THE MEMETIZATION OF DISINFORMATION IN BOLSONARIST DISCOURSE IN TIMES OF COVID-19

A MEMETIZAÇÃO DO DISCURSO BOLSONARISTA SOBRE COMBATE À PANDEMIA DA COVID-19: DEMOCRACIA SANITÁRIA À PROVA DA DESINFORMAÇÃO

LA MEMETIZACIÓN DE LA DESINFORMACIÓN EN EL DISCURSO BOLSONARISTA EM TEMPOS DEL COVID-19

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ABSTRACT: The article discusses how internet memes act as semiotic operators of Bolsonarist discursive in the service of disinformation about combat measures for the COVID-19 pandemic in Brazil. We employ some postulates from Discourse Analysis in the inspection of memes published on social media platforms by Brazilian internet users and parliamentarians aligned with the position of the former president of Brazil, Jair Messias Bolsonaro, about the pandemic reality in the

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country. The humorous criticism of the World Health Organization(WHO) guidelines is conveyed in jocular semiotic units (memes) in three main registers: prevention, treatment, and immunization against the disease. We infer how the memefication of fake news about the virus and its lethality corroborated in the denial of the severity of a global health problem on digital social media. The Bolsonarist discourse parallel to the global scientific consensus on measures to combat the disease has become an exemplary case of the ideologization of public health in Brazil with negative repercussions for health democracy in the country.

KEYWORDS: Internet Memes, Disinformation, Covid-19, Bolsonarism, Discourse,

RESUMO: O artigo discute como memes de internet atuam como operadores semióticos da formação discursiva bolsonarista à serviço da desinformação sobre medidas de combate à pandemia da COVID-19, no Brasil. Empregamos alguns postulados da Análise do discurso na inspeção de memes publicados em redes sociais online por internautas e parlamentares brasileiros alinhados à posição do ex-presidente do Brasil, Jair Messias Bolsonaro, sobre a realidade pandêmica no país. A crítica humorística às orientações da Organização Mundial da Saúde (OMS) é veiculada em unidades semióticas jocosas (memes) em três registros principais: prevenção, tratamento e imunização contra a doença. Inferimos como a memetização de fakenews sobre o vírus e sua letalidade corroborou para a negação da gravidade de um problema público global em redes sociais digitais. O discurso bolsonarista paralelo ao consenso científico mundial sobre medidas de combate à doença se tornou um caso exemplar de ideologização da saúde pública no Brasil com repercussões danosas para a democracia sanitária no país.

PALAVRAS-CHAVE: Memes de internet. Desinformação. Covid-19. Bolsonarismo. Discurso.

RESUMEM: El artículo discute cómo los memes de internet actúan como operadores semióticos de la formación discursiva bolsonarista al servicio de la desinformación sobre las medidas para combatir la pandemia de COVID-19 en Brasil. Empleamos algunos postulados del Análisis del Discurso en la inspección de memes publicados en redes sociales en línea por internautas y parlamentarios brasileños alineados con la posición del ex presidente de Brasil, Jair Messias Bolsonaro, sobre la realidad pandémica en el país. La crítica humorística a las orientaciones de la Organización Mundial de la Salud (OMS) se transmite en unidades semióticas jocosas (memes) en tres registros principales: prevención,

tratamiento e inmunización contra la enfermedad. Inferimos cómo la memetización de noticias falsas sobre el virus y su letalidad corroboró la negación de la gravedad de un problema de salud global en redes sociales digitales. El discurso bolsonarista paralelo al consenso científico mundial sobre las medidas para combatir la enfermedad se convirtió en un caso ejemplar de ideologización de la salud pública em Brasil con repercusiones negativas para la democracia sanitaria en el país.

PALABRAS CLAVE: Memes de Internet. Desinformación. Covid-19. Bolsonarismo. Discurso.

Introduction

The COVID-19 pandemic was declared in March 2020 by the World Health Organization (WHO). Caused by the novel coronavirus (SARS-CoV-2), the disease originated in Wuhan, China, and was characterized by rapid contagion, with symptoms ranging from a common cold to severe pneumonia. Governments in various countries worldwide implemented emergency policies in an attempt to contain the health crisis. However, some of these leaders acted as allies of the SARS-CoV-2 virus by undermining the containment measures agreed upon within the WHO framework to control the spread of the disease. Additionally, these authorities, with their media-ideological apparatus (primarily social media) and their communication methods (textual, visual, audiovisual), contributed to strengthening an adversary in the fight against the health crisis: the so-called infodemic, as declared by the WHO, characterized by massive waves of misinformation about the disease and its containment measures on digital platforms.

In Brazil, former President Jair Messias Bolsonaro (2019-2022) acted as an "agitator" of misinformation about the virus, its causes, and the effects of its spread through live broadcasts on digital social networks. The role of the agitator, as noted by Blumer (1939), is to lead audiences, the public, and viewers to challenge and question their way of life, creating social unrest where it did not previously exist (Nunes, 2013). Bolsonaro's rhetoric, which ran counter to the global scientific consensus on disease mitigation measures, reverberated among his supporters and followers on social media. Our hypothesis is that this contributed to making the pandemic in the country one of the exemplary cases of the ideologization of public health globally, with devastating repercussions for national public health democracy by affecting the effectiveness of public policies addressing the global health crisis. Monteiro, Roth, and Shelley-Egan (2023) suggest that Brazil's failure in managing the pandemic during Bolsonaro's presidency was not necessarily due to a lack of public policies, competent scientists, or high-quality knowledge production, but

rather to how scientifically validated knowledge and health protocols were ignored or neglected due to political disputes. In this context, electronic social networks became a privileged locus for the dissemination of the infodemic, serving the ideological purposes of Bolsonarismo¹.

In an era characterized by the increased use of the internet, facilitated by the greater portability of electronic devices, the circulation of fraudulent information or fake news has also grown. During the coronavirus pandemic, such misinformation served to question the scientific validity of virus mitigation measures based on medical and health guidelines. The term "fake news" refers to the intentional production and mass dissemination of false information aimed at "attracting audiences, deceiving, disinforming, inducing errors, manipulating public opinion, discrediting or praising an institution or individual on a specific issue, to gain economic and political advantages" (Galhardi *et al.*, 2020, p. 4203, our translation).

