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The presence of Chilean women researchers in Spanish-language journals

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Abstracts

Introduction: This research article describes and analyses the conditions of access to scientific journals faced by women researchers and the opinions of these researchers about the characteristics, possibilities and limitations of the different stages of the research process and the access to scientific publications, particularly the conditions of gender equality. **Method:** The study started with the exhaustive review of a sample of journals that could potentially include work developed by women researchers; and the analysis of 29 survey-questionnaires and 3 in-depth interviews applied to Chilean female researchers. **Results and conclusions:** the current situation faced by Chilean female researchers is, without trying to be negative, clearly improvable. In order to generate the conditions to strengthen the performance of female researchers, especially in the dissemination of knowledge, female researchers need to act as a collective and in collaboration with the corresponding academic and political institutions.

Keywords

Women researchers; science; knowledge; Chile; equality; gender.

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1. Introduction and state of the art review

1.1. Gender and science

In the field of science, the work carried out by women has historically received little recognition. History books and bibliographic dictionaries make few or no references to the contributions of women. The history of science has omitted the names of women and their participation in the generation of knowledge, despite the fact that science was probably a female activity in its origins (Ben Hassine, 2000).

The need to carry out this article derives from what some researchers have been called a necessary concern (Aris, 2012: 3) given that the education field has “*historically* been characterised by a high female presence” and this motivate us to investigate the differences in research production in terms of the authors’ gender.

The role of women in our informative world derives from the correct management of communication, whose “social mission at the beginning of the 21st century, [...] opposed the ideal and positive sense of that concept” (Díez Medrano, 2010: 3), so we can expect that the role of women in society will be reconsidered also through this social mission.

This marginal situation was not limited to the dark years previous to the achievement of human rights by women. In fact, the scientific activities and production of women still face certain *de facto*, not legal, limits, both in terms of job positions and dissemination.

Important international reports, mainly European, have focused on the gender differences that exist in the academia. Some examples are the 2001 ETAN report on women and science and the 2003, 2006 and 2009 *She Figures* reports (European Commission, 2009) on the situation of women researchers in Europe.

In general terms, these reports conclude that the proportion of women researchers is around 30%, with wide variations among countries, ranging from 12%, in Japan, to more than 40% in the Baltic countries, Bulgaria, Croatia, Portugal, Romania and Slovakia (European Communities, 2009). These reports have also noted that gender imbalance in research centres and universities is similar (ETAN, 2001).

Studies on the Chilean context have offered similar results. The study carried out by Allende, Babul, Martínez and Ureta (2005), for example, pointed out that only 35.14% of all Chilean researchers are women. Meanwhile studies carried out by Chile’s National Commission for Scientific and

Technological Research (CONICYT, according to its initials in Spanish), point out that the proportion of women is even lower (28.3%) but also that it has increased in recent years (CONICYT, 2007).

These figures coincide with those offered by similar but smaller studies carried out in Cuba and Spain (Kiss *et al.*, 2007; Martí-Lahera, 2011; De Filippo, Sanz and Gómez, 2009).

Studies of this kind have also pointed out that there has been an increase in the absolute number of women researchers (European Commission, 2007; De Filippo *et al.*, 2009), and that this increase is even greater than that of men (6.3% against 3.7% in Europe). However, it has been concluded that if active pro gender equality policies are not adopted, gender inequalities will be perpetuated for many more years (European Commission, 2007).

The analysis of the data on the situation in Europe shows a marked contrast between male and female researchers in terms of the ratio of total number of researchers to total number of active researchers, which reveals the fact that women are still in great disadvantage (European Commission, 2007).

In terms of the academic career of women, several studies (European Communities, 2009; Guil, 2007; Sierra, Buéla-Casal, Bermúdez, and Santos Iglesias, 2009; De Filippo *et al.*, 2009; Santos, Sierra, Buéla-Casal, 2008; Martí-Lahera, 2011; Rebufel, 2009; Kiss *et al.*, 2007; ETAN, 2001; Ledin, Bornmann, Gannon & Wallon, 2007; Prpic, 2002) indicate that when women begin their academic career during their undergraduate studies, their participation is similar to that of men. However, as women advance in the academic career in doctoral, postdoctoral studies, and in the different academic hierarchies, their participation declines significantly. The graphs created to represent this phenomenon are scissors-shaped in almost all countries where female representation has been studied. The following scissors-shaped graph shows the situation in Europe and Chile, respectively:

Figure 1. Proportions of men and women in a typical academic career, students and academic staff.



Source: European Communities (2009).

