero-Lázaro, 2023). | 3           |
| Experimental Design                              | A between-subjects experiment was conducted to examine the effects of viewing Facebook profiles on reactance, perceptions, and sexual prejudice (Matsick et al., 2020).<br><br>An experimental design assessed gender demographic options in Google Ad Settings (Shekzawat et al., 2019a).<br><br>Evaluating recommendation quality and popularity bias using different metrics (Elahi et al., 2021).   | 3           |
| Survey Questionnaire                             | Accuracy of gender assignments on Twitter (Fosch-Villaronga et al., 2021a).<br>Compared gender inference between gay and straight male Twitter profiles. The research varied in objectives, platforms, and sample sizes (Fosch-Villaronga et al., 2021b).<br><br>Analyzed objectifying gaze among French Instagram users (Sokolova et al., 2022).   | 3           |
| Data Analysis                                    | Using computer vision and semi-supervised Convolutional Neural Networks (CNN) to analyze Instagram images (de Freitas & Moura Filho, 2022).<br><br>Analyzes a popular channel, performing time-series analysis and employing an entropy-based decision tree classifier to identify key features influencing video popularity (Saurabh & Gautam, 2019).  | 2           |
| Content Analyze                                  | Examined AI Luda Lee Gallery interactions, focusing on hegemonic masculinity (Koh, 2023).<br><br>Gender interest disparities in Reddit job ads (Thelwall & Stuart, 2019).   | 2           |
| A Cross-Platform Analysis                        | Analyzing pregnancy-related social media images on various platforms. Introducing image grids and synthetic images for visual language comparison (Bogers et al., 2020).  | 1           |
| Kay et al's 2015 Audit Methodology               | Analyzing gender representation in search image results for professions. Comparing image results to labor force ratio in 2015 (Metaxa et al., 2020).  | 1           |
| Online Tracking and Self-Reported Survey Data    | Combining online tracking and survey data. Assessing content targeting based on user characteristics (Bol et al., 2020).  | 1           |
| Comparative Study of Platforms                   | Compare male and female image quantities. Collected via Microsoft Bing Search API (Singh et al., 2020).   | 1           |
| Systematic auditing approach                     | The study uses 240 automated browsers to simulate user behavior, controlling for personalization, randomization, and time effects. It employs non-gendered and gendered query terms to ensure the rigor and control of the research, investigating the personalization of search engine results (Ulloa et al., 2022).   | 1           |

### 3.4 Selection of Social Media Platforms and Algorithmic Types

In the review of 18 articles, the chosen social media platforms for research are commonly well-known mainstream platforms. The distinction among these studies lies in the different algorithmic functions selected and whether the research conducts comparative analyses across multiple platforms or focuses on in-depth analyses of a single platform. Single-platform studies and multi-platform comparative analyses frequently select Twitter, Instagram, Facebook, Google, and Reddit. Additionally, emerging research is beginning to address gender bias in algorithm learning and design within popular AI text-to-image generation software. For detailed information on the social media platforms and algorithm types selected in different studies, refer to Table 6.

**Table 6: Selection of Platforms and Algorithm Types in the Chosen Articles.**

| Platforms   | Algorithm types   | References   |
|---|---|--|
| Twitter   | Algorithm inferring user gender and Reshaping gender biases.  | Adá Lameiras & Rodríguez-Castro (2021)<br>Fosch-Villaronga et al. (2021a)<br>Fosch-Villaronga et al. (2021b) |
| Instagram   | Shaping objectified gender stereotypes in artificial intelligence algorithm frameworks.               | de Freitas & Moura Filho (2022).<br>Sokolova et al. (2022).  |
| Facebook  | Rainbow filter function; Algorithmic personalized   | Matsick et al.(2020)<br>Bol et al. (2020)  |
| Google  | Image search and Ads personalization  | Metaxa et al.(2021)<br>Shekhawat et al. (2019a)  |
| Reddit  | Gender interest inference   | Thelwall & Stuart (2019)   |
| YouTube   | Hot trends in educational channels  | Saurabh & Gautam (2019)  |
| DALL-E2   | AI Image Generation   | García-Ull & Melero-Lázaro (2023)  |
| Luda Lee is an open-domain AI chatbot                       | Algorithmic learning from user-generated content.   | Koh (2023)   |
| Twitter, MovieLens  | Recommendation algorithms on popularity bias.   | Elahi et al. (2021)  |
| Google, and Getty   | Image search  | Albawardi & Jones (2023)   |
| Google, Bing, Baidu, Yandex                                 | Image search  | Ulloa et al. (2022)  |
| Pinterest, Twitter, Reddit                                  | Image search  | Bogers et al. (2020)   |
| The New York Times online, Wikipedia, Shutterstock, Twitter | Algorithms of various digital media platforms on learning and managing social media content creation. | Singh et al. (2020)  |