What we observed in Brazil was less about expressions of anti-science from Bolsonaro supporters and more about the reproduction of alternative versions of scientific narratives regarding the characteristics, severity, and management of the health crisis. This aligns with the phenomenon of "post-truth," where the circumstances of objective facts are less influential in shaping public opinion than appeals to emotion and personal belief (Habowski; Conte; Milbradt, 2020). In this context, the mocking criticism of the scientific consensus on prevention, treatment, and immunization measures, operated by government sympathizers and in alignment with the Head of State, is performed through internet memes as part of the machinery for disseminating (and countering) misinformation about COVID-19.

The ease with which memes circulate on online social networks is largely due to their humorous nature, simple language, variety (images, videos, phrases), and lack of authorship. According to Oliveira and Porto (2023), people share them due to their relevance and their ability to provoke some form of emotional response, such as laughter or indignation. However, in a context of misinformation, these semiotic-discursive units can serve as promising vehicles for "chaos propagandists" and "prophets of deceit" (Guterman; Lowental, 2019), who are identified with the "ingroup self" (Adorno, 2015) and act to stir up discursive spaces through the normalization of alternative truths in service of ultraconservative and segregationist ideologies.

¹ We understand Bolsonarism as a pathological political and cultural phenomenon that is referenced in the discursive performance of former President of the Republic, Jair Bolsonaro, but is not limited to this, characterized by the shaking of democratic pillars of our social coexistence, acting to undermine dialogic-communicative processes in the public sphere and the free development of diverse personalities and identities in society by reinforcing prejudices and racism. In this sense, its language approaches fascist gestures without being confused with the historical phenomenon of Fascism, as warned by Lessa (2020), Gentile and Piovezani (2020), and Traverso (2016, 2017).

In this article, we discuss the connections between internet memes and farright discourse in misinformation about the coronavirus in posts by members of Bolsonaro-supporting online social networks and Brazilian lawmakers positioned in the field of radical right-wing politics, on their digital social networks. We consider these internet users and politicians as "agitators of deceit," animating social media in favor of informational chaos, thereby eclipsing the gravity of the global public health problem posed by the pandemic. Our analysis is grounded in the theoretical-methodological framework of Discourse Analysis, which understands language as a mediation between subject and reality, establishing a relationship between language and ideology (Orlandi, 2020).

Thus, part of our focus is on dissecting the scientific epistemic narrative proposed by Jair Bolsonaro in the discourse of his supporters regarding the pandemic and the measures for its containment, and its connections with the discursive formation of the far right through internet memes. To this end, we employed methodological procedures including the comparison and inspection of a set of memes under the hashtag #BolsonaroTemRazao on the social network X (formerly Twitter), reproduced by parliamentarians aligned with Bolsonarism, as well as those circulated in Bolsonarist groups on WhatsApp ("Brasil Bolsonarista" and "Patriotas de Direita") and Telegram (the official group of President Bolsonaro, "Canal Direita da Opressão" and "Direita Realista"), published between 2020 and 2021.

The criteria for selecting these social media channels were based on the accessibility to virtual communities formed by supporters of the former president in the first case, and the second field was focused on the pages of politicians aligned with Bolsonarism. Both in the groups and on the pages of political figures, the selected posts featured: markers of the discursive genre of memes, according to Díaz (2013), Shifman (2014), and Chagas (2020), and referred to the semantic axes established for analyzing the Bolsonarist approach to sanitary measures against COVID-19, namely prevention, treatment, and immunization. Our analysis was based on a total of 13 meme pieces, aiming to critique the threats to the democratic potential of the digital public sphere, replete with normative ideals, from the observation of the institutional (deontological/ethical) and praxeological universe in online networks aligned with Bolsonarism. We observed, thus, the discursive practice of misinformation that contravenes moral and normative ideals of freedom of expression in democracies², at a critical moment for global public health, where scientists and health experts identified information as one of the most effective weapons against the spread of the novel coronavirus.

² We are inspired here by the reconstructive methodological model of social criticism presented by Honneth (2013).

his text is organized into three parts. In the first section, we discuss two phenomena typical of the "post-truth era" that have recently become prominent in the public sphere: epistemic self-referentiality as absolute truth and the discrediting of consensual science. In the first case, we observed a disregard for the deontology of communication, such as checking reliable sources of information before publishing, and in the second, a compulsory denial of knowledge derived from expert systems, without justifiable arguments, based on findings from scientific research. We infer that these two events contributed to the politicization of public health during the COVID-19 crisis in Brazil, under the government of Jair Messias Bolsonaro, a radical right-wing populist, through discursive-media strategies. In the second section, we contextualize internet memes as multimodal digital devices that have become a language of online communication, carrying persuasive discursive potential.

From this perspective, we explore internet memes used in the political sphere (also known as political memes) and how they are employed to propagate values and ideas, including for the purpose of misinformation. In the final section, we analyze the Bolsonarist discourse conveyed through memes collected from online groups and pages of supporters of former President Jair Bolsonaro. We discuss the propagation of the Bolsonarist discursive formation through these jocular semiotic devices during the pandemic and their connections with misinformation about the consensual scientific discourse delivered by health institutions on a global scale. Finally, we present our conclusions regarding our research findings.

Bolsonarist Agitation on Digital Social Networks: Misinformation and Discrediting of Consensual Science in Pandemic Times

The proliferation of groups on online social networks represents a contemporary communicational and political phenomenon with significant impacts on ways of interacting, relating, informing, and forming opinions, leading to redesigns of the public sphere as an informational agora. In this regard, Habermas (2022) discusses that, as a locus of political integration for citizens of the state, the public sphere ensures the continuity of the democratic collective entity. However, it loses its ethical-normative vigor, based on deliberation, when colonized by misinformation allied with symbolic violence that escapes the deontological principles governing ethically responsible communication.

The pollution of the digital public sphere by false news undermines social media as a reliable place for investigating information on public issues and the doubts they generate, thereby contributing to the weakening of democracy as a form of government and way of life (Dewey, 1927; Voirol, 2017).

Habermas (2022) notes that we are witnessing a new structural change in the public sphere, characterized by a semi-public, fragmented, and self-referential mode of communication that manifests widely on digitized social networks, with significant implications for the reliability of the content transmitted. The proliferation of self-referential informational content solely based on the beliefs of its issuer on social media, without fact-checking or deontological concerns, threatens the clarifying potential of the public sphere, leading to a loss of dialogic (Habermas, 1989, 2020) and investigative-educational (Dewey, 1950) potential in communicative processes, with substantial implications for the development of critical capacities of social actors (Boltanski, 2015; Boltanski, Thevenot, 2007).

