The gender gap in scientific research in the field of communication in Spain

La brecha de género en la investigación científica en el ámbito de la comunicación en España

Sánchez-Jiménez, R., Alonso-Muñoz, L., y Botezan, I.

Rodrigo Sánchez-Jiménez. Universidad Complutense de Madrid (España).
PhD in Documentation from the Universidad Complutense de Madrid, where he is Associate Professor in the Department of Library and Information Science. His research focuses on scientometrics, information retrieval, text mining, and the quantitative analysis of scientific communication, with particular interest in gender studies and open scholarly databases.
https://orcid.org/0000-0002-3685-7060, rodsanch@ucm.es

Laura Alonso-Muñoz. Universitat Jaume I de Castelló (España).
PhD in Communication from Universitat Jaume I de Castelló, where she serves as an Associate Professor of Journalism in the Department of Communication Sciences. Her research focuses on the study of digital political communication, the study of the populist phenomenon, and the analysis of disinformation.
https://orcid.org/0000-0001-8894-1064, lalonso@uji.es

Iuliana Botezan. Universidad Complutense de Madrid (España).
PhD in Documentation from the Universidad Complutense de Madrid, where she is Associate Professor in the Department of Library and Information Science. Her research focuses on information policies, gender studies in science, open access, and the reuse of public sector information.
https://orcid.org/0000-0002-0167-8986, ibotezan@ucm.es

Received: 12-03-2026 – Accepted: 25-07-2026
https://doi.org/10.26441/RC25.2-2026-4538

ABSTRACT: Purpose. Over the decades, the field of communication has consolidated as a scientific discipline, fostering notable gender parity among researchers at a quantitative level, but not at a qualitative one. The primary objective of this research is to comprehensively analyse gender participation and inequalities in communication research in Spain across five decades. **Methodology.** To achieve this objective, gender participation in communication research in Spain was analysed based on 15,479 articles indexed in Scopus between 1968 and 2025. **Results and conclusions.** The findings indicate that the field has attained a remarkable level of quantitative parity, with a balanced distribution of male and female authors, in contrast to other disciplines. However, despite this parity, subtle qualitative inequalities persist. Women are underrepresented at the highest productivity levels and occupy more peripheral positions in academic leadership networks, reflecting the Matilda Effect. Collaboration patterns exhibit a slight trend toward gender homophily, with women participating less frequently in networks that enhance productivity and visibility. **Original contribution**. These findings highlight the need to move beyond strategies focused solely on quantitative inclusion and implement measures that address the structural dynamics of academic networks and institutional contexts shaping participation. Numerical parity is a necessary, yet insufficient, condition for gender equality in science.

Keywords: gender gap; communication; scientific research; Spain; Matilda Effect.

RESUMEN: Propósito. A lo largo de las décadas el campo de la comunicación se ha consolidado como disciplina científica, lo que ha fomentado una notable paridad de género entre los investigadores a nivel cuantitativo, pero no cualitativo. Esta investigación tiene como objetivo

principal analizar exhaustivamente la participación de género y las desigualdades en la investigación en comunicación en España a lo largo de cinco décadas. **Metodología.** Para alcanzar este objetivo se analiza la participación de género en la investigación en Comunicación en España a partir de 15.479 artículos indexados en Scopus entre 1968 y 2025. **Resultados y conclusiones.** Los resultados indican que el campo ha alcanzado un nivel notable de paridad cuantitativa, con una distribución equilibrada de autores y autoras, en contraste con otras disciplinas. Sin embargo, a pesar de esta paridad, persisten sutiles desigualdades cualitativas. Las mujeres están menos representadas en los niveles más altos de productividad y ocupan posiciones más periféricas en las redes de liderazgo académico, lo que refleja el Efecto Matilda. Los patrones de colaboración muestran una ligera tendencia hacia la hemofilia de género, y las mujeres participan con menos frecuencia en redes que mejoran la productividad y la visibilidad. **Aporte original.** Estos hallazgos señalan la necesidad de ir más allá de las estrategias centradas exclusivamente en la inclusión cuantitativa y adoptar medidas que aborden la dinámica estructural de las redes académicas o los contextos institucionales que configuran la participación. La paridad numérica es una condición necesaria, pero insuficiente, para la igualdad de género en la ciencia.

Palabras clave: brecha de género; comunicación; investigación científica; España; Efecto Matilda.

1. Introduction

Gender inequalities in the scientific field are a global phenomenon that has persisted over time across a wide range of disciplines (Cole & Zuckerman, 1984; Fox, 2020). Historically, women have experienced structural inequalities across various areas of knowledge production (García-Dauder & Pérez-Sedeño, 2017), a reality that translates into an underrepresentation in scientific authorship (Larivière *et al.*, 2013) and a persistent gap in terms of productivity and impact (Huang *et al.*, 2020). While parity is closer to being achieved in the health and social sciences than in technological disciplines (Holman *et al.*, 2018; Larivière *et al.*, 2013), disparities remain evident as academic rank increases. This phenomenon, known as the leaky pipeline (Sánchez-Jiménez *et al.*, 2023), affects both the European Union and, specifically, Spain, where progress in women's access to doctoral programs has not yet translated into an equitable consolidation of high-level research careers (European Commission, 2021, 2024).

These persistent gaps are due to a combination of structural factors, implicit biases in merit evaluation (Moss-Racusin *et al.*, 2012; Shen, 2013), and a tendency for female scientists to be nearly 20% more likely to leave the research career each year (Huang *et al.*, 2020). Reversing this trend is fundamental not only for equity but also for scientific quality itself, given that groups with greater gender diversity tend to achieve more inclusive, reliable, and broadly innovative outcomes (Nielsen *et al.*, 2017).

However, despite the extensive literature on the gender gap in science in general, there is a need to understand how these dynamics operate over time within specific academic fields that have recently undergone deep institutional transformations. The field of communication in Spain constitutes a particularly relevant case study. Over the last half-century, this discipline has evolved from its initial academic structure to become a fully consolidated, internationally integrated, and highly productive scientific field. Nonetheless, although the incorporation of women into the scientific discipline of communication sciences is a reality at a quantitative level, the extent to which this has translated into genuine equality between men and women remains largely underexplored.

Therefore, the main objective of this study is to comprehensively analyse gender participation and inequalities in communication research in Spain over an extensive period (1968-2025). Based on a robust dataset of 15,479 Scopus-indexed articles, this work seeks to move beyond simple productivity counts to examine the structural and qualitative dimensions of the gender gap. Specifically, this study analyses four highly relevant issues: 1) the distribution of productivity between male and female authors, 2) the configuration of collaboration and co-authorship networks

(gender assortativity), 3) the presence of women in academic leadership positions (corresponding authorship), and 4) the patterns of thematic specialization and institutional variability. By addressing these dimensions, this research aims to determine whether the field has achieved true equality or if subtle structural barriers persist that limit female recognition and leadership.

2. Gender Inequalities in Communication Research

In recent years, scientific production in the field of communication has grown significantly (Martínez-Nicolás *et al.*, 2019). Between 1968 and 2025, the study period of this research, the trajectory of communication research in Spain has gone through various phases that have culminated in a process of institutionalization and consolidation.

The first decades of this period correspond to a pre-consolidation phase characterized by a nascent, albeit limited, access of women to doctoral training and to the consolidation of academic positions within the Spanish university system (Sánchez-Jiménez *et al.*, 2023). Following this initial phase, the discipline entered a phase of continuous growth, which led to what the literature describes as a phase of maturity that began in the early 2000s and consolidated in the second decade of the 21st century (Carrasco-Campos & Saperas, 2022; Martínez-Nicolás, 2009). This period of maturity was driven by three main factors: the transformation of research objects due to changes in the global media system (Hartley, 2012), a renewed academic agenda, and an institutional shift marked by the prominence of scientific associations, journals, and bibliometric databases (Carrasco-Campos & Saperas, 2022; Martínez-Nicolás *et al.*, 2019). During this time, Spain experienced a clear integration into the international framework, evidenced by a steady increase in scientific production and the growing presence of Spanish authors in indexed international journals (de-Filippo, 2013; Fernández-Quijada & Masip, 2013). In this vein, the progressive incorporation of female researchers into the field of communication and, consequently, the resulting quantitative parity, must be understood not as an isolated phenomenon, but as a historical process that runs parallel to the institutional maturity, internationalization, and bibliometric standardization of communication research in Spain.

However, while the institutional consolidation of the communication field has fostered a remarkable quantitative gender parity among researchers, an in-depth analysis of prior literature highlights a paradox: the numerical equality observed in communication research coexists with qualitative disparities that persist over time (Huang *et al.*, 2020).

