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DIGITAL IMAGE: BETWEEN SCIENTIFIC DISSEMINATION AND SOCIAL NETWORKS

IMAGEM DIGITAL: ENTRE DIVULGAÇÃO CIENTÍFICA E REDES SOCIAIS

IMAGE NUMÉRIQUE: ENTRE DIFFUSION SCIENTIFIQUE ET RÉSEAUX SOCIAUX

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ABSTRACT: This work aims to analyze the use of images in the scientific dissemination specifically in digital environments, seeking to understand what scientific dissemination is, to follow an approach on the role of image in this type of discourse. For such an undertaking, we take as theoretical basis the notions postulated in the framework of the digital discourse analysis, as proposed by Marie-Anne Paveau (2017), and the discourse of scientific dissemination on the media, by Patrick Charaudeau (2009). Specifically, it aims to (i) reflect on the growing integration of objects connected to our existence, focusing on the functioning of scientific dissemination - and the images it mobilizes - in a digital environment, as well as to (ii) comment on the uses of the image of scientific dissemination in the dialogue with social networks. To do so, images are examined according to the technodiscursive proposals and the iconization category, as well as from the discursive restrictions in the scope of scientific dissemination. The analyses show that, in the sphere of scientific dissemination, the phenomenon of discourse iconization is widely mobilized, both by a scientific dissemination magazine and by the digital enunciators who appropriate it, promoting uses that were not initially foreseen.
KEYWORDS: Digital discourse. Scientific dissemination. Digital image. Iconization.

RESUMO: Este trabalho tem por objetivo analisar o uso de imagens na divulgação científica especificamente em ambientes digitais, procurando compreender o que é a divulgação científica, para seguir numa abordagem sobre o papel da imagem nesse tipo de discurso. Para tal empreendimento, tomamos como base teórica as noções postuladas nos quadros da análise do discurso digital,

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conforme proposta por Marie-Anne Paveau (2017), e do discurso de divulgação científica na mídia, de Patrick Charaudeau (2009). Especificamente, objetiva-se (i) refletir sobre a integração crescente dos objetos conectados à nossa existência, focando no funcionamento da divulgação científica - e as imagens que mobiliza - em ambiente digital, bem como (ii) tecer comentários sobre os usos da imagem de divulgação científica no diálogo com as redes sociais. Para tanto, examinam-se imagens segundo as propostas tecnodiscursivas e a categoria iconização, bem como a partir das restrições discursivas no âmbito da divulgação científica. As análises evidenciam que, na esfera da divulgação científica, o fenômeno da iconização do discurso é vastamente mobilizado, tanto por uma revista de divulgação científica, quanto pelos enunciadores digitais que dela se apropriam promovendo usos não inicialmente previstos.
PALAVRAS-CHAVE: Discurso digital. Divulgação científica. Imagem digital. Iconização.

RÉSUMÉ: Ce travail vise à analyser l'utilisation d'images en diffusion scientifique spécifiquement dans les environnements numériques, en cherchant à comprendre qu'est ce que la diffusion scientifique, à suivre dans une démarche sur le rôle de l'image dans ce type de discours. Pour une telle entreprise, nous prenons comme base théorique les notions postulées dans les cadres de l'analyse du discours numérique, telle que proposée par Marie-Anne Paveau (2017), et du discours de la diffusion scientifique dans les médias, de Patrick Charaudeau (2009). Plus précisément, il vise (i) à réfléchir sur l'intégration croissante d'objets connectés à notre existence, en se concentrant sur le fonctionnement de la diffusion scientifique - et des images qu'elle mobilise - dans l'environnement numérique, ainsi que (ii) à commenter les usages de l'image de la diffusion scientifique dans le dialogue avec les réseaux sociaux. Pour cela, les images sont examinées en fonction des propositions technodiscursives et la catégorie iconisation, ainsi que des restrictions discursives dans le cadre de la diffusion scientifique. L'analyse montre que, dans le domaine de la diffusion scientifique le phénomène de l'iconisation du discours est largement mobilisé, tant par une revue de diffusion scientifique, que par des énonciateurs numériques qui se l'approprient en promouvant des usages non prévus initialement.
MOTS CLÉS: Discours numérique. Diffusion scientifique. Image numérique. Iconisation.

1 INTRODUCTION

Approaching visual discourse in a digital environment is an arduous task, since its specificities cover several aspects: from the disposition, the colors, and the mobilized forms, to issues related to the environment in which it is produced and circulated. Discuss about scientific dissemination discourses is also not a simple undertaking, if we understand that the problems involved concern the characteristics that circumscribe them, that is, the situation of communication (genre, discursive purpose, partners in the enunciative act, among others)[1].

In this article, we will reflect on the uses of the image in scientific dissemination, seeking, first, to understand what scientific dissemination is, to follow an approach on the role of the image in this type of discourse. Subsequently, we will reflect on the growing integration of connected objects to our existence (PAVEAU, 2017), focusing on the functioning of scientific dissemination - and the images it mobilizes - in a digital environment. Finally, we will comment on the uses of the image of scientific dissemination in the dialogue with social networks.

