

THE SIGNIFICANCE OF SCIENTIFIC PUBLISHING AND THE HASTY LIMITS OF ITS BOUNDARIES

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Rosario Rogel-Salazar
rosariorogel@gmail.com
<http://orcid.org/0000-0002-6018-0635>

Research teacher of the Political and social sciences faculty, Mexico's State
Autonomous University, Cerro de Coatepec s/n, Ciudad Universitaria,
Toluca, Mexico's State, Mexico

— *Abstract*—

This essay aims to analyze –from the perspective of scientific communication– the distinction between scientific journals and popular science publishing, as well as the way in which these differences are coupled when it comes to public policy strategies that seek to promote the development of certain type of knowledge, by means of a publication ranking. The main question of these reflections is whether, in academic publishing practice, there is a distinction between both types of publications and, if there is actually a difference, in which way and how, said difference manifests itself.

Keywords

Scientific communication, scientific publishing, popular science publishing, good publishing practices, scientific journals, science and technology policies.

DIFFERENCE BETWEEN DOING SCIENCE AND DISSEMINATE IT¹

Undoubtedly, the seemingly simplest issues are always the most difficult to address. When, for example, there is talk about dissemination of science, experts agree that it is a specific discipline that seeks to "bring scientific knowledge closer to society in general" (see Beyer-Ruiz and Hernández García, 2009). In fact, the etymology of the word refers to the Latin *divulgatio*, which refers to the action and effect of spreading, promoting or publishing something to make it available to the general public.

So far, the difference between "doing science" and "disclosing science" seems relatively simple: those so-called "scientific" activities are conceived as those exercised by "scientists"; therefore, the dissemination of science would be related to making known to a general public the activities developed by these scientists.

And this is where the problems begin, for such an explanation would imply that scientists are autonomous people who act independently and far from society, and that is impossible. Scientists, of course, are part of the social system; it is only that their communication forms, means and strategies between them, differ to some degree of the society's general communication forms, means and strategies; that is, we can affirm that there is a distinction between:

- **Peer-to-peer communication:** a scientist who goes to another scientist -from the same field of studies- to make known his findings or research results and thereby legitimize scientific and technological knowledge, either by establishing consensus or dissents; and,
- **Disseminate science:** action related to "make known to the general public" -whether or not scientific- the findings or research results that were previously discussed and analyzed by experts.

1 The reflections presented here are based on a debate that began as a result of a comment made by me in the Facebook group on "*Disclosure Mexican Magazines*" on October 25 and 26, 2016. I thank Patricia Magaña Rueda, Gerardo Ochoa and Juan Carlos Carmona for their questions and openness to dialogue. Of course, the comments here are my responsibility and do not necessarily reflect the position of the institution in which I work.

This distinction makes no less "science" to one or the other, in both cases we are talking about scientific communication. These are different "communicative approaches" because the audiences to which they are addressed are different and, precisely because of this, the strategies to strengthen such communication tend to be adjusted, otherwise the central objective of "make known"² would be more difficult. We are also talking about two different moments: the first when scientists analyze and discuss among themselves the relevance -or not- of a particular finding, and the second when said finding is made known to the general public through disclosure.

This is referred to in linguistic studies when they point to the existence of two enunciators in two different situations: on the one hand the scientist who communicates his findings to other scientists, with the aim of confronting them and - eventually - legitimizing them; and, on the other hand, the disseminator who recovers those findings and places them in a perspective that allows "to incorporate into the everyday world the world of science, provide meanings referents and signifiers to the reader so that he can understand the scientific news" (Ciapuscio, 1988: 81).

In this sense Ciapuscio (1988: 77) analyzes the relevant pragmatic and semantic aspects in the process of composing texts of scientific dissemination. In this regard, he points out that all text exhibits certain typical global structures; these are formal schemes that are "filled" with particular contents. This is what allows explaining that the same fact can be narrated in different ways, depending on the type of text to which it is alluded. In the case of science, the source texts require a type of formal and syntactic structure, which is usually adjusted to the moment of "translating" these texts for dissemination, which allows the retransmission of information to wider audiences.³

At this point it is important to clarify that in order to participate in scientific communication "between peers" it is absolutely necessary to be part of the scientific and technological community; where it is understood that

2 I take up on the concept of communication by Niklas Luhmann (2007) as a distinction between: information, to make it known and to understand it. From this perspective, a communication takes place only when these three aspects can be synthesized. For the Luhmannian position, this distinction in turn produces distinctions, and this is what keeps the system in operation.