According to Dewey (1950), investigative logic, whether employed by scientists or ordinary citizens, is typically activated when faced with uncertainties, risks, or disruptions to the normal order of life we are accustomed to experiencing. Its purpose is to lead us toward an understanding of what is happening so that we can adopt behaviors and attitudes aimed at resolving the issue. However, the promising investigative reasoning for the democratic resolution of public problems relies on access to elucidative sources for addressing these issues and faces one of its greatest challenges in times of post-truth, characterized by widespread skepticism toward political and democratic institutions (Fernandes *et al.*, 2020).

We infer that two phenomena of the post-truth era have recently become prominent in the public sphere: epistemic self-referentiality as absolute truth, which relates to the phenomenon of discrediting consensual science in official expert forums (Collins, Evans, 2010), and the disregard for the deontology of communication, with numerous cases documented in various studies within the context of sanitary campaigns for prevention, treatment, and vaccination during the COVID-19 pandemic, including in Brazil. This, in turn, has contributed to the anti-vaccine movement against COVID-19^[1], resulting in the politicization of public health (Moutinho, 2020), particularly in countries governed by radical right-wing populists, where the dissemination of false news aligns with the discrediting of expert systems (science) and sanitary institutions.

The relationship between the far-right and anti-science thinking was previously identified by Adorno (2019) when discussing the expressiveness of authoritarian personality in the context of post-World War II America. Among the traits characterizing the authoritarian persona were anti-intellectualism and anti-scientific attitudes. The authors found a strong incidence among subjects of explanations for objective phenomena through pseudoscientific or even anti-scientific formulations, displaying incompleteness, denials, or excessive simplifications of aspects of reality. According to the author:

High scorers [on the fascist scale], in general, lack the ability to question information provided in a ready, dichotomous, and simplified manner, which constitutes a defense against the discovery of modifications in the rigidly perceived exteriority and against the perception of weaknesses in oneself. Therefore, their explanations for objective phenomena tend to be pseudoscientific or even anti-scientific, exhibiting incompleteness or excessive simplifications of aspects of reality (Adorno, 2019, p. 58, our translation).

In the current global political climate marked by the rise of extreme-right populism, we encounter gestures, ultraconservative mindsets, and the use of fascist rhetoric (Piovezani, 2021, Piovezani, Gentile, 2020) that contextualize affinities between egocentric attitudes and a propensity for disinformation in the form of fake news. These are disseminated by media figures we refer to as "prophets of deceit," using the terminology of Guterman and Lowental (2019), who described the phenomenon of "fascist agitation" in their research on the rise of antisemitism in the early 20th century in the United States. Considering such agitation during the pandemic times means recognizing its harmful impacts on health clarification campaigns, contributing to insecurity in line with the normalization of ultraconservative and segregationist ideologies (Oliveira; Gomes, 2019).

Disinformation, beyond contributing to the erosion of democracy, serves the public poorly, particularly in critical health situations where human lives are at stake. Merton (1977) warned that the production of impersonal and reliable scientific knowledge is only possible in democratic regimes. The author argues that political judgments about scientific theories and subsequent interference in their legitimization are contrary to the evaluative sphere of scientific activity. We do not assert that science is beyond contestation, as scientific knowledge inherently carries undeniable ambiguity (Bauman, 1999). However, as Beck (2011) confirms, in the past, only science spoke to society, but recent modern reflexivity has allowed society to also speak to science.

This is not about disbelief or disregard for the scientific institution, but rather because we need it, which makes it a subject of public interest and controversy. Science can be verified, especially in the face of conflicting information about controversial technoscientific artifacts, such as medications and vaccines, whose public credibility is influenced by various factors, including personal experiences, social networks, trust in authorities (Carrion, 2018), and, in the case of anti-vaccination beliefs, studies suggest the relevance of considering cognitive bases such as confirmation bias and intuitive thinking (Lindeman; Svedholm-Häkkinen; Riekki, 2022). However, the debate over the relevance of a particular knowledge or medication for preventive and therapeutic purposes requires evidence and rational discussion among actors with scientific expertise, at the technical level or, at the very least, scientific

literacy, meaning audiences capable of discerning between legitimate doubts about the efficacy of treatments and vaccines and political-ideological speculation about health risks produced by technoscience.

In the period of uncertainty caused by the COVID-19 pandemic, we observed media agitators of deceit who leveraged the electronic infrastructure of online networks to spread disinformation and undermine the adoption of sanitary measures against the virus. Studies have shown that the presence of a link and/or source validating a message, even if false, can evoke credibility among digital platform users, particularly those in vulnerable situations (Bapaye; Bapaye, 2021). Brown, Keefer, and McGrew (2019) have found that situational factors influence the receptiveness to misleading information, as different circumstances can affect individual's willingness to accept or believe in messages that may be nonsensical or fraudulent yet appear plausible. The authors identify factors such as the context's complexity, the information source's perceived authority, the information's alignment with individuals' pre-existing beliefs or desires, and people's motivation and cognitive capacity as mediating elements in the influence of these situational factors.

Oro and Alves (2020) argue that former President Jair Bolsonaro's actions during the first year of the pandemic in 2020 were based on relationships and alliances with certain Pentecostal evangelical leaders who resisted the consensus scientific arguments about the coronavirus in Brazil. The researchers identified symbolic logic and practices that politicized the pandemic, manifested in a governance approach that promoted scientific denialism advocated by the World Health Organization (WHO) by naturalizing the virus, viewing "science as pessimism, media as the driver of collective panic, care as unnecessary, and the disease as 'something from outside'" (Oro; Alves, 2020, p. 141, our translation).

Thus, Bolsonaro's supporters used digital social networks to attack health and scientific authorities, delegitimizing social isolation and promoting the use of medications that have no proven efficacy against the coronavirus, such as chloroquine and hydroxychloroquine (Bárbara, 2020). This rhetoric found resonance among his supporters. In his live streams and interviews, as well as through his digital channels, Bolsonaro promoted these medications (Ricard; Medeiros, 2020). However, according to the WHO and renowned scientists, there was no scientific evidence that the substance was effective in treating the virus, nor any other existing drug, beverage, food, or vaccine (Júnior *et al.*, 2020).