For such an undertaking, the corpus was delimited by the thematic criterion. The extracts and images considered in this text fall under the broad theme "coronavirus". This choice does not dialogue with the idea of "transforming discourses into corpus[2]", seeking to meet the growing demand for researches on the topic (PAVEAU, 2020), but it is motivated by several concerns. As individuals who live the pandemic and watch the proliferation of discourses about the virus, there is concern about how the theme is constructed verbally and visually. As researchers, based on this perception, we ask ourselves "what is the coronavirus anyway?" and, from an imagery perspective, "what is the 'true' representation of the coronavirus?", questions that arise from the contact with the flood of texts and images that daily circulate on the media.

[1] This first paragraph highlights that in this article we will not promote an in-depth study of either the digital image or the discourse of scientific dissemination, given the extent of each of the themes. Above all, we will reflect on the boundary between them, that is, the extent to which this dialogue is established.

[2] All direct quotes are freely translated by the authors.

As a methodology that met the sensitive nature of this text, we selected the verbal and the visual extracts "on the flight" (MOIRAND, 2020), that is, from our personal experiences and readings, limited here to digital contact with the analyzed materials. The "exploratory data" (*Ibidem*), which make up this small corpus, also allow us to consider the discursive parts anchored at the present time - even though this is not our main goal.

2 SCIENTIFIC DISSEMINATION: BETWEEN SCIENCE AND JOURNALISM

Based on the notion of communication contract, it is important to ponder that, throughout the discourse, considering the specific conditions of each communicational situation, there are restrictions to be observed. We will focus specifically on media scientific dissemination and, in this scenario, Charaudeau (2016) proposes four main characteristics: (i) visibility; (ii) readability; (iii) seriousness; and (iv) emotionality.

Briefly, according to Charaudeau (2016, p. 6-7), (i) visibility restriction addresses the questions of "[…] selecting only the scientific facts that will have a more or less immediate impact on the daily life of individuals"; (ii) the legibility restriction refers to the issues of the lexicon, phrase construction, as well as "texts, titles and subtitles, images, and graphics in order to allow, at the same time, a more immediate understanding"; (iii) the seriousness restriction is marked to mediate "the distance between scientific language and the understanding of an open audience"; and (iv) the emotionality restriction is marked by the search to capture the reader, in order to take "scientific research as an adventure in search of the truth". In this article, we mobilize those restrictions to reflect on the discourse of scientific dissemination in a digital environment, paying attention to the extent to which they are observed in the selected corpus.

By scientific dissemination, we understand the recontextualization of the scientific knowledge, that is, a change of context that redefines the spaces in which it circulates, the genres in which it is anchored and the interaction between the presumed enunciators. Instead of the simple 'transmission' of information from the scientific sphere, the purpose of scientific dissemination, according to Charaudeau (2016), is to "[…] make (knowledge) accessible to a large number of individuals (to disseminate and to diffuse) the results of the scientific research" (CHARAUDEAU, 2016, p. 1). It is, as the linguist explains, an aim that is both educational and citizen.

Thus, the discourses produced within the scientific field that circulate outside of it, in the journalistic field, for example, participate in discourse genres of scientific dissemination[3] and are, therefore, situated on the border between two discursive fields: the scientific and the journalistic. This overlapping of fields establishes some specificities, also in the exploration of the use of image, our focus in this text. From this definition, we infer that scientific dissemination plays a frontier role.

The scientific field is, according to Bourdieu (1997, p. 21), "[…] a social world and, as such, makes impositions, requests, etc., which are, however, relatively independent from the pressures of the global social world that surrounds it". The structure of this field is defined by the relationship of forces between the protagonists, researchers, and institutions, which aim at mastering knowledge as symbolic capital.

In turn, the journalistic field is conceived as a "[…] social system focused on the production of information about the present. All its distribution of prestige and recognition is associated with this capacity" (GOMES, 2004, p. 53). The researcher also affirms that the agents that obtain, with greater speed, quality, relevant, and exclusive information and write it in the most appropriate way define its structure.

[3] Scientific dissemination is anchored in several discursive genres, such as an essay, an article, an editorial, scientific dissemination news, scientific dissemination note, among others.

Scientific discoveries rose to prominence, according to Grillo (2013, p. 68), during the two great wars, establishing a closer relationship between scientists and journalists. During the period, also according to the researcher, "[…] the professionalization and specialization of scientific journalists was developed, and newspapers started to put full-time professionals on science subjects" (GRILLO, 2013, p. 68).

In the interim, we can establish a scale that goes from scientific discourse to journalistic discourse. In it, scientific journalists would occupy the intersection of these two discursive fields. Scientific journalism, according to Bueno (1985), "[…] is a special case of scientific dissemination. [...] It must be at the service of the interests of the community and to honor facts and information that do not harm national culture" (BUENO, 1985, p. 1420).

As Bueno (2009) points out, the evolution of scientific journalism follows the evolution of communication itself and, as a result, the researcher claims to be consolidating a new phase of Brazilian scientific journalism, "[…] which effectively signals the growth of new spaces for dissemination and for the accelerated training of press professionals and scientific communicators" (BUENO, 2009, p. 119).