To understand this phenomenon, it is necessary to move beyond descriptive metrics and apply a structural framework based on the mechanism of cumulative advantage (DiPrete & Eirich, 2006). This mechanism suggests that gender imbalances in academia manifest not only as direct exclusions, but as a continuous accumulation of minor disadvantages over time (DiPrete & Eirich, 2006). This dynamic is, at a theoretical level, linked to the Matthew Effect (Merton, 1968), which posits that already prominent scientists accumulate greater visibility and rewards. By introducing gender into this equation, the Matilda Effect explains why female academics persistently face structural barriers that hinder their recognition and professional career development compared to their male colleagues (Rossiter, 1993).

Consequently, even when the environment is balanced at a quantitative level, as occurs with communication research in Spain, the Matilda Effect explains and justifies why women can be concentrated at initial or intermediate productivity levels, while presenting greater difficulties in reaching reference positions (García-Jiménez *et al.*, 2022; Pooley & Socolow, 2013). These systemic biases operate at multiple levels, from evaluation and access to funding (Larivière *et al.*, 2011; Ley & Hamilton, 2008) to academic advancement (Shen, 2013), which ultimately causes female representation to progressively decrease as academic rank and prestige increase (European Commission, 2021, 2024; Pell, 1996; Sánchez-Jiménez *et al.*, 2023). This can also lead to a lack of plurality within the academic sphere (Goyanes *et al.*, 2024).

The qualitative disparities outlined by the Matilda Effect also extend to the way researchers collaborate and specialize, which ultimately shapes the structure of academic networks. In scientific research, collaboration networks are fundamental for increasing productivity, securing funding, and building both scientific and social capital (Bozeman *et al.*, 2001; Gazni *et al.*, 2012; Pezzoni *et al.*, 2012). However, the literature indicates that women often have fewer opportunities to participate in the collaboration networks that culminate in publications and sustained academic advancement (Mauleón & Bordons, 2006; Sonnert & Holton, 1995; Xie & Shauman, 1998). Furthermore, collaboration patterns often exhibit gender assortativity or homophily, a tendency for collaborations between individuals of the same gender that has been observed globally across various disciplines (Bunker Whittington *et al.*, 2024; Sánchez-Jiménez *et al.*, 2024). In the field of communication, women are particularly affected by these co-authorship and citation dynamics (Knobloch-Westerwick & Glynn, 2011; Knobloch-Westerwick *et al.*, 2013; Rajkó *et al.*, 2025; Wang *et al.*, 2021), which can restrict their ability to access the academic "elite" and occupy central leadership positions (Burgess & Shaw, 2010; Sá *et al.*, 2020).

These network dynamics are intrinsically linked to horizontal segregation and thematic specialization. Given that women systematically face greater difficulties in being recognized as scientific authorities (Fricker, 2007; Moore *et al.*, 2018), they can be structurally relegated to specific and less central knowledge domains. Prior research shows that men maintain a higher representation in prestigious authorship positions (Freelon et al., 2023; West *et al.*, 2013) and tend to dominate disciplines with limited social impact and closer links to power (Goyanes *et al.*, 2022; Holman *et al.*, 2018). Conversely, lower or differentially oriented thematic specialization can negatively affect the overall visibility and academic capital of women (Leahey, 2006). Therefore, analysing both network interrelations and thematic specialization provides a robust theoretical framework to evaluate whether the achievement of numerical parity has genuinely translated into qualitative integration within the field of communication in Spain.

3. Data and Method

To investigate gender inequalities in Communication research in Spain, we used the Scopus database. Scopus is a well-established bibliographic database that is widely used in quantitative studies of Communication research (Codina Bonilla *et al.*, 2020; Gregorio-Chaviano *et al.*, 2023). Indeed, it is particularly well suited to this field, as can be illustrated by a simple comparison with other data sources. According to Scopus, as of July 2026, researchers affiliated with Spanish institutions had produced 17,127 publications in the field of Communication, representing 6.1% of the global output and ranking Spain as the world's third-largest producer of scientific literature in this area. By contrast, OpenAlex, whose coverage is based on considerably less restrictive inclusion criteria, reports a total of 18,780 publications from Spanish institutions, yet these account for only 2.7% of the global output.

Apart from coverage and bibliometric aspects, another important reason to choose Scopus is related to the method used to determine the gender of authors, which relies on name-based information available in bibliographic databases. Accordingly, the quality of author information was essential. Scopus has high quality of author information being particularly important (Baas *et al.*, 2020). Other gender studies in science employing a name-based approach have faced challenges in the past with the use of initials instead of full names by authors, editors, or databases providing the final information for such analyses. This appears to be a particular problem in the other major database we considered, Web of Science (Huang *et al.*, 2020).

It is important to clarify how we delineated the Communication literature in this database. Scopus does not provide a document-level classification that is sufficiently specific to accurately identify Communication research. However, freely available subject-based source lists are available that include journals classified within the field of Communication. For this study, we used the source list provided by SCImago Journal & Country Rank.

The 2024 edition—which was the most recent version available when the data were collected, as the 2025 edition was not released until June 2026—included 493 titles in the Communication category. Using the ISSNs of these sources (482 journals, 10 monographic series, and one conference proceedings series), we constructed a query in Scopus and subsequently filtered the results by the authors' country of affiliation.

As a result, the dataset includes 15,479 articles with at least one author affiliated with a Spanish institution. The records cover works available in the Scopus database from 1968 through February 2025, downloaded using Scopus API. We used Scopus Author Id's as the basic author identification mean, which allowed us to download information regarding the authors directly from their profiles, including last known affiliation. Using the database canonical, normalized version of names and surnames significantly improves quality and allows for minimal manual processing of author data.

In order to infer author gender, we adopted the classification method developed by Van Buskirk, Clauset, and Larremore (2023), which is rooted in Cultural Consensus Theory (CCT) and mathematically resolved using an Expectation-Maximization (EM) algorithm. We used the Python package Nomquamgender, which implements the CCT method for gender assignment using the default parameters. Unlike traditional approaches that linearly average data sources, this model recursively infers both the cultural consensus regarding the gender associated with a given name and the reliability of each database used. Consequently, the system dynamically weighs the most competent sources according to geographic and temporal context, translating the analysis into a probabilistic continuum of certainty that mitigates the limitations of standard supervised algorithms. This method has already been applied in local studies (Spoon *et al.,* 2023; Matias-Rayme *et al.*, 2024; Yang & Deng, 2024) as well as in more ambitious, global-scale research (Sánchez-Jiménez *et al.,* 2024; Shi & Wu, 2024).

The study of gender inequalities in science is largely grounded in a relational perspective. This reflects both a fundamental characteristic of how scientific research is produced and a key consideration when examining what is essentially a sociocultural phenomenon. For these reasons, network analysis plays a central role in our study. The different networks were generated using custom Python scripts developed specifically for this research (available upon request). They were subsequently edited, analysed, and visualised using the network analysis software Gephi. Details of the configuration and parameters used for each network are provided in the corresponding Results sections.

To compare the distributions of network centrality metrics and other continuous variables between male and female authors, non-parametric tests were used throughout. The distributions of bibliometric and network indicators are typically highly skewed — a small number of authors concentrate high productivity or centrality values, while the majority show low values — which precludes the use of parametric tests that assume normality. Accordingly, the Kruskal–Wallis H test was applied to assess whether statistically significant differences existed across gender groups (female, male, and unknown). Where significant results were found, Dunn's post-hoc test with Bonferroni correction was used to identify which specific pairwise comparisons drove the overall effect.

We also developed a specific methodology to examine the feminization and masculinization of research topics. Rather than defining research topics a priori and subsequently classifying the literature or constructing dedicated corpora for analysis (Goyanes, Tóth, & Hálo, 2024), we adopted a classical bibliometric approach and integrated it with a gender perspective. The analysis of thematic specialization by gender was based on keyword co-occurrence analysis, a well-established method in bibliometrics and the sociology of science for mapping the intellectual structure of scientific fields (Callon *et al.,* 1983). This approach treats keywords assigned by authors or database indexers as proxies for research topics, based on the epistemological assumption that the terms researchers use to index their work reflect both the conceptual content of their publications and the disciplinary context in which they position themselves.

Although the limitations of this assumption are well documented—notably that keyword practices vary across research communities and that indexing does not always capture the full thematic scope of a publication—keyword analysis remains the most scalable approach for characterizing the research agenda of a large scientific corpus.