### 3.5 The Impact of Social Media Algorithms on Gender Bias and Content Creators

Figure 2 depicts a significant interplay between gender bias in social media algorithms' reinforcement of gender stereotypes and content creators, with 9 studies explicitly finding this interaction. Additionally, 5 studies focus on examining the inherent gender biases within algorithms and their role in propagating gender stereotypes. The majority of these 14 articles concentrate on the impact of algorithms on female stereotypes, followed by research on gender-marginalized groups such as the LGBTQ community. Notably, with the advancement of AI technology, the study of gender bias in AI applications that merge algorithms with content creation, such as chatbots and AI-generated images, is on the rise. The remaining 4 studies primarily analyze the influence of social media algorithms on popular content recommendations and their implications for content creators, offering insights into how algorithmic design can better facilitate content creation. For more details, refer to Figure 2.



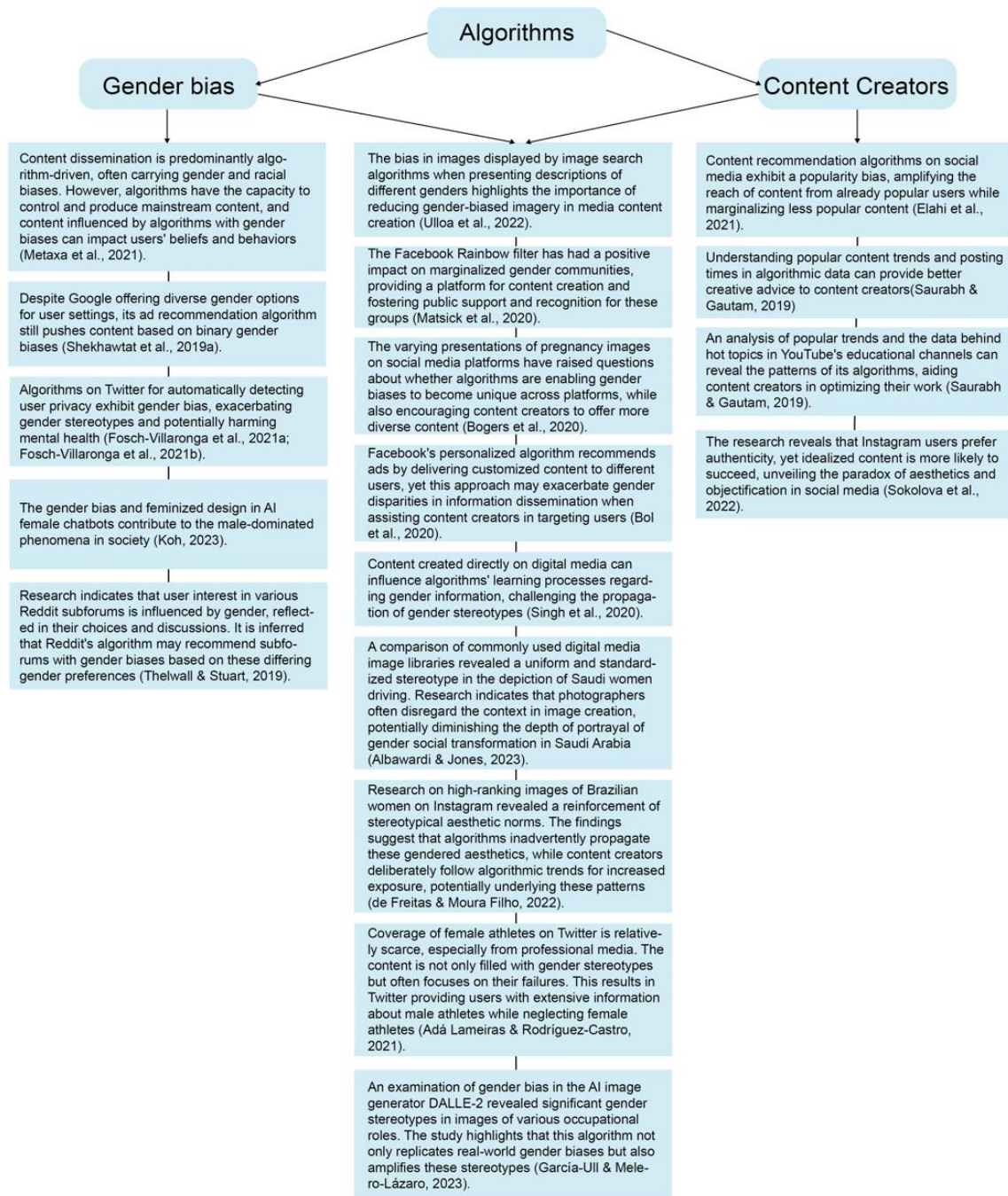


Figure 2: The impact of algorithms on gender bias and content creators

## 4. Discussion

This study systematically reviewed 18 articles from January 2019 to August 2023 on the interplay between social media platforms, internet algorithms, gender bias, and content creators. The research spans three main directions: the impact of algorithmic functions on the propagation of gender bias and stereotypes, the influence of algorithms on the creative direction of content creators and potential inequalities, and how algorithms affect gender bias and stereotypes by learning from the content produced by creators.

In response to RQ1, we found that these aspects are interconnected and interactive. Within the studies, eight distinct research areas were identified: 1) Gender image presentation by social media algorithms; 2) Analysis of gender privacy and content promotion by social media algorithms, reinforcing binary gender classifications; 3) The impact of gender bias within social media algorithms on content creation; 4) The direct influence of social media algorithms on content creation; 5) Social media features' effects on different gender groups; 6) Internet algorithms' identification of gender interests; 7) The portrayal of male characteristics in feminized AI robots; 8) Gender stereotypes in AI-driven content creation.

