

## SCIENTIFIC DISSEMINATION TEXTS: ANALYSIS OF TWO REPORTS ON PESTICIDES

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- *ABSTRACT: This work is constructed with the intention of examining the text of scientific dissemination as a syncretic text to verify how the senses are constructed in each of the reports, also highlighting the concept of observer in discursive semiotics as responsible for the maintenance of perspective or the point of view of discourse. To reach its objective, the work, because both journals use visual and verbal language to compose their reports, firstly aims to verify how their texts selected for analysis create unity of meaning by integrating the two modalities of language. Second, it proposes to examine how the issue of pesticides is approached by the report of the magazine Super Interessante and by the magazine Pesquisa Fapesp. What is observed in the texts is the purpose of disseminating scientific information in a more accessible way to the public for which they are intended. Although both use similar language resources, they are used differently in function of the difference of their interlocutors, which establishes the observer responsible for conducting the point of view. The discursive semiotics will be the theoretical-methodological basis to understand the syncretic mechanisms involved in the constitution of the mentioned texts of scientific divulgation and, in using it, we will try to highlight its proposals for the treatment of the verbo-visual texts.*
- *KEYWORDS: Discourse. Enunciation. Observer. Point of view. Syncretism.*

### Introduction

Scientific dissemination texts are those that aim to make public the knowledge produced by different segments of society that, through research, produce science. Their primary purpose is to transmit to the population a knowledge necessary to understand the world in which it is inserted and to help it make decisions.

There is no consensus among the different studies on the scientific dissemination texts about when they appeared in the Western world. Some claim that this occurred simultaneously to the discoveries that were being made, others establish the 17<sup>th</sup> century as the landmark of the emergence of this type of text, since it corresponds to

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the period of the emergence of modern science, whose objective was to allow access to the knowledge of the universe to all people. In fact, however, what actually happened until the 19<sup>th</sup> century was the diffusion of scientific knowledge to a restricted group of people, that is, those with the highest level of culture and who belonged to the social class of the highest levels of society.

It was from the 20<sup>th</sup> century, especially its end and the beginning of the 21<sup>st</sup> century, that the means of disseminating scientific information to the general population, including print media, television and the Internet, intensified. But in order for this knowledge to reach a group of people who did not have technical knowledge about the different scientific facts, the information went through a process of “didacticization”, that is, the texts produced to spread the knowledge reached by modern scientific researches started to be produced in a way that could spread the facts more clearly, without the repetition of the scientific jargon, which could make it difficult for lay people to understand. Therefore, the texts of scientific dissemination began to assume an instructional and, most of the time, journalistic character. In their form, they sought to highlight objectivity in the reproduction of facts, which implied creating the withdrawal effect from the subjective point of view of those who communicate certain content to their interlocutor.

Among the various means of communication in Brazil, which take on the task of socializing scientific knowledge, certain magazines stand out, such as *Scientific American Brasil*, *Pesquisa FAPESP*, *UNESP Ciência*, *Superinteressante*, *Mundo Estranho*, considered in general the most representative of this type of project in Brazil today.

It is important, however, to note that there are differences in the way each of these magazines proposes to disseminate scientific information. The differences consist primarily in their target audiences. *Scientific American Brasil* is responsible for disseminating current scientific facts to a public that already has information, therefore, it is not totally lay on the subject; it is a magazine produced by scientists themselves. The magazines *Pesquisa FAPESP* and *UNESP Ciência*, in turn, focus on disseminating the knowledge produced by the academy, but in doing so, seek to use a language more accessible to different sectors of society with university education. Between these two, however, there is a difference. While *Pesquisa FAPESP* is produced exclusively by journalists who treat knowledge as a fact of journalistic dissemination, in *UNESP Ciência* it is mostly the scientists themselves who disseminate the knowledge, although their text tries to adapt to the language of the lay reader. *Super Interessante* and *Mundo Estranho* magazines, in turn, focus on a more generic audience, which corresponds to the young elementary and middle school students; they also give journalistic treatment to the facts they report and their language is built from the image of their target audience.

The specific purpose of this article will be to analyze two scientific dissemination texts produced by two of the previously mentioned magazines from two central objectives. The first one will try to verify how the verbal and visual elements are

composed in the highlighted reports, since it is also characteristic of this type of text the use of the visual element to compose the information to be disseminated. The second will examine how the senses are constructed in each of the reports, highlighting the concept of observer in discursive semiotics as responsible for maintaining the perspective or point of view of discourse, since both reports will address the issue of the use of pesticides in food production in Brazil. The perspective from which these analyses will be elaborated will be that of discursive semiotics, arising from the proposals of Algirdas Julien Greimas and the semioticians who continued his work.

## **Two questions regarding the theoretical-methodological proposal of discursive semiotics**

This article does not intend to reproduce the framework of the discursive semiotics, through the resumption of the meaning-generating process, but it should emphasize that its attention will be focused mainly on the elements of the so-called discursive level, in which the manifestations of the person, time and space are organized, for the constitution of their syntax, and those of the themes and figures, which make up the semantic element of this level of the process. For the examination of the discursive manifestation of the reports of scientific disclosure, through the perspective of semiotics, however, we intend to discuss further two concepts that seem to us central to characterize the language of this specific type of texts, which are the concept of syncretism and the idea of observer subject in the constitution of meaning.