The proportion of women in the academic staff of Spain's Higher Council of Scientific Research (CSIC, according to its initials in Spanish) has reached 41% in the Full-time Scientists category (CT) and 23.5% in the Research Professors category (PI). Although these figures do not reach the targets set for 2010 by the European Union (25% on the highest category, according to the agreement the Competitiveness Council signed in Spain on 18 April, 2005), they show that the Higher Council of Scientific Research is significantly closer to its goals. Moreover, the last percentage is much higher than that of the Spanish universities, whose proportion of women in the Full-time Professor category is 15%.

There has been a proper implementation of the regulation No. 4 included in the 2005 'Horizontal action for gender equality', which requests "the inclusion of at least 40% of the least represented gender in the regular and alternate commissions proposed to evaluate the access and promotion policies in the professional career, in all of its categories"). However, the implementation of other recommended actions has not progressed as much as that of the aforementioned regulation.

The 2010 data provided by the Spanish Higher Council of Scientific Research indicated that 56.4% of the pre-doctoral research fellows and 52.5% of the hired doctors are women. However, women only represented 41.6% of the hired staff in the Ramon & Cajal Programme, which is lower than the percentage reached the previous year: 47.5%. However, there are two different processes that affect this figure: first, the lower number of women incorporated the previous year and, second, the high number of women that was promoted to the Full-time Scientist position. This fact seems worrisome as it is, in good measure, the prelude of leadership of the stable groups and positions.

The economic crisis has caused a reduction of the Public Sector Employment offer which has had important effects on the Spanish Higher Council of Scientific Research. In 2009, the number of external job vacancies opened for full-time scientists was 50 in 2009, 202 in 2008, and only 26 in 2010. The number of promotion job vacancies went from 310 in 2008 to 125 in 2009 and to 42 in 2010. The consequences of this strong reduction affect various aspects of the scientific life (the average age of the scientific staff exceeds 50 years).

In 2009, despite a positive change in the scissors-shaped graph, there was a decline in the success rate of women with respect to men. Similar success rates became similar in the years of abundance, but this balance, as reflected by the data, is not as stable as it was believed. In order for the evolution of the scientific career of the women at the Spanish Higher Council of Scientific Research to continue the positive trend of recent years, these results should be analysed in more detail and work must be done to improve them.

1.2. Women and science in Chile

In Chile, women represent 51% of the population, according to estimates of the National Institute of Statistics (INE, June 2010). Meanwhile, women constituted 47.5% of the first-year university students during the 2002-2009 period, according to the Statistical Yearbooks of the Rectors' Council (*Anuarios Estadísticos del Consejo de Rectores*. www.cruch.cl). Considering the participation of men and women in the total number of graduates, by degree, in the 1999-2009 period, women only outperformed men in the completion of bachelor's degrees and postgraduate diplomas, but not in the case of master and doctoral degrees, in which they represented 36.7 and 38.8 per percent, respectively.

One of the causes of the results that are about to be presented is the concept of women that has been promoted in Chile by the mass media, because given the nature of the concept and “submerged in these processes, information cannot be a neutral product. It is a cultural artefact, a series of socially-produced messages that convey a good part of the dominant ideas of our society, fragmenting reality and invalidating any systemic social vision, the discourse of the information appears as an indirect but effective form of social conditioning” (Antezana, 2012: 79).

Thus, it is not surprising that according to the Accomplishments Report of the 2006-2009 Gender Agenda of Chile’s National Commission for Scientific and Technological Research (CONICYT), *Commitments of the Government of Chile to advance gender equality*, in the last ten years women have substantially increased their participation in fields that are the basis for any projection of scientific productivity, which will increase, eventually, their presence in scientific publications: an increase of 245% in the completion of master’s degrees and of 343% in the completion of doctoral degrees. However, in terms of participation, women only represent 36.2% of master’s degree graduates and 38.2% of the doctoral degree graduates. The previous percentages are even lower in the case of the social sciences, with a participation of just 29.9%.

Similarly, the participation of women on projects awarded by Chile’s National Fund for Scientific and Technological Development (FONDECYT) during the 2001-2008 period increased more than 200%, which is clearly related to the 445% increase in postgraduate scholarships (for master’s and doctoral degree programmes) granted to women during this period.

The previous situation is also reported by other studies carried out in the European Union, which reveal levels of vertical segregation against women, who find it more difficult than men to access hierarchically superior positions, despite having equal qualifications (*Women in Scientific careers: Unleashing the potential*, OECD, 2006).

Another important variable is the level of participation in the scientific councils and higher scientific institutions, which in the case of women is increasing in northern European countries, up to 40%.