Addressing RQ2, the findings underscore the critical importance of applying multidisciplinary theories and frameworks to deeply understand the impact of social media algorithms on content creation and gender bias. These theories, spanning psychology to sociology, illuminate how algorithms shape social identities and behaviors. Social role theory and gender expression theory, for example, demonstrate how algorithms push content based on gender preferences, intensifying binary classifications. Visual communication and cognitive regime theories explore algorithms' image presentation choices and their marginalizing effects. Studies on algorithmic fairness highlight representational biases, underscoring the need for fairness in content and the impact of algorithms on social inequality. These interdisciplinary insights are invaluable for understanding algorithms' effects on content creation and gender bias, guiding us toward a more equitable digital society.

In response to RQ3, the diversity of research methodologies proved essential for investigating the influence of social media algorithms on content generation and gender biases. Experimental designs, surveys, data and content analyses, and online monitoring provided a broad and nuanced perspective, revealing the complex ways algorithms influence content and gender portrayals. This methodological variety enriches the study's findings, enhancing its accuracy and reliability, and offers a comprehensive understanding of social media algorithms' specific effects on gender bias.

RQ4's analysis of selected algorithmic platforms showed a preference for well-known social media and digital media platforms like Facebook, Twitter, Instagram, and Google, with varied focus on specific algorithmic functions. This diversity reflects the researchers' interest in the multifaceted impacts of algorithms on content creation and gender bias, highlighting the importance of studying these functions for a deeper understanding of algorithms' roles in shaping content and bias. Notably, in 2023, studies began examining gender stereotypes in content produced by AI algorithms acting as content creators.