We thus conceive that Bolsonaro's consensus anti-science narrative against SARS-CoV-2 isolation protocols benefits from recent attacks on the institutions that safeguard our democratic regime and from the open virtual communicative space provided by social media, which accommodates multiple voices and perspectives, including those of disinformation agitators. Their actions contribute to levels of

reflexivity (individual, interpersonal, and collective) that manifest in behaviors either favorable or unfavorable to disease treatments and vaccinations³.

The reflexivity, on different scales, of COVID-19 vaccine skepticism facilitated by online Bolsonaro agitation, resonates, in our view, with the distortion of public opinion formed through the propagation and consumption of fallacious information about the pandemic. This fosters the formation of counter-publics animated by opposition to the science endorsed by the WHO. In this sense, we draw attention to the use of internet memes by Bolsonaro's agitators as effective discursive tools for disseminating misleading messages about prevention, treatment, and vaccination against COVID-19 on social media platforms that gather followers of former President Jair Bolsonaro.

The Memeification of Health Policy on Social Media: A Tool for Satirical Critique of COVID-19 Containment

The term "meme" was coined by biologist Richard Dawkins in 1976 in his book *The Selfish Gene* (2006), where he used the word to describe what he called a "cultural gene." The term "meme" is actually a shortening of "mimeme," a Greek word related to the concept of imitation. Analogous to genes, memes are replicable cultural units shared among individuals and then passed on. In Dawkins' conception, ideas, music, poetry, art, fashion, and even religious perspectives are considered memes. Thus, they are commonly compared to viral agents (Brodie, 2009; Mejia, 2022) because they are replicable agents that require a host to reproduce (Buchel, 2012). Unlike genes, however, memes propagate at a significantly higher speed and in a horizontal manner, being shared among peers through imitation (Buchel, 2012).

However, internet memes can be considered one of the products of the popularization of internet access during the late 1990s and early 2000s. Over the past decades, they have become phenomena of online communication, being predominant objects in an era where media is notably more participatory (Milner, 2020). However, this more inclusive nature of digital media, compared to traditional media, does not necessarily equate to greater democratization of the public sphere, particularly because the content circulating on these networks is less regulated and more susceptible to deontological deviations (Habermas, 2022). As Orlandi (2013, p. 9, author's italics, our translation) points out, "a new discursive materiality emerges to talk about reality and a new reality arises."

³ Numerato, Vochocová, Štětka, and Macková (2019) examine the various dimensions of reflexivity present in discussions about vaccination on social media. These include individual reflexivity, where users reassess their own beliefs and decisions in response to information they encounter; interpersonal reflexivity, which involves the exchange of information and experiences among users; and collective reflexivity, which manifests itself in social movements and online campaigns related to vaccination.

Generally associated with humorous images, internet memes can take various forms: gifs, catchphrases, hashtags, images, or videos. In this research, we adopt a concept of internet memes based on Díaz (2013) and Shifman (2014), understood as units of information sharing common content and/or format. They are virtually shared among online communities and may undergo transformations or remixing in the process. They can arise or be intentionally created, and they have a very rapid reach, spreading swiftly. It is worth noting that they are not necessarily humorous (Freire, 2016). There are different ways to use humor to communicate, including irony, sarcasm, satire, self-deprecation, or provocation (Martin, 2007), which can be employed for critique.

Werneck (2015) noted that a critique will unfold in many different ways depending on the intensity with which it is made. When employed as a joke, the critic's dissatisfaction is still present in the critique, but the criticized party does not feel attacked. In this sense, humor, due to its strictly symbolic nature, "is not afraid of the reactions of others and, therefore, one can say whatever one wants" (Werneck, 2015, p. 199, our translation). In the case of memes, it is interesting to note how this humorous peculiarity opens a door for these digital objects to perform critique, convey ideas, thoughts, or discourses in a simple and easily understandable manner. Additionally, as mentioned earlier, other factors contribute to their communicational process: their simplicity, intertextuality, and context.

Let us begin with simplicity: the language of a meme must be easily understood by the audience to ensure that its effect is assimilated by the user (Mejia, 2022). Shifman (2014) further emphasizes that it is this simplicity that allows its content to be more readily copied and altered by the online community. Next, we have intertextuality, which pertains to referencing other events (or texts, films, novels, songs, games, etc.) that have occurred, either implicitly or explicitly. Nunes (2020) asserts that while it is not necessary to know the entire trajectory of a meme, it is important to recognize that memes are part of a practical community and should be analyzed in a way that identifies their relationship with surrounding elements. This brings us to the contextual realm in which the meme was created and shared. Bergson once stated that humor can cause a certain estrangement if one is not part of the cultural milieu from which it originates (Sola-Morales, 2020). Similarly, Werneck and Loretti (2018) argue that a critique is only understood if it makes sense, both in its moral and contextual aspects. Therefore, to better understand the discourse conveyed in a meme, it is necessary to know the context of its creation and circulation, because "without the political, economic, and social context of its production, they lose their meaning and effectiveness [...]. Their meaning is nothing more than the situational context and the actors they reference." (Mercado; Scargiali, 2020, p. 282, our translation).

When we understand the elements that contribute to the communicative viability of memes, we see how they invite users to interact with and share their content. This set of factors elevates memes beyond the online realm, allowing them to have effects in offline contexts. They impact how we view the world and shape our perspectives (Fielitz; Ahmed, 2021). As Damasceno (2020, p. 133) expresses, "it is the memetic narratives, embedded with speed, simplicity, and virality, that constitute formative powers in the dissemination of information." Therefore, "perceiving the meme in its communicative and interactive conception in cyberspace, with the power to influence behaviors and give visibility to ideas, values, and conduct, elevates the dimensions of its sociocultural understanding" (Eleutério *et al.*, 2021, p. 9, our translation).

Given the level of popularity memes have gained in recent years, these discursive units have also become the focus of research regarding their influence and meaning, especially within political spheres through their circulation in digital media (Shifman, 2014; Freire, 2016; Medina, Garcia, Martínez, 2021; Chagas, 2020). From this, we can identify a process in which memes track the changes and transformations in digital technologies.

Medina, Garcia, and Martínez (2021) recall that the relationship between political communication, media, and humor dates back to the earliest informational media directed at the public. Caricature, for example, emerged as a means of expression that combined information with popular art, leveraging the reader's imagination to deliver political critique since the 18th century. The media system, until the end of the 20th century, was essentially linked to cultural, business, and journalistic elites; however, it has now opened up space for other actors to engage in public debates (Miskolci, 2023).

