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Presence and representation of female scientists in the Spanish press

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Abstract
Introduction: This R&D project is based on the hypothesis that female scientists are invisible in the Spanish media. **Objectives and methods:** To test this hypothesis and to examine the image of female scientists offered by the Spanish press, this study analyses the science news disseminated by the five major general-interest paid-for newspapers during six non-consecutive months. **Conclusions:** The results reveal that these newspapers only dedicate 2.6% of their pages to science news and that only 14.3% of these news stories focus on female scientists, while the great majority of news, 70.7%, focuses on male scientists and the rest, 15%, have both male and female scientists as protagonists. Science news stories that focus on female scientists describe the research studies of these women in a dispassionate manner, without giving them a protagonist role, and without using evaluative adjectives to describe them. Thus, there is a significant level of inequality in the informative treatment given to male and female scientists in the Spanish press.

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Keywords
Women; Science; Equality; Press; Representation.

Contents

Translation by **CA Martínez Arcos**, Ph.D. (Universidad Autónoma de Tamaulipas)

1. Introduction

The main objective of this research study is to promote gender equality in the coverage of scientific information in the Spanish press and the media in general. In order to fulfil this general objective the study has three partial objectives: to increase the visibility of women scientists in the Spanish media; to promote gender equality in the coverage of scientific information in the Spanish media; and to produce a white paper for journalists and media professionals to raise their awareness about their role as active agents in achieving gender equality in specific areas of science and technology.

Based on these parameters, this research study particularly aims to:

- Demonstrate the level of visibility of women scientists in the Spanish media.
- Identify the image of women scientists that is promoted in the Spanish press, and the gender prejudices and stereotypes that are used in the media representation of female scientists.
- Verify the degree of correspondence between the media representation of female scientists and their actual situation in Spain.
- Characterise the public image or social perception of women scientists in Spain.

In addition, this research study has other uses: to use the media to promote equality in the design, production and management of science and technology; to increase the presence of women scientists in companies and institutions; to promote vocations in scientific careers among women; to facilitate the decision making process involved in social issues of gender; to offer a practical guide for the exercise of corporate social responsibility by public and private organisations that promote gender equality in science and technology as an dynamic force in the sustainable economy; and to create an observatory of the image female scientists in the media.

The initial hypothesis comes from a doctoral thesis titled "S*cience journalism"* (*La información periodística de la ciencia*), defended by Julia García Agustín, a member of this research project, in 2012 at the School of Information Sciences of the Complutense University of Madrid (Spain). In short, this thesis concluded that Spanish female scientists are invisible in the media.

This hypothesis was formulated after reviewing the literature on the presence of women in the Spanish press, which generally pointed out that:

- The degree of visibility of women scientists in the Spanish media is low or very low.
- The image of women scientists in the Spanish national press is stereotypical and does not reflect their real identity.
- There is no correspondence between the media representation of female scientists and their actual situation in Spain.
- The public image or the social perception of women scientists in Spain is very low and lacks definition.

After addressing the problem raised by the initial hypothesis, it is important to examine its importance according to the current Spanish legislation. Spain's Sustainable Economy Law (Ley 2/2011), in its chapter VI on corporate social responsibility, article 39 on the promotion of corporate social responsibility, states that "the Government will provide [corporations] a set of characteristics and indicators for their self-assessment in terms of social responsibility, as well as report models and references, all in accordance with the international standards in this area".

In this regard, the Law points out that "the set of features, indicators and models referred to in the previous paragraph should respond to the objectives of management transparency, good corporate governance, the commitment to the local sphere and the environment, the respect of human rights, the improvement of relations at the workplace, the promotion of the integration of women, the promotion of effective equality between men and women, and the promotion of equal opportunities".

This research study aims to respond to the provisions of the sustainable economy law, insofar as it proposes the promotion of the integration of women in the different fields of science and technology, as well as the promotion of equality between male and female scientists in the process of training, research and professional practice.

The balanced and equal treatment of male and female scientists as protagonists of the science news disseminated by the media is the catalyst needed to promote equality in the management, design and production of science and technology. Thus, an increase in the news about women scientists in the media will contribute to the reduction of the quantitative and qualitative differences that exist between women and men of science in the coverage of specialised information. Informative equality will promote scientific vocations among young and teen female students and will facilitate the incorporation of women in enterprises and institutions dedicated to research and technology.

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2. State of the art review

The media are a key element in the creation, modification and reinforcement of public opinion. The agenda setting and the framing carried out by the media motivate and influence audiences.