In Chile, the Gender Perspective system of the National Commission for Scientific and Technological Research (CONICYT) includes in its initiatives “instances of action and dialogue in order to promote the participation of women in science”. So far, it has funded workshops, scientific conferences, dissemination activities, and, in general, compensatory measures such as: financing for the pre and postnatal period women researchers who are part of the National Fund for Scientific and Technological Development projects and for research fellows of the National Programme for Postgraduate and Overseas Scholarships; differentiated measurement of the scientific productivity of women who have given birth in the last five years, to apply for projects funded by the National Fund for Scientific and Technological Development; contests to finance actions aimed at the Promotion of Women in Science, Technology and Innovation, etc.; and a permanent statistical registration programme.

These remedial or compensatory measures only involve demands associated with results of a politically-intervened process (such as participation quotas in the Chilean Academy of Sciences, the National Exact Sciences Award, the National Applied Sciences and Technologies Award, the Senate, the Chamber of Deputies, the Ministries, etc.), but without strengthening the foundations of the process, such as productivity, which implies, among other things: 1) the promotion and

consolidation, according to the case, of their own journals, especially those indexed in the ISI Web of Science (formerly Web of Knowledge) and SciELO; and 2) the validation and assessment of spaces for scientific publications.

In short, the participation of women in science and technology represents only 33%, that is, 5,000 of the 15,000 registered researchers, according to the 2008 “R&D Spending Survey” carried out by the INE-CONICYT-MINECOM (*Encuesta Gasto I+D*). This participation percentage is lower than of such countries as Argentina (50%), Brazil (48%), Portugal (43.4%), Spain (36.7%) and Colombia (36.4%), according to the 2008 “R&D Spending Survey” of the Network on Science and Technology Indicators (RICYT), carried out by the INE-CONICYT-MINECON (*Ricyt, Encuesta Gasto I+D 2008*).

1.3. Journals and databases

Directories, and citation indexing services are currently the best criteria to compare the quality of scientific journals, enhance their discovery and facilitate content exchange.

The Institute for Scientific Information Web of Science of Thomson-Reuters [1] is the most prestigious scientific citation indexing service among teaching and research assessment committees in different countries.

The Scientific Electronic Library Online (SciELO) is a Latin American electronic directory. Although it does not include a category that is expressly dedicated to communication journals, this library classifies these journals in the Social Sciences and Humanities categories. Therefore, SciELO is one of the preferred publishing platforms for Latin American researchers since, after Web of Science, it is the most relevant platform for researchers to validate their work before the ministries of education, which are the ultimate evaluators of their work. At first, SciELO was specially developed to respond to the needs of scientific communication in developing countries and particularly in Latin America and the Caribbean, since its visibility system provides an efficient solution to ensure universal access to and projection of the scientific literature, diminishing the phenomenon known as ‘lost science’. This has received the name of “Modelo SciELO”, which contains procedures to measure the use and impact of journals. According to its authors, this system or model is based on three components:

a) A purpose-created system that allows the electronic publication of complete editions of scientific journals, the organisation of bibliographic databases and full-texts, the retrieval of texts according to their content, the preservation of electronic files and the production of statistical indicators of the use and impact of the scientific literature. The methods also includes journal evaluation criteria, based on the international standards of scientific communication. Full texts are dynamically enriched with hypertext links to national and international databases.

b) The application of the SciELO system in the operation of websites that offer electronic journal libraries, facilitating the operation of national and thematic websites. The pioneering application is the SciELO Brazil website (www.scielo.br).

c) The development of partnerships between national and international scientific communication agents –such as authors, editors, scientific and technological institutions, support agencies, universities, libraries, centres of scientific and technological information, etc.-, in order to

disseminate, improve, and maintain this system. The operation of the SciELO network is based on national infrastructures, which helps to ensure its sustainability.

The better the SciELO network is implemented in Latin American journals in the coming years, the quicker the scientific information generated locally will be available. This will contribute to the increase in the use of scientific and technological information in the decision making process at different levels.

2. Materials and method

2.1. Instruments and population of study

Two methodological strategies were applied: the survey and the in-depth interview.

2.1.1. The survey

The number of sampled researchers, journals and specialised directories could have been larger, up to several hundred researchers and dozens of journals and directories, given that they are our object of study. However, our universe was limited to 29 women researchers who were selected based on their relevance in the Chilean research environment, after a first preselection of 189. In addition, we selected all those (scientific and informative) journals in which these women researchers had published research results, and excluded from the sample those journals in which these women researchers had not published their work (although the survey investigated the names of the journals in which these researchers would like to publish in the future). A total of 96 journals and 4 directories were thoroughly analysed. Of these journals, only three directly affected the evaluation of these researchers by the Chile's National Commission for Scientific and Technological Research (CONICYT). Fortunately, this universe of journals did not exclude any of the journals that had been considered important based on their quality rankings and their inclusion in databases nationally recognised in Chile.

