

**Communicating Science in Chile.
Problems in Journalism Training and Scientific Communication**

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Abstract

The public communication of science, as a mediator between science and society, is vital (Cortassa, 2010, 2012), but in the case of Chile the situation is complex and has many limitations. One of them is the training of science journalist. In this paper we present the results of an analysis of the Journalism Curriculum in Chile and the results of a survey done during 2012 and applied to 70 Chilean scientific journalists. The study shows that universities are not delivering contextual and conceptual bases in science communication and most science journalists lack professional training, having to fill this gap through self-education. This reflects the need of strengthening the training of journalists in Chile, to generate narratives of science beyond the usual stereotypes (results and applications) and to improve the relationship between science and society.

Introduction

In 2012 Chile was 46th in the Global Ranking of Journals and Country Scientific Indicators, well below the United States but fourth in Latin America, after Brazil, Mexico and Argentina (Scimago, 2013). However, since the year 2000 Chile has increased its scientific output, with an annual growth of 11% between 2006 and 2011, with 75 % of publications in English (Conicyt, 2013a). In relation to the training of researchers, while in 2011 there were less than 800 researchers per million inhabitants, below the OECD average of 3620 (Blondel and Norambuena, 2011), since 2008 there have been 5809 graduate scholarships abroad, with expectations of increasing this indicator in the near future (Becas Chile, 2013). In recent years the State funding for outreach and assessment of science also increased. Between 2000 and 2008, the Millennium Science Initiative has made increasing investment to promote activities directed to the non-scientific society, with 882 products or activities and 872 media articles (Mideplan, 2010). The Explora Program, which aims to contribute to the creation of a scientific and technological culture in society, particularly in schoolchildren, increased its resources of 334 million pesos in 2008 to 508 million pesos in 2010 (Conicyt, 2013b). However, other aspects have not advanced, such as the incorporation of science museums to the education and public outreach of science (Comisión Asesora Presidencial Institucionalidad Ciencia, Tecnología e Innovación, 2013).

Not only that, but neither the growth of national scientific output nor the efforts to develop scientific outreach activities are reflected in a better public value of science in Chilean adults. While the adults of southern Chile, declares being interested in science contents (Villarroel *et al.*, 2013), Chile is the Latin American country that less values scientific work (Moreno *et al.*, 2009). For example, only 31.4% think that scientific knowledge is useful for the formation of political and social opinion (Fazio and Gonzalez, 2009). Also, while 47% of people living in Bogotá and 42.2 % living in Madrid considered that Science and Technology Funding is a priority, in Santiago de Chile, the result was 0% (Moreno *et al.*, 2009). In all Latin America results are far away from the 76% of positive assessment to state funding of science and technology in the United Kingdom (Ipsos Mori, 2011).

In addition, Chilean scientific growth has not been translated into greater media coverage. For example, only 0.8% of the Chilean TV News Content covers Science and Technology (Departamento de Estudios CNTV, 2011), showing a

reduction by half compared with previous years coverage (Departamento de Estudios CNTV, 2010). The limited time given to Science and Technology on TV News, shows that “the current legal doctrine does not guarantee a proper popularization of science on television, the media that has more influence on our population” (Soto, 2011:16).

About newspaper coverage, Chile is the third Latin American country that has less news about science and technology (Massarani and Buys, 2007). The Chilean newspaper that most covers Science and Technology’s news is *El Mercurio*, but this coverage is less than 1% of all the news published (Parodi and Ferrari, 2007), being the popular topics those related to physics, astronomy and space science (Massarani and Buys, 2008).

One aspect directly related to public communication of science and technology in Chile is the training of professionals who are devoted to the communication of science. In Chile, scientists do not have the necessary academic background to appropriately communicate their projects and research to society, because their undergraduate programs exclude this area (Alvarez, 2013).

The case of Chilean science journalists is even more complex, because they face several challenges in their own profession. For instance, high mobility, lack of job stability, intense workdays (Délano *et al.*, 2007.), lack of space in the media to cover “science and technology” news and little interest from local scientists to communicate their research (Econnect, 2007). But besides all this, there is also lack of formal training in undergraduate journalism programs (Gutiérrez, 2008; Prenafeta, 2008b). Additionally, no concrete results were obtained from the Law Project presented to the Chilean Parliament in 2008 that sought making compulsory the teaching of science and technology in undergraduate journalism programs (Boletín 6021-19, 2008).

Under this scenario, this paper aims to explore how Chilean journalists have overtaken this lack of formal training in science journalism and also offers a characterization of the Chilean “science journalist”.

Methodology

To analyze the educational curriculum, in 2012 we made a cadastre of all undergraduate journalism programs in the country (from public and private universities). We looked into the entire curricula to check if they included a course,

workshop or seminar (compulsory or elective) linked to the following topics: Science Communication, Science Journalism, Popularization of Science, Epistemology, Philosophy of Science, History of Science, Anthropology of Science, Sociology of Science or any kind of Social Studies of Science (SSS). We wanted to know if future journalists were receiving a formal training in any of these aspects that we consider to be essential to have a broad and critical look at science.