Since most articles involve multiple authors who may be of different genders, the attribution of gender to research topics required a specific procedure. For each keyword associated with a given article, all authors were treated as contributing equally to that keyword, in proportion to their share of authorship. The percentage of female participation reported for each topic therefore reflects the cumulative weighted contribution of female authors across all articles indexed under that keyword. Under this approach, for example, an article with two female authors and one male author contributes 67% to the female share of each of its associated keywords, rather than being classified as a "female" or "mixed" article as a whole. To our knowledge, this method for computing gendered thematic profiles from keyword data has not been previously applied in this type of study.

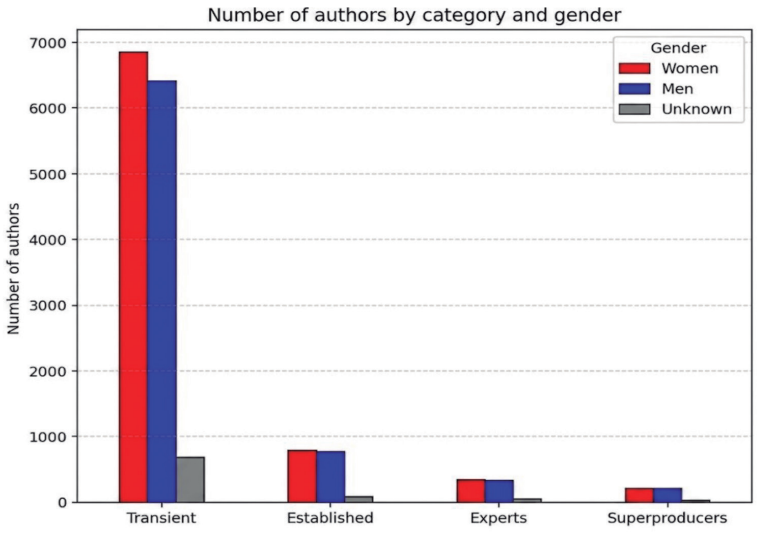
4. Results

The analysis of our database reveals that the 15,479 articles studied involve a total of 16,752 authors. The gender distribution shows a relative balance, with 8,185 women (48.86%) and 7,725 men (46.11%). There is a group of 842 authors (5.03%) whose gender could not be determined automatically; of these, 390 are identified only by initials, while the rest correspond to uncommon compound names, non-binary gender names, or names used interchangeably by people of different genders, as well as some errors in the processing of the original data.

4.1. Productivity of Male and Female Authors

Productivity data for the entire network are similar regardless of gender: male authors average 2.18 authorships, while female authors average 2.06. As shown in Figure 1, female authors slightly predominate in the low and intermediate levels of productivity, whereas men slightly predominate in the highest level, which, moreover, is the most visible.

Figure 1. Productivity of male and female authors with 1 or 2 works (transients), 3 to 5 (established), 6 to 10 (experts), and more than 10 (super-producers)



Source: Made by authors.

This results in a greater apparent predominance of male authors' work over that of female authors when examining, for example, the leading authors in the field, an analysis that is frequently carried out and can be observed in Table 1.

Table 1. Leading Male and Female Authors by Output in Communication in Spain

Author	Institution	Production
López-García, Xosé	USC	64
Codina, Lluís	UPF	63
Goyanes Martínez, Manuel	UC3M	63
Casero-Ripollés, Andreu	UJI	56
Tejedor, Santiago	UAB	51
Aguaded Gómez, José Ignacio	UHU	50
Díaz-Campo, Jesús	UNIR	50
Feijóo Fernández, Beatriz	UVIL	48
de Zúñiga, Homero Gil	USAL	47
Bravo, Blanca Rodríguez	ULE	43
Arcila, Carlos	USAL	43
Costa-Sánchez, Carmen	UDC	41
García Avilés, Jose A.	UMH	40
Gómez García, Salvador	UCM	40
Segado-Boj, Francisco	UCM	40
Salaverría, Ramón	UNAV	39
Ureta, Ainara Larrondo	UPV	38
Castillo-Esparcia, Antonio	UMA	37
Guallar, Javier	UB	37
Igartua, Juan José	USAL	36

Source: Made by authors.

4.2. Collaboration Patterns and Gender Assortativity

The analysis of collaboration patterns provides an interesting perspective on gender dynamics in Communication research. Of the articles analysed, 5,723 (37%) were published by mixed teams, while 4,695 (30.3%) were authored exclusively by women and 4,692 (30.3%) exclusively by men. This slight predominance of single-gender teams may suggest the existence of "homophily" or "gender assortativity" in co-authorship relations. Gender assortativity can be defined, in this case, as the tendency of authors of the same gender to collaborate more frequently in the context of scientific publication. This phenomenon has been observed at the global level (Sánchez-Jiménez *et al.*, 2024) as well as in multiple thematic and geographical contexts (Bunker-Whittington *et al.*, 2024).

To properly interpret these data, it is essential to consider the role of single authorship, which continues to be a relevant practice in the Humanities and some Social Sciences. In the field of Communication in Spain, we detected significant differences in team size: mixed-gender articles have an average of 3.29 authors, while articles authored exclusively by women average 1.71, and those authored exclusively by men, 1.68. These averages reflect the prevalence of single-authored or small-team publications, which complicates the direct interpretation of collaboration patterns by gender and, therefore, the determination of whether or not there is a structural tendency toward same-gender collaboration.

We believe a more complex approach is necessary to analyse this phenomenon, with network analysis appearing to be the natural candidate. In this case, authors can be represented as nodes and co-authorship relations as edges or connections between them. When authors co-authored

more than one work the weight of the connexion between them was increased correspondingly. The result of this process is thus a weighted non directed co-authorship network. The whole network consists of 16,752 nodes representing researchers and 44,685 edges representing coauthorship.

There are several methods to measure homophily in complex systems such as social networks (in this case, scientific collaboration networks). One of the most widely used is Newman's assortativity coefficient, which is based on the correlation coefficient between the attributes of connected nodes. This index allows for evaluating the extent to which nodes with similar characteristics tend to be connected within a network. Formally, it is calculated for categorical variables and produces a value between –1 and 1: positive values ($r > 0$) indicate homophily, i.e., greater connectivity between nodes with the same attribute (gender) than expected by chance; a null value ($r = 0$) indicates no trend, suggesting random connections; and negative values ($r < 0$) reflect heterophily, i.e., a propensity to connect nodes with different attributes (genders).

Another common metric for assessing attribute homophily, in this case, gender, is the proportion of homogeneous links. This measure is obtained by dividing the number of links between nodes with the same attribute by the total number of links in the network. Its formulation is as follows:

H = (Number of homogeneous links) / (Total number of links)

The value of H is interpreted similarly to Newman's index: a value close to 1 indicates strong homophily; a value near 0.5 suggests no bias or weak homophily; and values below 0.5 indicate heterophily, that is, a greater connection between nodes with different attributes.

Additionally, modularity (Newman, 2006) can be used to estimate gender assortativity as a byproduct of community analysis. In this case, if the nodes of the network are grouped by a categorical attribute (e.g., authors' gender) and the modularity of this partition is calculated, a high value would indicate that nodes with the same attribute tend to form relatively isolated communities. Conversely, a low modularity suggests that the attribute in question does not significantly structure the network.

In the case of the co-authorship network analysed, the Newman assortativity coefficient obtained was 0.0969, suggesting mild gender homophily. The proportion of homogeneous links reached a value of 0.4993, close to the neutral threshold of 0.5, pointing to a slightly heterophilic network, though only marginally so. Finally, the modularity associated with gender-based partitioning was 0.0452, an equally low value, reinforcing the idea that gender is not a decisive factor in the structural configuration of academic collaborations within this discipline. Overall, these results suggest a slight tendency toward gender assortativity in the co-authorship network in Communication in Spain. While there is some preference for collaboration between authors of the same gender, this does not appear to constitute a dominant or structural pattern in co-authorship dynamics.

The representation in Figure 2 (available on Zenodo[1] and editable with Gephi-lite) offers a simplified version of the collaboration network between male authors (red nodes) and female authors (blue nodes), where node size is proportional to productivity and edge thickness (and, to a large extent, node proximity) is proportional to the number of co-authorships between two nodes. The co-authorship network we generated is based on filtering out the least intense co-authorship relations (fewer than two joint works) and selecting the giant component, which results in a simplified network of just 1464 nodes and 3406 edges. This excludes some elements of the network but allows the core structure to be represented using a Force Atlas 2 algorithm.

