

**Gender bias in scientific recognition: Presence and evolution of women in research awards
in Spain (2000-2023)**

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Abstract

This study analyses the presence and evolution of female scientists in research awards in Spain between 2000 and 2023, addressing under-representation and systematic gender biases that disadvantage women in the recognition of scientific achievements. Based on a unique sample of 171 different research awards in all fields of knowledge, totalling 4062 prize winners, the analysis of the 24-year time frame studied reveals an average 31.6% increase in awards to women over the period as a whole, nearing the 40% threshold for accolades received in the final years considered. This is thus similar to the percentage of female representation within the field of science in Spain. Despite this overall progress, awards for women are less prominent than those given to men, wherein they receive 39.5% of prizes for specific works, but only 25.1% of career awards, regarded as more prestigious. Until now, no study for a European country has involved the analysis of such a large sample over time as the one presented here, and it clearly indicates how gender inequalities have been progressively reduced in the more than two decades studied, but they still persist in particular in relation to the most distinguished awards. The data shown here may favour informed decision-making on the part of public authorities, encouraging greater recognition of women scientists.

Keywords: women, women scientists, awards, gender bias, recognition, winner

1. Introduction

Science awards and honours are a recognition given to people who, due to their careers and the relevance of their findings in a specific field of knowledge, make significant advances therein, serving as spokespersons for science before universities, institutions and social actors. Furthermore, they have an influence on research, extending these achievements as a service that is transferred to society (González Orta, 2015; Holmes et al., 2020). Awards offer a distinguishing improvement in the status, prestige and consideration of scientists within their field and translate into progress in their professional careers, in many cases benefiting from membership of the societies awarding the prizes, job promotions, greater responsibilities in organisations, and salary increases. Moreover, there are other intangible benefits such as increase in social capital, visibility and status, which they are also able to transfer to the institution they form part of (Melnikoff and Valian, 2019).

Women account for 33.8% of those who work in science and technology in Europe, despite the fact that, according to the *She Figures* report (European Commission, 2021a) the number of those holding PhDs stands at 47.8%; in addition, in terms of senior research posts, the figure is a mere 11%. In the case of Spain the number of women PhD holders stands above the European average and exceeds that of men, given they account for 52.6% of the total; however, these data begin to decrease when we look at the percentage of full-time female researchers in the Spanish science and technology system, where they represent 39.6% (FECYT [Spanish Foundation for Science and Technology], 2025).

Despite women having a strong presence in science, they are less recognised for their scientific contributions than their male colleagues, to which they are obliged to work much harder and demonstrate more scientific achievements while not receiving the same credit. The so-called “Matilda effect” (Lincoln et al., 2012) shows that men are much more likely to win awards and prizes due to the long-standing and systematic under-representation of women in science (Gehmlich and Krause, 2024). Gender inequalities, above all those at the highest levels, reinforce a system that undervalues women from the beginning of their careers, where their merit is less recognised despite there being no significant differences in terms of numbers of published articles, citations per article, or participation in international collaborations, suggesting that disparities in awards are not due to differences in academic performance (Meho, 2021). It is noteworthy that only 10 women were awarded the Nobel Prize in Physics, Chemistry, Economics, and Physiology or Medicine during the first 100 years of the prize's history (Lunnemann et al., 2019), and that overall, less than 4% of Nobel Prizes in science have been granted to women with a mere 2.7% in Physics specifically (Danylova and Komisarenko, 2024). Similarly, only 19% of the most prestigious scientific awards between 2016 and 2020 were given to women scientists (Meho, 2021). Moreover, Gehmlich and Krause (2024) found that women are less likely to receive scientific prizes that are named after men.

A number of scientific societies have begun implementing measures to address gender disparities, including the creation of committees tasked with expanding nominee pools in accordance with gender parity criteria. Examples include Advancing Earth and Space Sciences (AGU) and the Royal Society in the United Kingdom, which actively seek candidates and encourage the nomination of individuals who might otherwise be overlooked. Similar initiatives are already

embedded in prestigious awards such as the Abel and Kavli Prizes (Jaynes et al., 2019), alongside broader efforts like the Nominate Her movement, which aims to raise awareness of potential female candidates (Gehmlich and Krause, 2024). Moreover, institutions and organizations have issued various directives and recommendations to reduce the gender gap in science. However, these initiatives are typically non-binding and are not always implemented promptly or uniformly across countries and regions.

In addition, there is still a considerable lack of comprehensive studies and publicly available data analysing gender disparities in scientific awards and honours, both at the international level and within specific national or regional contexts. To address this gap, the present study offers the first large-scale, systematic analysis of the representation of women scientists among recipients of national research awards in Spain over a 23-year period (2000–2023). Drawing on the most extensive and detailed dataset compiled to date in the country, this paper not only documents trends in female awardees across scientific fields and award types, but also examines temporal dynamics, levels of recognition, and potential structural biases. In doing so, it provides empirical evidence to inform future equity strategies and contributes to the broader international debate on gender and scientific recognition.

2. Literature Review

Scientific awards, as mentioned above, are a social recognition that in addition to often entailing significant financial benefits, gives those who receive them prestige and honours in their field, boosting the careers of new researchers and consolidating those of more experienced investigators (González Orta, 2015). Despite this, a clear gender gap exists, meaning that female scientists are not rewarded for their achievements in the same way as their male counterparts.

Despite the relevance of the topic, few studies have examined the presence and progression of women among recipients of scientific awards, or addressed the broader social implications of their underrepresentation in these forms of recognition. In this regard, Lincon, Pinus and Leboy (2011) analyse the academic prizes of the previous two decades in 13 scientific societies and find that the awards given to women in 10 of these were far below those obtained by men in the same disciplines. The findings reveal that as well as being awarded fewer prizes, these were mainly related to service or teaching. Something similar is detected in the study on gender inequalities in prizes awarded by the American Psychological Association (APA), where accolades with a greater female presence are those related to humanitarian or social policy aspects (Orchowski et al., 2021).

In a seminal study, Lincoln et al. (2012) identified structural biases in the processes by which scientific prizes are awarded, highlighting the lack of formal oversight and transparency in selection committees. The authors also note that nomination letters can perpetuate gender stereotypes by using less assertive language to describe female candidates, referring to their personal lives, or omitting descriptors typically associated with excellence—factors that undermine women's perceived merit. To mitigate these biases, the authors recommend using gender-neutral evaluative language, broadening nominee pools, and ensuring greater female representation on selection committees.