With regards to the survey, the universe (or number of respondents) was derived from the number of universities linked to this research project: 12. It was established that 50 to 70 respondents would be selected from each participating university, except for the Complutense University which had over 100 participants. The age of the universe of respondents ranged from 17 to 23 years, in accordance to the average university student profile.

Statistical processes were reviewed and validated by Professor Julio Gutiérrez Muñoz, a mathematician and physicist from the University of Alcalá de Henares.

2.1.2. The in-depth interview

In-depth interviews were applied to three women researchers, each representative of a different time period in Chile. The selection criteria privileged the time variable, above other variables, because it was initially established that the political history of Chile was closely related to the development of female researchers. Even the social role of women in Chile varied according to the government in power (Guil, 2007).

2.2. Instruments

2.2.1. The survey

Data collected from the survey indicate probability. In fact, all opinion polls present sampling errors, large or small, so there cannot be absolute certainty about what they investigate.

The survey questionnaire contained 10 open-ended questions.

2.2.2. The in-depth interview

The in-depth interview focused on 8 areas: 1) life-cycles; 2) features of the research production in communication; 3) possible periodization: late 1960s, early 1970s, mid-1970s to 1980s, 1990s, and 2000 to 2010; 4) Organisation: universities/research centres; 5) ideology: positions towards research; 6) types of research: academic-university (research funded by the National Fund for Scientific and Technological Development, www.fondecyt.cl/578/channel.html- and others) and applied-commercial research (CNTV, ADIMARK, etc.); 7) production spaces; and 8) research work.

2.3. Procedure

The first phase of the research involved a thorough sampling of the publications that could potentially include the works of Chilean women researchers. The main focus of the research was the study of the directories and citation-indexing systems that include these publications, in the field of communication, the social sciences and humanities, and, above all, those journals with the highest impact among Chilean researchers, according to the experience of the daily work of our Chilean research group.

The following step was to investigate the academic career of the researchers. We developed profiles for all participants, depending on their affiliation –in order to represent all Chilean university levels in the area of communication-, including their jobs so far, their lines of research and their projection.

After investigating respondents' academic career and profile, we designed the questionnaire that would be used to investigate their perception about the current situation of Chilean women researchers.

Subsequently, an email-based survey was carried out to get the views of a representative group. The collected data were later debugged, transcribed and coded.

The map of the field involved the historical review, from a gender perspective, of the communication research carried out in Chile.

The second phase consisted of applying the in-depth interviews to the key informants, i.e. to women researchers with an outstanding career in the field.

We also investigated the academic trajectory of the selected women researchers, based on the aforementioned criteria, and correlated this information with their life story. For this activity, the strategies used were the following:

- (a) The review of their curriculum vitae
- (b) Use of in-depth interview to outline their life story.

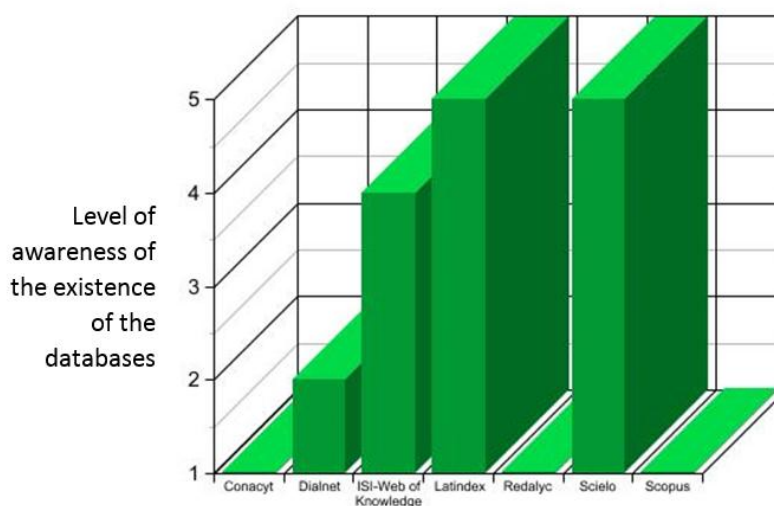
In this way it was possible to analyse both trajectories, compare them and establish similarities and differences which, despite the particular socio-political contexts, are recognised.

After establishing a common pattern, two new interviews were applied to current researchers, with the aim of identifying more clearly the current conditions, from a gender perspective.

3. Analysis and results

This section presents the survey results, whose most important aspects are:

Figure 2. Visibility of international electronic databases or directories in Chile.