[1] https://zenodo.org/records/17584349. It can be visualized and edited using Gephi Lite: https://lite.gephi.org

Figure 2. Co-authorship Network by Gender in the Field of Communication in Spain

Source: Made by authors.

It is clearly visible that many of the main nodes (by size) correspond to male researchers, although there are also a considerable number of medium- and large-sized nodes representing female researchers. Groups can also be clearly observed around the main nodes, representing regular collaborators. These groups may be more or less dispersed, but due to the filtering criteria they tend to appear as well-defined clusters. While there are groups in which men predominate and others in which women predominate, no predominant patterns or strongly marked structures seem to emerge from this phenomenon, which visually explains the low level of homophily we had already detected.

Probably due to the distribution of productivity already discussed, many of these groups appear to be structured around nodes representing male authors. This led us to hypothesize that, although in general terms scientific output and collaboration in Communication in Spain do not seem to present gender inequalities, there may be a bias related to aspects of "seniority" or leadership that can be identified and explained in the data.

4.3. Leadership Analysis

Although leadership is a somewhat diffuse concept and to some extent difficult to measure, we can approximate it by analysing the frequency with which authors act as corresponding authors, even if imperfectly (Moya-Anegón *et al.*, 2013; Sánchez-Jiménez *et al.*, 2017). Similarly, we can approximate leadership relations (appearing prominently within the research team that publishes results) using the same information. It is important to note that information on corresponding authorship is not always available, so only 9,047 of the 15,479 articles analysed contained this information.

In just under half of the works (49.9%), a male corresponding author was identified, while the proportion of female corresponding authors was somewhat lower (46.9%), and the number of works where the gender of the corresponding author could not be determined was small (3.0%). Additionally, there are some works with multiple corresponding authors (0.3%), which are an anomaly, but were also considered. From the perspective of the authors themselves, male authors acted

as corresponding authors at least once in 2,810 cases (36.3% of male authors), while female authors acted as corresponding authors 2,809 times. However, since the number of female authors is greater than that of male authors, the percentages are slightly lower (34.2% of female authors).

Table 2 presents the top 20 authors by leadership, as well as the percentages of leadership relative to their total output. As can be seen, only 6 of these authors are women. Given that the number of women who have led at least once is reasonably like that of men, it seems necessary to seek a reasonable explanation for this phenomenon.

Table 2. Leadership Data for Male and Female Authors with the Most Corresponding Authorships in Communication in Spain

Author	Institution	Docs.	Docs. corresponds	% corresponds
López-García, Xosé	USC	64	47	73.4%
Casero-Ripollés, Andreu	UJI	56	47	83.9%
Feijóo Fernández, Beatriz	UVIL	48	46	95.8%
Díaz-Campo, Jesús	UNIR	50	46	92.0%
Codina, Lluís	UPF	63	45	71.4%
Goyanes Martínez, Manuel	UC3M	63	45	71.4%
Aguaded Gómez, José I.	UHU	50	41	82.0%
Tejedor, Santiago	UAB	51	38	74.5%
Costa-Sánchez, Carmen	UDC	41	38	92.7%
Segado-Boj, Francisco	UCM	40	36	90.0%
Ureta, Ainara Larrondo	UPV	38	35	92.1%
Igartua, Juan José	USAL	36	32	88.9%
Arcila, Carlos	USAL	43	31	72.1%
Palau-Sampio, Dolors	UV	34	31	91.2%
Fernández, Erika	UVIGO	33	30	90.9%
Gómez García, Salvador	UCM	40	29	72.5%
Tur-Viñes, Victoria	UA	32	29	90.6%
Nicholas, David	CIBER Research	34	29	85.3%
Guallar, Javier	UB	38	28	73.7%
Salinas, Daniel Torres	UGR	32	28	87.5%

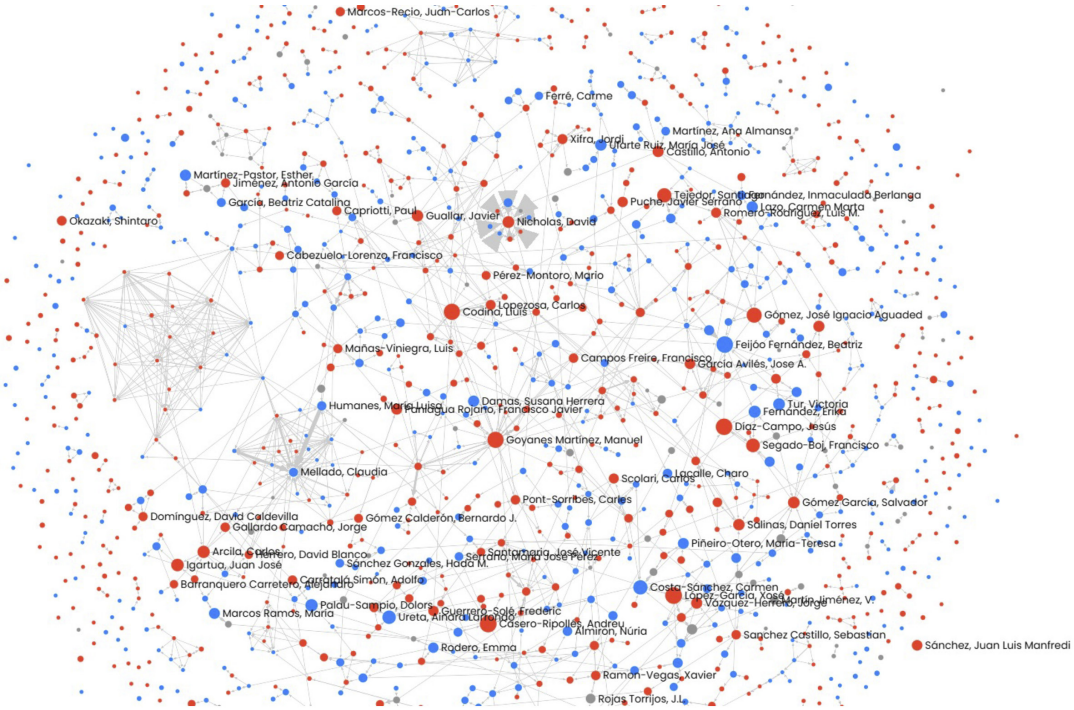
Source: Made by authors.

To achieve a more balanced perception of the phenomenon that considers not only overall averages or the group of authors with the highest number of corresponding authorships, we sought a structural perspective based on a leadership network. To construct this leadership network, we considered the asymmetric relationships between the corresponding authors of the works and the individuals who accompanied them as co-authors but without the role of corresponding authors. The network is also available on Zenodo[2] and can be visualized and edited with Gephi-Lite. Network statistics were generated from the than that of co-authorship, partly because the phenomenon only allows for the creation of n–1 edges between the corresponding author and the n co-authors of a work (one between the corresponding author and each non-corresponding co-author). By contrast, co-authorship networks allow for the creation of $n \times (n-1) / 2$ edges among the authors of the same work. Moreover, as already noted, information on corresponding authors is not available for all works.

[2] https://zenodo.org/records/17584397

Figure 3 includes only nodes with a degree of three or more, meaning that only the most significant actors are present, along with the most relevant structural characteristics. We did not remove nodes outside the giant component because in this case several recognizable authors would have been excluded from the representation.

Figure 3. Leadership Network by Gender in the Field of Communication in Spain



Source: Made by authors.

As shown in this figure, where red nodes (men) and blue nodes (women) are sized proportionally to the number of works published as corresponding authors, there is some variety in terms of gender from the perspective of leadership. There are numerous nodes that systematically assume leadership in both genders, although larger red nodes appear somewhat more frequently.

Eight network metrics were applied (Table 3): authority, PageRank, betweenness centrality, indegree, weighted indegree, closeness centrality, harmonic closeness centrality, and the number of times an author appeared as a corresponding author (times as corresponding). These metrics allow for the evaluation of different dimensions of leadership, ranging from structural prestige to brokerage capacity and proximity within the network.

Table 3. Leadership Network by Gender in the Field of Communication in Spain

Metric	Mean (♀)	Mean (♂)	H (Kruskal-Wallis)	p-value	Sig. Dif.
Authority	0.00188	0.00155	4.482	0.1063	No
PageRank	0.000059	0.000061	3.348	0.1875	No
Betweenness Centrality	0.0000006	0.0000009	0.520	0.7709	No
Indegree	0.4497	0.5085	3.975	0.1370	No
Weighted Indegree	0.4960	0.5835	3.804	0.1492	No
Harmonic Closeness	0.2812	0.3068	14.239	0.0008	Yes (♀ < ♂)
Closeness Centrality	0.2733	0.2986	14.170	0.0008	Yes (♀ < ♂)
T. Corresponding	1.5540	1.6039	3.680	0.1588	No

Source: Made by authors.