The concept of implicit bias is also used by Meho (2021), who analyses 141 awards over the last two decades, detecting an increase in the period of prizes given to women, although they continue to lag behind men. Moreover, the percentage of prizes to women scientists is lower than that which would correspond to them according to their presence in R&D activities, and these inequalities are more pronounced in more prestigious awards, as well as in disciplines such as biological sciences, computer science and mathematics. These inequalities are particularly evident in major awards such as the Nobel Prize (Lunnemann et al., 2019; Neikirk et al., 2024), the Fields Medal in Mathematics, the Robert Koch Award in biomedical sciences, and the Lasker Award, which is often considered a precursor to the Nobel Prize in Medicine. In the case of the latter, women have historically received less than 8% of the awards, a figure that has remained virtually unchanged since the prize's first decade (1946-1955). This is especially striking given that the awarding body has recently promoted diversity and greater female representation in science and medicine (Jacobs et al., 2023b).

This gender inequality also presents intersectionalities with other factors that impede a higher female presence in academic recognitions. Those belonging to marginalised or minority groups - due to their ethnicity, race, sexual orientation and in particular non-white people (Jacobs et al., 2023b) may be disadvantaged in award processes. Even the fact a specific prize carries a male or female name can be decisive in the probability of it being awarded to a woman. A recent study (Gehmlich and Krause, 2024) which analysed 346 scientific awards and medals and a total of 9,000 awardees found that just “one in eight female academics win prizes bearing the names of men”. These prizes with male names account for almost two thirds of scientific awards. It is striking that female academics have greater chances of winning awards named after prominent female scientists, achieving 47% compared to 53% of men.

Other studies (Holmes et al., 2020) highlight significant progress in institutions where women have gained more representation in decision-making bodies. At the American Geophysical Union, the proportion of women on the honours committee increased over a 15-year period, coinciding with a rise in female awardees, from 20% in 2008 to 50% in 2019. Although this correlation does not imply causation, it suggests that gender-balanced committees may help mitigate bias in recognition processes. This smaller gap is also observed in awards for junior researchers, with disparities increasing as awards become more prestigious and better paid (James et al., 2019).

In biomedicine, studies reveal a persistent under-representation of women in scientific awards, despite a gradual increase over time. Women receive a mere fifth of prizes in Sleep Medicine and Nephrology (Haidinger et al., 2022; Naime and Karroum, 2022) and only 15% in Haemostasis and Thrombosis (Jacobs et al., 2023a). In Transfusion Medicine, at the current rate, gender parity would take more than a century to achieve (Jacobs et al., 2022).

In Spain, where this research is focused, few studies have examined gender differences in prizes. Segarra Saavedra et al. (2020) found that between 1982 and 2019, 92.3% of 113 National Research Awards granted by the Ministry went to men, while only 9.7% recognized women. Additionally, in 28 of 37 editions analysed, no awards were granted to female scientists, and three of the eleven prizes awarded to women were concentrated in the final year of the period studied. Similarly, an analysis of prizes awarded by the *Real Academia Galega de Ciencias* [Royal Academy of Sciences

of Galicia] from 2013 to 2021 shows that 80% of recipients with indirect nominations -ominated by institutions or the awarding body- are men. However, when candidates apply directly and the selection process involves blind review, the gender gap narrowed (Magalhães and Valdiglesias, 2022).

Nevertheless, the work that performs an exhaustive analysis on the participation of women in scientific prizes in Spain is the study by González Orta (2015), which compiles 37 of the most recognised prizes in the different branches of science between 2009 and 2014. It reveals a greater presence of female prize-winners in research by young people, accounting for 45% of awards, whereas the most prestigious accolades that recognise the career path of the researcher are given to women scientists on only 17.6% of occasions. The glass ceiling is also present in Spanish science, because as the prestige and value of the awards increases, the proportion of women decreases, going from 25% in those worth €5,000 to only 7% in those valued at €100,000.

Another key aspect is the presence of women on prize juries. Women make up 21.7% of selection committees for Spanish awards (González Orta, 2015). This is relevant, as a higher proportion of women on these committees increases the likelihood of a prize being awarded to a female scientist (Lincoln et al., 2012). The most common nomination methods are: 1) direct candidate nomination, 2) automatic nomination through participation in academic events, and 3) indirect nomination by relevant individuals or institutions. The latter is the most prevalent, especially for higher-value prizes where women are most underrepresented (González Orta, 2015). Frequently, the juries of these high-prestige prizes include previous awardees, constituting a mechanism that reinforces existing inequalities. Furthermore, other discriminatory mechanisms—such as the internal nature of selection and nomination processes, continue to hinder women's access to scientific recognition. These closed and often opaque procedures perpetuate existing power dynamics and gender imbalances by relying on informal networks and evaluation criteria that may exclude or undervalue female candidates.

To this end, greater rigor in candidate selection and training against implicit bias in committees is recommended to ensure that evaluations focus on scientific merit rather than personal information (Gehmlich and Krause, 2024). Implementing transparent parity measures in jury composition is also encouraged, as this would create “a direct connection between greater objectivity and transparency in requisites and criteria and a higher presence of women awardees” (González Orta, 2015). However, proactive efforts remain limited, with bias more easily reduced in lower-stakes awards, while male dominance persists in prestigious prizes (James et al., 2019; Meho, 2021).

In this sense, a key issue is gender co-optation, or gender-washing, the instrumental use of gender equality discourse by institutions to signal a commitment to inclusion while failing to address the structural barriers that marginalize women within systems of academic prestige (Walters, 2022). Such practices are particularly relevant in the context of scientific awards, where the creation of gender-specific prizes or isolated recognitions for women may serve as symbolic gestures rather than indicators of systemic transformation.

In the vein of the aforementioned studies, this work analyses the presence and evolution of women in scientific prizes awarded in Spain between 2000 and 2023. In this way, the general aim of this study is to discover whether the incorporation of women into science that has taken place on a

general basis in the country in recent decades transfers to the sphere of scientific honours and prizes to the same extent, or whether there are still inequalities in terms of recognition of achievement.

In order to respond to this, the following five research questions are posed:

1. To what extent has gender parity been achieved in the awarding of research prizes in Spain over the past two decades?
2. What proportion of prize winners during this period were women, and how has this changed over time?
3. Which fields of knowledge show higher or lower levels of female representation among award recipients?
4. Does the proportion of female winners vary according to the relevance of the prize –career-based awards being more prestigious than awards for specific works-?
5. Are there significant gender differences in prize recipients depending on the awarding institution's type and its geographical scope?

3. Material and Methods

Firstly, a census was conducted of research prizes awarded in Spain from 2000 to 2023, recording both individuals and institutions that received awards. The selection of this time frame was based on data accessibility, as earlier years offer fewer sources in databases, and many awards emerged or began to be awarded more regularly starting in the early 2000s. The inclusion criterion was that they had to be research prizes awarded by an institution, public or private entity located in Spain. The database created from the systematic compilation of this information is available for public consultation at <https://campeona.org/>.