## **The verbal and visual in scientific dissemination texts**

When doing an interview with the Editor-in-Chief of *Pesquisa FAPESP Magazine*, Neldson Marcolin, on 03/12/2018, he was asked about the presence of the visual element in the reports that the magazine produces. On this question he stated the following:

The report is composed of text and images. There is the goal of giving information through the image, but there is the goal to attract the reader as well. If we are flipping through the magazine and see a spectacular photo or a curious photo or a photo that refers to something in our area, we stop and read. “Why is this image here? What is the text about?”, are the obvious questions. We connect one thing to another. The goal is also to draw attention to what we want to communicate. [...] I think that this element (the visual), in science, has an even greater importance, because the objective is: if I don’t grab you for one thing, I grab you for another. If I can’t attract you by the subject I’m dealing with, I try to attract you by a clearer and more pleasant text. If I can’t attract the reader for either

of those two things, I think he/she can stop at an interesting photo or graphic, which pulls him or her into the text.<sup>1</sup>

What can be seen in Neldson Marcolin's answer is that what he calls an illustration, whether it is the photograph, the graphic, or the arrangement of colors, etc., has the objective of informing the reader about the subject being dealt with in the report, but more than that, it should attract the reader to the informative text that the magazine presents to him or her. The first perspective pointed out by the editor corresponds to what in semiotics we call syncretism, that is, the visual and verbal elements make up a whole of meaning, so that the meaning of the text is given according to the relationship of motivation that exists between the verbal element and the visual. The second perspective, according to the editor, is a form of manipulation of the enunciator over the enunciatee, that is, a way of making the enunciatee carry out the act of reading according to the enunciator's selection of the visual elements. Although it is recognized that the concern with the disposition of the image is really a persuasive procedure, the hypothesis of this work is that the visual element reaffirms the presence of the observer, a concept of discursive semiotics that will be addressed in the next section, in the discourse of the report that establishes the perspective from which this discourse is constructed.

The term syncretism refers to the concept of neutralization, as proposed by Hjelmslev (2009), since it is not an overlap of languages, the verbal and the visual, but a composition of the two elements for the production of a single object, that is, the text of the scientific dissemination report.

At the same time, however, as we analyze the syncretic discourse of the reports selected for this article from the theoretical point of view of discursive semiotics, it is necessary to take into consideration the characteristics proper to each of the languages responsible for the composition of the text. As language is constituted, according to Hjelmslev's proposal (2009), by a plan of content and a plan of expression, it is necessary to identify the elements that constitute the plan of visual language expression, which differ from those of verbal language.

While in the verbal text it is possible to examine, from the point of view of the plane of expression, the syntactic-semantic arrangement of the graphic and sound categories, in the case of the visual text and the verbal-visual it is necessary to observe how other expressive elements are mobilized, which, according to Teixeira (2009), concern the chromatic, eidetic, topological and material categories.

The chromatic category concerns the incidence of color, which can give rise to two manifestations: the chromatic visual texts and the achromatic ones. The chromatic ones correspond to those in which there is a manifestation of different colors or concentration of one or another color. Those we call achromatic correspond to the visual texts in black and white, since they alternate the absence of color (white) and chromatic indistinction (black), although, to maintain the contours of the objects reproduced, they make use of

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<sup>1</sup> Entrevista concedida ao pesquisador, não publicada.

a varied range of shades between white and black, which corresponds to the different shades of gray that make up the images. In fact, therefore, there is truly no visual text without color. What we call achromatic text is just a way of differentiating colored visual text from black and white. In addition to these elements of the chromatic category, one must also consider the intensity of the color (strong or soft), the brightness (intense or matte), the incidence of luminosity (direct, providing the highlight; oblique, producing the shadow).

The eidetic category of visual text refers to the shape of objects. According to the geometric arrangements, shapes can be of two types, flat and non-flat. Flat shapes are those that are inserted in a single plane and have length and width; the non-flat ones, or geometric solids, as they can also be called, need more than one plane to be represented and therefore have length, width and height. In addition, flat shapes can be delimited by straight segments (rectilinear) or not delimited by them (curves); non-flat shapes are characterized by polygon or round bodies.

The topological category corresponds to the arrangement of objects in space. From it, therefore, it is possible to speak of high and low; upper and lower; above and below; right and left; center and periphery. The material category refers to the material with which the object is produced and should hardly be taken into account in planar objects, such as photography, advertisement, and even in figures that appear in scientific dissemination texts, as is what we examine in this article. One could think, as a result of the material category, in the tactile category, in which the object could be perceived as having a rough or smooth trace; hot or cold; hard or soft, etc., but this would only matter for very specific objects, which is not the case of scientific disclosure reports either.

What is important to emphasize in the analysis of the visual text and the verbal-visual is how these categories of the visual expression plane construct the meaning intended to be conveyed through the objects. Thus, when examining the reports of the magazines selected here, it is necessary to verify how they produce meaning and how, associated with the verbal, they organize the composition of the significant elements of the texts. This is what we intend to show in the topic of analysis of the chosen scientific dissemination texts.

### **Observer status in the constitution of the discourse.**

According to the discursive semiotics proposal, the observer corresponds to the

cognitive subject delegated by the enunciator and established by him or her, thanks to the disengagement procedures, in the discourse-enunciate, in which he or she is in charge of exercising the receptive-doing and, eventually, the interpretative-doing (that is, that is about other actants and narrative programs and not on him or herself or on his or her own program) (GREIMAS; COURTÉS, 2008, p. 347-348).