Uzeda, Ferreira, and Silva Jr. (2021) note that there has never been such a high level of interdependence between humans and technology. The essential nature of information and communication technologies (ICTs) for daily activities has transformed them into a "second nature." Similarly, the authors highlight that the popularity and portability of digital technologies have promoted an exponential increase in the acquisition, transmission, and discussion of information. Thus, a "new media ecology has been able to mediatize public opinion in its ways of obtaining information, making decisions, and acting" (Miskolci, 2023, p. 18, our translation). Consequently, the perception of political participation has expanded to include common practices such as commenting on blogs or sharing posts (Shifman, 2014).

We see that memes, from this perspective, are objects that permeate this new socio-cultural political system. On the one hand, they can serve as a form of political participation and individual expression of citizenship, and on the other, as a means of propagating the values of a political leader. According to Shifman (2014), memes

can operate as (i) tools of persuasion or political advocacy; (ii) popular action; and/ or (iii) modes of popular expression and discussion. For example, the hashtags #EleNão or #ForaTemer both qualify as internet memes and are, effectively, forms of political expression. Thus, it is essential to recognize that memes matter because they are characteristic elements of the digital age and represent a new way of "doing politics." After all, "politics is also related to the demands of different interest groups for representation, that is, to the accumulated symbolic relations arising from the procedures of articulating private entities in the public sphere and their effects" (Freire, 2016, p. 37, our translation).

Research indicates that the use of digital social networks is a strategy employed by populist leaders, allowing them to mobilize followers and serve as a communication medium for their audience, offering a way to influence more people (Recuero; Soares, 2022). According to Fielitz and Ahmed (2021), this is a tactic often used by the far-right in our digitized societies because a successful political movement needs to be entertaining, i.e., it must be engaging, reference elements of popular culture, and be participatory. In this sense, internet memes become perfect tools for far-right groups in terms of collaboration and communication, as they exploit the vulnerabilities of the journalistic media ecosystem to increase the visibility of their messages and audience (Marwick; Lewis, 2017, our translation).

As media content, memes can disseminate persuasive messages in an attempt to convince the masses and incite them to political action. With rhetoric that highlights certain aspects of a candidate, movement, or cause, they seek to synthesize positive points or satirize negative ones, consolidating their theoretical proposal through metaphor (Chagas, 2020, p. 239, our translation).

Thus, they present themselves as creative epistemic units, expressing ideas in an effective and concise manner, easily understood by those familiar with the concepts they convey (Buchel, 2012). In the case of the COVID-19 pandemic, we are interested in exploring this semiotic object from the perspective of disinformation⁴ aimed at discrediting consensual science. In this study, we understand disinformation as a "phenomenon based on the sharing of false content to influence public discourse" (Recuero; Soares, 2022, p. 75, our translation), which can take on different formats and languages.

⁴ It is also important to highlight that internet memes were also used to counter fake news, ridiculing those who shared speeches and positions inspired by former president Jair Bolsonaro, such as "whoever gets vaccinated will turn into an alligator".

The Memetization of Disinformation about the COVID-19 Pandemic and Its Connections with Bolsonarist Discursive Formation

To fulfill the purposes of this article, we initiated a search for memes related to the COVID-19 pandemic on the social network platform X, focusing on pages belonging to radical right-wing politicians and Bolsonarist groups. The search was conducted using keywords such as COVID-19, pandemic, chloroquine, science, social isolation, vaccine, and medication. The comparison of significant semantic markers within the anti-science discourse (including text messages, audio, GIFs, memes, and images) was of great interest for discussing their affinity with the "farright discursive formation" concerning the pandemic.

In terms of data organization and interpretation, we employed the method of Discourse Analysis, which serves as a methodology for investigating the power relations among observed subjects. This method conceives language as a necessary mediation between humans and natural and social reality (Orlandi, 2020), understanding that mediation is expressed through discourse. Such discursive practices contain mechanisms of domination intrinsic to language (Cappelle *et al.*, 2003), because discourse is one of the pillars that generates meaning in a text, where the enunciating subject becomes present and externalizes their socio-historical context and a social semiosis, involving ideological and power registers that constitute a discursive formation that (re)produces regimes of truth (Gregolin, 1995).

Moreover, this method seeks to understand how communicational flows were produced, exploring the entire social and historical context. It thus refers to the study of the articulation between language and ideology. The latter materializes through discourse, which, in turn, is traversed by socio-historical issues—implying that meanings are necessarily ideologically referenced. Additionally, "Discourse Analysis acknowledges the existence of different languages, seeking to understand how they function" (Bortolin; Fernandes, 2017, p. 89, our translation), for "it is within the heterogeneous set of different languages that man signifies" (Orlandi, 1995, p. 40, our translation).

By leveraging Discourse Analysis (DA) (Orlandi, 2013; 2020) as a method for processing and interpreting the data compared, we focused on memes illustrative of the Bolsonarist discourse regarding measures to combat the COVID-19 pandemic. The collected material was divided into two groups: Group A (9) refers to those mapped within Facebook groups of supporters of former President Jair Bolsonaro, and Group B (4) includes material taken from the X (Twitter) pages of parliamentarians aligned with Bolsonarism, covering the period between 2020 and 2021.

Given this, we propose to analyze memes as a playful-critical discursive genre, often infused with mockery, aiming to identify the intertextual elements that reference preventive, therapeutic, and immunizing measures against COVID-19 in social networks active among Bolsonarists.

Memes about Coronavirus Prevention

In the prevention category, one of the materials found in the Bolsonarist groups (Group A) studied evokes the following widely shared news item on Bolsonarist sites: "UFPE professor debunks the lockdown fallacy and exposes the dangers of social isolation." Upon reading the published text, which is hosted on the "Direita.Tv" portal, it is asserted that measures such as lockdowns and social isolation pose dangers to society, claiming that this policy model tends to increase the number of deaths. The "alternative" science, postulated by a higher education professor, is mobilized to legitimize criticism of preventive measures against the spread of the virus.