The data compiled by Wikidata were used as a starting point to identify the prizes. In particular, all of the prizes classified within the instance “Distinción” [“Honour”] (Q618779) and related to Spain at Wikidata were stored. This initial list was revised and filtered to exclude those awards not related to Research, or which had not been presented in the set time frame. Additional sources were then included via the consultation of different lists of awards found on the websites of public institutions, such as the National System of Publications of Public Subsidies and Grants (BDNS); the Ministry of Science and Innovation; different autonomous regional governmental departments; the Youth Institute of Spain; official professional associations; scientific academies and universities, and private companies and organisations. These resources served to identify new awards not included in the primary source.

Once the complete list of awards was identified, a tool for data entry, coding and analysis was created, which established different analysis variables, following previous works focused on gender bias in scientific prizes (Cadwalader and Leboy, 2012; González Orta, 2015). The following variables were coded and analysed:

Variables relating to the prize

1. Name of prize

2. Awarding body
3. Awarding body type (0= Public; 1= Private; 2= Foundation; 3= Academic society; 4= University).
4. Geographical scope of awarding body (0= National; 1= Regional -NUTS¹ 2-; 2= Provincial -NUTS 3-).
5. Modalities of the prize (in the event of various categories, for example, for junior researchers, and another for senior researchers).
6. Prize type (0=Works; 1=Career). This variable indicates prize relevance, with career awards considered more prestigious than those for specific works (e.g., articles, theses, or books).
7. Prize knowledge area (0= General; 1= Life Sciences; 2= Experimental Sciences; 3= Arts & Humanities; 4= Social and Legal Sciences; 5= Engineering & Architecture)
8. Prize for junior researchers (0= Yes; 1=No)
9. Prizes exclusively for women (0= Yes; 1=No)
10. Prize name sex (0=Woman, if female prize name, 1=Man, if male prize name; 2=Not applicable, if prize not named after person).

Variables relating to the prize winner

1. Name of prize winner
2. Sex of prize winner (0=Woman; 1=Man; 2=Not applicable - for prizes awarded to entities).
3. Year awarded

The prize data have been compiled and processed manually from the sources identified, whereas the information relating to each prize winner, such as date of birth or affiliation, has been compiled via a search for the name of the prize winner on their personal, academic or institutional web pages, as well as on Wikipedia and press releases.

Regarding statistical analysis, the results for categorical variables were expressed as numbers and percentages. Subgroup comparisons were performed using the Chi-square test, and the Fisher's exact test was used for 2x2 tables when the number of events was less than 5. Additionally, a z-test was conducted to compare proportions between groups. R Statistical Software (R Foundation for Statistical Computing, Vienna, Austria) was used for the analysis.

4. Results

A total of 171 individual research prizes were analysed in 241 different modalities over the period 2000-2023.

These prizes add up to a total of 4062 awards, with 2000 being the year of the lowest sample (62 awards), and 2022 the year with the most prizes registered (304). The average number of prize winners analysed per year therefore stands at 169.

Of these, 2753 were awarded to men, 1272 to women, and 37 to entities. If we exclude the entities from the analysis and focus solely on prizes awarded to physical persons (n=4025), for the entire

¹ Nomenclature of Territorial Units for Statistics

period men received 68.4% of prizes and women 31.6% ($p < 0.001$). If we discount the prizes awarded exclusively to women scientists, the ratio for women in general drops by 1.3 points, to 30.3%. Table 1 shows the descriptive data for the global period for the different variables analysed.

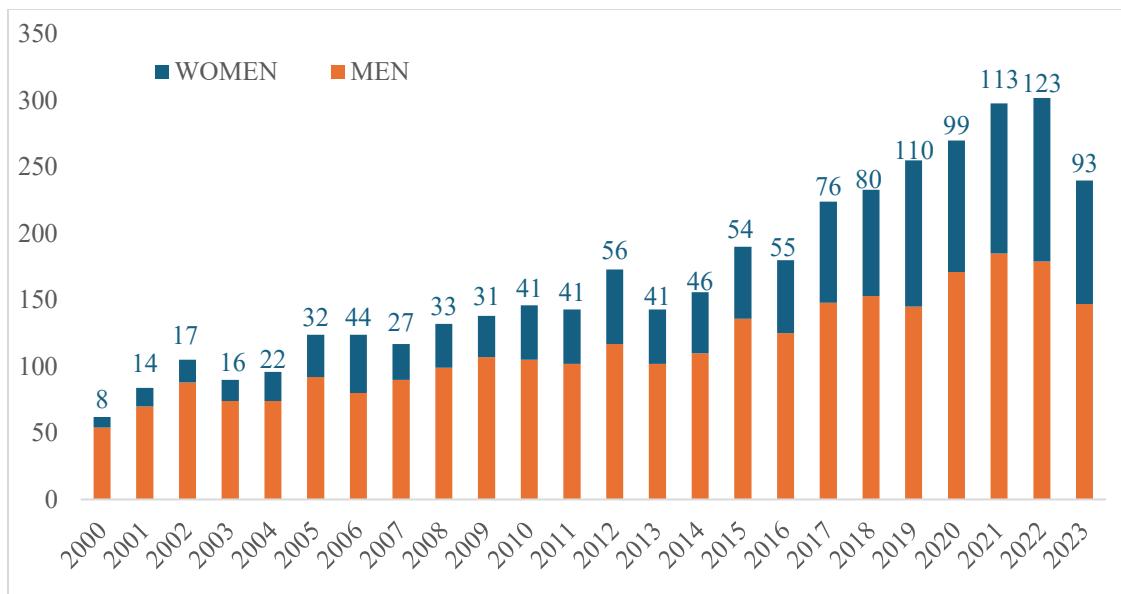
Table 1: Descriptive statistics of the sample by gender

		WOMEN		MEN	
		N	%	N	%
Prize winners		1272	31.6	2753	68.4
<i>Excluding women-only prizes</i>		1195	30.3	2753	69.7
Typology	Works	720	39.5	1104	60.5
	Career	552	25.1	1649	74.9
Junior researcher	Yes	379	31.1	839	68.9
	No	893	31.8	1914	68.2
Area of knowledge	General	386	30.5	880	69.5
	Life Sciences	234	36	416	64
	Experimental Sciences	211	24.9	636	75.1
	Arts & Humanities	63	28.1	161	71.9
	Social and Legal Sciences	327	41.3	465	58.7
Entity type	Engineering & Architecture	51	20.7	195	79.3
	Public	354	32.1	750	67.9
	Private	134	32.2	282	67.8
	Foundation	175	22.7	595	77.3
	Academic Society	492	31.5	1070	68.5
Entity geographical scope	University	117	67.6	56	32.3
	National	722	26.8	1973	73.2
	Regional (NUTS-2)	339	36	603	64
	Provincial (NUTS-3)	94	43.7	215	56.3

The number of different individual prize winners (excluding entities) is 3480, specifically 2348 men and 1132 women. Thus, the rate of prizes awarded to each winner considered in our sample is 1.16, with limited differences between men (1.17) and women (1.12).