Citizens create their mental images as sets of beliefs that are shaped based on the information transmitted by the media. Their tastes, preferences, attitudes, opinions and biases are formed as a result of the processing of the information they receive in the form of news messages. A natural or legal, individual or collective, person who is excluded from the journalistic information becomes publicly invisible and will not have any social notoriety and relevance whatsoever. This is the justification for our research hypothesis: women scientists are invisible in the media.

To understand this hypothesis and to build a solid scientific basis for this research it is necessary to review the state of the art and the literature on this subject matter and the previous studies that have explored similar subjects.

2.1. Women's studies by the United Nations

In the second half of the 20th century, and especially since the 1960s, women studies began to be developed in different disciplinary areas. In the 1970s "gender" started to be used as a category of analysis and became an essential factor in the interpretation of reality. From the 1960s the gender perspective was gradually incorporated in academic research. There is a scientific consensus that defines gender as a social construct and relegates the predominantly biological character that it had for centuries. As a result of its social consideration, gender becomes susceptible to change.

In the last five decades, gender studies have been a priority for the main international organisms. The first decisive step was taken by the United Nations (UN) in 1947, with the Commission on the Status of Women, which created a draft intended to be a legal instrument to articulate the rights of men and women. Moreover, in 1950 the the *Declaration of the Rights of Man* became the *Universal Declaration of Human Rights* (United Nations, 1947).

In 1979 the UN General Assembly adopted the *Convention on the Elimination of All Forms of Discrimination against Women* (United Nations, 1979). According to this convention, "all human beings are born free and equal in dignity and rights", "without distinction of any kind and, therefore, without distinction of sex". Men and women have the same "economic, social, cultural, civil and political rights" and it is necessary to eliminate discrimination against women "in all its forms and manifestations".

The declaration urged the States Parties to condemn any form of discrimination, "by all the appropriate means and without delay". These means include laws that suppress the trafficking in

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women and exploitation of the prostitution of women. The following sections of the convention address the equality of women in the field of education, in employment, health care and family planning, in rural and poor areas, and in marriage.

To verify the fulfilment of the Declaration's objectives, a year later, in 1980, the UN celebrated the World Conference on Women in Copenhagen (Denmark). The next important milestone took place in 1993, when the General Assembly drafted another declaration for the World Conference on Human Rights, held in Vienna from 14 to 25 June (United Nations, 1993). The goal was to reaffirm and renew the principles of the Universal Declaration of Human Rights of 1950. The new declaration highlighted such concepts as "universal respect", human rights such as a "birthright" and "obstacles to development". The document addressed racism, terrorism and drug trafficking, and called for support to dismantle the *apartheid* and to protect children, disabled people and refugees.

The declaration urged governments to take and strengthen measures to protect women and girls. The goal was to eliminate violence against women in the private and public spheres, as well as sexual harassment, exploitation of prostitution, trafficking of women, and any sexist bias in the legal systems. It also attacked harmful practices against women arising out of certain traditional practices, religious extremism, and cultural prejudices. The text highlighted, once again, women's right to adequate health care and access to management positions and announced that the next Conference would be held in Beijing two years later.

The UN's Fourth World Conference on Women was held in Beijing (China) from 4 to 15 September, 1995. It was attended by more than 180 governmental delegations and 2,500 non-governmental organisations. It was the first time that the human rights of women were treated worldwide to achieve positive results in all five continents. Similar conferences had been previously held in Mexico (1976), Copenhagen (1980) and Nairobi (1985). However, Beijing's Conference is considered to be the greatest and most important conference. All the obstacles that women faced "to achieve equality, development and peace" were identified through 12 "areas of concern" (United Nations, 1995).

For this research, the following areas of concern must be emphasised:

- Inequality in the participation of women in the definition of the economic structures and policies and in the production process.
- Inequality in the exercise of power and decision-making.
- Lack of adequate mechanisms to promote the advancement of women.
- Lack of awareness of the human rights of women which are nationally and internationally recognised and lack of commitment to these rights.
- Insufficient media mobilisation to promote the contribution of women to society.
- Lack of sufficient recognition and support to the contribution of women to the management of natural resources and the protection of the environment.

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The objective of the Beijing Platform for Action was to reach equality for women in all spheres of society, the equal sharing of responsibilities in the family, their involvement in the economic and social development, and their right to control their own fertility. In the public domain, the goal was to encourage women to participate in politics, non-governmental organisations and national and international actions. The text of the conference contained a chapter (J) that focused on "women and the media".