One of these "new spaces for dissemination" is the Internet itself, a specific environment from which we will reflect upon the recontextualization of scientific information, focusing our analytical gaze on *Superinteressante* magazine. From there, we will observe its operation in two environments: on the official website of the magazine and on its Facebook page. Then, we will debate about the iconization of the discourse from the scientific sphere and its subsequent circulation on social networks, specifically on Instagram, focusing mainly on the appropriation that is made of it and its unprecedented uses.

3 IMAGE IN SCIENCE COMMUNICATIONS

As Barcelos, Gomes and Oliveira (2018) affirm, in a text of scientific dissemination, the image arouses the interest of the non-specialized reader, as well as it facilitates the understanding of the subject to be approached. The image, therefore, corroborates the dual purpose of scientific dissemination, established in the fine line between informing and capturing the reader (CHARAUDEAU, 2009). To reflect on this functioning, we focus on some images of the coronavirus that circulated widely on the media.

Next, we present three images of the SARS-CoV-2 coronavirus: the first (figure 1) is a black and white[4] image of the virus taken in the laboratory, collected in a scientific article; the second (figure 2) presents a "highlighted color microphotography", as the caption points, and was extracted from the online version of the *National Geographic* magazine; and the third (figure 3) is an image worked by American medical illustrators, who currently circulates in the most varied spaces around the world.

The first capture was produced in a "[…] transmission electron microscope (TEM) Tecnai 12 BioTwin™, [...] using a low dose mode and the images were captured using a 2k × 2k CCD camera mounted on the side"; the second capture was produced in an "electronic microscope"; and the third in the "software Autodesk 3ds Max" (GIAIAMO, 2020). This information reveals not only the degree of specialization for these images to be produced, but also the expected effects and the expected modes of circulation, according to the respective purposes.

Next, we present the three images mentioned:

[4] In a publication on Twitter, EHESS professor and researcher, Andre Gunthert, writes: "What color is the coronavirus? The virus is smaller than the length of the light wave. The images in this universe are necessarily gray. Photos of the virus (for not to be confused with 3D images) are colored voluntarily to better identify the details", accompanied by images of the virus. This publication dialogues directly with the purposes of this text (GUNTHERT, 2021)

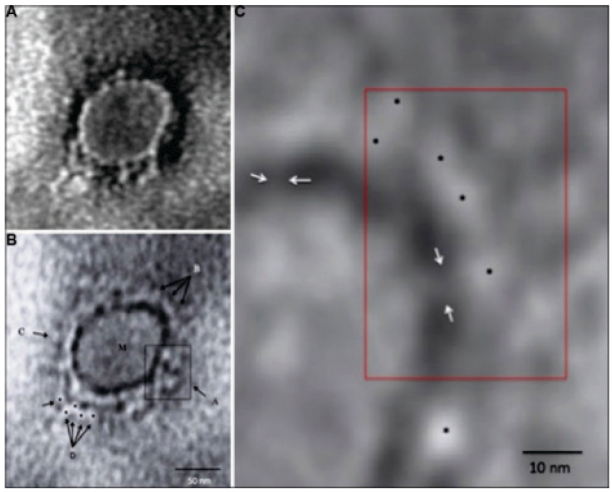

Figure 1: Microscopic image of SARS-CoV-2
Source: Prasad *et al.* (2020)

Figure 2: Microphotography of SARS-CoV-2 virus
Source: Susin (2020)

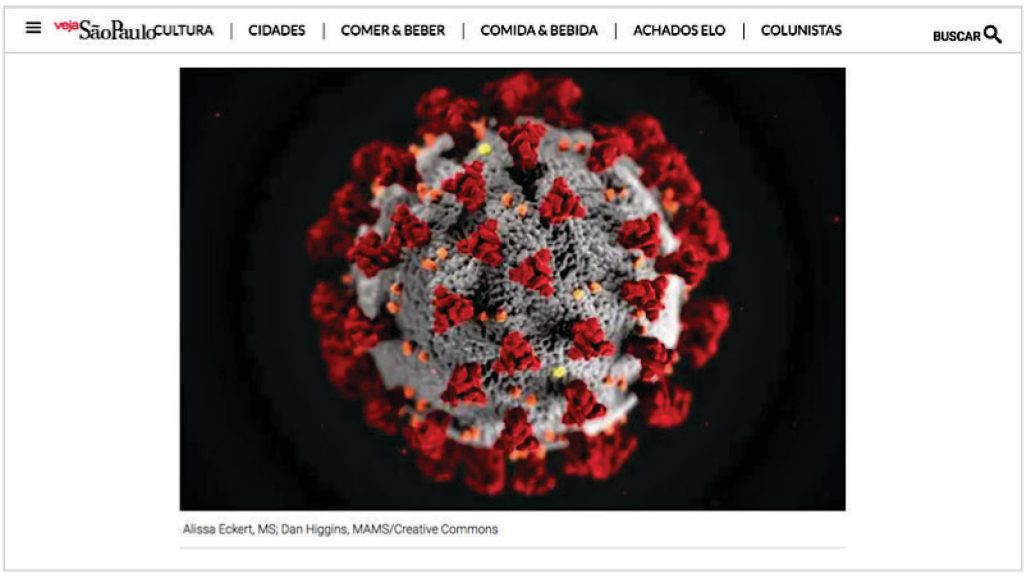

Figure 3: Graphical representation of coronavirus
Source: Redação Veja (2020)

From the images presented above, we are faced with two spheres: scientific and journalistic. The first, which is focused on research, brings the virus as it is, while the second, which is within the scope of scientific dissemination, promotes a global representation of the virus. In turn, the third, the one that most interests us, went through several editing processes, which build different effects, and make it circulate abundantly in different digital environments.