3 The fact that scientific dissemination has its origin in a text previously disseminated among experts of a specific theme, explains the presence of the *source* category, even though the *source text* is not always explicit in discourses of dissemination (in this regard see Ciapuscio, 1988)..

"pair" is equal, symmetrical or similar to another. Every scientist - no matter his area of expertise and his level of knowledge- has "pairs", with them he talks and exposes his ideas, proposals, findings, questions and answers. There is no possibility that a scientist or technologist does not have "peers" otherwise, science would be exercised as if it were religious ideology and that is one of its main risks that must be monitored, as Cereijido (1994) points out.

And although the dissemination of science and technology is also exercised by scientists, who make enormous efforts to explain to the general public certain findings or results found in a scientific field, this work also has specialized disseminators, who know the scientists' communication strategies and are able to "translate" them to languages comprehensible for a general public; in many cases, disseminators make use of didactic resources or concrete examples to facilitate the understanding and implications of the scientific and technological findings.

However, as Ciapuscio (1988: 80) points out, this translation is not limited to the transfer of certain contents from one linguistic system to another, it is about the transition from one level of language to another level of language, and clearly the scientific content, the disseminator faces the enormous challenge of attracting the reader. It is, in short, not only to inform but also to persuade.

An example of these differences could be found in the role played by an astronomical observatory and a planetarium. While the first is a site (institution) where they are scientifically analyzed, evaluate and monitor astronomical and atmospheric phenomena, the second is a place addressed to all public where astronomical shows are presented and you can observe recreations of the night sky from various places on Earth and at different times of the year. In both cases, discoveries are related to astronomy; however, the way of communicating the concrete fact is different, because the publics and the objectives of the communication are also different.

TWO CULTURES AND DISSEMINATION

At this point, the term "science communication to a general public" may be more appropriate, rather than "science dissemination", in the understanding that communicating is putting in common.

This "sharing" requires, on the part of the disseminator, to master strategies that allow him to transmit the scientific information without

losing nuances, but gaining clarity and impact. In this sense, Beyer-Ruiz y Hernández García (2009) affirm that:

The disseminator is responsible for the management of strategies for transmitting scientific information through different means of communication, preferably mass media: radio, the press, television, exhibitions in science museums, publications such as bulletins and magazines. The so-called disseminator of science must, in itself, accumulate a wealth of important scientific knowledge and a set of skills to efficiently nourish the communication processes of that collection (Beyer-Ruiz and Hernández García, 2009: s / p).

Another problem arises when one notices the proximity of the works about diffusion of science with the literary creation. At this point, it is necessary to recognize the "false" distinction between science and the humanities that Charles P. Snow points out in his speech *The Two Cultures and the Scientific Revolution* - pronounced in 1959 at the University of Cambridge - where he pointed to the deep detachment between intellectuals literary and scientific, because of their lack of communication and consequent incomprehension, where they could find two cultures that, without common dialogues and tendencies of hyper-specialization, had managed to separate from each other, forgetting one of the few common objectives: society's progress.

This generates one more doubt, although we do not fail to recognize the importance of advocating for the search for points of dialogue between science and the humanities, we must analyze and deepen the work of dissemination and ask ourselves if it is a question to know closer to science or the humanities, or if to publish humanistic texts implies in itself to divulge -without mediating any type of "translation"-, or if the disclosure is the hinge that allows certain degrees of unification of both points and, even, if that dialogue between the two cultures is the objective - or at least one of the objectives- of the disclosure. At this point I limit myself not to affirm, but to ask.

There is, on the one hand, the sensation of speaking of something different when referring to scientific and technological knowledge, arts and humanities and when talking about the *dissemination* of such knowledge. And although it would be desirable to shed more light on the points of convergence between this knowledge, the truth is that these are at least discourses with different textual "textures", different specific objectives and diverse audiences.