In the same entry that refers to the observer, the authors observe that there are different ways of catching his or her attention: 1) he or she may remain implicit; 2) he or she may be in syncretism with another communication (narrator or narratee) or narration actant; 3) his or her cognitive doing can be recognized by the observed subject.

In this way, the “I” implicit in enunciation (or communication) delegates to another cognitive subject the direction of discourse in order to act on the enunciatee. This is how, therefore, the perspective and the point of view are established in the discourse.

Since textualization is understood as “the set of procedures [...] aimed at the constitution of a discursive continuum, prior to the manifestation of discourse in this or that semiotic (and, more precisely, in this or that natural language)” (GREIMAS; COURTÉS, 2008, p. 504), the perspective depends on these procedures by making use of the relationship between enunciator and enunciatee and, differently, from the point of view, does not require the mediation of the observer (GREIMAS; COURTÉS, 2008). Thus, perspective consists in the choice that the enunciator makes when organizing narrative programs syntagmatically by producing the narrative structures of his or her discourse from its controversial dimension. This is way, therefore, a text about a crime, for example, can be produced from the perspective of the criminal or the policeman investigating the case. In this example, choosing the perspective of the policeman to narrate the facts at the expense of that of the criminal does not mean that the second perspective is eliminated, but rather that it is hidden by the privileged subject of the enunciation. In the case of the point of view, according to Greimas and Courtés (2008), there is a variation of narrative focus, that is, the enunciator does not use an observer to privilege one perspective over another, but rather offers different interpretative possibilities for the enunciatee to perform the reading of the narrative.

In proposing the reformulation of the concept of perspective in semiotics, in the entry corresponding to this concept in the second dictionary of semiotics (GREIMAS; COURTÉS, 1986), Jacques Fontanille, responsible for the drafting of this entry, will state that the perspective needs an observer in the same way as the point of view, with the condition of defining the observer as an actant and not as an actor.

A point of view will be called “perspective” when the traits of cognitive doing that produce the focalization are partially or totally implied (for example by reducing an assistant to a spectator or to an abstract focalizer), when the plurality of possible points of view is virtualized and reduced, thanks to an identification of observation skills, that is, when the enunciatee has no other possibility to interpret the enunciatee than by adopting the point of view imposed on him or her (in the pictorial perspective, for example)<sup>2</sup> (GREIMAS; COURTÉS, 1986, p. 165, our translation).

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<sup>2</sup> Original: “Un point de vue sera dit « perspectif » quand les traces du faire cognitif focalisant sont partiellement ou totalement implicitees (par exemple en réduisant un assistant à un spectateur ou à un focalisateur abstrait), quand la pluralité des points de vue possibles est virtualisée, et réduite grâce à une identification des compétences

In this sense, therefore, for Fontanille, the point of view corresponds to the discursive configuration in which a competence of observation different from that of the presupposed subject of the enunciation is admitted (GREIMAS; COURTÉS, 1986, p. 170). What seems to occur in the reformulation presented by Fontanille in relation to the concepts of “perspective” and “point of view” is that they become practically synonymous. For Fontanille, it seems to us that these concepts are confused in the case of the pictorial text, because in this type of text it is unlikely that the enunciator can produce a variation of the narrative focus of his or her discourse to the enunciatee.

What was intended to affirm in this subitem of the work, by taking up concepts not yet sufficiently deepened by semiotics, such as focalization, perspective and point of view, is that the didactization procedure present in the texts of scientific dissemination is constructed through the production of a syncretic object in function of its enunciatee. This determines, therefore, the perspective, or point of view, from which the theme of these texts is focused. This issue will be further explored in the analysis that will be developed in the next item of this article.

### **Analysis of scientific dissemination reports**

In order to fulfill the purpose behind the production of this work, presented in the introduction, we have elected two reports dealing with the same subject, namely, the production of agrochemicals in Brazil. This theme was explored by two different scientific articles published in two different magazines, in the same month and the same year. The first is the *Super Interessante* magazine, issue 393, September 2018; the second is the *Pesquisa FAPESP* magazine, year 19, no 271, September 2018. Our task will therefore be to verify how the senses are produced in these two texts, to the extent that we understand them as syncretic texts.

Initially we observed the composition of the covers of the two magazines selected as our analysis corpus.

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*d'observation, c'est-à-dire quand l'énonciataire n'a pas d'autre possibilité pour interpréter l'énoncé que d'adopter le point de vue qui lui est imposé (dans la perspective picturale, par exemple)” (GREIMAS; COURTÉS, 1986, p. 165).*

Figure 1 – Cover of *Super Interessante* magazine



Source: *Super Interessante* magazine, ed. 393, sep. 2018.

In addition to the title of the magazine highlighted in the red spot located on the top of the cover, with a call for the second report highlighted by the magazine, which is repeated in other issues, the central emphasis is on the subject of pesticides.

The image centered on the cover, on a green background, is that of a human skull wearing a turban topped by different types of food (strawberry, bell pepper, broccoli, eggplant, grape, carrot, banana, orange, pear, onion and pineapple). The phrase “The country of agrochemicals” appears just below the image, in direct relation to another phrase in the same syntactic organization, “The country of carnival”, which consists of a reference to Brazil, through the resumption of the novel’s title, published in 1931 by Jorge Amado. And the idea of carnival is rescued by the reference also made explicit between the human skull wearing a fruit turban and large ring earrings and the figure of Carmem Miranda, symbol of carnival festivities in the country. This expression also refers to the image of Brazil as the place of the great festival of Western Christian culture where there is excess, relaxation of customs and behaviors.