No significant differences were found in authority, PageRank, betweenness centrality, indegree, weighted indegree, or number of times as corresponding author after applying the Kruskal–Wallis test ($p \geq 0.05$ in all cases). Although mean values for these metrics tended to be slightly lower for women than for men, these differences do not allow us to conclusively state that there is lower centrality or recognition in these indicators.

In contrast, significant differences were observed in the metrics of closeness centrality ($H = 14.17$, $p = 0.00084$) and harmonic closeness centrality ($H = 14.24$, $p = 0.00081$). In both cases, female nodes presented lower mean values than male nodes, indicating that, on average, female authors occupy more structurally peripheral positions within the network. Dunn's post hoc tests with Bonferroni correction confirmed that differences between the female and male groups are statistically significant ($p \approx 0.0012$ in both cases), while no differences were observed between the female and unknown groups or between the male and unknown groups.

Taken together, these results suggest that while there are no clear differences in terms of structural prestige or explicit editorial leadership roles, female authors tend to occupy less central positions from the perspective of structural proximity within the network. This finding may be indicative of lower visibility or more localized participation in peripheral communities within the scientific leadership network.

4.4. Thematic Specialization Analysis by Gender in Communication

The analysis of the main research topics in the field of Communication reveals differentiated patterns in terms of gender participation. Table 4 presents the twenty most prolific topics in terms of number of published documents, showing a generally balanced distribution between male and female authors, with female participation percentages ranging between 45% and 55% in most cases.

However, significant exceptions emerge that suggest areas of differentiated specialization. Particularly noteworthy is the topic Gender, with 71% female participation, followed by Advertising (60.2%) and Instagram (61.7%). This concentration suggests the existence of thematic niches where female researchers are predominantly represented, apparently related to areas traditionally linked to gender studies, consumer behaviour, and new forms of social communication.

The topics listed in Table 4 represent the most frequent keywords in the corpus and should not be read as mutually exclusive categories: a single article may contribute to several entries simultaneously — a study on gender representations in advertising, for instance, would be counted under both *Gender* and *Advertising*. The keyword co-occurrence network presented in Figure 4 offers a fuller picture of how these themes overlap and cluster within the field.

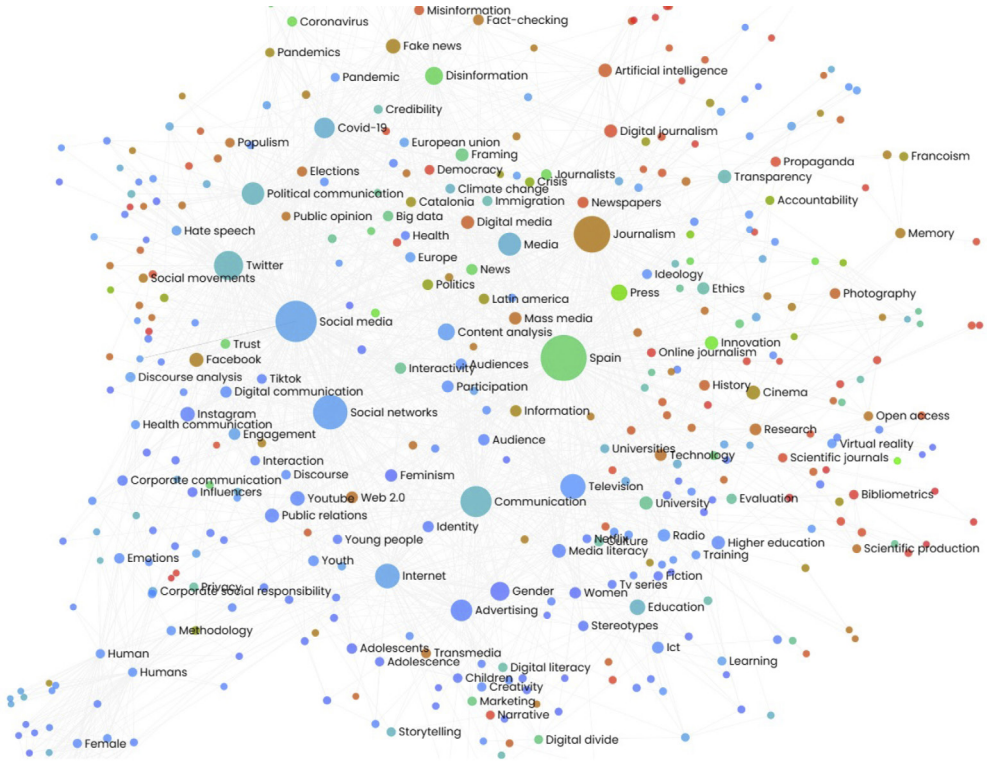
To provide a more comprehensive representation of the topics, their distribution, frequency, and interrelations, we created a third network, which in this case represents the co-occurrence of keywords. The nodes represent keywords provided by Scopus, derived either from the authors' original keywords or, in some cases, from keywords added by the database itself. Node size is proportional to the number of documents containing these keywords, and colour is associated with the gender of the authors who wrote the corresponding articles. The edges between nodes represent the co-occurrence of these keywords within the same document. Thus, stronger connections imply a more frequent co-occurrence of the terms in the same documents. The layout algorithm used (Force Atlas 2) positions nodes with stronger relationships closer together in space, meaning that spatial distribution can be interpreted in terms of conceptual proximity to trace the basic thematic structures, creating clusters of topics. Clusters are usually identified by using a common colour scheme for all its members, but because colours where associated to the gender variable, only distances can be used in this representation to infer topical similarity.

Table 4. Main Topics by Number of Published Documents, Number of Authors, and Percentage of Female Authors

Id	Keywords	Docs.	Authors	Author per doc.	% females
119	Spain	951	2,313	2.43	49.4%
2799	Social media	837	2,308	2.76	52.9%
1211	Journalism	724	1,813	2.50	45.3%
661	Social networks	673	1,716	2.55	53.4%
121	Communication	594	1,375	2.31	51.3%
2422	Twitter	546	1,397	2.56	51.1%
120	Television	453	965	2.13	54.5%
177	Internet	437	1069	2.45	52.9%
112	Media	398	946	2.38	51.8%
1275	Political communication	386	932	2.41	51.2%
257	Advertising	365	852	2.33	60.2%
17964	Covid-19	339	1330	3.92	51.7%
1711	Gender	304	718	2.36	71.0%
2356	Disinformation	276	756	2.74	49.2%
115	Content analysis	252	673	2.67	53.5%
175	Press	233	455	1.95	48.7%
1028	Education	218	531	2.44	51.4%
14452	Fake news	196	506	2.58	46.0%
4544	YouTube	195	500	2.56	58.7%
10446	Instagram	194	529	2.73	61.7%

Source: Made by authors.

Figure 4. Co-occurrence Network of Terms in the Field of Communication in Spain



Source: Made by authors.

The keyword co-occurrence network (available on Zenodo[3] and viewable in Gephi Lite) is composed of 435 nodes and 2,031 edges. This is a selection of topics created by removing all nodes representing topics that are connected to others with a frequency lower than 5. Nodes outside the main component were also filtered out, so only those representing concepts well represented in the literature studied were selected. Reddish nodes represent topics with a predominance of male authors, bluish nodes represent topics with a predominance of female authors, and green nodes represent topics with greater gender balance.

From the network, a coherent pattern appears to centre on gender studies, identity, and social communication. The topics Feminism and Women show the highest female participation rates, with 75.1% and 74.2%, respectively. It is noteworthy that these topics not only display a pronounced gender bias but also maintain considerable productivity, with Gender reaching 304 documents. Another highly feminized topic appears to be advertising, with Advertising (365 documents). This indicates that female specialization in these areas does not represent marginal niches but rather consolidated and productive research areas within the field of Communication.

Conversely, topics with higher male participation are concentrated in technical and traditional areas of journalism and digital communication. Digital journalism shows the strongest male bias (38.1% female participation), followed by Newspapers (39.2%) and Artificial intelligence (41.6%). This pattern suggests a male tendency toward specialization in more technical and traditional aspects of the field, including digital journalism, artificial intelligence applied to communication, and traditional media such as print press. It is significant that these topics, although showing considerable productivity, tend to have fewer documents and authors than the female-dominated topics.