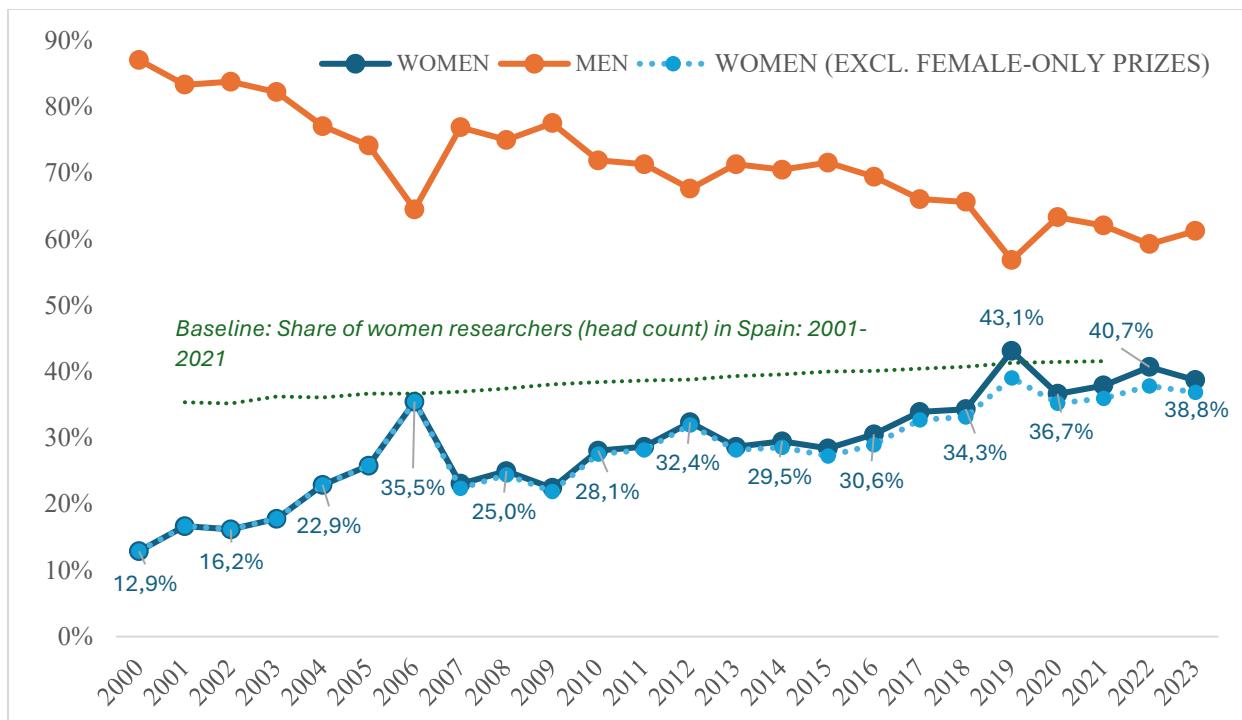
For its part, figure 1 indicates the total number of prize winners by year and distribution between men and women. It shows the gradual increase of the sample analysed over the period, as well as the rise in the percentage of awards given to women over the last two decades.

Figure 1: Yearly evolution of the number of prize winners by gender.



The evolution of the gender gap between men and women in the winning of awards can be seen more clearly in Figure 2. At the beginning of the period of analysis (2000-2003) women received fewer than 20% of prizes. From 2004 to 2015, this percentage is situated between 20 and 30%, and in two specific years it exceeds 30%. From 2016 the rate of prizes to women no longer drops from 30%, reaching a peak in 2019 with 43% of prizes awarded. If only the last 5 years of the analysis (2019-2023) are considered, the ratio of prizes to female researchers is situated at the 40% threshold (39.4%) -37% if women-only prizes are excluded-. For the period as a whole there is average annual growth in prizes to female researchers of 6.2%. The percentage of women researchers in Spain has been included as a comparison (data from 2001 to 2021, source: Gender Statistics Database -European Institute for Gender Equality), which grows from 35 to 40% throughout the period. It can thus be perceived that in the final years of the period, the percentage of awards obtained by women increasingly resembles their presence in the Spanish research community, although without reaching parity.

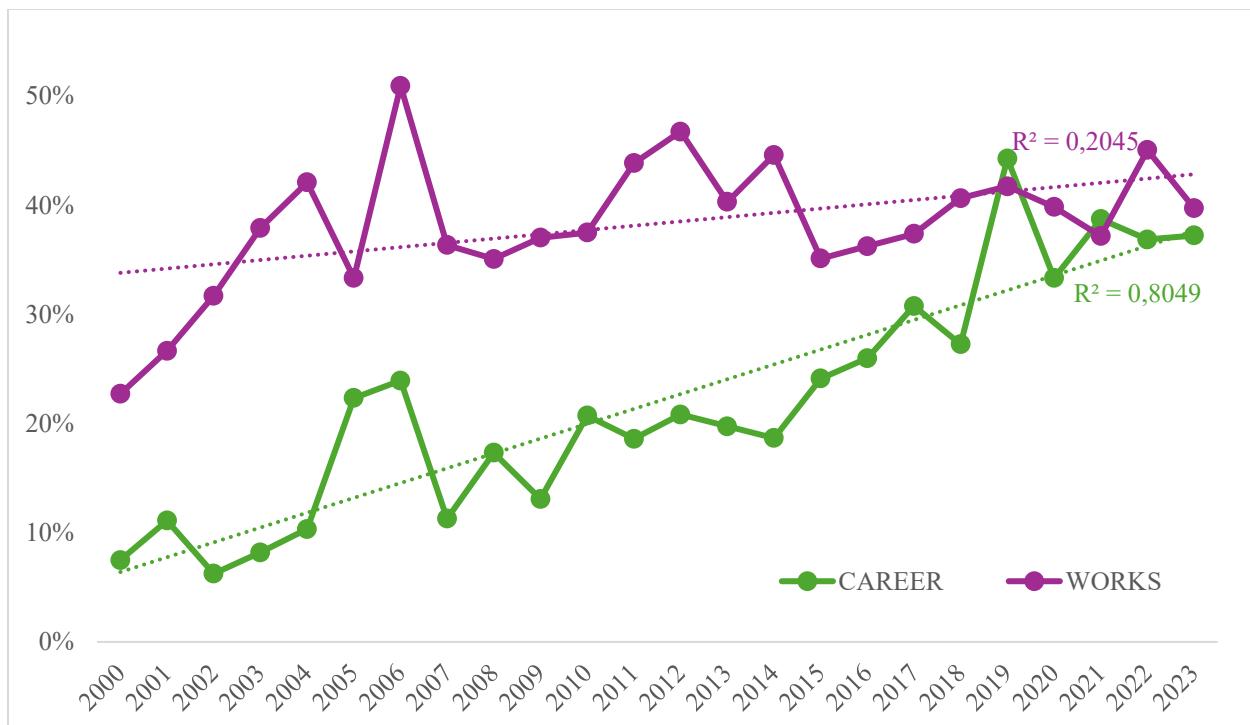
Figure 2: Yearly evolution of the percentage of prize winners by gender.