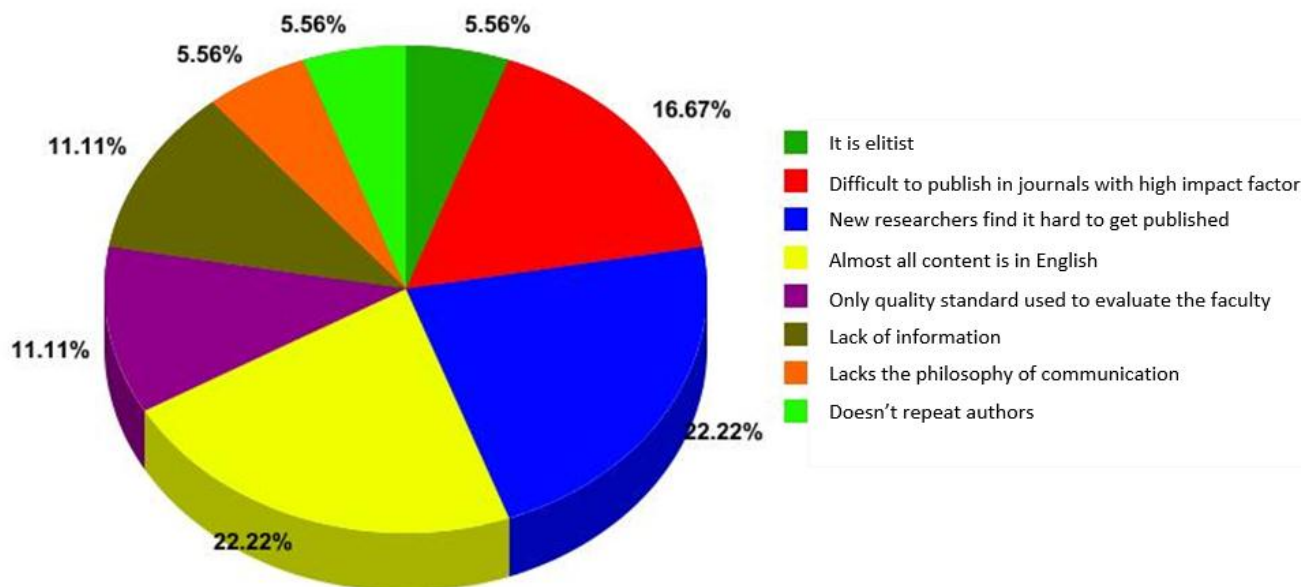


Source: authors' own creation

Figure 2 shows that Chilean women researchers are pragmatic since they know more those indexes on which their evaluation is based (Web of Science and SciELO). Knowledge about the existence of Latindex derives from the great usability of the tools this website offers to locate journals, regardless of whether they are included in quality databases or not. In other words, Latindex is an important library of reference to search journals. Dialnet performs the same function, but is less known because it is of more recent creation.

A striking finding is that neither Scopus (the European competitor of Web of Science, in terms of the visibility rankings of its articles and journals) nor Redalyc were known because they are not still not important references in the evaluation of informative journals. It is true that their quality is high, but their reference value is in the process of consolidation.

Figure 3. Social disadvantages of the Chilean indexing system



Source: authors' own creation

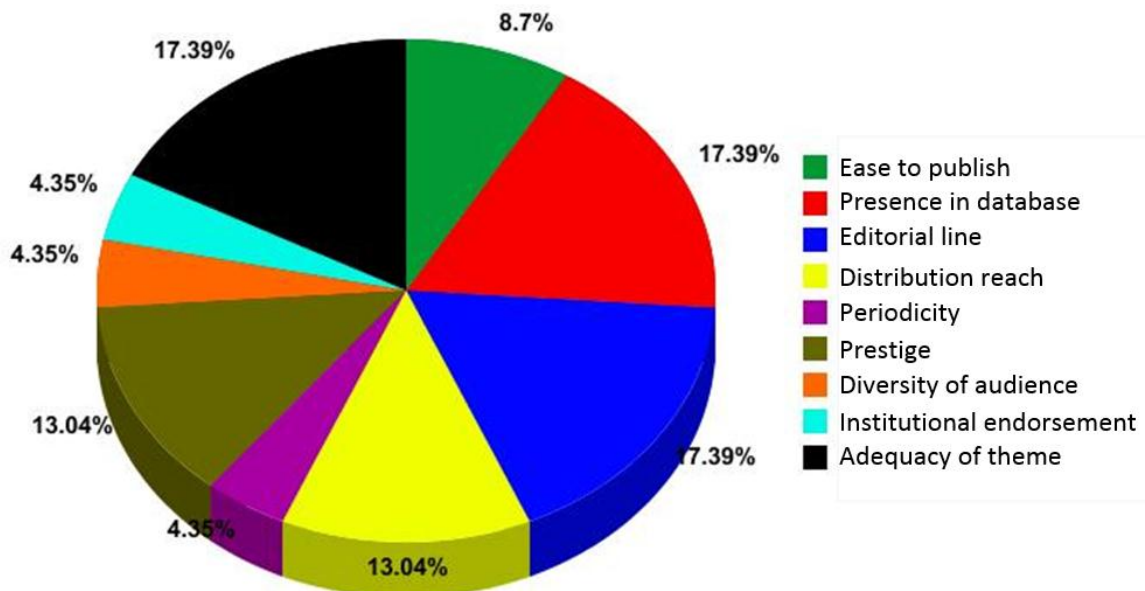
Figure 3 shows that the Ministries of Education and the Quality Assessment Agencies, which are responsible for evaluating the research work of professors, privilege the databases whose journals are overwhelmingly published in the English language. Most Latin American journals in the field of humanities address proximity cultural aspects and are thus usually written in Spanish. In fact, the inclusion of citations to Spanish and Portuguese journals in the area of Humanities (including those that translate articles into English in their bilingual editions) in the Thomson-Reuters' JCR are minimal.