The data reveal a notable asymmetry in gender specialization patterns. While female-dominated topics include both a greater number of documents and a higher concentration of female researchers, male-dominated topics show less pronounced differences and generally lower production volumes. This difference suggests that female thematic specializations may be more consolidated and represent more dynamic areas of growth within the field of Communication.

The observed specialization may reflect both differentiated academic interests and possible structural barriers that channel researchers toward certain disciplinary subfields. The concentration of women in gender studies, identity, and new forms of social communication contrasts with the male orientation toward more technical and traditional aspects of journalism and digital communication.

4.5. Gender Distribution by Institutions

The analysis of gender participation across the main Spanish academic institutions specializing in Communication reveals significant institutional differences that complement the thematic patterns observed earlier. The institutional distribution data (Table 5) shows considerable variability in female participation percentages, ranging from 39.4% to 67.01%, suggesting the existence of differentiated institutional cultures in terms of gender.

At the upper end of female participation are the Universitat d'Alacant (67.01%), Universidad de Valladolid (66.57%), and Universitat Autònoma de Barcelona (61.74%). These institutions significantly exceed the national average and may represent more favorable academic environments for female participation in Communication research. Conversely, at the lower end are the Universidade de Santiago de Compostela (39.4%), Universitat Pompeu Fabra (40.06%), and Universidad de Granada (42.81%).

[3] https://zenodo.org/records/17584417

Table 5. Gender Distribution across Major Spanish Institutions

University	Docs.	Authors	Author per doc.	% females
Universidad Complutense de Madrid	1,434	915	0.64	48.39
Universidad Rey Juan Carlos	792	384	0.48	55.88
Universitat Autònoma de Barcelona	759	500	0.66	61.74
Universitat Pompeu Fabra Barcelona	746	340	0.46	40.06
Universidad de Sevilla	717	436	0.61	52.76
Universidad Carlos III de Madrid	630	326	0.52	45.29
Universidad de Granada	626	534	0.85	42.81
Universidad de Málaga	607	373	0.61	52.22
Universitat de València	581	405	0.70	50.06
Universidad del Pais Vasco	520	437	0.84	52.11
Universidad de Salamanca	473	316	0.67	48.17
Universidad de Navarra	468	215	0.46	48.88
Universitat de Barcelona	462	425	0.92	52.45
Universidad de Valladolid	458	239	0.52	66.57
Universidad Jaume I	421	239	0.57	54.12
Universidade de Santiago de Compostela	399	232	0.58	39.4
International University of La Rioja	377	160	0.42	55.51
Universidad de Murcia	332	292	0.88	54.37
Universitat d'Alacant	323	209	0.65	67.01
Universitat Oberta de Catalunya	282	203	0.72	57.89

Source: Made by authors.

This institutional variability in gender representation suggests that, beyond thematic specializations, organizational and institutional factors influence the differential participation of male and female researchers. The observed differences could be related to specific institutional policies, departmental traditions, or recruitment and promotion dynamics unique to each university. It is particularly noteworthy that some of the institutions with the highest scientific output, such as the Universidad Complutense de Madrid, maintain relatively balanced distributions (48.39%), while others with lower output show more pronounced biases in both directions.

5. Conclusions and Discussion

This study offers a comprehensive analysis of gender participation in Communication research in Spain across more than five decades of scientific output, revealing a panorama that resists simple characterizations of either equality or inequality. Communication is a consolidated scientific field in Spain (Carrasco-Campos & Saperas, 2022; Martínez-Nicolás, 2009), and the data show that it has achieved remarkable quantitative gender parity, with an almost balanced distribution of male and female researchers. This situation contrasts favorably with patterns observed in more technological or scientific disciplines, where the gender gap remains persistent (Larivière et al., 2013), and is consistent with the projections of Holman et al. (2018), who identify the health and social sciences as the areas closest to achieving parity. Yet our findings make clear that quantitative parity does not entail qualitative equality: several dimensions of academic recognition, leadership, collaboration, and thematic positioning reveal persistent and structurally grounded gender imbalances that aggregate indicators of participation tend to conceal.

The productivity data reveal a pattern in which the overall averages for male and female authors are similar, but men are disproportionately represented among the highest-output researchers. This discrepancy between aggregate parity and distributional asymmetry at the extremes aligns

with models of cumulative advantage (DiPrete & Eirich, 2006). The pattern is also consistent with the leaky pipeline phenomenon and with the global findings of Huang *et al.* (2020): as the career stage advances — from general authorship to high productivity to leadership — the gender balance shifts progressively in favor of men, even in fields that appear to have achieved parity in aggregate terms. In the Spanish context, where near-parity at the doctoral level has been documented (Sánchez-Jiménez *et al.,* 2023), the persistence of a gap at the top of the productivity distribution suggests that the mechanisms of cumulative disadvantage begin to operate at later career stages, and that their effects remain visible in bibliometric data even when standard aggregate indicators appear to show equality.

The analysis of collaboration patterns yields a result that is, in some respects, the most counterintuitive of the study: co-authorship in Communication research in Spain does not seem structured along gender lines in any meaningful way. The tests we made to detect gender homophily approach the values expected under a random collaboration model, indicating that male and female researchers do not show a strong structural preference for same-gender collaborations. This finding stands in notable contrast with the significant gender assortativity reported at the global level by Sánchez-Jiménez *et al.* (2024). The comparatively low segregation observed here may be partly attributable to the near-parity in the overall gender composition of the field: as the proportion of male and female authors converges, the baseline probability of mixed-gender collaboration increases simply by virtue of the available pool of potential collaborators, making structural homophily more difficult to sustain. This does not, however, rule out more localized forms of gender clustering at the level of research groups or thematic communities, which aggregate network metrics may not fully capture. Indeed, the cluster structure visible in the co-authorship network — where many groups appear organized around a central, frequently male node — points to the importance of seniority and leadership, rather than gender assortativity per se, as the more decisive factor shaping collaboration dynamics in this field.

The directed leadership network analysis reveals precisely this dynamic in structural terms, and constitutes perhaps the most analytically significant contribution of this study. While the total number of male and female authors who have acted as corresponding authors at least once is nearly identical, significant differences emerged in closeness centrality and harmonic closeness centrality, with female authors occupying systematically more peripheral positions in the network. This distinction matters: closeness centrality measures how efficiently a node can reach all others in the network, and lower values for women indicate that, on average, female corresponding authors are more remote from the core of the scientific community — a structural position that constrains their access to collaboration opportunities, informal visibility, and the channels through which academic capital tends to circulate. Notably, no significant differences were found in prestige metrics such as PageRank or authority, suggesting that women who reach leadership positions do so with comparable formal recognition to their male counterparts. Rather than confirming the traditional Matilda Effect (Rossiter, 1993; Knobloch-Westerwick & Glynn, 2011; Ley & Hamilton, 2008; Rajkó *et al.,* 2025) - which typically manifests as a deficit in citations, funding, or explicit credit - our results suggest a displacement of the phenomenon. For women who successfully secure leadership roles, the bias in formal recognition appears to be attenuated; yet inequality persists in the topological location from which those roles are exercised. Understood through the framework of cumulative advantage (DiPrete & Eirich, 2006), this structural peripherality is not a static condition but a dynamic one: more central actors disproportionately attract new collaborations, citations, and recognition over time, while peripheral actors face compounding barriers to visibility that aggregate parity figures systematically conceal.

Taken together, the collaboration and leadership findings reveal an important asymmetry that requires interpretive care. The absence of strong gender assortativity in co-authorship might at first suggest that women are well integrated into the collaborative fabric of the field.

The leadership analysis complicates this interpretation: women participate in mixed-gender networks at comparable rates to men, but occupy more peripheral positions within those networks. This points to a form of inequality that operates not through segregation — keeping women out of certain collaborative spaces — but through positioning: women are present in the networks that matter but located further from their structural cores. This is a subtler mechanism than those typically captured by binary measures of inclusion or exclusion, and one that has significant implications for how the field conceptualizes and measures gender equality in academic settings.

The thematic analysis reveals clear patterns of horizontal gender segregation in the research agenda of the field. Women predominate in gender studies, advertising, and new forms of social communication, while men show stronger representation in digital journalism, traditional print media, and artificial intelligence. These patterns align with broader literature on gender and disciplinary specialization (Leahey, 2006; Larivière *et al.*, 2013), and are consistent with wider mechanisms that associate female participation with socially oriented research areas and male participation with more technical or technologically intensive domains. A particularly relevant aspect of these findings, however, is that female-dominated thematic areas are not marginal by volume: gender studies and advertising are among the most productive topics in the corpus, which means the horizontal segregation observed does not correspond straightforwardly to a core–periphery distinction based on output. Whether this high publication volume translates into equivalent visibility and impact — in terms of citation rates, journal prestige, or interdisciplinary reach — remains an open question that the present study is not designed to answer, but that constitutes an important avenue for future research.