Type of prizes

This positive evolution in prizes received by women researchers shows considerable differences when analysed separately by prizes for research careers or specific works (as in the case of a book, a doctoral thesis or an article). Thus, in the case of prizes for specific works, the percentage of awards given to women stands at 39.5% for the total period (table 1) (vs 60.5% for men, $p < 0.001$), with a slight upward trend (3.9% annual growth rate), but which shows certain stability over time. In fact, the peak for prizes to women researchers occurs in 2006, when they even exceed (50.9%) those received by men. Nevertheless, if we only consider prizes related to careers in research (of greater relevance than those for a specific work), the percentage of awards to women researchers stands at 25.1%, in contrast to the 74.9% of accolades given to men ($p < 0.001$). In this case there is a marked growing trend in female prize winners, with 2019 being the year of the highest figure, showing a rate of 44.3% in terms of awards obtained by women. For the period as a whole, the average annual increase in career prizes received by women stands at 13.2%. Figure 3 shows the progressive convergence between both award types, with career prizes being more numerous in two of the final years of the study, 2019 and 2021 (figure 3).

Figure 3: Yearly evolution of the percentage of prizes awarded to women by typology



Junior researchers

The differences in the awarding of prizes to women and men are statistically significant in both the senior researcher category (31.8% women vs. 68.2% men; $p < 0.001$) and the young researcher category (31.1% women vs. 68.9% men; $p < 0.001$). Focusing the analysis exclusively on prizes for junior researchers, who represent 30.2% of the sample studied ($n=1218$), the same trend is observed. Women receive more prizes for specific works (41.3%) compared to career achievement awards (28.5%), both statistically significant compared to men (58.7% and 70.5%, respectively; $p < 0.001$). For prizes recognizing consolidated research careers, women receive only 22.4% of awards (vs. 77.6%; $p < 0.001$), but this figure rises to 39.2% for specific works awards ($p < 0.001$) (Table 2).

Table 2: Number and percentage of prizes awarded by level of research career consolidation, prize type and gender

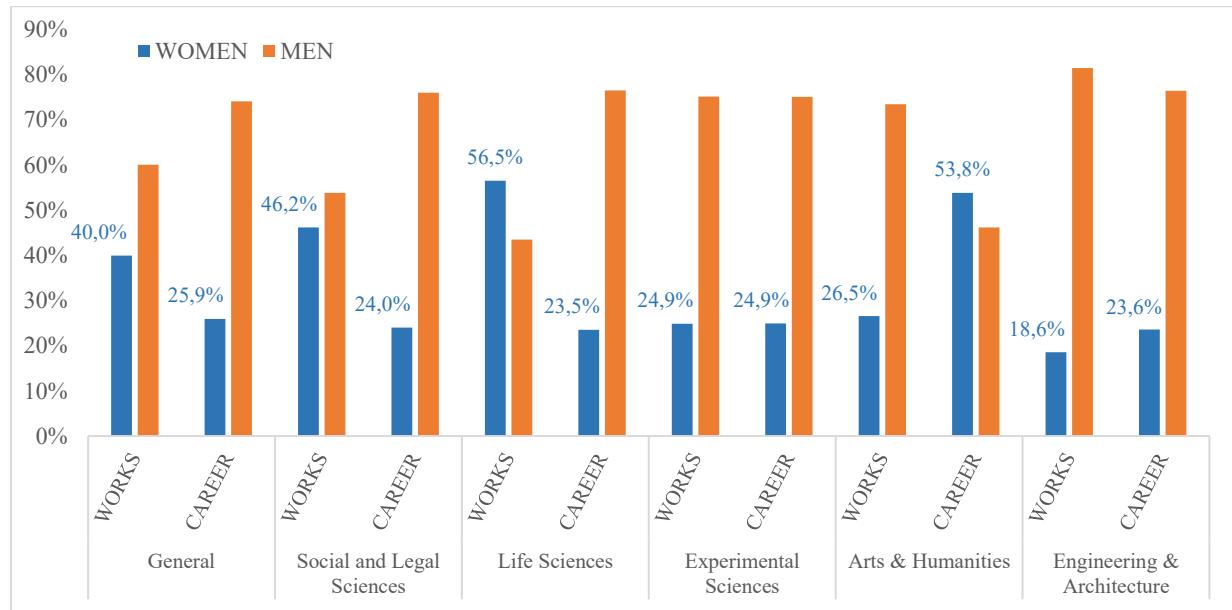
	FEMALE		MALE	
	N	%	N	%
Senior researchers	893	31.8	1914	68.2
Works	616	39.2	956	60.8
Career	277	22.4	958	77.6
Junior researchers	379	31.1	839	68.9
Works	104	41.3	148	58.7
Career	275	28.5	691	71.5

Areas of knowledge

If the prizes are analysed according to large areas of knowledge, it is in Social and Legal Sciences that we see a higher percentage of accolades to women, with 41.3% of the total of prizes awarded, followed by Life Sciences. The field with the greatest inequality is Engineering and Architecture, where just 20.7% of prizes are awarded to female researchers (table 1). For all areas of knowledge, results are statistically significant ($p < 0.001$).

In the analysis according to prize type, it is observed that in all cases men receive more prizes than women except for the Works type within Life Sciences (56.5% of prizes to women researchers), and in the Career type in Arts & Humanities (53.8%). In the latter case attention should be drawn to the fact that the population of career prizes in this field stands at 13 awardees, to which the results should be read with caution. Regardless, this analysis reveals that the tendency to award more prizes to men than women occurs in practically all fields of science and in the two typologies defined (figure 4).

