

Editorial and discursive strategies in science communication magazines for children

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Abstract

This text resumes a research made in order to build a systematized database that, subsequently, allowed an approach to the discursive modes and to the contents of Mexican science communication magazines for children. The research was addressed from the perspective of the production of the medium, i.e. speeches produced through the magazines themselves (language, layout, content, formats, etc.), as well as the ambitions of the people who produced those magazines. It was also made a deep analysis of format, content, discursive strategies, publishing, distribution, etc. of two specific publications: "Chispa" and "National Geographic Kids in Spanish". The research question was: *What are the editorial strategies and discursive strategies (explicit or implicit) used by the producers of Mexican science communication magazines for children?* The answer was sought with actors involved in the production of science communication magazines. The work was carried out in a period from March 2005 to April 2007.

Introduction

Children acquire a good part of its early approximations to scientific information through formal education: at the classroom. But, generally, they have a great deal of curiosity and appetite to know things that their teachers or parents cannot satisfy with simple answers. Fortunately, in Mexico we have a growing amount of public communication of science and technology projects made especially for children, including magazines. Science provides different lens through which children can observe

and experience the world. It is proved that, if they are motivated, little children can develop an interest in science, which leads them to critical and creative thinking.

In Mexico, several efforts have been done in order to communicate science for infant public, such as science communication magazines. Unfortunately there was no clear systematization about all of the magazines that have been published, its foundations, its history, the role they played (or tried to play) and the experience that they inherited through the activity of popularizing science for children.

This motivated me to perform a research in order to build a systematized database that, subsequently, allowed an approach to the discursive modes and to the contents of this kind of magazines. The research was addressed from the perspective of the production of the medium, i.e. speeches produced through the magazines themselves (language, layout, content, formats, etc.), as well as the ambitions of the people who produced those magazines.

The research question was: *What are the editorial strategies and discursive strategies (explicit or implicit) used by the producers of Mexican science communication magazines for children?* The answer was sought with actors involved in the production of science communication magazines. But before approaching the producers, it was necessary getting know the magazines, in order to be able to perform an analysis of forms and contents used by Mexican science communication magazines for children.

Eempirical delimitations

The research primarily focused on the Federal District, as it is in the capital of the country where the greatest amount of editorial productions is done. However, as a result of the study of the state of the art and field work, some other periodic publications were detected at Michoacan, Hidalgo, Coahuila, Jalisco, Morelos, Chiapas and Guanajuato.

The work was carried out in a period from March 2005 to April 2007. The subjects and objects of study were science communication magazines for children with national circulation - and some of local circulation and periodical publication, as well as the actors involved in their planning and production. The qualitative nature study focused on:

- a) Analysis of forms and content in science communication magazines for children published between 1979 and 2006;
- b) Interviews with actors (editors, journalists, designers, scientists, members of the editorial committee) involved in the production process and construction of the discourse of these magazines.

Methodological design and analysis tools

Listed below are the steps followed to assemble the research methodology, as well as the tools that were designed to carry out the field work:

- *Final Delimitation of the analysis universe.* Chispa and National Geographic Kids in Spanish (NGKids) were selected as representative models of the magazines that have been produced at this country. Three numbers of each magazine were chosen, corresponding to different periods (different editors can mark changes in strategies). Chispa numbers studied were: 58 (January 1986), 96 (March 1989) and 178 (May-June 1996). National Geographic Kids in Spanish numbers were: 7 (November 2004), 16 (August 2005) and 22 (February 2006).
- *Gathering of magazines copies and systematization*
- *Analysis of the magazines.* The analysis of the magazines (Chispa and National Geographic Kids in Spanish) was carried out in such a way prior to the depth interviews, in order to observe and analyze each one without the influence of what the producers later told of their magazines and, therefore, to have a greater scientific rigor in the results obtained.
- *Critical discourse analysis of the selected magazines*
- *Design of in-depth interview and investigative work with actors (producers)*
- *Categorization of in-depth interviews*
- *Comparative analysis between the product (and his speech) and what the producers say about the product*
- *General Interpretation*

Results

During field work, I found: 11 science communication magazines for children, 3 science communication supplements for children, 6 magazines for children with notes or sections about science, 2 comics or cartoons and 3 Web pages.

Table 1. Listing of all the science communication periodical publications for children found during the process of field work.