From this image, it is possible to identify a tension between life and death, as opposed to joy, the carnival festivity and food, representations of life, to the skull, which refers to death, two semes of the axis of the opposites of the semiotic square, from which is built the meaning of the discourse on agrochemicals in the magazine’s report. The image thus reaffirms the perspective from which it will deal with the problem of the use of agrochemicals in Brazil, that is, the trivialization of its use, which could cause the death of many people. The text that appears on the right side of the central image calls the reader’s attention to the action of a law in Congress that confirms what this image wants to denounce:



Brazil is the world champion in the use of pesticides. And Congress is mobilizing so that agriculture can use even more. Understand why this opens dangerous gaps (Text that appears next to the image produced on the cover of the magazine).

The text reinforces the abusive use of agrochemicals by the Brazilian agricultural sector and highlights Bill 6299/2002, authored by Senator Blairo Maggi (PP-MT). Finally, it invites the reader to read the report to understand to what extent this bill will bring harm to the general population.

**Figure 2** – Cover of *Pesquisa FAPESP* magazine



Source: *Pesquisa FAPESP* magazine, year 19, no. 271, sep. 2018.

The cover of *Pesquisa FAPESP* magazine corresponds to a panoramic photo, obtained by the high angle shot resource that captures, from top to bottom, part of the extension of a corn plantation in Campo Novo do Paricis (MT). In the lower middle part, on the left side, there is a white and blue tractor, standing out from the dominant green of the photo, which sprays agrochemicals over the corn. Unlike the cover of the previous magazine, the cover of *Pesquisa FAPESP* magazine values life and makes no reference to death. Its central theme is the food that ensures the subsistence of the human species.

At the bottom of the entire horizontal extension of the cover, just above the highlights given to five other articles inserted in the body of the magazine, in large white letters, appears the word “agrochemicals”. In the central part of the cover, on the right side, above the tractor image, below the name of the magazine highlighted at the top, on the corn plantation, the following text is registered: “Bill puts pesticide use on the table: they boost agricultural productivity, but can cause health problems for workers and contaminate the environment”.

As in the previous magazine, this time Fapesp's magazine refers to Bill 6299/2002, previously mentioned, but in a different way, it informs that this bill is providing society with the possibility of a debate on the issue of pesticides used in Brazilian crops. The text points out that the use of agrochemicals can be seen from two different points of view. On the one hand, it is responsible for increasing food productivity, which is positively valued because it reinforces the perspective of maintaining life and benefits Brazil, one of the largest producers of agricultural products. On the other hand, the pesticide can "cause health problems" both for the worker handling the product and for other people, since it affects the environment. The choice of the expression "health problems", however, does not materialize the perspective of death, since the syntagma used corresponds to non-death. Thus, it does not establish an opposition between life and death, two opposing semes, but the maintenance of the positive deixis, that is, life and non-death, which will be responsible for maintaining the meaning of the text of the report as a whole.

### **Text from *Super Interessante* magazine**

Inside the magazine, the report resumes the title and subtitle that were highlighted on the cover, as presented in subitem 1 of this article. The title and subtitle take the entire page 22, which begins the report, and is produced in gold yellow. Beside it there is a photo of a female hand holding a strawberry, from which a dark liquid flows, similar to an oil (figure 3). The female arm of the photo is wearing until near the wrist a golden yellow blouse; the background of the photo is green. The first relation that can be established is between the gold, which refers to gold and wealth, and the green, which refers to vegetation, to the forest. Thus, there is reference to the Brazilian flag itself, green-yellow. The title and subtitle of the report are present there: the country of the agrochemicals is the Brazil.

**Figure 3** – Image of the presence of pesticides in agricultural products



**Source:** *Super Interessante* magazine ed. 393, sep. 2018, p. 23.

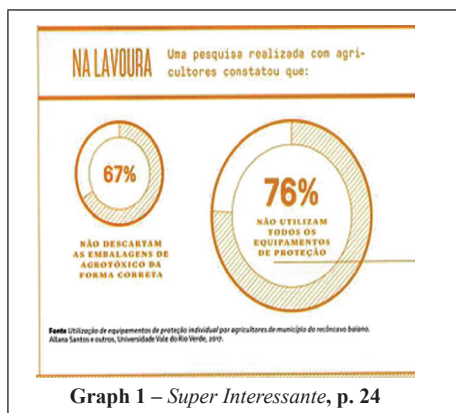
On page 24, the verbal text of the report of *Super Interessante* magazine begins with a narrative about Vanderlei Matos da Silva, who, from 2008 to 2011, died at the age of 31 with a diagnosis of hepatorenal syndrome caused by intoxication. During this three-year period, he had worked in the pineapple plantation of Del Monte Fesh, in Limeira, responsible for the preparation of the “toxic syrup”, a mixture of agrochemicals used in the production of pineapple. This narrative associated with the photo reproduced above in figure 3 identifies the liquid that flows from the strawberry. This is the toxic syrup.

Following the narrative, the high consumption of agrochemicals in Brazil and the reference to Bill 6299/02 are highlighted as follows: “On June 25, a commission of the House of Representatives approved Bill 6299/02, which became known on social networks as ‘poison bill’” (GARATTONI; LACERDA, 2018, p. 24). Its author, a senator, is, according to the report, “one of the world’s largest soybean producers” (GARATTONI; LACERDA, 2018, p. 24), who, in 2016, “took a leave of absence from the Senate to take over the Brazilian Ministry of Agriculture” (GARATTONI; LACERDA, 2018, p. 26).