Bearing in mind that the target audience for scientific dissemination is not only formed by actors in the scientific field (professors, researchers, students, etc.) and directed only to them, "[…] scientific images are manipulated so that we can apprehend them, they have a relationship with the referent sought by the reader" (GUIRADO, 2018, p. 298). This manipulation of images aims to reach and to attract more and more readers - also for marketing reasons - a fact that also results in the choice of iconic images.

Alongside that, in a report by the American newspaper *The New York Times* (GIAIAMO, 2020) entitled and subtitled "The Spiky Blob[5] Seen Worldwide. How C.D.C medical illustrators created the coronavirus pandemic's most iconic image", medical illustrators

[5] "Until 1990, the **blob** was classified as a fungus. Its scientific name literally means 'multi-headed mold', but it is not exactly that. What intrigues scientists is that it has the structure of a fungus, but it behaves like an animal. "We don't know if he is an animal, a fungus, or something in between," the Paris Zoo president said in a note (our emphasis). (ROSSINI, 2019).

from the Centers for Disease Control and Prevention, Alissa Eckert and Dan Higgins, say they were hired to create "an identity for the virus. Something to grab the public's attention" (GIAIAMO, 2020, § 3).

In the report, the illustrator states that she "uses art to make difficult medical concepts more approachable" and, according to her, the graphic representation is "a little bit easier for people to look and to understand" (GIAIAMO, 2020, § 5), compared to photography. To produce this illustration of the coronavirus (figure 3), they took what professional medical artists call the "beauty shot, which is an individual close-up".

Eckert and Higgins also describe some of the graphic choices they made in specific image editing programs: the choice of texture, with the intention of looking like "something that you could actually touch" and the light, which was calibrated to give greater "level of realism", due to the shadows created by spikes (the tips of the virus), including help to "[…] display the gravity of the situation and draw attention" (GIAIAMO, 2020, § 11).

The focus, according to them, was on the structure of the virus, especially the protein Spike S, which is largely responsible for its rapid dissemination, as stated by infectologist Nancy Bellei. According to her, the Spike protein is "responsible for the entry of the virus into our cell, it is the one that attaches to our ACE2 receptor. This means that the antibodies produced against it are able to prevent the entry of the coronavirus, neutralizing it (ANONYMOUS, 2020)"; therefore, its protagonism at this moment.

4 SCIENTIFIC DISSEMINATION IN A DIGITAL ENVIRONMENT

In addition to traditional media, scientific dissemination has found favorable space to its purposes on the new media, notably those in the digital universe from Web 2.0. In this context, many print media vehicles have also started to present digital versions (such as newspapers, magazines, television programs, etc.), offering access possibilities from different platforms.

Superinteressante scientific magazine, for example, makes its content available on five platforms: Twitter, Facebook, Instagram, YouTube and Spotify. In them, Internet user has access to the same content from various semiosis, carried out in different digital environments. Below, we present a brief mosaic: in the center, in red, the header of *Superinteressante* magazine website, which contains the icons of social networks on the far right and, around the header, we see the respective screenshots of the profiles of the magazine in each of these networks:

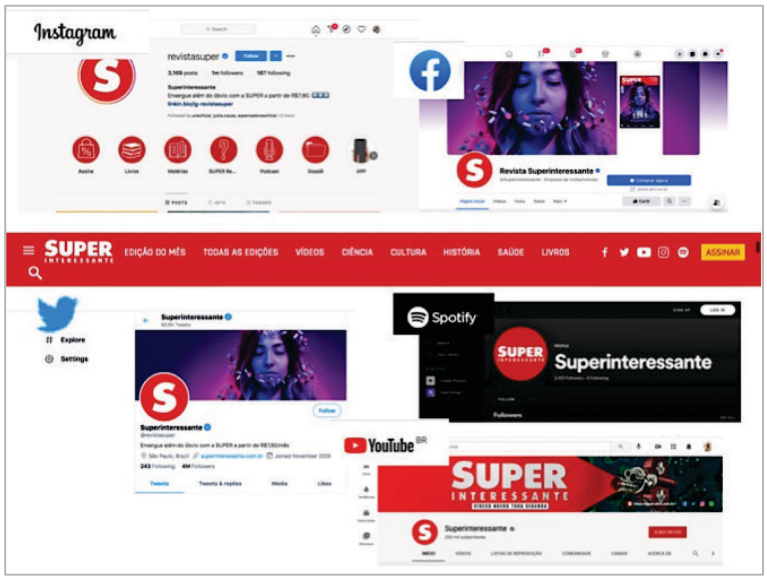

Figure 4 : Platforms explored by *Superinteressante* magazine
Source: SUPERINTERESSANTE (Facebook, Instragram, Spotify, Twitter, Youtube), 2021

Thus, we can conclude, in the wake of Siqueira (2014), that

> […] if for some time we have already known the importance of producing meanings about science [...], now we must also think about online video platforms, social networks, blogs, spaces for comments and mobile devices that provide access to them as new spaces for science dissemination.