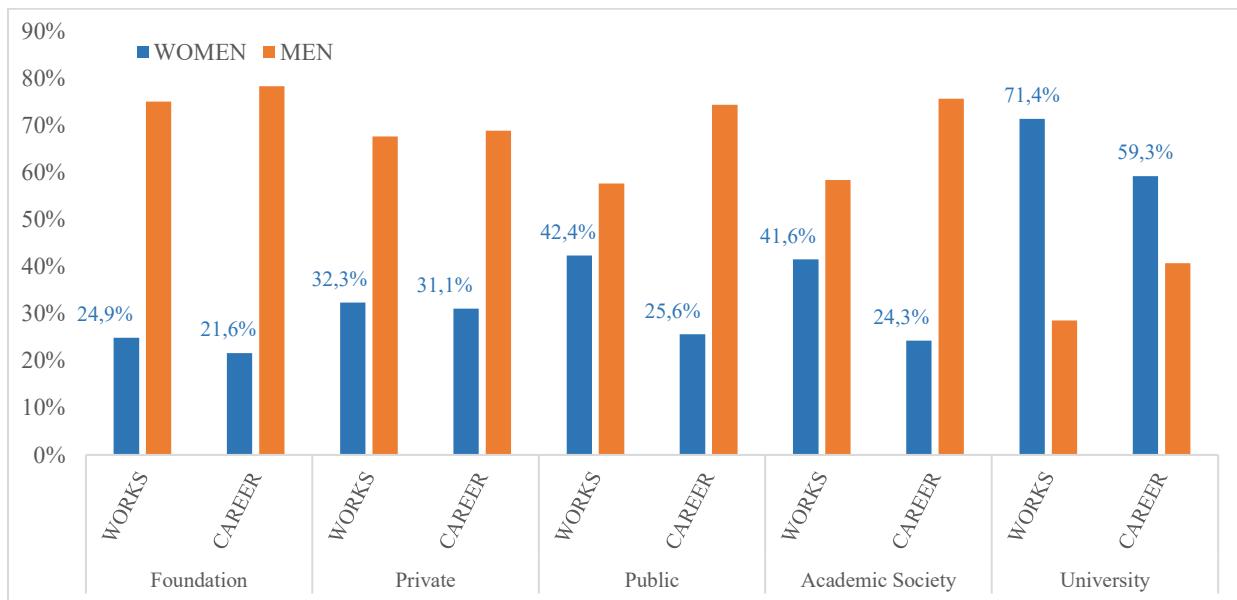
Figure 4: Percentage of prizes awarded by areas of knowledge, typology and gender



Typology of entity and geographical scope of awarding institution

Regarding gender differences depending on type of entity awarding the prize, it is noteworthy that prizes given by foundations are those that are less likely to reward women (22.7%). On the other hand, awards given by universities ($n=173$) do show a greater inclination towards awarding prizes to female researchers (67.6%), moving away from the general trend in this study. Nevertheless, it must be taken into account that in this subgroup there are prizes exclusively for women, or whose subject matter is gender equality, to which these data are clearly biased. If we segment this variable according to typologies, in the five awarding entity groups, women are given fewer accolades for trajectories than for specific works; that is, they receive less prestigious awards. This difference is particularly acute in prizes awarded by public institutions ($n=1104$) and in those given by academic societies ($n=1562$) (figure 5). Results are statistically significant ($p < 0.001$) between women and men across all five subgroups.

Figure 5: Percentage of prizes awarded by awarding entity, typology and gender



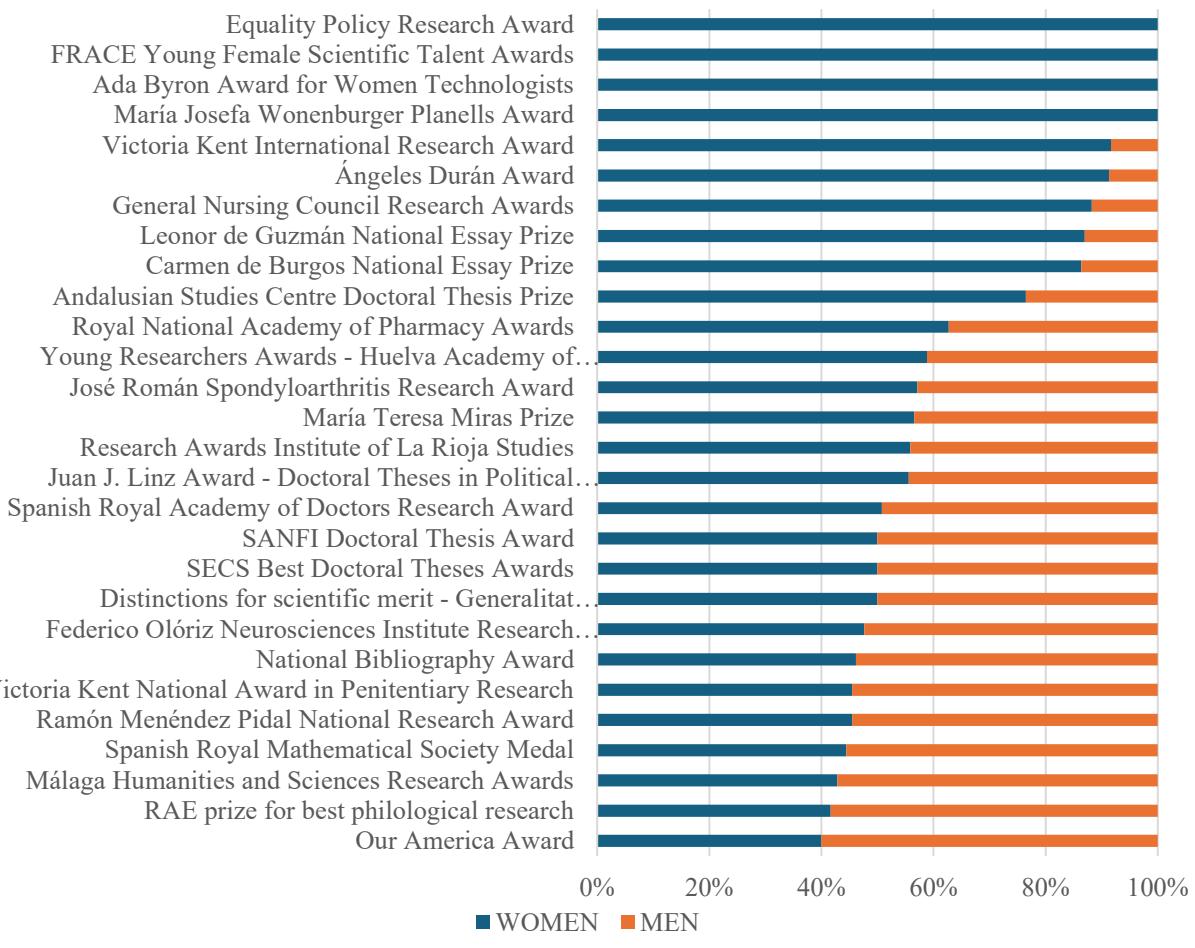
As indicated in table 1, the wider the geographical scope of the institution (therefore, prize relevance and reach), the fewer women there are who receive awards. Thus, if women receive 43.7% of prizes awarded by provincial institutions (NUTS-3) ($n=215$), the figure drops to 36% at the NUTS-2 ($n=942$) level, and to 26.8% in entities and institutions with national reach ($n=2695$)² ($p < 0.001$ vs men across all three subgroups). As in the case of the previous variables analysed, at all three levels there are more women with prizes for specific works than for career-long achievements.