According to this chapter, the technological advances had facilitated world communication, eliminating borders and influencing adults and young people. However, many times, the media broadcast negative images of women, or pornographic and degrading products that should be hunted down and eliminated through self-regulation. Similarly, this chapter proposed a series of measures for governments such as the promotion of education, research and equitable participation among women. This chapter promoted gender equality in the appointment of positions of responsibility and supervision, and communication networks among women, especially electronic networks.

The Declaration also granted much importance to all the traditional national and international media. According to the declaration, the media had to defend the freedom of expression and the balanced image of women and men. The objective was to use "balanced and diverse images of women" and to eliminate sexist stereotypes, pornography and scenes of violence in the media.

As a follow-up to that Conference, five years later, the UN General Assembly celebrated a Special Session to examine the achievements of the Beijing Platform for Action: *Women 2000: Gender Equality, Development and Peace for the Twenty-first Century* (United Nations, 2000). The special session was held in New York from 5 to 9 June 2000. The main issues addressed there were child marriage, female genital mutilation, health care and the enforcement of compulsory primary education.

After briefly addressing the past fifty years of pro gender equality international actions encouraged by the United Nations, it is necessary to know how gender equality has been researched in the academic and scientific sectors in Spain.

2.2. Science news and female scientists in Spain

Some decades ago, Mihaly Csikszentmihalyi (1988, 1999) proposed a systems model for innovation in science. He highlighted two fundamental concepts: the scientific domain and field. Csikszentmihalyi argued that innovation in science and the scientific advancement and consolidation in a sector do not only depend on the ontological growth of the theoretical and methodological domain, i.e. the body, knowledge and methodological, technological or material innovations in an area of human knowledge, but, very fundamentally, they also depend on the systemic and social space of the field; that is, the community, institutions and human interactions that surround and

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collect the scientific creation and the innovation capacity, which promotes the growth and consolidation of that domain, its social dissemination and its human development.

A country where the scientific field is developed is a country where there is a network of social structures that support, perceive, monitor, accept and feed the scientific creation, through institutions, mass media and educational developments in teaching institutions where the innovative genius in science is registered, channelled and supported. Together the field and the domain form an interactive system whose synergy depends on the success, advancement, and recognition of science in a country and before the international community of scientists (Csikszentmihalyi, 1999: 315).

The systems model of creativity developed by Csikszentmihalyi is vital to understand the dramatic reason for the lack of scientific development in a country, and to fit a theory of gender on scientific innovation in a nation facing the underdevelopment of the scientific domain that hosts, encourages and develops scientific innovation. If a country has problems to integrate a scientific field, i.e., to collect, recognise and provide an infrastructure of social support to the human scientific capital that it sees arise, the same problem is worse if this scientific capital is formed by women. Here we refer to the deficiencies that can occur in the recognition of the domain of women as key actors of the social action that is science.

Our research is based on the premise that is impossible for science to advance if its recognition in the field is not promoted, through social communication and, in particular, the dissemination of scientific information. The correlation between the dissemination of scientific information and the scientific development of a community is clearly established in the aforementioned theory. But there is also a tradition of studies on the recognition of the intellectual domain, the importance of social communication for science, as a contributing factor for its development.

Spain is far behind in the dissemination of science in general. Speaking of science in Spain in 1908, Ortega y Gasset, a philosopher and journalist, stated before the Assembly for the Advancement of Science that "we [Spanish people] are culturally bankrupt, we drag an ancient debt of the spirit. The case of Cajal, and particularly the case of Hinojosa, cannot mean pride for our country; they are rather a shame, because they occurred by chance" (Ortega y Gasset, 1908).

The great philosopher referred to the cases of two internationally renowned scientists that constituted unique examples in the history of Spain. Pedro Laín Entralgo, who wrote an in-depth biography of the great Ramón y Cajal, stated in his work: "Cajal has been for the Spanish people a myth-man who was both a hero and a social placebo. For some, he was at least a hero. For others, he was a social placebo. Cajal, a myth-man in the form of a social placebo, an inverse scapegoat for the diffuse feeling of guilt that exists in relation to the cultivation of science and operates under the moral wings of the Spanish society" (Laín Entralgo, 1972).

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Already a century ago, Pedro Laín Entralgo, a scholar of creative psychology described the state of the scientific domain in Spain, namely, the lack of moral urgency in the Spanish society towards the development of science.

While Spain faces problems in the organisation of science in general, these problems are greater in the science produced by women. Recently, Rosa Claramunt, Professor of chemistry and author of the book titled "Women in Science and Technology" (*Mujeres en Ciencia y Tecnología*, 2012), pointed out that this phenomenon is global. According to the theory of this renowned scientist, in the history of science women have been relegated to the role of, what she calls, *family assistants*. In other words, their crucial role as scientists has been concealed by family ties that allowed the work of women scientists and, at the same time, hid it in the background. Many women scientists were forced to work in the shadow of their husbands, fathers or brothers, to complete their doctoral studies *in absentia* because that academic possibility was not acknowledged, and to see their achievements attributed to other researchers or thrown into oblivion.