> The circulation of scientific knowledge does not occur only in the formal space of teaching or research institutions. Like education, it takes place in several other spaces and moments: it happens in everyday life, it happens in media "products" and in a special way, in audiovisual character such as films, series and animations. Television programming, YouTube videos and other interactive spaces on the Internet are places where images of science and technology also circulate. (SIQUEIRA, 2014, p. 89)

The variety of discourses (verbal, visual, verbal-visual, audible, etc.), proposed by these new environments for interaction, also has an impact on its functionalities, as well as on enunciative roles. To understand some of those functions, we will consider a report that was published in *Superinteressante* magazine, on October 20, 2020, both on the website (figure 5) and on the magazine's Facebook (figure 6), seeking to observe some discursive specificities of each environment, presented in the following, respectively:

Figure 5 : Report from the *Superinteressante*=magazine on the website

Source: Rossini (2019)

Figure 6: Report from *Superinteressante* magazine on Facebook
Source: SUPERINTERESSANTE (Facebook), 2021

As far as *Superinteressante* is concerned, it currently has 54,725 thousand subscribers. On the website, the magazine presents itself as a "young, modern, relaxed, instigating, provocative" magazine, so that when reading it, the readwriter[6] "[…] discovers a surprising and creative world that involves a great diversity of fascinating subjects: science, history, technology, health, behavior, citizenship and environment" (PLURIABRIL, 2019). Based on the number of subscribers and the characterization presented by the company itself, the importance of this vehicle for the scientific dissemination in Brazil and its repercussion in digital media becomes evident.

In this scenario, the report published on the website offers, for example, options for sharing on social networks (a characteristic that we can observe on the icons on the left side of figure 5 - Facebook, LinkedIn, Twitter, and WhatsApp - from which Internet users are redirected to specific platforms). On the other hand, the same report published on social networks (figure 6) offers more forms of interaction, such as like (and the variations: love, laugh, being amazed, cry, get angry and more currently "strength"), share and comment.

These functionalities follow those of Facebook social network itself, characterized, for example, by non-linear reading, a process that modifies the thread of the discourse in digital universes, since

> […] the native statement (like the non-native digital statement brought online) is neither elaborated nor received according to the linearity that defines the syntagma, but contains clickable elements, which direct the readwriter from a target-wire to a source-wire, establishing a relationship between two discourses. The action of the technowords is exercised in the syntagmatic unfolding of the statement, its enunciative functioning and its semiotic materiality. (PAVEAU, 2017, p. 146)

Sharing and comments also construct specific manners of interaction and digital writing, marked by expansion, i.e., the possibility of "[…] extending writing with additions (especially comments) and facilitated circulation (sharing and reblogging)" (PAVEAU, 2017, p. 31). Furthermore, the possibilities of demonstrating feelings, through a click, are in accordance with the decisions of each readwriter if we consider that, in each environment, there are different technodiscoursive possibilities, including clickable items, which are available to the Internet user.

From a digital discourse perspective, such possibilities are aligned with the affordances theory - a set of possibilities -, which proposes a description of the objects in the production of discourses. These are the clickable possibilities that the readwriter has in each

[6] According to Paveau (2017), the readwriter is the result of the power that the hypertextual/digital reader has to decide between clicking on the hyperconnection(s) presented throughout the text, becoming, according to the linguist, also a writer of this text.

environment. As far as affordances are concerned, a study by Oliveira and Rodrigues (2006) observed that they are a "[…] combination of physical properties of the environment that are uniquely situated in relation to the (echo)system". Paveau (2012) also points out that affordance "[…] is a property of an object or characteristic of the immediate environment that indicates the relationship that the user must establish with the object, as he must use it" (PAVEAU, 2012, p. 53).

From this perspective, on *Superinteressante* magazine Facebook page it is only possible for the readwriter to comment below scientific dissemination news because there is this technological possibility imbricated with language[7]. In the same way, in Instagram's environment, other possibilities of interaction are offered, such as to enjoy; to comment; to make a post and/or a story, to send a publication to someone, to talk through messages, etc.

That been said, in social networks, scientific dissemination is achieved through the greater interaction established both between the magazine and the readers, as well as between the readers themselves. This possibility comes in the wake of the technological developments of "[…] web 2.0, social web or participatory web, which emerged in the early 2000s. It connects people and is based on multi-agent interaction" (PAVEAU, 2017, p. 15).

Regarding the images in scientific dissemination, it is not possible to verify significant differences between the use on the official website and on the social network, since the publication on Facebook is, in fact, a link (or hyperlink) that directs the Internet user to the website of the magazine and, because of this, the image used is the same. In this case, the social network works, therefore, as a diffuser of the website's content and the image remains with its traditional function in scientific dissemination: to capture the reader's attention. This hyperlink connects two discourses, a thread of the target-discourse to a thread of the source-discourse (PAVEAU, 2015).