Prizes with widest gender gap

The gender gap becomes highly evident when analysing specific prizes. Figures 6 and 7 therefore show those accolades with greater gender inequality (among those awarded to at least 10 people), in favour of both women and men. If we exclude the four prizes that are 100% awarded to women, given they are exclusive to female researchers, we find only 16 examples in which the rate of prizes to women is 50% or higher (figure 6). Among the prizes with greater female presence, we find a number that are linked to the topic of gender equality (Victoria Kent, Ángeles Durán, Leonor de Guzmán, and Carmen de Burgos awards), or those given within highly feminised spheres (such as the General Nursing Council Research Awards).

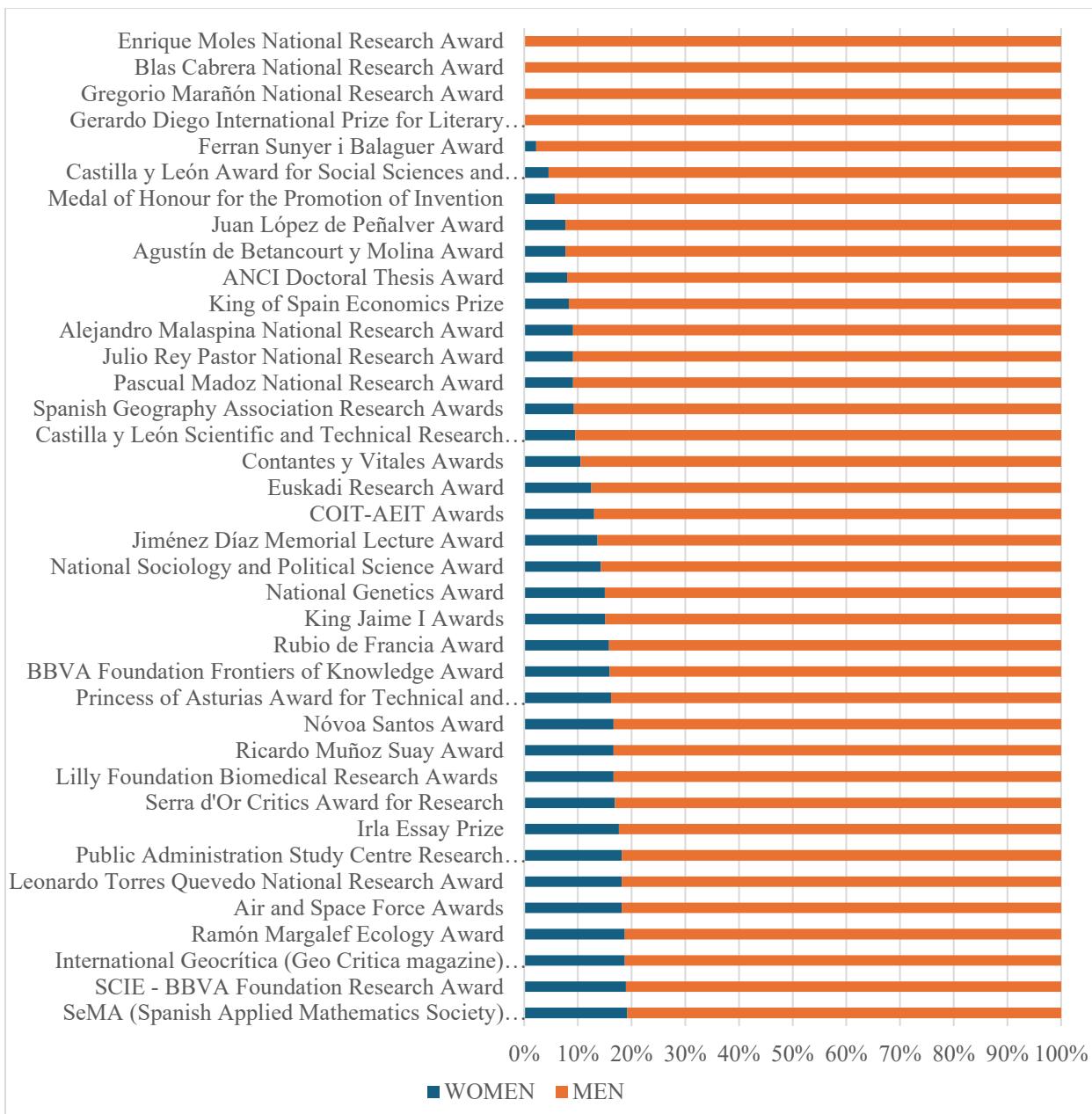
Figure 6: Prizes with the highest percentage of awards to women

² Prizes awarded by universities have been excluded from this analysis.



For their part, there are 92 prizes with an award rate to men equal or higher than 50%. In fact, for reasons of space, figure 7 only represents those prizes that have been awarded to over 80% men. Attention should be drawn here to the fact that three of the four prizes exclusively awarded to men are the prestigious National Research Awards (the Enrique Moles Prize for Science and Chemical Technology; the Blas Cabrera Prize for Physical, Material and Earth Sciences; and the Gregorio Marañón Prize for Medicine). These accolades are awarded by the Spanish state via the ministry with competencies in matters of Research and Science.

Figure 7: Prizes with the highest percentage of awards to men



5. Discussion and Conclusions

In this study we performed a longitudinal analysis on research prizes awarded to women in Spain over a 24-year-period, from 2000 to 2023. Our results show a sustained increase in this period in terms of accolades received by female researchers, going from award rates under 20% in the first years of the study to close to 40% in the final years of the sample. In the period as a whole there is 6.2% average annual growth in prizes to female researchers, growth that is particularly significant in awards related to scientific careers, which have increased on average by 13.2% per year. However, it should be noted that it began from very low figures.

This study provides practical insights for science policy and contributes conceptually to gender studies in academia. It expands the analysis beyond high-prestige international prizes by

incorporating a broader dataset encompassing multiple levels of institutional recognition over two decades. The findings highlight the persistent underrepresentation of women among recipients of the most prestigious awards, contrasted with their greater presence in less prominent recognitions. Prizes function as institutionalized forms of symbolic capital, legitimizing and reinforcing dominant cultural and academic values (Wijnberg, 2003). By examining the stratification of awards by symbolic weight and impact, this study deepens the theoretical understanding of how gendered structures of merit and excellence are socially constructed and reproduced within the symbolic economy of science and culture (van den Brink and Benschop, 2012).