This was the case of Marie Curie, initially, and many others such as Rosalind Franklin, the true researcher of the DNA molecule, and Marguerite Perey, the discoverer of Francium. Science among women has been, for centuries, a semi-covert issue and in the Spanish case it is probably one of the most obvious cases.

As any communication process, scientific information is a discourse in which roles, stereotypes, interactive practices and agendas are activated and intertwined in broader domains of the social life of women. Scientific information favours certain images and self-images, and blocks out other types of construction of identity (Butler: 2003). Therefore, our research aims to show that the link that exists between the development of women and the communicative development is an absolute implication. We aim to show that while in the Spanish media the coverage of science and its development is poor, the representation of women in science, and thus the strengthening of the systemic social domain of women in science, is extremely poor.

Underlying our theoretical framework is a theory of gender whose tradition of study is very clear: the relationship between gender equality and social and interpersonal communication. The development of women, the achievement of equality and the elimination of sexist biases, have a vital relationship with the communication systems, networks and structures that exist in social life at any given time (Lauretis, 2004).

The influence of interpersonal and primary social communication in the construction of the self-image of women has been historically analysed. The influence of non-mediated interpersonal communication, the influence of the primary groups (like family, friends, professional groups and peers in school) are vital to the construction of the image of women and their professional projection. The study on how to intervene in the context, in order to change personal determinations is deficient. In addition, there is a shortage of research studies on personal interaction as a process marked by

gender determinations: being women or men determines specific communication patterns, which will influence the construction of identity and the idea of the "self".

As acknowledged by feminist theory since decades ago, the media are vital in the transmission of professional stereotypes and life styles (Cáceres, 2008). The critical feminist theories have highlighted the passive, objectified, anti-intellectual profiles of women that appear in the media (Convoy and Sandbury, 1997). In these theories, femininity is a "social construct" of standard beauty, which has nothing to do with the advancement in knowledge or social innovation (Braidotti, 2000).

There is a large literature on the influence of stereotypes, gender roles, projected images and conventions around women, the aesthetic stereotypes and how these factors influence women's limited professional projection (Tan, 1982). Some important studies are those related to advertising (Bernárdez, 2000, 2005, 2009, 2010; García and Piñeiro, 2011; Figueroa, 2012), cinema (Padilla, 2009; Gil and Gómez, 2010; Zuñiga, 2013) and television (Gamboa, 2001; Guerra, 2007; Rodríguez, 2009; Requeijo, 2010; Camarero and Marcos, 2012; Muniz, Saldierna, Marañón and Rodríguez, 2013).

These studies constitute our body of research and are our point of departure for the development of our conclusions. However, in Spain there is no tradition of mass communication studies on women in science. Due to this gap and the vital influence of the relationship between media communication and the development of gender this project received the support of the R&D programmes of the Spanish Women's Institute. We want to offer an up-to-date overview of the current representation of female scientists and to verify whether the traits, stereotypes, roles and image factors generated in science journalism still have the same social construction of a poor domain, i.e. a social structure poorly capable of promoting, hosting, supporting and developing science in women.

3. Method

To achieve the proposed objectives, this study analyses as object of study: the visibility of women scientists in the Internet and the Spanish print media; the image of women scientists in the national press and the gender prejudice and stereotypes used in the media representation of female scientists; the correspondence between the media representation of female scientists and their actual situation in Spain; and the social perception of women scientists in Spain.

This analysis is based on a mixed, quantitative and qualitative, method that includes: the analysis of the journalistic discourses used in the science news, with an emphasis on gender inequalities, based on a selected sample of the newspapers with the widest national dissemination; focus groups to identify the public image of women scientists; in-depth interviews with science journalists; and in-depth interviews to women scientists and male and female experts.

The research design is based on an exhaustive review of the literature on the effects of the media and women in science.

The empirical work was developed through the application of different techniques appropriate to each unit of study.

Media content:

- Content analysis of the journalistic discourses.
- Sample: news articles on science and technology published in the five paid-for general-interest national newspapers with the largest circulation and dissemination according to the media monitoring organisations *OJD* and *EGM*: *El País, El Mundo, Abc, La Razón and Público*. The news analysed were those published during six non-consecutive months: April, May, June, September, October and November, 2012. Here it is important to note that the print edition of *Público* disappeared in February 2012 and we replaced it with *La Vanguardia*, which in terms of dissemination it is the third most important paid-for general-interest national newspaper in Spain.
- Variables: dissemination data; data on the coverage in terms of informative gender and extension; sources of information, news section of inclusion; and categorisation of characters.