Finally, by addressing RQ5, the study explored the interactions between algorithms, gender bias, and content creators. The characteristics of algorithms shape content visibility and perpetuate and intensify gender stereotypes, leading to gender biases in professional fields (Metaxa et al., 2021). These algorithms manipulate popularity trends, learning and identifying content with gender bias, affecting content creators who follow these trends and exacerbating social issues related to gender stereotypes (Singh et al., 2020). Research has shown that social media platforms consistently exhibit bias in displaying gender-related images (Bogers et al., 2020), and content creators often unconsciously perpetuate female stereotypes (Adá Lameiras & Rodríguez-Castro, 2021). Additionally, the commercial application of targeted advertising algorithms sometimes results in judgments based on stereotypes (Shekhawat et al., 2019a). Algorithmic bias not only adversely affects marginalized communities, intensifying existing gender biases (Fosch-Villaronga et al., 2021a) but also reinforces social norms (Fosch-Villaronga et al., 2021b). With AI's advancement, algorithms have become content creators,

reproducing content that reflects gender stereotypes and reinforces the unfairness of monolithic gender portrayals (García-Ull & Melero-Lázaro, 2023). These findings underscore the need for algorithmic fairness, responsible content creation, and inclusive marketing strategies to address gender bias on social media platforms and promote gender equality.

## 5. Limitation

This study delves into the relationship between social media algorithms, content creators, and gender bias through quantitative and mixed-method approaches but relatively neglects the analysis of qualitative research. Moreover, the 18 articles analyzed in this study primarily focus on mainstream social media platforms like Google, Instagram, Twitter, Reddit, and YouTube, with most studies relying on image-based methods to assess gender bias induced by algorithms. This highlights the limitations in platform selection and methods of validating gender bias in research, suggesting that future studies should consider a more diverse range of platforms and verification methods. Despite utilizing the PRISMA method and referencing literature from authoritative databases between 2019 and 2023, expanding the research scope to a broader range of databases and incorporating qualitative methods could offer richer insights.

Furthermore, current research explores algorithms' negative impacts on gender bias. To deepen research in this field, future endeavors should pay more attention to the potential positive roles of algorithms in promoting gender equality and empowering women, exploring how algorithms can support gender diversity and equality, thereby pushing the research toward a more comprehensive and balanced direction.

## 6. Conclusion

This study, employing the PRISMA systematic literature review method, analyzed a curated selection of 18 studies to unveil the interplay between social media algorithms, gender bias, and content creators. These investigations underscore the significant role that social media algorithms play in shaping content creators and perpetuating gender stereotypes, emphasizing how algorithmic control over trending content not only influences how creators present content but also reinforces gender stereotypes, contributing to potential societal inequalities. Furthermore, as algorithms learn, content imbued with gender biases, such as those prevalent in media, can amplify algorithms' recognition of gender biases, perpetuating the spread of gender stereotypes. From actual behaviors to algorithmic feedback, extending to user perceptions and societal impacts, this complex ecosystem highlights the intricate interplay between algorithms, gender, and content creators.

The studies employ diverse theories and frameworks, offering multifaceted perspectives on this interaction. Applying these theories and frameworks enriches the research methodology, allowing for a deeper understanding of the impact of algorithms on gender bias and content creators. From social role theory to algorithmic fairness frameworks, from visual communication theory to gender performance theory, these diverse theoretical underpinnings provide a comprehensive grasp of this complex issue, contributing to constructing a more equitable and inclusive digital society. These studies reveal the complex connections between social media algorithms, gender bias, and content creators. These findings highlight the necessity for algorithmic fairness, advocate for responsible content creation, and suggest more inclusive marketing strategies to promote strategies for gender equality in society. This comprehensive review offers crucial insights into the challenges and complexities of the field, providing valuable guidance for further research and practical efforts.