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5-8 May 2014, Salvador, Brazil

Name of the publication	Publication classification					Editorial institution
	Science communication magazine for children	Science communication supplement for children	Children magazine with notes or sections about science	Comic strip / comic book	Web page	
Chachalaca	X					Museo del Papalote
Chiapa 	X					Innovación y Comunicación, S.A. de C.V.
Ciencia para niñas y niños	X					Consejo de Ciencia y Tecnología del Estado de Chiapas
Diverticiencia 	X					Centro de Investigación y Desarrollo del Estado de Michoacán (CIDEM)
Ecología 	X					Bimbo y Provenex, S.A. de C.V.
El Barco de Papel 	X					Centro Michoacano para la Enseñanza de la Ciencia y la Tecnología
Gira tu Cabeza 	X					Museo del Rehilete
Grandes Descubrimientos Naturales 	X					Museo del Desierto, Instituto Cuahutlense de Cultura, Artes y Raíces a los Niños Cuahutlenses y el INAH Coahuila
Ingenio	X					Sin el dato
Lucío y los Insectrónicos 	X					Cámara Nacional de la Industria, Electrónica, de Telecomunicaciones e Informática
National Geographic Kids en Español 	X					Editorial Televisa
a.m.ig.ig.s		X				Diario a.m. de León, Guanajuato
El Rincón de la Ciencia 		X				Periodico La Unión de Morelos
Helix 		X				Revista Ciencia y Desarrollo (Conacyt)
Colibri 			X			Dirección General de Publicaciones y Bibliotecas, S.E.P.
ERIS Nature 			X			Editorial Televisa
México Desconocido para Niños 			X			Revista México Desconocido
Nickelodeon 			X			Grupo Editorial Armonía
Revista Cometa 			X			AEROMEXICO y Editorial MAPAS
Tiempo de Niños			X			Secretaría de Educación Pública
Universo Big Bang 			X			Editorial Televisa
Fisicómics				X		Facultad de Física de la UNAM
La Medicina Genómica 				X		Instituto Nacional de Medicina Genómica INMEGEN
¡Wow!kat					X	Centro de Ciencias Explora
Helix					X	Revista Ciencia y Desarrollo (Conacyt)
Lucío y los Insectrónico					X	Cámara Nacional de la Industria, Electrónica, de Telecomunicaciones e Informática

The main objective of this work was to collect and systematize the general references corresponding to the corpus of the collected science communication magazines for children, all of which were produced in Mexico between 1979 and 2006. It was possible to find out: the cities in which the magazines were edited and produced, periodicity, if the institution that published the magazine was private or governmental, target audiences, number of pages per publication. Also, it was possible to make an historical reconstruction of the field, organizing the magazines in order of appearance.

In order to read the complete results and systematization, please go to the following link: <http://ccdoci.iteso.mx/cat.aspx?cmn=browse&id=5072>

Discussion of the findings

Chispa and NGKids in Spanish magazines were designed in very distant historical moments, and under very different conditions and contexts. Each magazine has particular characteristics. They were studied as key elements in the history of science communication for children in Mexico, one for pioneering and remain in circulation for 19 years; the other one for being an example of a successful magazine in this genre.

With the information collected and analyzed, it was now possible to describe the main components of a **model of the science communication for children through magazines**. There are six key components in this model:

1. **Science represented/interpreted in the magazines.** The analyzed magazines created representations of science, outside the original context within which it was created (discovered, researched, studied), and thus produce certain social constructions of science specifically for children, who are not in a position to understand the original speeches of science (such as a research report). And, eventually, these social constructions of the science presented by the magazines might become part of *the culture* (we must not forget that the magazines are produced within socio-historical contexts inserted in a specific culture).
2. **References to the social context from which the discourses come from.** One of the premises of Science, Technology and Society studies is that the target audience for science communication products, children in this case, should have the necessary

social context references from which the information that is being given comes from, in order to understand these science discourses (Medina and Kwiatkowska, 2000). This does not always happens in the analyzed magazines, although in some occasions explicit references to the social context were found, in addition to some non-explicit references.