Media professionals:

- Semi-structured in-depth Interviews to editors and male and female journalists specialised in science and technology from each of the five studied newspapers, to assess the objectivity and the participation of female journalists in the coverage of science news.

Women scientists:

- In-depth interviews to female scientists in order to define the identity of women working in the various areas of science and technology.

Publics:

- Three focus groups to explore the public image and the social representation of women in science.

This article will focus on the analysis of the journalistic discourses in order to assess the coverage of news about women scientists offered by the five aforementioned newspapers, their sources of information and the image of women they disseminate.

4. Results

The analysis of the science news published *El País, El Mundo, Abc, La Razón* and *La Vanguardia* during April, May, June, September, October and November, 2012, has shown that only 231.5 pages

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of the total of pages generated by the five newspapers during the period of study are dedicated to science. This represents 2.26% of all the published information. Therefore, it can be affirmed that the five most-disseminated general-interest paid-for newspapers in Spain pay very little attention to science news.

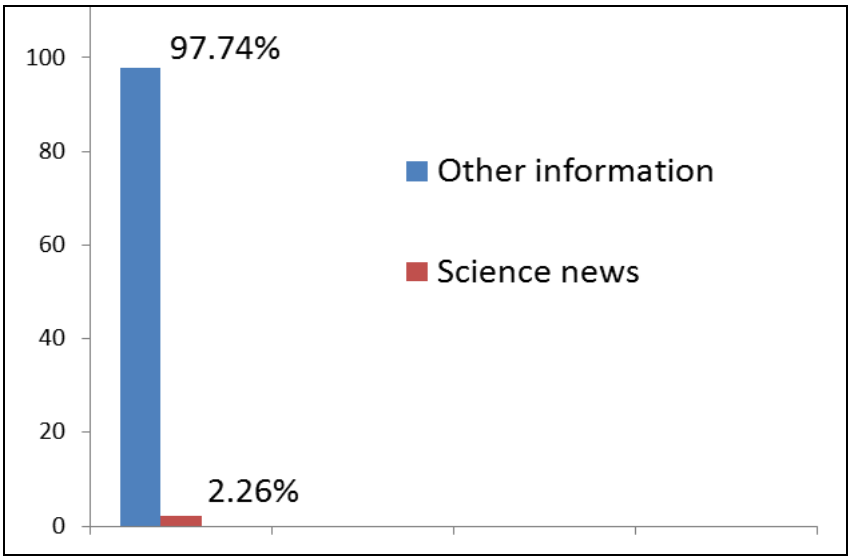

Figure 1. Proportion of pages with science news in comparison to the total amount of news content generated by the sample of five newspapers during the period of study.

The analysis of the number of pages and articles published by each newspaper shows that *El Mundo* is the paper with the largest amount of scientific information (82 pages and 80 articles), followed closely by *El País* in number of pages (71.5) but not in terms of articles (51). The newspaper in the last place is *La Razón* with only 11 pages and 11.5 articles.

Interestingly, the news sections in which the scientific information is included vary depending on the newspaper. *El Mundo* has a section specialised in "Science", although it also publishes articles on "Culture", "Economy", "Spain", "Madrid", "World" and "Other voices".

El País usually includes this type of information in the section "Life and Arts", but also in "Society", "Culture", "International", "Spain" and "Economy". *Abc* includes this information in "Society" but also in "Family", "Culture", "Spain", "Madrid" and "*Vocento*".

La Vanguardia generally includes the scientific information in the sections "Trends" and "La contra" ("The Opposition"), or through interviews. Finally, *La Razón* does it in the section "Science and Society". Therefore, only one newspaper has a section specialised in this type of information, and it is the paper that also devotes more pages and articles to this subject matter. In addition, newspapers do not have criteria to classify the scientific information, which can appear in very different sections.