According to the enunciator, the Bill presents 30 measures that change “the situation of agrochemicals in Brazil”, going from simpler things, such as the elimination of the name “agrochemical” on product packaging, being replaced by “phytosanitary defensive”, to more radical proposals, such as determining that “Ibama and Anvisa could no longer veto the release of new agrochemicals, even if they present environmental or health risks” (GARATTONI; LACERDA, 2018, p. 26).

On page 24, a graph recording information on farmers’ behavior regarding the disposal of agrochemical containers and the use of protective equipment appears, and on page 26, information on the growth in the use of pesticides in the country is highlighted. Both highlights appear in gold lettering.

**Figure 4 – Use of pesticides**



**Figure 5 – Growth of pesticide use**



**Source:** *Super Interessante* magazine, ed. 393, sep. of 2018, p. 24.

**Source:** *Super Interessante* magazine, ed. 393, sep. of 2018, p. 26.

On p. 25, there is a photo (figure 6) of a red pepper plant in which four human hands appear performing four actions: application of the toxic syrup, product pruning, removal of the red pepper, placement of the bell pepper in a container. The four hands performing the actions are dirty with the toxic syrup. The background of the photo is green-yellow.

**Figure 6** – Image of the presence of pesticides in food



**Source:** *Super Interessante* magazine, ed. 393, sep. of 2018, p. 25.

The report presents a first subtitle, “The Dose and the poison”, in which there is an explanation about the dosage of agrochemicals in food, whose “limit is usually between 0.01 and 0.5 milligrams per kilo of food” (GARATTONI; LACERDA, 2018, p. 26). In addition, this subitem explains the natural process for cleaning agrochemicals from food (with the inclusion of figure 7, reproduced below, which takes up practically the entire page 27 of the magazine) and the mechanical process that consists of washing the products at home, using bicarbonate in the washing solution.

**Figure 7 – Operation of pesticides in the plantation**



**Source:** *Super Interessante* magazine, ed. 393, sep. of 2018, p. 27.

“The offensive of agrochemicals” is the second subtitle of the report and it discusses Anvisa’s participation in controlling the use of agrochemicals in different products, as proposed by Bill 6299/02, at the same time as the issue of the substance “glyphosate”, which is very harmful and is present in most agrochemicals. This subitem is accompanied by two graphs. The first registers the most consumed agrochemicals in Brazil, and the second the proportion of agrochemical use in the different Brazilian states.

The last subtitle of the report, “The glyphosate and the hunger”, states that glyphosate is an herbicide used to cleanse the soil of several crops, most notably soybeans. It also presents the case of gardener DeWayne Jonhson, 46, who won compensation from the Monsanto industry for being affected by glyphosate use. The report concludes by saying that science states that agrochemicals residues “present in food pose no risk - as long as the norms and limits for agrochemicals use are obeyed. But this does not depend solely on science. It also has to do with something more subjective and obscure, but no less important: politics” (p. 32 of the report *Super Interessante* magazine). In the last illustration (figure 8) of the report, which corresponds to the last page, several foods appear without the ostentatious presence of toxic syrup at the same time as ways of reducing agrochemical residues are presented.



is possible to identify a gradation of the presence of the pesticide, from its insertion inside the product (figure 3), to its application in the crop (figure 6) and also in the peel of the final product, at the time of cleaning (figure 8). The graphs correspond, in the report, to the visualization of information produced by verbal language, in such a way as to reinforce the data regarding the misuse of containers in which the agrochemicals are transported (figure 4), the growth of agrochemicals use in Brazil (figure 5), and the cycle of agrochemical action in the plantation (figure 7). Thus, what this brief analysis confirms is that the visual and verbal elements constitute a whole of meaning that produces a discourse in defense of the fight against the action of Brazilian politicians who want to increase the freedom of the farmer in the use of agrochemicals.

### Text from *Pesquisa FAPESP* magazine

The opening of the article in *Pesquisa FAPESP* magazine appears on pages 18 and 19, which correspond, like the cover of the magazine, to a panoramic photo of a tractor spraying agrochemicals in a wheat crop in Rio Grande do Sul. This photo (figure 9) is composed by a tractor in the center, and contrast between the blue of the sky and the green of the wheat crop. The title and subtitle of the report (examined in subitem 2 of this article), signed by Yuri Vasconcelos, appear on the left corner of page 18, which begins the report; on the right corner of page 19 there is a graph informing the evolution of agrochemicals in Brazil.

**Figure 9 – Wheat plantation photo**



Source: *Pesquisa FAPESP* magazine, year 19, nr. 271, of sep. 2018, p. 18 and 19.

The text begins by stating that Brazil stands out as one of the great consumers of agrochemicals because it is an agricultural power. The sale of agrochemicals moves US\$ 10 billion per year, which corresponds to 20% of the global market, which is around US\$ 50 billion. The need to use agrochemicals in Brazilian crops (540,000 tons in 2017) is due a lot to the tropical climate, since there is no harsh winter capable of containing the pest cycle. According to the enunciator, the use of agrochemicals, although important for agricultural crops, causes problems for the environment and for people's health, especially in relation to the worker. To modernize Law 7802/1989, which regulates the use of agrochemicals in Brazil, it says that the Senate proposed Bill 6299/2002, which presents several modifications to the previous law. At the top of page 20, further to the left, there is a photo (figure 10) with a dark background in which militants with serious expression appear, expressing opposition and support for the bill, during the debate in the special commission of the House of Representatives in 2018. Below the photo, on the same page, in the column on the right, there is a highlighted sentence: "In Brazil, 84 thousand people suffered intoxication after exposure to agrochemicals between 2007 and 2015" (VASCONCELOS, 2018).