Chilean women researchers publish overwhelmingly in Spanish. In fact we did not find a single publication originally written in English. Of these researchers, 22.22% considered that the language barrier is important and that submitting work to these foreign journals, even bypassing the problem of the work's translation, is complicated.

Moreover, it is difficult to publish in these journals since the small annual number of articles published by these journals indicates that only a minimum percentage of researchers in this area can get their work published.

Surprisingly, 22.22% of women researchers believe that being a new researcher is an obstacle to get published. This figure contrasts with the data collected in other investigations that point out that the number of new authors for publication is high. However, being a new researcher is a limitation that women researchers consider important.

Figure 4. Criteria for choosing a journal to submit research work



Source: authors' own creation

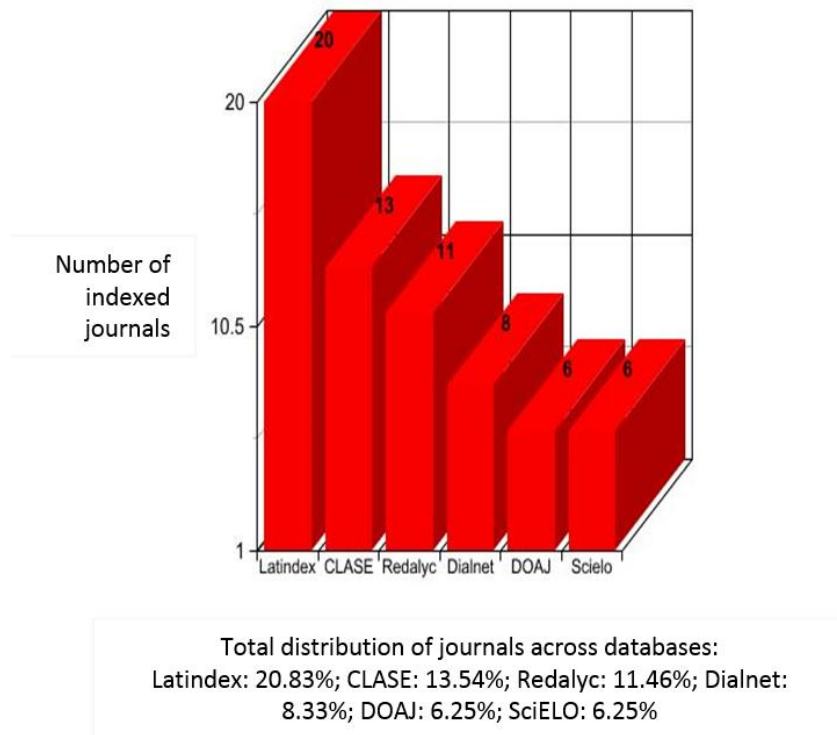
Figure 4 shows that the three most common answers (17.39% each) were coherence with the editorial line, adequacy of the theme (which are functional criteria to facilitate the publication of their work), and presence in databases. However, other responses related to the journals' visibility level were also chosen by significant percentages of the respondents (13.04% each): distribution reach and prestige.

The following analysis focuses on the technical criteria, aside from the authors, of the 96 journals, in which Chilean women researchers have published at least one research article, according to the review of their curriculum vitae. We assessed the percentage of journals that meets a list of 43 ideal criteria, based on the unification of the criteria used by Latindex and SciELO.

The analysis focused on establishing how many of the 96 journals are included in each database. The most common database is Latindex, with 6,551 indexed publications.