## References

- Abul-Fottouh, D., Song, M. Y., & Gruz, A. (2020, August). Examining algorithmic biases in YouTube's recommendations of vaccine videos. *International Journal of Medical Informatics*, 140, 104175. <https://doi.org/10.1016/j.ijmedinf.2020.104175>
- Adá Lameiras, A., & Rodríguez-Castro, Y. (2020, February 26). The presence of female athletes and non-athletes on sports media Twitter. *Feminist Media Studies*, 21(6), 941–958. <https://doi.org/10.1080/14680777.2020.1732439>
- Albawardi, A., & Jones, R. H. (2021, October 18). Saudi women driving images, stereotyping and digital media. *Visual Communication*, 22(1), 96–127. <https://doi.org/10.1177/14703572211040851>
- Allport, Gordon. W. *The nature of prejudice*. Addison-Wesley Pub. Co. 1979.
- Arriagada, A., & Ibáñez, F. (2020, July). “You Need At Least One Picture Daily, if Not, You’re Dead”: Content Creators and Platform Evolution in the Social Media Ecology. *Social Media + Society*, 6(3), 205630512094462. <https://doi.org/10.1177/2056305120944624>
- Bogers, L., Niederer, S., Bardelli, F., & De Gaetano, C. (2020, July 22). Confronting bias in the online representation of pregnancy. *Convergence: The International Journal of Research Into New Media Technologies*, 26(5–6), 1037–1059. <https://doi.org/10.1177/1354856520938606>
- Bol, N., Strycharz, J., Helberger, N., van de Velde, B., & de Vreese, C. H. (2020, October 4). Vulnerability in a tracked society: Combining tracking and survey data to understand who gets targeted with what content. *New Media & Society*, 22(11), 1996–2017. <https://doi.org/10.1177/1461444820924631>
- Bozdog, E. (2013, June 23). Bias in algorithmic filtering and personalization. *Ethics and Information Technology*, 15(3), 209–227. <https://doi.org/10.1007/s10676-013-9321-6>
- Cartwright, P. (2014, December 13). Understanding and Protecting Vulnerable Financial Consumers. *Journal of Consumer Policy*, 38(2), 119–138. <https://doi.org/10.1007/s10603-014-9278-9>
- de Freitas, L. C., & Moura Filho, R. N. D. (2022, November). Aesthetic normalization of gender in the Instagram application: A portrait of the Brazilian woman. *Computer Law & Security Review*, 47, 105753. <https://doi.org/10.1016/j.clsr.2022.105753>
- Elahi, M., Kholgh, D. K., Kiarostami, M. S., Saghari, S., Rad, S. P., & Tkalčič, M. (2021, September). Investigating the impact of recommender systems on user-based and item-based popularity bias. *Information Processing & Management*, 58(5), 102655. <https://doi.org/10.1016/j.ipm.2021.102655>
- Fabris, A., Purpura, A., Silvello, G., & Susto, G. A. (2020, November). Gender stereotype reinforcement: Measuring the gender bias conveyed by ranking algorithms. *Information Processing & Management*, 57(6), 102377. <https://doi.org/10.1016/j.ipm.2020.102377>
- Fosch-Villaronga, E., Poulsen, A., Søråa, R., & Custers, B. (2021, May). A little bird told me your gender: Gender inferences in social media. *Information Processing & Management*, 58(3), 102541. <https://doi.org/10.1016/j.ipm.2021.102541>
- Fosch-Villaronga, E., Poulsen, A., Søråa, R. A., & Custers, B. (2021, May 26). Gendering algorithms in social media. *ACM SIGKDD Explorations Newsletter*, 23(1), 24–31. <https://doi.org/10.1145/3468507.3468512>
- García-Ull, F. J., & Melero-Lázaro, M. (2023, August 24). Gender stereotypes in AI-generated images. *El Profesional De La Información*. <https://doi.org/10.3145/epi.2023.sep.05>
- Glottfelter, A. (2019, December). Algorithmic Circulation: How Content Creators Navigate the