**Figure 10** – Demonstrations against and in favor of the pesticide use bill



Source: *Pesquisa FAPESP* magazine, year 19, nr. 271, of sep. 2018, p. 20.

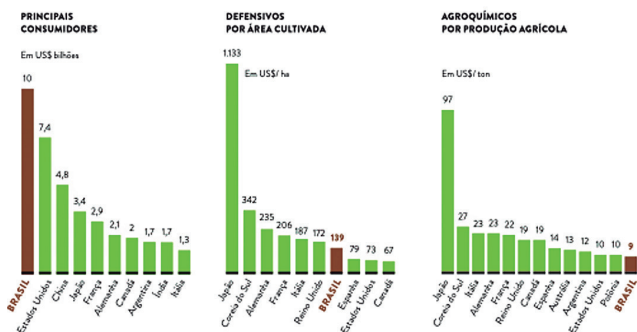
The following page presents three graphs comparing Brazil to other countries with regard to pesticide use.



**Figure 11** – Pesticide use in different countries on the planet

**PESTICIDAS NO MUNDO**

Uma comparação do uso no Brasil e nos maiores mercados globais, em 2013



Source: Pesquisa FAPESP magazine, year 19, nr. 271, of sep. 2018, p. 21.

The first subtitle of the report, “Points of disagreement”, contains four points on which Bill 6299/2002 focuses: the name of the substance used to combat agricultural pests should no longer be “agrochemical” but should be replaced by a more appropriate one; the competence for registering or vetoing an agrochemical should be solely that of the Ministry of Agriculture and not jointly with Anvisa or Ibama; the criteria for evaluating the product must take into account its toxicity (including form of use, climatic conditions during application, time of exposure to the agrochemical, among others) and not the fact that it presents carcinogenic, mutagenic (alteration of DNA) or teratogenic characteristics (fetal malformation) or hormonal alterations; the product will be automatically registered for 24 months from the beginning of the analysis by the competent authority, when it has been approved in at least three countries of the Organization for Economic Cooperation and Development (OECD). The fourth point on which the bill is focused is highlighted in a second subtitle of the report, entitled “Automatic Registration”.

In the top left corner of page 22 there is a table with the most marketed active ingredients in agrochemicals in Brazil and in the top left corner of page 23 a photo of workers applying pesticides in sugarcane fields in the interior of Rio de Janeiro.

**Figure 12** – Most used substances in pesticides

**MAIS COMERCIALIZADOS**  
Os ingredientes ativos líderes em vendas no Brasil, em 2016

SUBSTÂNCIA	O QUE É	VENDAS (em mil tons)
GLIFOSATO	herbida	185,6
2,4-D	herbida	53,4
MANCOZEBE	fungicida	33,3
⊙ ATRAZINA	herbida	28,6
⊙ ACEFATO	inseticida e acaricida	24,8
CARBENDAZIM	fungicida	13,3
DICLORETO DE PARACUATE	herbida	11,6
IMIDACLOPRIDO	neonicotinoide	9,1

⊙ Substâncias proibidas na União Europeia

Fonte: IMAFLORA

Source: Pesquisa FAPESP magazine, year 19, nr 271, of set. 2018, p. 22

**Figure 13** – Workers applying pesticides



Source: Pesquisa FAPESP magazine, year 19, nr 271, of set. 2018, p. 23

From the use of a third subtitle, “Fact or myth?”, the report questions whether Brazil is really the paradise for agrochemicals manufacturers, comparing it to other countries. Research shows that yes, Brazil uses many agrochemicals, including some that are prohibited in other countries on the planet. Environmentalists criticize the permissiveness of Brazilian legislation and are against the new bill. There is reference to the case of Monsanto, as mentioned in the report of the magazine *Super Interessante*, which had to indemnify former employee Dewayne Johnson.

It is also worth noting that at the end of the report “Agrochemicals in the spotlight”, there is reference to a research project financed by Fapesp, coordinated by Larissa Mies Bombardi (FFLCH-USP), entitled “*Brasil e União Européia – a agricultura e a dialética do uso de agrotóxicos: Diferenças, restrições e impactos das commodities brasileiras no mercado europeu*” [Brazil and the European Union - agriculture and the dialectics of agrochemical use: Differences, restrictions and impacts of Brazilian commodities on the European market] and to the book, resulting from the research, entitled “*Geografia do uso de agrotóxicos no Brasil e conexões com a União Europeia*” [Geography of agrochemical use in Brazil and connections with the European Union. In this sense, therefore, the enunciator present in the discourse attributes to the enunciation of the works produced by Larissa Bombardi the responsibility for what is informed in the text of the report.

Following the previous report there is a related one, which continues the theme with the title “Alternatives on the table” and as subtitle “Adoption of technologies based on agriculture 4.0 is the way to reduce the consumption of agrochemicals in national crops”.