Chart 1: Memes about Coronavirus Prevention

Figures 1, 2 and 3 – #BonsolnaroTemRazao on social network X. Source: Screenshot;

Figures 1 to 3 are posts made by parliamentarians Carla Zambelli (PL), Flávio Bolsonaro (PL), and Eduardo Bolsonaro (PL) (Group B), featuring the meme #BolsonaroTemRazao, used to reference the socioeconomic implications of adopting preventive measures against COVID-19, such as social isolation. The hashtag had been used previously but saw significant activity on March 25, 2020, following a speech⁵ by then-President Jair Bolsonaro calling for an end to what he termed "mass

⁵ CanalGov. Official Statement by the President of the Republic, Jair Bolsonaro. Youtube. Broadcast live on March 24, 2020. Available at: https://www.youtube.com/live/VWsDcYK4STw?si=SfoZ9Ef2zVv0U-5V. Accessed on: August 8,2024.

confinement" and for the reopening of businesses, becoming the top trending topic on the social network X (formerly Twitter). Netizens promptly took to X to express their support for the leader⁶.

In the cases above, the impact on workers' income who adhere to quarantine and stay at home to protect their health and that of the community is emphasized. By using expressions like "And now, lockdown advocates?" and "Stay at home, Globo will pay your bills at the end of the month," we see a critique, through the use of sarcasm, against social isolation. In the posts by Carla Zambelli and Eduardo Bolsonaro, both present headlines that support their stance against quarantine, indicating that the measure had more negative than positive consequences, such as unemployment and hunger versus the virus's spread. In this sense, there is a critique from the openly Bolsonarist parliamentarians, who directly attack the republican conception of health as a common good that must be preserved and guaranteed to all, regardless of economic losses. This stance reveals the neoliberal imperative that rests on maximizing individuals' efforts in producing goods and services, even if it comes at the cost of well-being and mental or physical health (Dardot; Laval, 2016).

The highlighted posts echo the Bolsonarist discursive agitation during the pandemic, where measures like lockdowns and social isolation are pointed out as dangerous for society, asserting that this policy model would even tend to increase the number of deaths. However, none of the above statements provide scientific data to support the discourse advocating the boycott of containment measures recommended by the scientific community to prevent the spread of the disease. Additionally, it is noteworthy that a communication outlet without public recognition is being used to validate denialist narratives about the severity of virus transmission (Souza, 2020).

Considering the use of the hashtag #BolsonaroTemRazao and how it reinforces a position of loyalty to the former president, hashtags play a strategic role in discursive transmission by allowing readers to interconnect through the grouping of posts that, in turn, contain personal experiences, thereby consolidating them as a form of propaganda or incitement (Chagas, 2020; Araujo; Oliveira, 2020).

Matos (2020), drawing from the Ministry of Health's database on false news related to the pandemic, highlights that in Bolsonarist digital social networks, when the use of face masks was mentioned, there were simultaneous discursive practices asserting that the masks were of poor quality or already contaminated if they were from China. The same occurred with the use of hand sanitizer, as the author reports that it was possible to verify statements such as: "Hand sanitizer is the same as nothing" and "Using hand sanitizer to prevent coronavirus alters breathalyzer tests at

⁶ Poder360. Internet users engage in battle of narratives after Bolsonaro's speech. Youtube. March 25, 2020. Available at: https://www.poder360.com.br/midia/internautas-travam-batalha-de-narrativas-apos-pronunciamento-de-bolsonaro/. Accessed on: August 8, 2024.

checkpoints" (Matos, 2020, p. 80, our translation). Additionally, the author also noted the prevalence of false news and misguided recommendations for hot drinks and medicinal teas against the virus, primarily based on traditional popular knowledge disseminated among common sense, aiming to prevent infection or even alleviate symptoms in case of illness. However, as the researcher himself observes, in line with what was clarified by the Ministry of Health (MS) (Matos, 2020, p. 81), no therapeutic resource has been proven effective in preventing coronavirus infection, whether it be a substance, medication, vitamin, or specific food. At the time, the online newspaper *Estadão*, on March 31, 2020, fact-checked and discredited the MS itself, which had published false information on its website claiming that hot lemon tea with baking soda had the potential to cure the coronavirus⁷.

Building on this same foundation, Neto (2021) found that misinformation surrounding the use of Natural Products during the COVID-19 pandemic was one of the most discussed topics when it came to fake news. As the author states, the expansion of treatment with herbal medicines⁸ is based on the idea that "natural remedies do no harm" (Neto, 2021, p. 10, our translation). Thus, the use of garlic, boldo, fennel, *jambu*, and even essential oils was some of the empirical evidence found regarding coronavirus prevention, but these did not present promising and efficient results in scientific studies for their use (Neto, 2021).

Memes about coronavirus treatment

In this section, news promoting the use of hydroxychloroquine for infected patients stands out. For instance, the following headline was published in the Telegram group "Canal Direita da Opressão": "Facebook admits it 'made a mistake' by censoring hydroxychloroquine." In its content, the author of the post claims that the social network revised its policy on what it considers misinformation and, in addition, cited scientific sources to defend the use of the drug, such as databases from the United States and the University of Texas, where a professor is mentioned to discuss the possibilities of chloroquine as a form of early treatment. Once again, we see the citation of experts in fake news to lend credibility to arguments put forth by those denying the scientific consensus held by the international community of experts (Souza, 2020).

Hot lemon tea with baking soda cures coronavirus. 04/03/2020. Available at: https://www.saude.gov.br/fakenews/46652-cha-de-limaocom-bicarbonato-quente-cura-coronavirus-e-fakenews. Accessed on: May 10, 2020.

According to the Ministry of Health, herbal medicines are those obtained with the exclusive use of active plant raw materials, whose safety and efficacy are based on clinical evidence and characterized by the stability of their quality. RESOLUTION OF THE COLLEGIATE BOARD - RDC No. 26, MAY 13, 2014. (Brasil, 2014).

Chart 2: Memes about Coronavirus Treatment



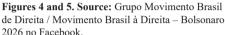




Figure 6. Source: #BonsolnaroTemRazao no X.

In Chart 2, we have compiled memes that strongly advocate the use of chloroquine and nitazoxanide as effective and inexpensive medications for treating the disease caused by COVID-19. In Fig. 4, the meme promotes nitazoxanide as a drug capable of combating the coronavirus. At the bottom of the image, the phrase "Against the Chinese plague" is displayed in uppercase, presumably to draw attention, and in red, the color of the Chinese flag. Thus, we can observe not only the promotion of a drug that was refuted by the Ministry of Health (MS) but also the blaming of a nation for the creation and spread of the virus.