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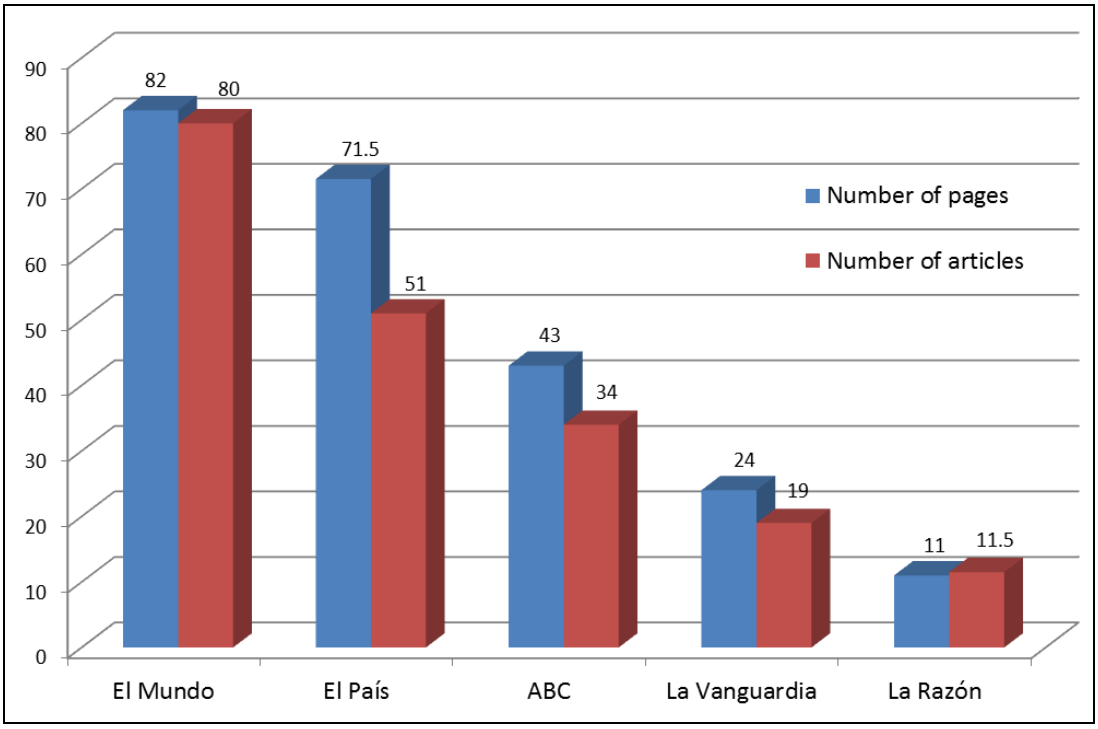

Figure 2. Number of pages and articles dedicated to scientific information by the sample of newspapers during the period of study.

Of the 195.5 analysed articles, 67% include the name of the author, while the rest are unsigned. Naturally, the analysis of gender equality is based only on the signed articles (67%). In this regard, of the signed articles, 62.4% were written by men and the rest by women, 37.6%. Therefore, the large majority of the signed science news articles were written by men.

If we examine the results of each newspaper, *Abc* and *El Mundo* are the papers that include the largest percentage of science news articles written by women: 44.4% and 42.2%, respectively. However, the percentage remains much lower than that of the articles written by men: 55.6% and 55.8%, respectively. *El País* is the newspaper with the third highest percentage of science news articles written by women: 38.4%. The rest, 61.6%, are signed by men. *La Razón* is the newspaper with the lowest percentage of science news articles written by women: 27%, against 72% written by men.

The analysis of the gender of the protagonists of the science news shows that male scientists are the protagonists of the stories much more often than their female counterparts. The newspaper with the greatest presence of female protagonists in science news is *La Razón*, in which of 20% of the science articles have female protagonists, against 65% of articles focused on men. The rest of the articles, 15%, focused on both genders.

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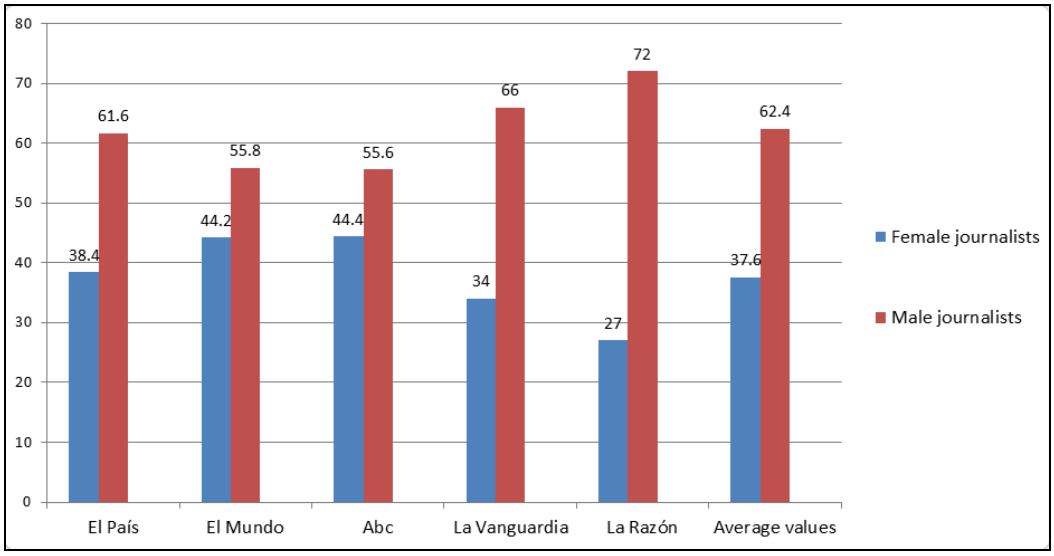