Now, if such convergence is possible, how is it concretized? By grouping texts of different nature into the same medium and hoping that it is the

"non-specialized" reader who, from what the disseminator approaches, weaves the bridge between sciences, technologies and humanities? When a science journal publishes a document, the author is required to have a specific textual treatment, where the pragmatic and semantic aspects are coupled with the type of target audience, or the target audience is the one who performs the "translation" with just knowing that you are approaching a magazine with a cutting edge?

And, as regards the area linked to scientific public policy strategies, it would be pertinent to ask how these differences are coupled with specific strategies that seek to "foster" the development of certain type of knowledge, through the recognition of certain publications?

THE DIFFUSE EDGES OF SCIENCE AND ITS DISSEMINATION: THE CASE OF MAGAZINES

Therefore, if the distinction between scientific and humanistic activities is relevant and, on the other hand, to disclose them, it may also be appropriate to distinguish the role of journals aimed at "spreading science", peer communication which is given in scientific, technological and humanistic journals.

In this regard, in an interesting recount of the main characteristics of scientific dissemination journals in Mexico Lujano-Vilchis and Martínez-Domínguez (2016) point out that the evaluation criteria used by the Science and Technology National Council to analyze dissemination magazines are similar to the traditional standards to the evaluation of scientific magazines. Dissemination journals resemble the traditional standards for the evaluation of scientific journals. This situation leads them to ask: what do the science and technology funding agencies mean by science dissemination and how does this conception affect the development of journals in this field?

At this point -and at the risk of being criticized by experts in science dissemination and in the edition of specialized journals in the field- I wonder if all the magazines that are on the so-called *Index of Mexican Journals of Scientific Dissemination and Technological science publish exclusively* "science dissemination", or if they are basically the same as the journals that publish scientific and technological research, but they are named in this way hoping to make a difference at some point

Another problem arises when, in the so-called index of scientific dissemination journals, the presence of publications that -under other parameters- could be considered of literary creation and, if so, the question is why search for

their recognition from the public policies of science and technology, and do not do the same in the case of public policies to promote culture? In other words, why not -in the case of Mexico- instead of requesting support from the National Council of Science and Technology, go to the National Council for Culture and the Arts? Or is it that by including publications of one type or another in scientific policy, it is possible to settle the distance between literary and scientific intellectuals to which P. Snow alludes?

Of course these reflections do not seek to denote any type of publication, they are so important and worthy of being supported both one and the other, the only thing I try is to reflect on the fleeting edges of the limits of communication between peers and the disclosure of science; and, if there is any distinction between the two types of communication, identify what is proper to each of them, as well as think about what would be "good editorial practices" in each case.

The question that motivates the reflection is the lack of *disclosure trade* that is noticed in some authors of texts that approach scientific and humanistic subjects, with a divulging intention. Such is the observation made by Sergio Régules (2016) when he states:

In summary, science, the author and the reader can leave very badly from a written text with excellent spelling and irreproachable knowledge of science, but with deficiencies of general culture and sensitivity and with techniques of writing ignorance and popularization that go much more besides putting the accents where it should be and knowing that the atomic number of the protactinium is 91. The corrector and the editor are to take care of the author's good image, of the science and of the magazine or web page where his text appears (Régules, 2016).

However, the distinction between the two types of communication -and the resulting problems- is not perceived either on the policy management side (since the evaluation criteria of the outreach journals are very similar to those of today extinct Index of Scientific Journals), nor of the magazines; whose contents could not be cataloged in all cases of informative work.

This difficulty is pointed out by Octavio Alonso (2017), general coordinator of the information system Latindex, who highlights the problems that are noticed when diverse databases design lists of criteria based on norms and good editorial practices to be able to "differentiate" the types and quality of academic journals:

[...] challenges are encountered when these lists of norms and practices have to be applied to journals that respond to different profiles and objectives, as is the case of many Latin American academic publications of cultural and popular interest that are widely consulted in academia. Such would be the case of magazines specialized in art, cinema, literature, painting or music, which do not always incorporate the quality criteria that are generally better served by magazines of the so-called hard sciences. Databases face difficulties in measuring all types of publications with the same standards, without having to force their own selection policies and this is mainly evident in databases or systems of multidisciplinary coverage, not only regional ones, but also those of international coverage (Alonso, 2017: 23).