In Fig. 5, there is a defense of hydroxychloroquine; the meme uses a testimonial about the drug's efficacy against the virus and includes the phrase "Why is PT against saving lives?" in uppercase, used to question the supposed lack of promotion of the drug as a valid treatment for the disease. Additionally, another striking element is the image of President Lula with two horns on his head, resembling a diabolical figure. In Senator Flávio Bolsonaro's post on X (Fig. 6), there is a defense of the use of hydroxychloroquine for infected patients, attributing to the Ministry of Health the approval of the medication as part of an early treatment policy for the disease. It is evident that invoking an institution with expertise in health issues aims to lend credibility to the disseminated (mis) information (Souza, 2020).

Telma Rocha *et al.* (2020) reiterate that the federal government made strategic use of the medication as part of the manipulation and interest games. Despite the intense publication of national and international studies attesting to the ineffectiveness of the aforementioned drugs for the treatment of coronavirus (Rocha *et al.*, 2020), disbelief and skepticism regarding the consensual scientific evidence were reinforced.

Silva and Silva Júnior (2021) conducted a precise study on the discursive strategies and truth games employed regarding the use of chloroquine in combating

COVID-19. The researchers noted that "truths" were falsified to support ideological and personal interests, disregarding public health. In this context, the medication was politicized and caused embarrassment to numerous researchers who disclosed the drug's inefficiency against SARS-CoV-29. Even so, the drug continued to be regarded by many of President Bolsonaro's followers as an "elixir of cure" (Silva; Silva Júnior, 2021, p. 62). Consequently, a discursive battle driven by political interests was established, with chloroquine defenders on one side and the opposition, who "conceal the real truth," on the other (Silva; Silva Júnior, 2021, p. 68).

Memes about Coronavirus Immunization

In Brazil, the start of vaccination was marked on January 17, 2021, with the approval by the National Health Surveillance Agency (Anvisa) of at least five vaccines¹⁰. Adverse symptoms such as fever, arm pain, and potential other reactions to the vaccines were the main elements highlighted by Bolsonaro supporters to cast doubt on COVID-19 vaccines (and others). Although the vaccine is scientifically proven to be effective, the fear of adverse events, combined with misinformation, pollutes cyberspace and the public sphere, undermining the public vaccination campaign (Nassaralla *et al.*, 2019).

⁹ GORTÁZAR, Naiara Galabarra; JUCÁ, Beatriz. Brazilian scientists live a nightmare amid the politicization of chloroquine. El Pais. Published on May 25, 2020. Available at: https://brasil.elpais.com/brasil/2020-05-25/cientistas-brasileiros-vivem-pesadelo-em-meio-a-politizacao-da-cloroquina.html. Accessed on: August 9, 2024.

¹⁰ Comirnaty (Pfizer/Wyeth); Coronavac (Butantan); Janssen Vaccine (Janssen-Cilag); and Oxford/Covishield (*Fiocruz* and *Astrazeneca*). Sputnik V and Covaxin were vaccines approved only for exceptional import. According to G1 (2021, n.p.): "Those who took the first dose of vaccines against Covid reached 40.76%. There are 86,332,655 doses applied, which corresponds to 40.77% of the population. Adding the first dose, the second dose and the single dose, there are 118,448,765 doses since the beginning of vaccination, in January".

Chart 3: Memes about Coronavirus Immunization









Figures 7 and 8. Source: Grupo Brasil & Brasileiros no Facebook.

Figures 9 and 10. Source: Grupo Movimento Brasil de Direita / Movimento Brasil à Direita – Bolsonaro 2026 no Facebook.







Figures 11, 12 and 13. Source: Grupo Movimento Brasil de Direita / Movimento Brasil à Direita – Bolsonaro 2026 no Facebook.

In Chart 3, we have examples of memes that satirized the coronavirus vaccine, suggesting that the measure was not safe for the Brazilian population and could even lead to the death of those vaccinated (Figs. 7 and 10)

In Fig. 8, "My Children, My Rules," the meme references the slogan "My Body, My Rules," a feminist phrase centered around bodily autonomy. The implication is that the decision to vaccinate children should be optional and under parental control. In Fig. 9, we see the current President of China, Xi Jinping, holding a syringe with the phrase "*Plimeilo João Dólia*." João Dória was the governor of São Paulo during the pandemic and a staunch advocate of vaccination. The politician announced the partnership between the *Butantan Institute* and the Chinese pharmaceutical company Sinovac for the creation and testing of the vaccine known as CoronaVac¹¹. The meme, therefore, mocks the Chinese president, who would be responsible for administering the vaccine to the former governor, attributing

¹¹ SÃO PAULO. BUTANTAN INSTITUTE. Government of SP will test and produce a vaccine against coronavirus. 2020. Available at: https://vacinacovid.butantan.gov.br/imprensa/governo-de-sp-vai-testare-produzir-vacina-contra-coronavirus. Accessed on: August 9, 2024.

grammatical errors to Chinese speakers when expressing themselves in Portuguese, such as the pronunciation of the word "plimeilo" (first), thereby reproducing racism against this Asian population in the country.

In Figs. 11 and 13, the memes play on the idea that the vaccine is not safe for consumption, considering that clinical trials during the pandemic were highly questioned. Finally, in Fig. 12, we see a vial with a photo of the former president inside, labeled "1st and 2nd dose," alluding to loyalty to Bolsonaro during his first term in 2018 and the second in 2022.

Thus, we observe that the use of memes related to COVID-19 pandemic response measures contributed to the discursive space of the politicization of public health in the country during the recent global health crisis. Indeed, "the mediation carried out by memes may be underestimated because it is so well hidden, subtle, and necessarily disguised, but its effect is clearly felt" (Silva; Lopes Júnior, 2023, p. 352, our translation).

In a pandemic scenario strengthened by denialism and misinformation, we found that memes were used as discursive operators of Bolsonaro's critique of the purportedly leftist bias in measures to combat the health crisis, in alignment with the WHO, acting as vehicles for the agitation of informational chaos, known as infodemic. The Bolsonaro agitation undermines the credibility of expert systems when it comes to science, making room for radical doubt (Guivant; Macnaghten, 2011).

Since 2020, under the administration of Jair Bolsonaro (PL), the federal government has minimized and questioned the risks of COVID-19 in favor of measures that would "save" the economy, without prioritizing human lives and reducing the threats posed by SARS-CoV-2 (De Lima, 2021).