Figure 3. Science news articles written by men and women in the five newspapers during the period of study.

Close behind is *Abc* with 16% of its science articles featuring women, against 71% featuring men, and 13% focused on both genders. *El Mundo* is the newspaper with the lowest percentage of articles focusing on women: 9.4%, against 76.5% dedicated to men and 14.1% dedicated to both genders. Looking at the average values, we can see that only 14.3% of the science news articles focus on women, against the 70.7% of articles dedicated to men. The rest of the articles, 15%, focused on both genders.

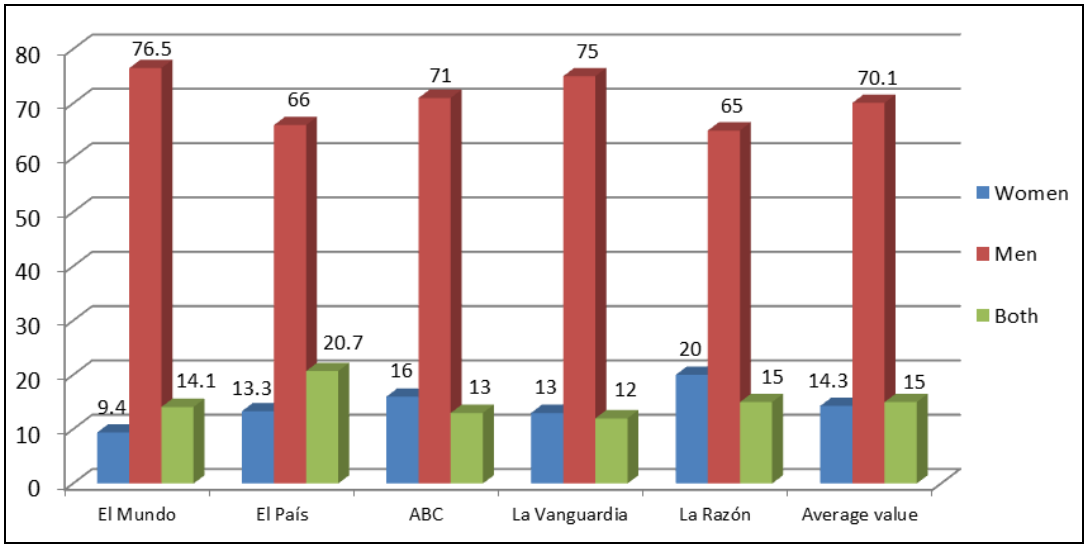

Figure 4. Presence of women and men in the sample of science news articles.

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With regards to the presence of male and female scientists in science news articles written by male or female journalists, we found no significant differences. Male journalists dedicate 13% of their science news articles to female scientists and the rest, 87%, to their male counterparts. On the other hand, female journalists dedicate 16.2% of their science news articles to female scientists and the rest, 83.8%, to their male counterparts.