According to the text, to minimize the impact to the environment of agrochemicals used in plantations, large producers are looking for solutions based on the so-called agriculture 4.0, such as sensors, intelligent machines that “talk to each other”, internet and robotization. The use of state-of-the-art technologies should allow rural producers

to apply inputs at variable rates, eliminating inappropriate practices, such as aerial spraying, the use of the backpack-type sprayer, uniform spraying, which harm man and the environment. This excerpt of the report refers to another report of the magazine, page 72, entitled “Autonomous Farming: Máquinas Agrícolas Jacto adds up to 383 patent applications and positions itself among the world pioneers in self-driving vehicles in the field”, produced by Domingos Zapparoli. One of the proposals of self-driving agricultural machines is to eliminate human contamination in the application of agrochemicals. At the top of page 25 to its half appears the photo (figure 14) of a Solintec company employee operating a computer during the sugarcane harvest.

**Figure 14** – Sugarcane harvest with 4.0 technology



**Source:** *Pesquisa FAPESP* magazine, year 19, nr. 271, of sep. 2018, p. 25.

In the lower left corner of page 26, another photo (figure 15) of a rural producer using a backpack-type sprayer to launch agrochemicals into vegetable crops; in the upper right corner of the same page, a graph (figure 16) with the proportion of pesticide use in the main crops of the country during 2017; at the top of page 27 the photo (figure 17) of a plane spraying pesticides into sugarcane plantations in São Paulo’s inland cities.

**Figure 15** – Spraying of pesticides on vegetable crops



**Source:** *Pesquisa FAPESP* magazine, year 19, nr 271, of set. 2018, p. 26.

**Figura 16** – Champion pesticides in agricultural pesticides in the country



**Source:** *Pesquisa FAPESP* magazine, year 19, nr 271, of set. 2018,p. 25

**Figura 17** – Spraying pesticide on a sugarcane plantation



**Source:** *Pesquisa FAPESP* magazine, year 19, nr 271, of set. 2018, p. 27

In this second report that continues the subject of the previous one, on page 26, a single subtitle appears, “Stimulus to agroecology”. It begins by stating that Bill 6670/16, which institutes the National Policy for the Reduction of Agrochemicals (*Política Nacional de Redução dos Agrotóxicos* – PNARA) and opposes Bill 6299/02, has been under discussion in the House of Representatives since 2016. It foresees measures to strengthen organic products production, agroecological agriculture and biological control, proposes the elimination of tax exemptions and financial incentives for the import, production and commercialization of agrochemicals. Agroecology defends sustainable management of crops, incorporating social, political, cultural, environmental and ethical issues into production. At the same time, it avoids the use of pesticides and chemical fertilizers, and stimulates the planting of organic products.

Regarding organic production, according to the text, there are divergent positions, as some sectors state that this alternative production practice is expensive and implies an increase in the cultivated area, which causes impact on the environment and forest degradation. Other sectors affirm that this is not true, since it favors the solidarity economy, prioritizes local markets and supports regional development. Finally, the report reaffirms that one of the efficient ways is to reduce poisoning on small properties and invest in the training of people, so that agrochemicals are applied with care when they are indispensable. The conclusion of the text states that this is the proposal of the *Aplique Bem* program, created by the Center for Engineering and Automation of the Agronomic Institute (CEA-IAC), in Campinas.

Unlike the previous text, the discourse of the report (or reports) of *Pesquisa FAPESP* magazine is not centered on the negative issue of Bill 6299/02 in progress in the House and Senate. Contrary to the discourse of the previous text, it seeks to highlight positive aspects in the bill and, as an alternative, presents technological development as a way to control the use of agrochemicals, which would reduce the risks that could be caused to people. At the same time, it refers to another bill, 6670/16, which has a different approach to addressing the issue, i.e., investment in agroecology.

It is also important to point out that the enunciator of the text establishes a contract with his enunciatee, which consists in ensuring the neutrality of the discourse, because nothing of what the enunciator says is explicitly assumed by this enunciatee, who always reports to researchers from Brazilian institutions that develop projects focused on agricultural issues in the country. This is a characteristic of the texts of the magazine *Pesquisa FAPESP*, which is to invest in neutrality and the scientific aspect of its content. It is not a magazine that assumes clear ideological positions, in explicit defense of a cause that is not, in its way of understanding, what science can prove or explain.

It should also be said that there is an important difference in the constitution of the enunciatee constructed by the discourses of the two magazines compared here. The one from *Super Interessante* is the young enunciatee, who looks for the magazine to keep up to date, including the public that intends to take the entrance examinations for Brazilian universities, reason why its language is simpler, more accessible to this profile of enunciatee, at the same time that does not worry about referencing its statements in scientific researches. In the case of the magazine *Pesquisa FAPESP*, the enunciatee projected in the discourse is the adult, at university level, which is why the language is more cautious and the discourse tries to build a sense of neutrality, since the statements presented must always be supported by scientific research that supports them.

## **Final considerations**

Looking at the two reports, what can be seen is that the difference between them lies exactly in the perspective from which the discourse manifested in the texts is constructed. While the report of the magazine *Super Interessante* has a tone of denunciation and protest, with a nationalist bias, marked by the colors with which it composes its photos and the graphics presented, highlighting mainly the harmful effects of Bill 6299/2002, the report of the magazine *Pesquisa FAPESP*, as we pointed out at the end of subitem 4 of this article, values the neutrality of science, supporting its statements in scientific works developed by Brazilian or international researchers.