And while the reasons are clear why databases -especially those of a multidisciplinary nature- are prevented to make specific distinctions that allow to account for some difference between scientific journals and those of science dissemination; what I am referring to in these reflections is that public policy makes a mistake in valuing the magazines that have the objective of disclosure, with the same instrument with which it was evaluated (until the year 2015) to the magazines that have as objective "communication between peers". Why? Because their goals, their audiences, their communication strategies are not the same. Because if the journals did not have different objectives, then a different catalog would not be required (I do not speak of an index, because what we have today does not generate indicators of science divulgation magazines performance).

We have, on the one hand, the lack of specific criteria of that "body without organs" that is the bureaucracy (as Deleuze and Guattari call it, 1985), to implement a support policy to the science popularization, but this shortage is also noticed in the academic communities themselves, which we have been (including myself) unable to mark the distinction between communication between experts and dissemination of science. I know that here I run the risk of being strongly denounced and criticized, but I venture to give concrete examples: what would be the informative approach of articles with titles such as the following?

- “Abundance and density of chilla foxes (*Pseudalopex griseus* Gray, 1837) and Culpeo (*Pseudalopez culpaeus* Molina, 1782) in a Xerophyte formation.”.
- “Co-movement, persistence and volatility of Mexican macroeconomic variables in the presence of structural change, 1940-2012”.

- “General theoretical model derived from the review of the Kaizen literature and its sustainability over time”.

Articles selected randomly from three journals that are included in the Mexican catalog of science dissemination publications. In analyzing them, I am surprised to find a great similarity, in terms of its structure, with the so-called "research articles" (introduction, materials and methods, conclusions, etc.) And it is not that this is inadequate, is just that I wonder: what is the distinction that marks the disclosure of science in these cases?

No, I'm not saying they're doing it "right or wrong." I just wonder: what's the difference between these magazines and scientific research journals? Undoubtedly, the bureaucracy is wrong to measure them with the same standard with which scientific journals are measured, but we cannot deny that the contents of some of them do not resemble what Sánchez-Mora y Sánchez-Mora (2003) define as Scientific Disclosure:

It is a multidisciplinary work whose objective is to communicate, through a variety of means, scientific knowledge to different volunteer publics, recreating that knowledge with fidelity and contextualizing it to make it accessible (Sánchez-Mora y Sánchez-Mora, 2003).

At least the examples given are not what is said to be "accessible" to non-specialist audiences. At this point I can only subscribe the words of Sergio Régules (2016):

EIn an ideal future I imagine that science communicators will learn fine techniques of literary writing, as well as the difficult offices of editor and proofreader, or at least they will learn to appreciate their value and will know that nothing should ever be sent to the press without it passing through the hands of these characters before, which can save the author and science from ridicule, and tedium to the suffering reader. Every article that appears in a publication that is respected is, in essence, collaboration, even if it only carries a signature, and it is important for potential authors to know it (Régules, 2016).

It should be noted that, in Mexico's case, there is no guide or canon to edit journals for science dissemination, as there is for scientific research journals. And while such criteria may be debatable -and indeed have been widely commented on by the academic community and have also been adjusted- at least they serve as a guideline that guides the implementation of a public policy.

And while pointing out the specific criteria that define a journal for the dissemination of science should be a fundamental part of the implementation of a public policy that seeks to support such activities, it is also true that this definition can and should be addressed by the own scientists and by experts in science dissemination.

My thing, in any case they are not sentences or affirmations, they are doubts. Doubts that, those who edit magazines in this area, have all the authority to be able to attend if they consider it prudent.

I have doubts; I translate them to a code that serves me to refine my questions. Scientists always start from a question that is not correct; otherwise it would not be fun to do science. The most important thing in science is the questions; Pablo Picasso said that computers are useless because they only give answers.

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