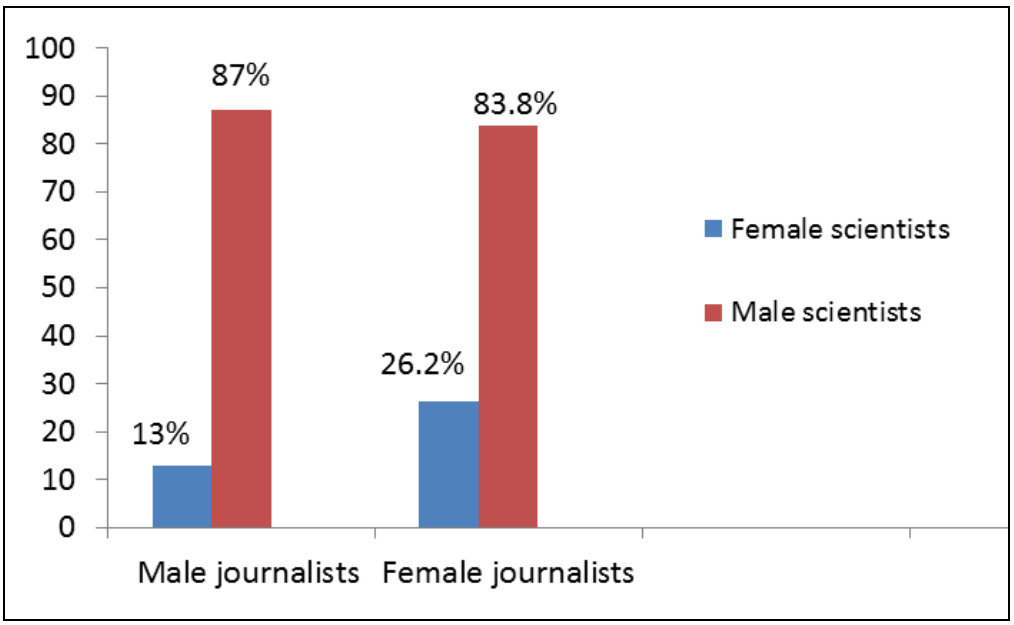

Figure 5. Presence of male and female scientists in the science news articles written by male and female journalists.

Finally, in relation to the representation of female scientists in the 14.3% of news articles that focus on them and the 15% that focuses on both genders, the study found out that these articles tend to describe their research studies without giving them importance. In addition, there is a widespread absence of adjectives, so that female scientists are "aseptic" in evaluative terms, which do not go beyond their identification within scientific field. In other words, these articles identify and characterise female scientists based on their academic qualifications, activities and position: biologist, oncologist, obstetrician, researcher, scientist, scholar, published scientist, author, teacher, professor, academic, doctor, deputy director, coordinator, manager, director, president and project manager.

Faced with this situation, the research studies carried out by men are narrated highlighting the importance of the author. Male scientists are also identified on the basis of their academic qualifications, scholarly activities and positions: doctor, professor, report editor, head of unit, head of department, chief, head of division, promoter of the study, etc. However, the science news articles include adjectives that identify and evaluate them positively: experienced, specialised, specialist,

clever, expert, problem solver, cautious, careful, leader, elite scientist, recognised, renowned, prestigious, talented, enormously successful, opinion leader, thinker, hard-working, professional, discoverer, entrepreneur, veteran, guru, analyst, teacher, extraordinary, cultured, Dean, brilliant, innovator, pioneer and authority.

5. Conclusions

Based on the previous results, it can be affirmed that the five major paid-for general-interest Spanish newspapers dedicate very little space to the coverage of scientific information and do not have criteria to classify this type of information in a particular section.

With regards to gender, men produce most of the science news articles: 62.4% of all the signed news items (67%), against 37.6% signed by women. However, the gender of the journalist has no relation with the selection of the protagonists of the news: both male and female journalists choose male scientists as the protagonists in 70.7% of their science news articles, and only dedicate 14.3% of the articles to female scientists.

The small groups of articles focused on female scientists (14.3%) and on both genders (15%) describe the research work of female scientists without giving them relevance, unlike what happens with the description of male scientists. In addition, female scientists are described aseptically, without the use of positive evaluative adjectives (e.g. leader, guru, or bright), unlike what happens in the description of their male counterparts.

The previous results lead us to confirm the initial hypothesis: the Spanish female scientists are invisible in the press. There is an important level of informative inequality in favour of male scientists, in terms of the amount of science news articles that is dedicated to them and in terms of treatment. Female scientists are the protagonists of much less news items than their male counterparts are, and when female scientists are the protagonists they are represented in a dispassionate way.

Given the reduced number of first hand experiences that people actually have in their live, the agenda setting and framing carried out by the media is essential in people's creation of mental images. The fact that only a very small number of science news articles focus on female scientists, and that these news articles adopt a dispassionate view in their description, negatively influences society's perception of this group.

Based on the systems model of creativity of Mihaly Csikszentmihalyi, it can be affirmed that the press could do much more to contribute to the innovation, advancement and consolidation of science in Spain, and to the promotion of the gender equality in this area.

Without the involvement of the press and the media in general, it will be hard to comply with Chapter VI of Spain's Sustainable Economy Law (*Ley 2/2011*, of 4 March 2011), since it will be difficult to

promote equality in the management, design and production of science and technology, to encourage scientific vocations in teen and young women, and to facilitate their incorporation in research and technology corporations and institutions.

Finally, it is important to note that we are currently developing two new research projects that can complete this study. These studies would focus, on the one hand, on a comparing the national and regional general-interest press to detect differences between them and, on the second hand, on examining other media, mainly television, since the Internet was already explored in this project.

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