- Effects of Algorithms on Their Work. *Computers and Composition*, 54, 102521. <https://doi.org/10.1016/j.compcom.2019.102521>
- Hall, P., & Ellis, D. J. (2023, March 14). A systematic review of socio-technical gender bias in AI algorithms. *Online Information Review*. <https://doi.org/10.1108/oir-08-2021-0452>
- Jacobsen, B. N. (2021, October 26). Regimes of recognition on algorithmic media. *New Media & Society*, 25(12), 3641–3656. <https://doi.org/10.1177/14614448211053555>
- Kiesling, S. (2011, December 20). interactional construction of desire as gender. *Gender and Language*, 5(2), 213–239. <https://doi.org/10.1558/genl.v5i2.213>
- Koh, J. (2023, April). “Date me date me”: AI chatbot interactions as a resource for the online construction of masculinity. *Discourse, Context & Media*, 52, 100681. <https://doi.org/10.1016/j.dcm.2023.100681>
- Lambrecht, A., & Tucker, C. (2019, July). Algorithmic Bias? An Empirical Study of Apparent Gender-Based Discrimination in the Display of STEM Career Ads. *Management Science*, 65(7), 2966–2981. <https://doi.org/10.1287/mnsc.2018.3093>
- Matsick, J. L., Kim, L. M., & Kruk, M. (2020, June 10). Facebook LGBTQ Pictivism: The Effects of Women’s Rainbow Profile Filters on Sexual Prejudice and Online Belonging. *Psychology of Women Quarterly*, 44(3), 342–361. <https://doi.org/10.1177/0361684320930566>
- Metaxa, D., Gan, M. A., Goh, S., Hancock, J., & Landay, J. A. (2021, April 13). An Image of Society. *Proceedings of the ACM on Human-Computer Interaction*, 5(CSCW1), 1–23. <https://doi.org/10.1145/3449100>
- Otterbacher, J., Bates, J., & Clough, P. (2017, May 2). Competent Men and Warm Women. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. <https://doi.org/10.1145/3025453.3025727>
- Saurabh, S., & Gautam, S. (2019, January). Modelling and statistical analysis of YouTube’s educational videos: A channel Owner’s perspective. *Computers & Education*, 128, 145–158. <https://doi.org/10.1016/j.compedu.2018.09.003>
- Schroeder, J. E. (2020, October 14). Reinscribing gender: social media, algorithms, bias. *Journal of Marketing Management*, 37(3–4), 376–378. <https://doi.org/10.1080/0267257x.2020.1832378>
- Shekhawat, N., Chauhan, A., & Muthiah, S. B. (2019, June 26). Algorithmic Privacy and Gender Bias Issues in Google Ad Settings. *Proceedings of the 10th ACM Conference on Web Science*. <https://doi.org/10.1145/3292522.3326033>
- Siciliano, M. L. (2023, April). Intermediaries in the age of platformized gatekeeping: The case of YouTube “creators” and MCNs in the U.S. *Poetics*, 97, 101748. <https://doi.org/10.1016/j.poetic.2022.101748>
- Singh, V. K., Chayko, M., Inamdar, R., & Floegel, D. (2020, January 22). Female librarians and male computer programmers? Gender bias in occupational images on digital media platforms. *Journal of the Association for Information Science and Technology*, 71(11), 1281–1294. <https://doi.org/10.1002/asi.24335>
- Sokolova, K., Kefi, H., & Dutot, V. (2022, December). Beyond the shallows of physical attractiveness: Perfection and objectifying gaze on Instagram. *International Journal of Information Management*, 67, 102546. <https://doi.org/10.1016/j.ijinfomgt.2022.102546>
- Tang, L., Omar, S. Z., Bolong, J., & Mohd Zawawi, J. W. (2021, April). Social Media Use Among Young People in China: A Systematic Literature Review. *SAGE Open*, 11(2), 215824402110164. <https://doi.org/10.1177/21582440211016421>
- Thelwall, M., & Stuart, E. (2019, July). She’s Reddit: A source of statistically significant gendered interest information? *Information Processing & Management*, 56(4), 1543–1558. <https://doi.org/10.1016/j.ipm.2018.10.007>



- Ulloa, R., Richter, A. C., Makhortykh, M., Urman, A., & Kacperski, C. S. (2022, June 19). Representativeness and face-ism: Gender bias in image search. *New Media & Society*, 146144482211006. <https://doi.org/10.1177/14614448221100699>
- Zhang, M., & Liu, Y. (2021, November). A commentary of TikTok recommendation algorithms in MIT Technology Review 2021. *Fundamental Research*, 1(6), 846–847. <https://doi.org/10.1016/j.fmre.2021.11.015>