In the text of *Super Interessante*, the established observer constructs a combative enunciator who denounces the bill that proposes less control over the use of agrochemicals in the country and addresses an enunciatee who is also supposedly engaged, young and receptive to the discourse in defense of more effective control over the use of agrochemicals in food produced by Brazilian farmers. The persuasive process initiated by the observer in order to build a perspective that intensifies the harmful effects of agrochemical use on farming is expressed in the images that accompany the text.

Since the cover of the magazine, which show a human skull with a turban topped by fruit and vegetables, in a reference to carnival and the image of Carmem Miranda, it points to the intensity of death in relation to the use of agrochemicals in food. The photos that compose the report with the verbal element are also marked by degradation, to the extent that the “toxic syrup”, referred to in the narrative that begins the text,

contaminates all food. The graphs summarize the information presented and, in all cases, also refer to the food.

The text of *Pesquisa FAPESP* magazine is also marked by an observer who directs the discourse from another perspective. Although it is also referred to food, it does not associate the agrochemical product with the death in the way the text of *Super Interessante* does. The central issue of the Fapesp magazine's report is the production of food. Considering that Brazil is one of the largest producers and exporters in the agricultural sector, it highlights the importance of using agrochemicals to increase this production and, consequently, to ensure the Brazilian agricultural market. What the discourse proposes to discuss, on the other hand, is the improper use of agrochemicals in crops. This will be the focus of the discourse, stating that there are alternatives to intelligently use the product that keeps the producer market in the country.

In this sense, therefore, the observer established in the discourse of the report, builds an enunciator who argues about the harmful effects of the misuse of agrochemicals, but aspectualizes in a soft way the use of the product. Among the values expressed in life and death, the agrochemical product is at the service of life and not the opposite. Three photos associated with the text illustrate actions that should be avoided because they cause damage. Figure 13, compared to Figure 15, points to the contamination of the worker with the product applied to the crop. In both photos, backpack-type sprayer is used, which is considered harmful, although in figure 13 the workers are more protected by the clothes they wear than in figure 15, where the farmer is completely exposed to the product. Figure 17 shows aerial spraying, capable of contaminating even more the environment and not only the individual worker.

Figure 10 in turn refers to the debate in the House of Representatives where Bill 6299/02 is discussed. What can be seen in this figure are five posters supporting the proposed law and one opposing, which reinforces the testimony of some researchers, interviewed by the reporter, who believe that Bill 6299/02 will be beneficial for the diversification and updating of agrochemicals that can be used by farmers. Figure 14 reaffirms the use of technology for the appropriate use of the product in crops.

In this article we intend to highlight the object with which we seek to discuss the question of the establishment of the observer in the discourse of scientific dissemination report, to the extent that the procedures of perspective and point of view are involved in this process, which have not been further elaborated so far by semiotic studies. At the same time, we try to insert the syncretism, in that, through what we can call a didactization procedure, the scientific disclosure reports examined in the two magazines mentioned organize two different textual procedures (the verbal and the visual) to create the final text by which the enunciator discusses his or her point of view on the object with the enunciatee.

Finally, it is important to draw attention to the fact that the photos that appear on the covers of the magazines (figures 1 and 2) have the function indicated by the editor of *Pesquisa FAPESP* magazine, Neldson Marcolin, which consists in attracting the reader to the content of the report. In the case of *Super Interessante*, the unusual

association of death with carnival is created; in the case of *Pesquisa FAPESP* magazine, the visual effect of the panoramic shot, which highlights the planting of corn as a source of production in Brazilian agriculture. In addition, Fapesp magazine uses the same visual resource in the presentation of the text of its report (figure 9), inside the magazine, when reproducing the photograph of a wheat crop, which provides the same effect of catching the reader, although the other illustrations are used to reinforce what is presented by verbal language. In the case of the magazine *Super Interessante*, in turn, the appeal to the reader appears highlighted only on the cover, because the illustrations inside the report have the sole purpose of reinforcing the information expressed by verbal language.

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CORTINA, A. Textos de divulgação científica: análise de duas reportagens sobre agrotóxicos. *Alfa*, São Paulo, v.64, 2020.

- *RESUMO: Este trabalho constrói-se com o intuito de examinar o texto de divulgação científica como um texto sincrético para verificar como os sentidos constroem-se em cada uma das reportagens, destacando ainda o conceito de observador em semiótica discursiva como responsável pela manutenção da perspectiva ou do ponto de vista do discurso. Para atingir seu objetivo, o trabalho, pelo fato de ambas as revistas se valerem da linguagem visual e da verbal para compor suas reportagens, pretende, primeiramente, verificar como seus textos selecionados para a análise criam unidade de sentido ao integrarem as duas modalidades de linguagem. Em segundo lugar, propõe examinar como a questão do agrotóxico é abordada pela reportagem da revista Super Interessante e pela da revista Pesquisa Fapesp. O que se observa nesses textos é o propósito de divulgar informações científicas de maneira mais acessível ao público a que elas se destinam. Embora os dois se valham do emprego de recursos de linguagem semelhantes, eles são utilizados de forma distinta em função da diferença de seus interlocutores, o que instaura o observador responsável pela condução do ponto de vista. A semiótica discursiva será a base teórico-metodológica para entender os mecanismos sincréticos envolvidos na constituição dos referidos textos de divulgação científica e, ao utilizá-la, procuraremos destacar suas propostas para o tratamento dos textos verbo-visuais.*
- *PALAVRAS-CHAVE: Discurso. Enunciação. Observador. Perspectiva. Ponto de Vista. Sincretismo.*

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