In relation to images, although they are the same, it is necessary to consider the greater degree of autonomy that the Internet users have in social networks: on the website, actions are limited to sharing and possibly inserting some text during this process, while on social networks, images, forged within scientific dissemination, are appropriated by users, who can circulate them in unexpected and unprecedented ways, covered with new functions, occupying new formats and building new meanings, as we will see hereinafter.

5 FROM SCIENTIFIC DISSEMINATION TO SOCIAL NETWORKS

So far, we have talked about how the scientific dissemination magazines themselves work with the image, focusing in particular on *Superinteressante*. From it, we tried to establish the similarities and divergences in two environments: the official website and the Facebook page. However, there is another aspect that seems interesting to be analyzed: the use that the Internet users themselves make of the images coming from the scientific dissemination, that is, the unpredicted or unseen uses.

The image of the virus graphically worked (the "stylized" virus, in the jargon of the experts, as presented in figure 3) establishes a paradigmatic relationship - and perhaps even competition - with other possibilities of representation (the use of other colors, with some variation in formats, different textures, the disposition alongside other elements, among many other aspects). A quick search on *Google Images* for coronavirus confirms the variety cited:

[7] The affordances, however, do not imply the plastering of functions in digital environments. The hashtag features, for example, as Paveau (2017, p. 198) points out, were incorporated by Twitter developers from the suggestion of a network user.

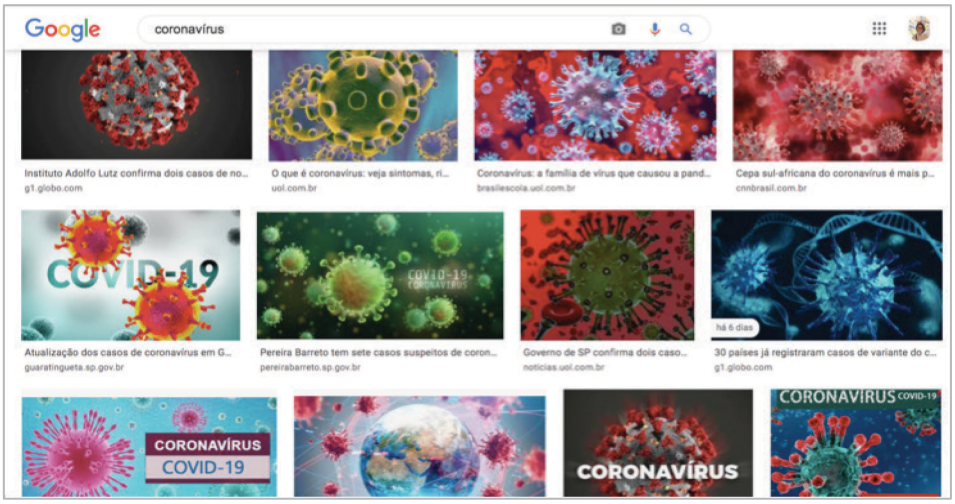

Figure 7: Search for "coronavirus" in *Google Images*
Source: Google (2020)

In its turn, when the representation reaches the status of "identity" of the virus - as the illustrators comment that this is really the objective of the graphic work they do - it starts to work in a syntagmatic relationship, that is, it is taken as the representation of the maximum approximation between the real and the visual. Thus, the image begins to circulate in many spaces (reports, interviews, opinion articles, etc.) as the "true image" capture of this microscopic organism[8].

This perception of the virus' identity is made possible through the process of iconization of its discourse, which according to the discursive Semiotics is defined as

> […] the result of a set of procedures mobilized to produce a sense of reality effect, thus appearing to be doubly conditioned by the culturally variable conception of "reality" and the realistic ideology assumed by producers and users of this or that semiotics. The referential illusion, far from being a universal phenomenon, can only be found in certain "genres" of texts, and its dosage is not only unequal, but also relative. (GREIMAS; COURTÉS, 2008, p. 251)

As Andre Gunthert (2015, P.135) states, "[…] digital writing has transformed language into information, attributing to it irreplaceable properties of conservation, reproduction or transmission", also asserting that "[…] digitalization, reducing the materiality of images, gives them new plasticity and mobility. Thus, we can affirm that the image's iconization in digital environment also occurs because in this environment it circulates with fewer restrictions, becoming more easily reproducible.

According to Paveau (2019), iconization can be defined as "[…] the use of the image that goes beyond mere illustration to become a true bearer of meaning" (PAVEAU, 2019, p. 2). In the process of digital conversion of our discursive activities, especially in social networks, iconization works as the maximum degree of representativeness, that one closest to the referent in linguistic terms.

The iconization process, besides placing the virus illustrated by Eckert and Higgins (GIAIAMO, 2020) in a hierarchical situation with other possibilities of representation, ends up transforming this microorganism into a true character of the "pandemic" narrative. This fact can be observed by the creation of proper profiles of the coronavirus in social networks, for example. Forward, we present a case extracted from Instagram through the simple search for the word "coronavirus".