This novel study, the largest of its kind in a European country, shows a clear decline in gender inequalities in scientific awards over time. Similar trends towards parity have been observed in both general studies (Meho, 2021) and specific fields like Sleep Medicine (Naime and Karroum, 2021), Transfusion Medicine (Jacobs et al., 2022), and Haemostasis and Thrombosis (Jacobs et al., 2023a). In Spain, this phenomenon is evident not only in science (González Orta, 2015; Segarra Saavedra et al., 2020) but also in culture, where women's representation in major national film awards (such as the Goya) has recently matched or surpassed that of men (McGowan and Yáñez-Martínez, 2022). This positive shift aligns with broader European trends, as several national and regional initiatives have been implemented to promote gender balance in artistic recognition and leadership positions (European Commission, 2021b).

However, significant differences remain when the results are analysed in a disaggregated manner. Women are more likely to receive awards for specific works than prizes for their scientific careers. In other words, they enjoy greater recognition in less relevant accolades. This phenomenon is common to all areas of knowledge, independently of the type of institution awarding the prize or the geographical scope thereof. Furthermore, this is the case for both prizes to consolidated researchers and those to junior researchers. These results are in line with previous studies which show that the greater the relevance of the award, the lower the female presence (González Orta, 2015; Magalhães and Valdiglesias, 2022).

Overall, although this study does not aim to explain the causes of these results, several factors may contribute to the findings. First, the incorporation of women into Spain's research sector, mainly during the 1990s and early 2000s, has led to an increase in female employment in R&D from 32.7% in 1999 to 41.6% in 2022 (Eurostat, 2025). This trend reflects broader patterns across Europe and other OECD countries, where more women are entering science but often face barriers to reaching leadership or key research roles (European Commission, 2021a). This gradual feminization of the scientific workforce has recently begun to translate into a growing number of women occupying the highest academic ranks. For instance, in Spain the percentage of female full professors (catedráticas) has increased from 20% to 27% over the last decade, yet a significant gender gap remains compared to the near-equal number in early academic careers (FECYT, 2025).

Secondly, not only are women incorporated into scientific activities, but they also have greater representation in leadership positions in research groups and laboratories. This greater visibility and assumption of responsibilities also results in a greater inclination towards being valued in research awards. Nevertheless, the management of research institutes in Spain remains largely male-dominated. For example, in 2024, only 17% (seven out of 42) of the research centres in

Catalonia (CERCA system) were led by women. However, this represents a significant improvement compared to 2021, when only one woman headed an institute (Ansede, 2024).

Thirdly, the composition of juries and evaluating committees have in recent years comprised more women. This condition operates in turn on two levels: on the one hand, the dynamics of incorporating women into scientific activity, such as for instance their progressively greater presence in scientific academies and societies (INE, 2023), mean they form a larger part of these juries; on the other hand, the legislative actions in matters of gender equality put into place in Spain in recent years play an important part. Hence, the modification of the Law on Science, Technology and Innovation, enacted in 2022, indicated the need for a balanced gender composition (minimum 40%) on evaluation committees and awards in the Spanish Science System, thus deepening the principle of an equitable male and female presence already indicated in the Law for the effective equality of women and men (2007).

In fourth place, the raising of awareness in institutions and Spanish society in general in gender equality matters translates into a greater number of women nominated for prizes than that which existed previously, which logically increases the probability of winning. This has been aided by the various initiatives launched to raise the profile of relevant women researchers, such as the “Scientists and innovators” database, promoted by the Ministry of Science, Innovation and Universities, which includes data on close to 400 women who have won awards or received important recognition, for example inclusion in scientific academies and European Research Council projects. This ministry, and other public bodies such as the Spanish Foundation for Science and Technology (FECYT) have put in place another series of actions destined towards promoting the participation and recognition of women researchers in the science system, including the configuration of the Women and Science Unit which, among other activities, generates the “Women and Innovation” and “Women Scientists in Figures” reports.

In fifth place, the establishment of new research awards in recent years, many specifically aimed at junior researchers, and sometimes exclusively to women scientists (eight different prizes in our study, four set up since 2019), have contributed, in part, to balance out the inequalities detected. The establishment of women-only prizes is a controversial measure that may lead to the creation of *ghettos* due to the camouflaging of the under-representation of women in scientific accolades (Lincoln et al., 2012), but these policies also help to highlight the activity of relevant female scientists, generating role models for young girls and women, encouraging scientific vocations and promoting the progressive feminisation of STEM (Science, technology, engineering, and mathematics) disciplines. Female recipients of these prizes (n=77) constitute 1.9% of the total winners across the entire sample. Excluding these awards from our study would slightly decrease the percentage of women receiving prizes during the period (from 31.6% to 30.3%), without significantly affecting the overall trend.

Nevertheless, despite the progress made, it is still perceived that women are less likely than men to receive the most prestigious awards. When focusing on prizes that recognize the careers of senior researchers, only 22.4% of the awards granted during the period went to female scientists—a drop of 9.2 percentage points compared to the overall average. A similar pattern—albeit less pronounced—is observed in awards for early-career researchers, where women received 28.5% of

the career-based prizes over the entire period. However, in four of the last five years analysed, women surpassed the 40% threshold, suggesting that although the gender gap is narrowing at a similar rate in both categories, parity is likely to be achieved sooner in junior researcher awards than in senior researcher awards.

Furthermore, although women's recognition for specific works has been close to that of their male colleagues in recent years, a significant imbalance persists in the most prestigious and socially recognized awards. For instance, as of 2023, out of the 10 National Research Awards for senior researchers (all named after men) granted by the ministry responsible for science, three have never been awarded to women, and three others show a concession rate to women below 10%. Significantly, in 2022 the aforementioned department created another 10 national research prizes specifically for junior researchers, naming all of them after illustrious Spanish women scientists. While this measure may be seen as a step towards equality, the differentiation between male scientists (whose names are on *senior* awards) and female scientists (whose names appear on *junior* awards) remains entrenched. Other prestigious international awards like the Rey Jaime I Awards and the BBVA Foundation Frontiers of Knowledge Awards have also largely overlooked female researchers in their numerous editions.

It is important to note several limitations of this study. Firstly, the sample size is larger in the final years of the research (when more prizes are awarded) compared to the initial years. Additionally, the sample is relatively small in the fields of Humanities (n=224) and Engineering and Architecture (n=246), which means the results may change with a larger sample size. Furthermore, it should be noted that the assignment of the sex variable to each researcher was based on their first names, or by identifying their sex from photographs or online information, rather than individual self-identification. Consequently, this variable is binary (male-female) and does not account for the full gender spectrum. Nevertheless, this approach is considered the most efficient for studies of this nature, as supported by previous research (e.g., Orchowski et al., 2021; Jacobs et al., 2023b).

Finally, this longitudinal study not only provides robust empirical evidence on gender disparities in scientific recognition in Spain, but also contributes to the analytical understanding of how academic merit and prestige are gendered. Moreover, it reinforces the need for ongoing, data-driven research aimed at informing more equitable recognition systems and support transformative gender policies in science. As such, it advances the intersection between quantitative analysis and gender studies, encouraging future comparative research across national contexts.

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