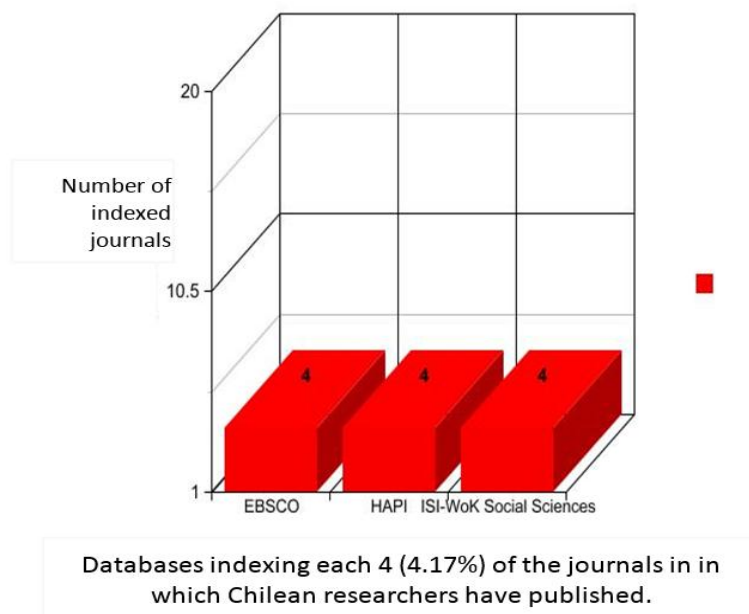
Figure 5 shows that Latindex, given its large number of indexed journals, was the most represented database. It is interesting that CLASE (Latin-American citations in the Social Sciences and the Humanities, with 1,500 journals indexed by the National Autonomous University of Mexico) and Redalyc (the Network of Scientific Journals of Latin America and the Caribbean, with 820 journals indexed by the Autonomous University of Mexico State), which are directories of reference in Latin America, are above Dialnet, operated by the University of La Rioja (Spain). Journals apply to be included by the most prestigious databases in order to increase their visibility (more redirected links) and to motivate authors to publish with them through the rank that these database grant.

Figure 5. Databases indexing more of the journals in which Chilean women researchers have published their work.



Source: authors' own creation

Figure 6. Databases indexing 4 journals in which Chilean researchers have published.



Source: authors' own creation

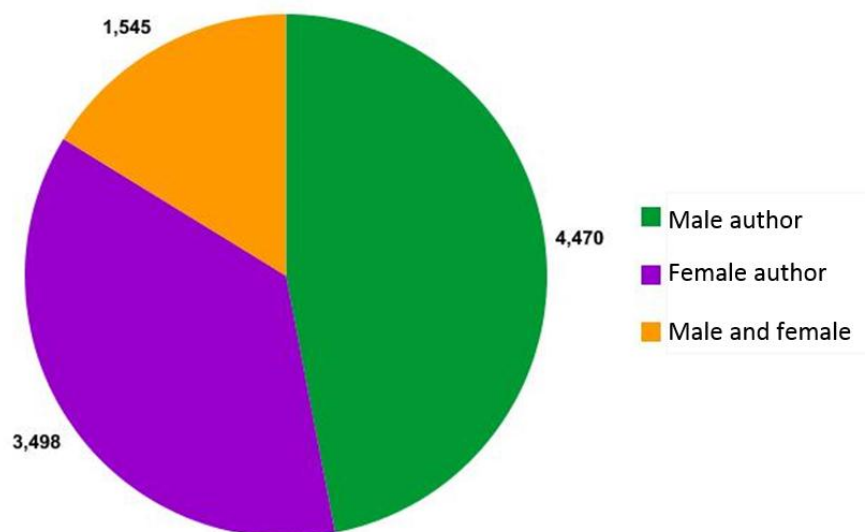
Figure 6 shows that the presence of Chilean women researchers in the database par excellence, Web of Science, only lists 4 of the 96 journals included in the sample. EBSCO (Elton Bryson Stephens, with 23,000 journals) belongs to a private publishing house, like Web of Science, of American nationality, like HAPI (Hispanic American Periodicals Index, with 336 publications) operated by the University of California in Los Angeles. These last two databases are not taken into account by the agencies assessing the quality of the faculty’s research work.

Given the importance of gender in research, it is important to note the number of articles written by women, in comparison to the number of articles written by men and by both men and women.

The analysis of the journals analysed from 2006 to 2010 produced the following results:

Articles written by men	4,470	(46.99%)
Articles written by women	3,498	(36.77%)
Articles written by men and women	1,545	(16.24%)
Articles written by 1 author	6,399	(67.27%)
Articles written by 2 author	1,935	(20.35%)
Articles written by 3 author	681	(7.15%)
Articles written by more than 3 authors	498	(5.23%)
TOTAL	9,513	100.00%
Number of articles about gender	689	
% of articles about gender/total of articles	7.24%	