This study has some limitations that should inform the interpretation of its findings. The cross-sectional design of the analysis does not allow for longitudinal conclusions about whether gender imbalances are narrowing or widening over the period studied; the dataset covers 1968 to 2025, but the results are presented as aggregate totals rather than as temporal trends, which limits the ability to assess the direction and pace of change. Additionally, the bibliometric and network-analytic approach is well suited to identifying structural patterns, but cannot explain the mechanisms that produce them: questions about why women are structurally more peripheral in leadership networks, or why certain research areas become feminized, require qualitative and sociological investigation that lies beyond what the present data support.

Despite these limitations, the study makes several contributions to the understanding of gender inequality in Communication research. It provides a very comprehensive bibliometric analysis of gender participation in Spanish Communication research, covering more than 15,000 articles and applying a multidimensional analytical framework that combines productivity, collaboration, leadership, thematic, and institutional perspectives. Methodologically, the gendered keyword co-occurrence mapping technique introduced here — which attributes thematic profiles to gender groups through a weighted authorship model rather than article-level classification — offers a scalable approach that could be applied to other disciplines and national contexts. Theoretically, the study extends the concept of the Matilda Effect to network topology, showing that structural peripherality in leadership networks constitutes a measurable and statistically significant dimension of gender inequality that is invisible to standard bibliometric counts. These findings have direct implications for research policy: they point to the need to move beyond strategies focused exclusively on quantitative inclusion toward measures that address the structural dynamics of academic networks, the institutional contexts that shape participation, and the thematic segmentation that may channel researchers along gender-differentiated trajectories. Numerical parity, this study suggests, is a necessary but insufficient condition for gender equality in science.

6. Contributions

Roles	Author 1	Author 2	Author 3
Conceptualization	X	X	X
Formal analysis	X	X	X
Funding acquisition			
Project administration	X	X	X
Research	X	X	X
Methodology	X	X	X
Data curation	X	X	X
Resources	X	X	X
Software	X		
Supervision		X	X
Validation		X	X
Visualization	X		
Writing – original draft	X	X	X
Writing – review & editing	X	X	X

References

Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. (2020). Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies. *Quantitative Science Studies,* 1(1), 377–386. https://doi.org/10.1162/qss_a_00019

Bozeman, B., Dietz, J., & Gaughan, M. (2001). Scientific and technical human capital: An alternative model for research evaluation. *International Journal of Technology Management,* 22(7-8), 636–655. https://doi.org/10.1504/IJTM.2001.002988

Bunker Whittington, K., King, M. M., & Cingolani, I. (2024). Structure, status, and span: Gender differences in co-authorship networks across 16 region-subject pairs (2009–2013). *Scientometrics,* 129(1), 147–179. https://doi.org/10.1007/s11192-023-04885-1

Burgess, T. F., & Shaw, N. E. (2010). Editorial board membership of management and business journals: A social network analysis study of the Financial Times 40. *British Journal of Management*, 21(3), 627–648. https://doi.org/10.1111/j.1467-8551.2010.00701.x

Callon, M., Courtial, J. P., Turner, W. A., & Bauin, S. (1983). From translations to problematic networks: An introduction to co-word analysis. *Social Science Information*, 22(2), 191–235. https://doi.org/10.1177/053901883022002003

Carrasco-Campos, Á., & Saperas, E. (2022). Los marcos teóricos en cinco revistas españolas de referencia sobre comunicación (2011-2021): Entre la centralidad y la dispersión teórica. *Communication & Society,* 35(2), 155–168. https://doi.org/10.15581/003.35.2.155-168

Codina Bonilla, L., Morales-Vargas, A., Rodríguez-Martínez, R., & Pérez-Montoro, M. (2020). Uso de Scopus y Web of Science para investigar y evaluar en comunicación social: Análisis comparativo y caracterización. I*ndex.comunicación: Revista Científica en el Ámbito de la Comunicación Aplicada,* 10(3), 235–261. https://doi.org/10.33732/ixc/10/03usodes

Cole, J. R., & Zuckerman, H. (1984). The productivity puzzle: Advances in motivation and achievements. En M. W. Steinkamp & M. L. Maehr (Eds.), *Women in science* (pp. 217–256). JAI Press.

DiPrete, T. A., & Eirich, G. M. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. *Annual Review of Sociology*, 32, 271–297. https://doi.org/10.1146/annurev.soc.32.061604.123127

European Commission. (2021). She figures 2021: *Gender in research and innovation: Statistics and indicators*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/06090

European Commission. (2024). She figures 2024: *Gender in research and innovation: Statistics and indicators*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/934401

Fernández-Quijada, D., & Masip, P. (2013). Tres décadas de investigación española en comunicación: Hacia la mayoría de edad. *Comunicar*, 21(41), 15–24. https://doi.org/10.3916/C41-2013-01

de Filippo, D. (2013). La producción científica española en Comunicación en WOS: las revistas indexadas en SSCI (2007-12). *Comunicar,* 21(41), 25-44. https://doi.org/10.3916/C41-2013-02

Fox, M. F. (2020). Gender, science and academic rank: Key issues and approaches. *Quantitative Science Studies,* 1(3), 1001–1006. https://doi.org/10.1162/qss_a_00057

Freelon, D., Pruden, M. L., Eddy, K. A., & Kuo, R. (2023). Inequities of race, place, and gender among the communication citation elite, 2000-2019. *Journal of Communication,* 73(4), 356–367. https://doi.org/10.1093/joc/jqad002

Fricker, M. (2007). *Epistemic injustice: Power and the ethics of knowing*. Oxford University Press.

García-Dauder, D., & Pérez-Sedeño, E. (2017). *Las "mentiras" científicas sobre las mujeres*. Los Libros de la Catarata.

García-Jiménez, L., Torrado-Morales, S., & Díaz, J. (2022). El rol de la mujer en la ciencia y la docencia en comunicación: Análisis a partir de los programas universitarios en España. *Revista de Comunicación,* 21(2), 91–113. https://doi.org/10.26441/RC21.2-2022-A5

Gazni, A., Sugimoto, C. R., & Didegah, F. (2012). Mapping world scientific collaboration: Authors, institutions, and countries. *Journal of the American Society for Information Science and Technology,* 63(2), 323–335. https://doi.org/10.1002/asi.21688

Goyanes, M., De-Marcos, L., Demeter, M., Toth, T., & Jordá, B. (2022). Editorial board interlocking across the social sciences: Modelling the geographic, gender, and institutional representation within and between six academic fields. PLOS ONE, 17(9), Article e0273552. https://doi.org/10.1371/journal.pone.0273552

Goyanes, M., Herrero, E., & De-Marcos, L. (2024). Gender differences in representation, citation, and h-index: An empirical examination of the field of communication across the ten most productive countries. *PLOS ONE,* 19(11), Article e0312731. https://doi.org/10.1371/journal.pone.0312731

Goyanes, M., Tóth, T., & Háló, G. (2024). Gender differences in Google Scholar representation and impact: An empirical analysis of political communication, journalism, health communication, and media psychology. *Scientometrics,* 129(3), 1719–1737. https://doi.org/10.1007/s11192-024-04945-0

Gregorio-Chaviano, O., López-Mesa, E. K., & Peralta-González, M. J. (2023). Evaluación bibliométrica de la investigación en Comunicación en Colombia a partir de Scopus (2011-2021). *Palabra Clave,* 26(3), Artículo e2634. https://doi.org/10.5294/pacla.2023.23.3.4

Hartley, J. (2012). *Digital futures for cultural and media studies*. Wiley-Blackwell.