In figure 8, below, the virus gains a social network profile with the name @covid19_sarscov_2 and is presented, in the space designated for it in the app, with the following text written in Spanish: "Full name: Coronavirus SARS-CoV2. I am Covid-19, also known as 'coronavirus'. I was born in the city of Wuhan, in December 2019. I am infectious, so beware!".

[8] It seems interesting for us to observe how the graphically worked image builds more "truth" and "reality" sense effects than the image captured under the microscope - which would really be the one closest to the referent.

In one of the stories fixed in this profile (figure 9), we also see informations that the virus makes available about itself, such as: "I spread myself internationally", "I come from a subfamily of positive monocatonary RNA virus belonging to the family Coronaviridae", "Currently there are vaccines against me" and "It is possible to prevent me using a mask". This information of strong scientific character establishes the profile of the social network also as a more contemporary possibility of scientific dissemination, since the facts presented are scientifically proven[9].

Following we present the images of the Instagram's profile under analysis:

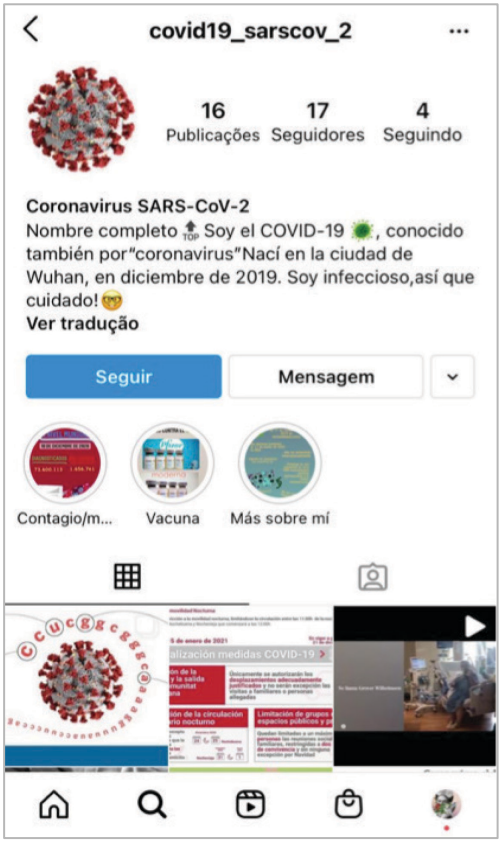

Figure 8: @covid19_sarscov_2 profile in Instagram
Source: CORONA SARS-CoV-2 (2020)

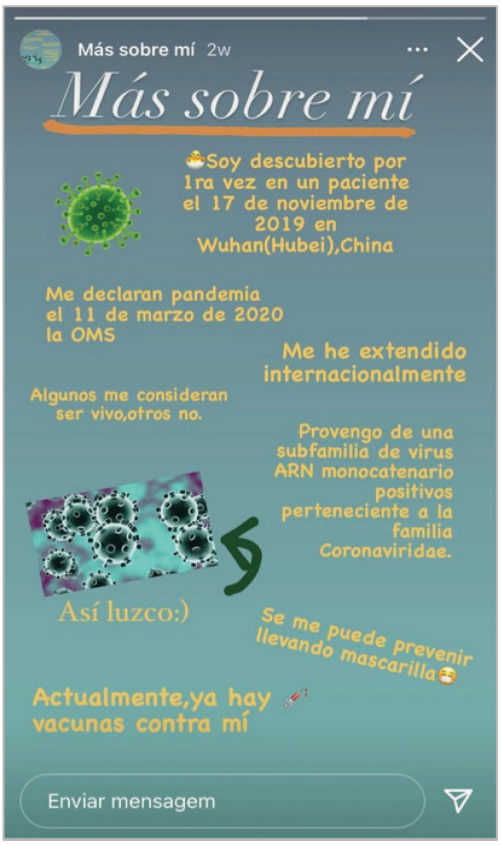

Figure 9: *Story* of the profile @covid19_sarscov_2
Source: CORONA SARS-CoV-2 (2020)

As we have seen above, this Instagram profile can also be understood as belonging to the scope of a certain scientific dissemination, because it meets the purposes proposed by Charaudeau (2016). Strongly, we see the seriousness restriction, since, although the account is not strictly scientific, it is anchored in science to enunciate: "I come from a subfamily of positive monocatonary RNA virus belonging to the family Coronaviridae", for example. Another restriction pointed out is that of readability, since it makes the discourse less complex, considering that it is directed to a wider and heterogeneous audience.

Furthermore, the choice of this account profile photo meets the visibility restriction, since the user chooses exactly the image of the virus that has become popular internationally, that is, the one that has been iconized in the sphere of digital discourse (as shown in figure 3). This use promotes greater legibility and understanding, since when confronted with this Instagram account, by iconization, the reader already infers which virus it is: Covid-19.