3. **World's vision represented through the magazines.** The producers of Chispa and NGKids in Spanish discourses have the intention to generate changes in their readers. They do not set out explicitly that they are looking to train citizens in order to have the capacity to make decisions related to the society in which they live. However, they claim that they expect certain changes in their readers, such as: adopt a scientific thinking towards life; have information that, in a future, moves them to approach in a deeper way to science (which could be interpreted as searching for more information just because they want to, they need it or are curious); approach to knowledge; learn about "things" by making them; looking for solutions on their own; look at the world with a different perspectives; etc. Some of the expressed intentions of the producers could be detected in the analyzed texts (using Critical Discourse Analysis), such as: the child will learn to approach knowledge with a different vision, to preserve the environment, have scientific thinking (propose inventions, observe with curiosity), become familiar with the operation of things they use daily, etc. Some of the articles explain how scientific knowledge can be used to benefit society. However, this does not happen in all of the articles.
4. **The scientist represented in the discourse of science popularization.** It was unexpected to find out that, in these magazines discourses, the scientist is hardly represented. There are some notes in which the names of scientists who are conducting some research are mentioned; this can be used in order to legitimize or validate what is said in the note or article (the scientist has the power to say the things he knows), or to help the child get closer to the work and environment of the scientist (especially with pictures). Lamo, Gonzalez, and Torres (1994) have said that the scientific community is part of the social context, but that is not entirely reflected

in the articles. We can see scientists working, we read that they do research at universities around the world, we can deduce that what they do is somehow important for society, but the notes and articles never offer a data to link the scientist with the reader.

5. **The discourse addressed to children.** Language as symbolic form materializes in the vocabulary used in order to develop the texts of Chispa and NGKids in Spanish. It was discovered that, in both cases, vocabulary is simple for children, and that when any word could be unknown to the reader, it is generally accompanied by a brief explanation of its meaning. We verified that "science communication discourse exposes a series of procedures to replace specialized vocabulary, procedures that reflect, propose and build social representations" (Berruecos, 2000: 105). Scientific concepts are reconfigured to suit the children's context. Replacement of specialized vocabulary is a typical pattern (Thompson, 2002) which can be found in these science communication models for children. It was interesting to discover that, in both Chispa and NGKids in Spanish, the topic that appears more frequently is biology, especially from the perspective of the animal world. However, the animal world portrayed in these magazines corresponds mostly to a global context, instead of reporting about endemic animals living in our country (local context). The images - their presence in the formats of the magazine, its colors, its size and its distribution within the notes- have a primary and fundamental importance to facilitate understanding of the text and to maintain the attention of the child as well.

6. **Production context.** From the perspective of the three pertinence places of the media machine (Charaudeau, 2003); in relation to *the place of production conditions*, it was found that practices of the publishing organization (Innovación y Comunicación, S.A. for Chispa or Editorial Televisa for NGKids) greatly affect the entire production process. Chispa and NGKids magazines, besides being symbolic forms, are commercial products. The possible "economic impact" posed by the producers are motor of many decisions, as well as the final forms of the magazines. If a cover is not striking, the magazine will not be sold, and if the magazine is not

sold, there is no possibility of further producing. Regarding the *practices of the product elaboration*, it was found out that there is a large amount of mediations, such as: collaborators delivery of material, the knowledge and points of view that the contributor has on the topic he/she writes about, time, the objectives of each magazine, the reader imagined by the producers, etc. In relation to the *place of the discourse construction*, it was observed that the magazines are configured with very peculiar characteristics: a verbal system specialized for children, which simplifies the scientist's discourses; an icons/images system distinctive of each magazine; a graphic format that allows agile reading and helps keep the reader's attention and interest.

Conclusions

If I had to sum up the answer to the research question of this work in a short paragraph, I would say that the producers of Mexican science communication magazines use strategies which, in one way or another, carry a goal behind, a specific goal. Sometimes these goals are of intellectual nature, training, educational, social, entertainment, and in other cases, the objectives are permeated by commercial interests. Different ways to do science communication through magazines were found, different styles, different purposes and possibilities.

Final notes

After completing this research, the following magazines/supplements were born (in Mexico): A volar (magazine), De veras (magazine), Muy Junior (magazine), Dime abuelita por qué (comic), Quo niños (magazine supplement), La Canica (magazine), Chema Tierra (newspaper), Recreo (newspaper supplement), Frijolito (newspaper supplement).

The following magazines no longer exist: Universo Big Bang, National Geographic Kids in Spanish, Revista Cometa, Medicina Genómica. This invites us to reflect on the following questions: are we doing our job well? Do science communication and popularization need to be renewed and innovate? Why do science communication magazines for children not reach long periods of life?

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