Holman, L., Stuart-Fox, D., & Hauser, C. E. (2018). The gender gap in science: How long until women are equally represented? *PLOS Biology*, 16(4), Article e2004956. https://doi.org/10.1371/journal.pbio.2004956

Huang, J., Gates, A. J., Sinatra, R., & Barabási, A. L. (2020). Historical comparison of gender inequality in scientific careers across countries and disciplines. *Proceedings of the National Academy of Sciences*, 117(9), 4609–4616. https://doi.org/10.1073/pnas.1914221117

Knobloch-Westerwick, S., & Glynn, C. J. (2011). The Matilda effect – Role congruity effects on scholarly communication: A citation analysis of Communication Research and Journal of Communication articles. *Communication Research,* 40(1), 3–26. https://doi.org/10.1177/0093650211418339

Knobloch-Westerwick, S., Glynn, C. J., & Huge, M. (2013). The Matilda effect in science communication: An experiment on gender bias in publication quality perceptions and collaboration interest. *Science Communication,* 35(5), 603–625. https://doi.org/10.1177/1075547012472684

Larivière, V., Ni, C., Gingras, Y., Cronin, B., & Sugimoto, C. R. (2013). Bibliometrics: Global gender disparities in science. *Nature,* 504(7479), 211–213. https://doi.org/10.1038/504211a

Larivière, V., Vignola-Gagné, E., Villeneuve, C., Gélinas, P., & Gingras, Y. (2011). Sex differences in research funding, productivity, and impact: An analysis of Quebec university professors. *Scientometrics,* 87(3), 483–498. https://doi.org/10.1007/s11192-011-0369-y

Leahey, E. (2006). Gender differences in productivity: Research specialization as a missing link. *Gender & Society,* 20(6), 754–780. https://doi.org/10.1177/0891243206293030

Ley, T. J., & Hamilton, B. H. (2008). The gender gap in NIH grant applications. *Science,* 322(5907), 1472–1474. https://doi.org/10.1126/science.1165878

Martínez-Nicolás, M. (2009). La investigación sobre comunicación en España: Evolución histórica y retos actuales. *Revista Latina de Comunicación Social,* 64, 1–14. https://doi.org/10.4185/10.4185/RLCS-64-2009-800-01-14

Martínez-Nicolás, M., Saperas, E., & Humanes, M. L. (2019). Mudanzas en la cultura científica: El nuevo contexto de la práctica investigadora sobre comunicación y sus implicaciones epistemológicas. En F. Sierra & J. Alberich (Eds.), *Epistemología de la comunicación y cultura digital: Retos emergentes* (pp. 23–42). Universidad de Granada.

Mauleóns, E., & Bordons, M. (2006). Productivity, impact and publication habits by gender in the area of materials science. *Scientometrics*, 66, 199-218. https://doi.org/10.1007/s11192-006-0014-3

Matias-Rayme, N., Botezan, I., Suárez-Figueroa, M. C., & Sánchez-Jiménez, R. (2024). Gender assignment in doctoral theses: Revisiting Teseo with a method based on cultural consensus theory. *Scientometrics,* 129(7), 4553–4572. https://doi.org/10.1007/s11192-024-05079-z

Merton, R. K. (1968). The Matthew effect in science. *Science,* 159(3810), 56–63. https://doi.org/10.1126/science.159.3810.56

Moore, K., Cid-Martinez, I., Toney, J., Smith, J. A., Kalb, A. C., Shin, J. H., & Spalter-Roth, R. M. (2018). Who climbs the academic ladder? Race and gender stratification in a world of whiteness. *The Review of Black Political Economy,* 45(3), 216–244. https://doi.org/10.1177/0034644618813667

Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M. J., & Handelsman, J. (2012). Science faculty's subtle gender biases favor male students. *Proceedings of the National Academy of Sciences,* 109(41), 16474–16479. https://doi.org/10.1073/pnas.1211286109

Moya-Anegón, F., Guerrero-Bote, V. P., Bornmann, L., & Moed, H. F. (2013). The research guarantors of scientific papers and the output counting: A promising new approach. *Scientometrics,* 97(2), 421–434. https://doi.org/10.1007/s11192-013-1046-0

Newman, M. E. (2006). Modularity and community structure in networks. *Proceedings of the National Academy of Sciences,* 103(23), 8577–8582. https://doi.org/10.1073/pnas.0601602103

Nielsen, M. W., Alegria, S., Börjeson, L., Etzkowitz, H., Falk-Krzesinski, H. J., Joshi, A., Leahey, E., Smith-Doerr, L., Woolley, A. W., & Schiebinger, L. (2017). Opinion: Gender diversity leads to better science. P*roceedings of the National Academy of Sciences*, 114(8), 1740–1742. https://doi.org/10.1073/pnas.1700616114

Pell, A. N. (1996). Fixing the leaky pipeline: Women scientists in academia. *Journal of Animal Science,* 74(11), 2843–2848. https://doi.org/10.2527/1996.74112843x

Pezzoni, M., Sterzi, V., & Lissoni, F. (2012). Career progress in centralized academic systems: Social capital and institutions in France and Italy. *Research Policy,* 41(4), 704–719. https://doi.org/10.1016/j.respol.2011.12.009

Pooley, J., & Socolow, M. (2013). Checking up on The Invasion from Mars: Hadley Cantril, Paul Lazarsfeld, and the making of a misremembered classic. *International Journal of Communication,* 7, 1920–1948.

Rajkó, A., Herendy, C., Goyanes, M., & Demeter, M. (2025). The Matilda effect in communication research: The effects of gender and geography on usage and citations across 11 countries. *Communication Research,* 52(2), 209–232. https://doi.org/10.1177/00936502221124389

Rossiter, M. W. (1993). The Matthew Matilda effect in science. *Social Studies of Science,* 23(2), 325–341. https://doi.org/10.1177/030631293023002004

Sá, C., Cowley, S., Martinez, M., Kachynska, N., & Sabzalieva, E. (2020). Gender gaps in research productivity and recognition among elite scientists in the U.S., Canada, and South Africa. *PLOS ONE,* 15(10), Article e0240903. https://doi.org/10.1371/journal.pone.0240903

Sánchez-Jiménez, R., Botezan, I., Barrasa-Rodríguez, J., Suárez-Figueroa, M. C., & Blázquez-Ochando, M. (2023). Gender imbalance in doctoral education: An analysis of the Spanish university system (1977–2021). *Scientometrics,* 128(4), 2577–2599. https://doi.org/10.1007/s11192-023-04648-y

Sánchez-Jiménez, R., Guerrero-Bote, V. P., & Moya-Anegón, F. (2017). The role of guarantor in scientific collaboration: The neighbourhood matters. *Journal of Informetrics,* 11(1), 103–116. https://doi.org/10.1016/j.joi.2016.11.004

Sánchez-Jiménez, R., Guerrero-Castillo, P., Guerrero-Bote, V. P., Halevi, G., & De-Moya-Anegón, F. (2024). Analysis of the distribution of authorship by gender in scientific output: A global perspective. *Journal of Informetrics,* 18(3), Article 101556. https://doi.org/10.1016/j.joi.2024.101556

Shen, H. (2013). Inequality quantified: Mind the gender gap. *Nature*, 495(7439), 22–24. https://doi.org/10.1038/495022a

Shi, W., & Wu, R. (2024). Women's strength in science: Exploring the influence of female participation on research impact and innovation. *Scientometrics*, 129(7), 4529–4551. https://doi.org/10.1007/s11192-024-05089-x

Sonnet, G., & Holton, G. (1995). *Gender Differences in Science careers: The Project Access Study. Rutgers University Press*.

Spoon, K., LaBerge, N., Wapman, K. H., Zhang, S., Morgan, A. C., Galesic, M., Fosdick, B. K., Larremore, D. B., & Clauset, A. (2023). Gender and retention patterns among US faculty. *Science Advances*, 9(42), Article eadi2205. https://doi.org/10.1126/sciadv.adi2205

Van Buskirk, I., Clauset, A., & Larremore, D. B. (2023). An open-source cultural consensus approach to name-based gender classification. *Proceedings of the International AAAI Conference on Web and Social Media*, 17, 866–877. https://doi.org/10.1609/icwsm.v17i1.22195

Wang, X., Dworkin, J., Zhou, D., Stiso, J., Falk, E., Bassett, D., Zurn, P., & Lydon-Staley, D. M. (2021). Gendered citation practices in the field of communication. *Annals of the International Communication Association*, 45(2), 134–153. https://doi.org/10.1080/23808985.2021.1960180

West, J. D., Jacquet, J., King, M. M., Correll, S. J., & Bergstrom, C. T. (2013). The role of gender in scholarly authorship. *PLOS ONE*, 8(7), Article e66212. https://doi.org/10.1371/journal.pone.0066212

Xie, Y., & Shauman, K. A. (1998). Sex differences in research productivity: New evidence about an old puzzle. *American Sociological Review*, 63(6), 847–870. https://doi.org/10.2307/2657505

Yang, A. J., & Deng, S. (2024). Dynamic patterns of the disruptive and consolidating knowledge flows in Nobel-winning scientific breakthroughs. *Quantitative Science Studies*, 5(4), 1070–1086. https://doi.org/10.1162/qss_a_00323