[9] As the following excerpt assures: "Clinical significate: *Coronavirus is a positive-sense monocatonary RNA virus* that can cause a variety of acute and chronic diseases in domestic animals, pets and humans. *In late 2019, a new coronavirus was identified in cases of viral pneumonia in Wuhan, China*. The International Committee on Virus Taxonomy (ICTV) named this new virus SARS-CoV-2. The disease caused by SARSCoV-2 is called *COVID-19*, which varies from mild forms with few or no symptoms to pneumonia and death in the most severe cases" (WGENE SARS-CoV-2, 2020, p. 1, emphasis added).

Finally, the other restriction proposed by Charaudeau (2016) is that of emotionality, which works as a discursive strategy of seeking to touch the affective side of the reader, in order to bring him/her even closer to the universe of the text in which he/she finds himself/herself along his/her hypertextual reading. This characteristic given by the perception of greater proximity is materialized, for example, in the use of the first person singular, of a more colloquial language, by the use of emojis and by the empathic alert that a way to eliminate the virus is using the mask.

In short, this Instagram profile can be understood, in a certain way, in the spectrum of scientific dissemination, since it aims to present the virus to people, to show the means to avoid it, as well as to present scientifically supported information about it. In doing so, the linguistic-discursive and iconic choices meet the restrictions of scientific dissemination discourse, as proposed by Charaudeau (2016).

6 FINAL REMARKS

Throughout our text, we sought to present how scientific dissemination is carried out in the *Superinteressante* magazine, from its website and its page on the Facebook environment. After that, we talked about the iconization of the discourse from the scientific sphere and its subsequent circulation on social networks, focusing mainly on the appropriation that is made by the Internet users and their unexpected uses. Scientific dissemination, as we have seen, is a re-contextualization of scientific discourse, with specific restrictions and purposes, as postulated by Charaudeau (2016). In this scenario, we focused on the iconization of the virus image (that is, iconization of its discourse) from the scientific sphere, the dissemination of science, passing through the uses in digital media until reaching the social networks.

If we return to the scale (cited at the beginning of this text), which ranges from a more scientific discourse to a more journalistic discourse, specifically regarding to scientific dissemination, we see the importance of inserting the role of digital media and social networks into this scale as well. These spaces of circulation also end up participating in a profane[10] scientific dissemination, so to speak.

Thus, the boundaries between scientific discourse, journalistic discourse, and social network discourse end up problematizing the boundaries between knowledge and its diffusion. Today, the virus not only has several ways of being visually constructed, but it also has profiles in social networks[11]. In this context, in the wake of Paveau (2008), we can think about the existence of a profane, popular or folk scientific dissemination.

The diversity of social places and digital environments in which the variety of forms of scientific knowledge manifest itself proves the need to understand their functioning beyond the most institutionalized spaces. As we have seen, not only scientific magazines - such as *Superinteressante* - disseminate knowledge on a given theme, but social networks have also been occupying this function, in unexpected and ludic ways - such as Instagram's profile briefly analyzed.

We agree with Paveau (2008) when she states that, from her point of view, "it is preferable to adopt a scalar view of things" (PAVEAU, 2008), which, in the specific case of this text, establishes the extreme of science (figure 1), going through the work with the scientific image (figure 2) and the more graphic and understandable elaboration (figure 3), up to the extreme of popular scientific dissemination promoted on social networks (figures 8 and 9).

These brief notes are also aligned with Vergara's (2008) statement that

[10] We anchor ourselves here in the proposals of Paveau (2008) to think about the relationship between a linguistics called scientific and another called profane or popular, developed mainly from the perception and experience.

[11] Other profiles can be easily found in Instagram itself, as well as on Facebook, for example. For the purposes and extension of this article, we have chosen not to incorporate new examples.

Due to the division of intellectual work and the high degree of specialization of current disciplines, the activity of dissemination is essential for all society [...] one of the characteristics of our time is precisely the questioning of a supposed dichotomy between the public completely devoid of knowledge and the scientist (VERGARA, 2008, p. 144).

When we are in the scientific domain, the virus appears in the lens of a microscope, while in scientific dissemination it is illustrated from an iconization of the discourse, a representation that becomes popular on a large scale. This circulation also echoes in social networks, where we briefly analyzed an Instagram account. In this social network profile, the virus is placed as enunciator, presenting itself visually from the iconization of Covid-19 virus image.

The user who proposes this profile is also placed in the sphere of scientific dissemination, once, as we have seen, it meets the restrictions and purposes of scientific dissemination discourse. In addition, although the limits between science and scientific dissemination are more salient, when it comes to the discourses produced on the web, we must keep in mind that the boundaries of scientific dissemination end up becoming more fluid, as evidenced by the various uses proposed on social networks, for example. Moreover, because, as we illustrate in this text, each hypertextual choice determines diverse ways and has certain dependence on the affordances of each environment.

In short, with our text, we sought to show how the image is popularized in the digital media and what are the strategies of scientific dissemination to make its discourse more attractive. In this sphere of communication, the phenomenon of image iconization seems to us to occur strongly, being mobilized both by scientific dissemination magazines, such as *Superinteressante*, and by the digital enunciators. That been said, the greater freedom of web 2.0 also makes it possible for science to be disseminated in the most varied environments; it is enough to surf the Internet to come across the diverse technological resources mobilized contemporaneously to promote scientific dissemination in digital media.

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