Figure 7. Total of articles distributed according to authors’ gender



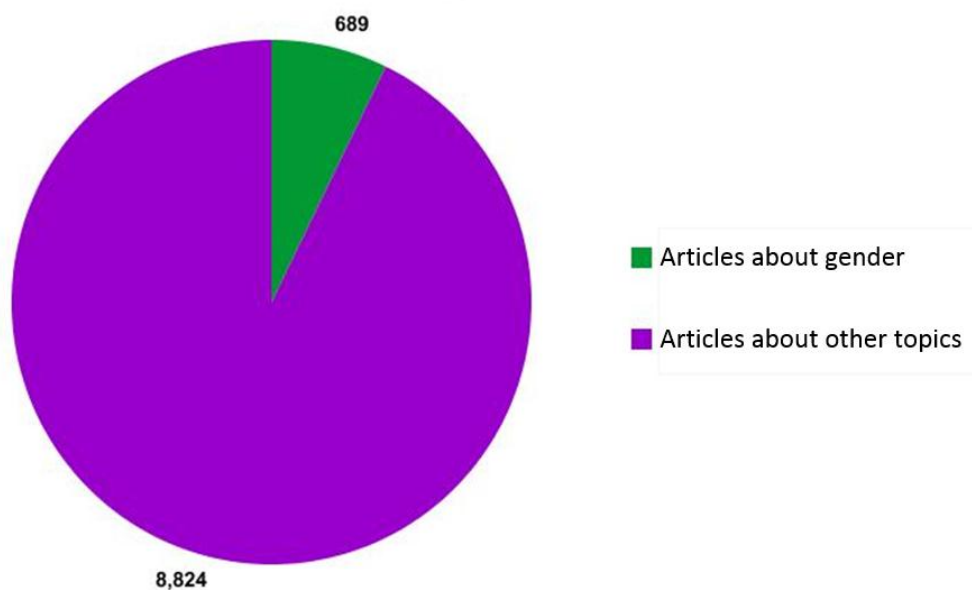
Source: authors’ own creation

Figure 7 shows that the percentage of articles authored exclusively by male researchers (one or several, as exclusive authors) is only 10% higher than that of articles authored exclusively by female researchers (one or several authors) in the 96 analysed journals: 46.99% versus 36.77%, respectively. Meanwhile, articles authored by both men and women researchers are less frequent (16.24%).

Aside from the valuation of the discussions over the single and multiple authorship, it is important to reflect on the fact that two thirds of the articles are written by a single author (67.27%) and that 20.35% were written by two authors. As the result, research articles written by teams of researchers (3 or more authors) barely reaches 12.38% of the sample.

The analysis also identified those articles whose subject matter is gender, due to the relevance of the topic.

Figure 8. Number of articles about gender



Source: authors' own creation

Figure 8 shows that only 7.24% (689) of the 9,513 analysed articles had gender as their central theme. While this number of articles is small, the fact that it represents more than 5% of the total number of articles means that gender can be considered as a recurring theme in Spanish-language journals.

4. Discussion and conclusions

Although subsequent field studies may correct and complement the data presented here, this article has to note that there has been an improvement in the visibility of women researchers in the field of communication. In 2010, it was concluded that “the distribution of gender in Chile was not equal in the professional field [in the case of communication] or in any other field”, and that “there is a historical burden that has relegated women to the background in the field of research” and therefore that “it was necessary to improve the visibility of women researchers and their research work” (Caldevilla, 2011: 68). However, now we have concluded that it is necessary:

1. To enhance the relationship between women researchers and their lines of research through web-based tools or specific social networks (Google groups, blogs and Facebook, for example).
2. To create a common code in the Spanish language that unifies quality and visibility criteria.
3. To obtain from UNESCO a specific code for communication, independent from Sociology and other social sciences or humanities.
4. To improve access to indexing systems.

With all these elements, taken as desiderátums in the two fields or areas that are analysed in this work, namely the research production of women and about gender and the improvement of the visibility of scientific work within the academia, it will be possible for the academic trajectories of women researchers to improve substantially.

ICTs and social networks are the best channels to achieve short-term goals because “*these networks allow and encourage the publication and sharing of information, self-learning; team work; communication among students and among students and teachers; feedback; access to other sources of information that support and even facilitate constructivist learning and collaborative learning; and contact with experts*” (Gómez, Roses and Farias, 2011: 132).

All the elements and data that due to their magnitude were not included in these pages are available for those readers who wish to expand their understanding of them on the following website: www.seeci.net/chile/. In addition, readers can share their opinions, ask questions and make contributions on the following blog: www.publicacionesinvestigadoraschilenas.blogspot.com.es/.

5. Notes

1. Web of Science is an online scientific citation indexing service created and managed by the *Institute for Scientific Information* (ISI), owned by the American company Thomson Reuters. It provides access to multiple databases and other resources that cover all scientific disciplines.

6. Funding and special thanks

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