With regard to the practicing science journalists, we made an exploratory survey during April and May of 2012. At that time there was no cadastre or database of science journalists in the country. Therefore, it was decided to construct a sample of science journalists from databases developed by the Chilean Association of Science Journalism (ACHIPEC) and from private databases of other science journalists. An on-line questionnaire of 18 questions (two questions for control and filter), of which 16 questions were closed and two were open, was applied to this group. This online self-applied questionnaire was answered by 108 professionals working in that period in public communication of science. Of these, 70 had the degree of social communication or were journalist and 37 were professionals in other fields, usually scientists devoted to the popularization of science (Valderrama, 2014). For this paper we have considered only the answers of the 70 journalists.

Results and Discussion

Gender and Geographic Concentration

While in Europe, Asia and Africa, men are the ones who are more devoted to scientific journalism, in America 55% of science journalists are women (Bauer *et al.*, 2013). However, in the case of Chile, 66% of science journalists are women, more than 10% above the average in America.

In addition, science journalists are concentrated in the metropolitan area, since more than a half of them are working in the capital, Santiago de Chile (54%). Next in percent concentration is the Biobío Region (16%) and Valparaíso Region (7%). In northern Chile, composed by five regions, scientific and economical activities primarily related to mining and astronomy are developed, but only the 5% of Chilean science journalists are working in these regions. It should also be mentioned that this low presence of professionals dedicated to public communication of science in northern Chile is alarming if we add the small rates of Explora Projects granted to

these regions (Conicyt, 2013b). However, all these results are consistent enough with the population density in these regions. This is not the case for the regions of O'Higgins, Maule, Araucanía and Los Lagos where the concentration of science journalists is low (between 1.4% and 2.8%) while the population density is bigger (around 5% and 6 %). The main exception to this is in the austral zone, where the region of Magallanes and the Chilean Antarctica has the second lowest “population density” in the country (0.9%), but concentrates the 6% of the Chilean science journalists, ranking fourth in this survey.

Communicating Science

Just over a half of those who answered the questionnaire have less than five years working as science journalists (51.4%), while 27% have been working on this for more than ten years. However, only 30% of them considered themselves as “science journalists”. Meanwhile, 43% said that they are “science communicators” and 27% said they are “popularizers of science”. These results are consistent with the fact that the majority of professional journalists work in corporate communication of public and private Chilean Universities (40%), Research Centers, Observatories and Laboratories (20%) or Government Agencies (13%). Only 13% works more closely to journalism, such as in Media (8.6%).

Since most of the Chilean science journalist work in corporate communication, they are mainly communicating news related to Chilean research (94.2%). However, if we review the source of information of those who are working in the media, 22.2% declared that this news come from developed countries in Europe or the United States.

Training and Self-training

The increasing creation of journalism degree programs in the Chilean universities during the last years was not related to the opening of courses, seminars or workshops of science communication (Prenafeta, 2008b). Currently, this situation has not improved, because the current journalism students do not have the opportunity of being trained in this area in their formal university studies.

The cadastre made in 2012 of all journalism degree programs in the country, demonstrates that from the 33 programs that offer a degree in Social Communication and/or Journalism, only 7 offer a course related with Science Communication,

Science Journalism or Social Studies of Science (3 are optional, 2 compulsory and 2 courses could be included if they have “student demand”).

Regarding current scientific journalists, 96% do not have any formal or graduate specialization in Science Journalism, Science Communication or SSS. Moreover, the vast majority of respondents do not have a specialized graduate training of any kind (60%), coinciding with the results obtained by Mellado *et al.* (2010). Of the remaining 40% that has some kind of specialization, 50% have a master degree but only in Social, Organizational or Corporate Communication. Only 14.2% have some master or formal specialization in Science Communication.

This is very problematic, because specialized training is necessary to have “professionals who understand the dynamics of science and technology (S&T) and the social, economic, political and environmental issues that brings scientific and technological phenomenon” (Prenafeta, 2008a:118).

This clear lack of formal training has been mitigated in different ways. First, 100% of those who answered the questionnaire have had to rely on scientific “self-education”, through reading scientific books, attendance to scientific meetings and talking with scientists. Most of them (97.1%) learned through work experience and reading science news, while 58.6% had to read science books written for a wide audience.

Conclusion

The data presented in this paper report a science journalist profile mainly female, dedicated to corporate communications in universities, working in the capital without formal-training in science journalism or science communication.

In general, this paper addresses two specific issues. First, there is little coverage of science and technology in the Chilean press (both print and television). This little space in Media drives to science journalists to work in the universities, communicating a corporative science made in Chile. Second, science journalists have a lack of formal-training in Science Communication, Science Journalism or Social Studies of Science.

This problem seems to be far from been resolved, because Chilean Journalism Curricula do not include this kind of courses. However, we believe that the solution to both problems is not exclusively related with more media space to cover Science and Technology or an increase of Science Communication or SSS in Journalism

Curriculum. More participative models, that consider scientific work and scientific community as an integral part of society, should be included in media coverage and in future designs of Journalism curricula, graduate programs, and specialization courses or in the design of cultural policies.

Risks, consequences, political and economic interests, military uses and controversies are part of scientific practice, of the making of scientific knowledge and of the creation of products. Therefore, to addressing holistically the training problem of science journalism in Chile the Social Studies of Science should be incorporated as a solid theoretical base, not only for communicating science to society, but also to do so in a critical way.

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