In fact, Bolsonaro's discourse during the pandemic advocated for a "neutral and non-ideologized" science, free from leftist bias, which would call for physical isolation as a form of prevention and the demystification of Chloroquine and Ivermectin as holistic treatment devices for the disease, without evidence from "pure" science. Thus, denying scientific consensus does not necessarily mean denying science; rather, what we witnessed was the political instrumentalization of science by the far-right. Nonetheless, the fact remains that the 'alternative versions' marking denialist discourse are presented as if they were science (Duarte; Benetti, 2021). "After all, what would explain the rise of 'gurus' of the far-right political sphere if not the need to globally legitimize a sort of 'alternative academic space'?" (Guimarães, 2022, p. 3, our translation).

Questioning and delegitimizing scientific consensus do not necessarily lead to the abandonment of science, but rather serve to raise doubts and mistrust "about a certain science, restricted to certain groups of researchers in certain institutions, which are deliberately associated with certain 'questionable interests'"

(Guimarães, 2022, p. 5, our translation). This scenario supports the emergence of "I-pistemologies" which, taking advantage of the critical moment of trust in the consensual scientific method, provide an opportunity for the "legitimacy of individual experience, life trajectory, immediate senses, emotions, and intuitions" (Cesarino, 2021, p. 80, our translation).

In the analysis of the memes created by Bolsonaro supporters discussed in this text, we observed how the potential for "epistemic reorganization" regarding prevention, treatment, and immunization permeated the digital infrastructure of the social networks studied, reshaping the perceived severity of the health crisis and the disease caused by the COVID-19 virus.

We also draw attention to the fact that the epistemic self in this context amplifies the "group self" (Adorno, 2015 reinforcing the authoritarianism of public figures who become identity beacons for groups of sympathizers and followers, such as former President Bolsonaro during the COVID-19 pandemic. As Cesarino (2021) explains, the effectiveness of the discursive mechanism grounded in Bolsonaro's "I-pistemology," from his presidential campaign in 2018, finds in his voters reproducers of content structured according to this politician's discursive formation. This is facilitated by the digital format, which allows anyone to replicate, consciously or not, "a very elementary political grammar" (Cesarino, 2021, p. 91, our translation).

Final considerations

With the advent of the novel coronavirus pandemic in March 2020, misinformation became the greatest enemy in the fight against the virus, and in Brazil, it was notably used as a political weapon by Bolsonarism to ideologize public health, hindering efforts in prevention, treatment, and immunization, according to medical-scientific guidelines legitimized by the World Health Organization (WHO). In public health, communication with lay audiences about prevention, treatment, and immunization based on reliable information is essential to ensure the control of an epidemic or pandemic (Leal, Vianna, 2013).

Through the amplification of online communication, we witnessed a strong decentralization of information, which particularly disadvantaged communication outlets considered central to our public sphere as a deontologically secure source of information. The problem of misinformation, in itself, affects the quality of democratic life and, in critical moments such as a global health crisis, negatively impacts the serious treatment of a public problem with worldwide reach. The anti-science discourse, which had been consensually agreed upon by experts, found a significant ally in memes as effective conduits for denialist narratives. The use of hashtags also

gains prominence, directly influencing the receiving public and, likewise, boosting the profiles that made the publication, generally producers and reproducers of the discourse of public figures who play an important role in the circulation of (mis) information (Recuero; Soares, 2022). Thus, the pandemic context, where people needed answers to their uncertainties about modes of contagion and treatment of the disease, became a perfect scenario for questioning the effectiveness of scientific and health institutions.

Based on the analyzed material, it is possible to assert that the discursive disputes within the pandemic context are permeated by ideologies and beliefs, embedded in a specific historical situation where denialism and anti-scientific attitudes are present and fuel Bolsonarist agitation. This agitation is reflected through sensationalism and distortion of news, where one can observe the formation of a discourse parallel to official versions through intertextuality that promotes a semantic shift in favor of conspiratorial narratives, based on videos, links, and social media memes.

Media manipulation, strengthened by this Bolsonarist agitation, positions science, and epistemic authorities as purveyors of falsehoods, while far-right agitators present themselves as defenders of the "truth." Pseudoinformation succeeds in garnering support for denialism, thereby ideologizing public health. Thus, under a Manichean perspective, informational chaos and hate speech are established.

According to Renato Lessa (2020), the "homo bolsonarus" is a "new man" of dystopian times, characterized by the traits and habits of an artificial creature, dominated by the fixed asymmetry in Brazilian history among individuals, materialized in a youthful being. His primary goal is to return society to its state of nature, where wills, instincts, and impulses govern human interactions, while social mediation is minimal or even non-existent. His main attributes focus on direct action, intimidation, horror of mediation, and a libertarian disposition.

The Bolsonarist parliamentarians mentioned here appear susceptible to anti-democratic propaganda in favor of deception and informational chaos during the pandemic. They are agitators working towards changing the status quo through the discrediting of expert systems, with Jair Bolsonaro serving as the group's epistemic leader. Bolsonaro, as the leader and spokesperson for his audience, positions himself as a politician who believes that social change must occur. Simultaneously, he presents himself as a man of the people, an ordinary figure who proposes incongruent and shocking solutions to national problems.

With diffuse activities, the agitators stand out within their own audience, high-lighting their grievances regarding society, the state, and its policies, influencing the release of moral sentiments that alienate members of these emotional and cognitive communities from promising reasoning for solving public issues, including those of global reach.

That said, we consider one of the most insidious effects of the proliferation of false news in the public sphere during critical times, such as the COVID-19 pandemic, to be the compromise of: 1) the reflective capacity of collectives for investigation, aimed at clarification and the adoption of responsible behaviors in response to a public issue, and 2) the robustness of public health democracy, which involves the right to ethically developed information based on reliable knowledge, for making individual decisions on prevention, treatment, and vaccination that impact public health.

Finally, we estimate that to restore the public sphere to its role as a locus for debating public issues, we need to be attentive to the discursive formats that misinformation can assume within the current digital culture, such as memes. These should not be underestimated as mere symbols of humor in politics. Moreover, we must take the essential nature of democratic pedagogy based on digital literacy more seriously. Memes are jocular discursive units that are easily assimilated but conceal cultural complexities behind their amusing appearance. We are discussing an informative modality that should be considered when addressing the regulation of digital platforms and the application of sanctions against the practice of fake news on social media. The mimetization of politics, in general, or specific policies, such as public health, can facilitate communication in digital activism, potentially uniting or dividing us in crucial moments, such as the COVID-19 health crisis, when individual behaviors impacted collective well-being.

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