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# A “war on science?” Far-right movements and the disputes over epistemic authority in Brazil

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## ABSTRACT

Current research on post-truth politics often portrays a war waged by anti-science populists against pure, truth-seeking scientists. This critical framework was replicated in Brazil, where the former President Jair Bolsonaro was accused of neglecting scientific expertise to promote alternative treatments for the COVID-19 pandemic. Bolsonaro was deemed responsible for replacing sound scientific evidence with religious and ideological claims, resulting in many deaths. In this article, we investigate public controversies surrounding chloroquine (HCQ) and indicate that Bolsonaro’s discourses were not based on anti-science statements, as the literature on post-truth politics often emphasizes. Instead, Bolsonaro invoked the symbols of modern science and claimed to have the actual experts on his side. Thus, we argue that to understand the challenge posed by far-right populists to scientific institutions, we need to employ analytical instruments that help us complicate easy demarcations of facts and stark binaries of science/anti-science.

## Uma “guerra à ciência?” Os movimentos de extrema-direita e as disputas sobre autoridade epistêmica no Brasil

### RESUMO

Pesquisas recentes sobre a política da pós-verdade costumam descrever uma guerra na qual populistas anti-ciência atacam cientistas supostamente guiados puramente pela razão. No Brasil, país no qual o então presidente Jair Bolsonaro foi acusado de promover tratamentos alternativos durante a pandemia de Covid-19, essa literatura crítica se disseminou. Nesse contexto, Bolsonaro foi considerado responsável por substituir evidências científicas sólidas por pressupostos religiosos ou ideológicos, o que teria provocado inúmeras mortes. Neste artigo, investigamos as controvérsias públicas em torno da cloroquina (HCQ) e indicamos que as políticas de Bolsonaro não se basearam exatamente em discursos contra a ciência, como a literatura

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sobre pós-verdade costuma apontar. Ao contrário, Bolsonaro invocou os símbolos da ciência moderna e afirmou ter os verdadeiros cientistas e especialistas ao seu lado. Portanto, apontamos que, se queremos compreender o desafio representado por populistas de extrema direita às instituições científicas, devemos adotar instrumentos de análise que nos ajudem a complexificar as simples demarcações de fatos e perspectivas binárias sobre a distinção ciência/anti-ciência.

## ¿Una “guerra contra la ciencia?” Los movimientos de extrema derecha y las disputas sobre la autoridad epistémica en Brasil

### RESUMEN

Las investigaciones actuales sobre la “política de la posverdad” a menudo describen una guerra librada por populistas anticientíficos contra científicos puros que buscan la verdad. Este marco crítico se replicó en Brasil, donde el presidente Jair Bolsonaro fue acusado de descuidar los conocimientos científicos para promover tratamientos alternativos durante la pandemia de COVID-19. En este contexto, Bolsonaro fue considerado responsable de sustituir evidencia científica sólida por afirmaciones religiosas e ideológicas, lo que provocó muchas muertes. En este artículo investigamos controversias públicas en cuanto a la cloroquina (HCQ) e indicamos que las políticas de Bolsonaro no se basaron en discursos anticientíficos, como suele enfatizar la literatura sobre la “política de la posverdad.” En cambio, Bolsonaro invocó los símbolos de la ciencia moderna y afirmó tener a los verdaderos expertos de su lado. Por lo tanto, sostenemos que si queremos comprender el desafío que plantean los populistas a las instituciones científicas, debemos adoptar instrumentos analíticos que nos ayuden a complicar las demarcaciones fáciles de los hechos y los rígidos binarios de ciencia/anti-ciencia.

## 1. Introduction

The post-truth phenomenon created an unusual intersection between research agendas conducted in departments of humanities and hard sciences. Over the past few years, Brazilian scholars with backgrounds as diverse as media studies and microbiology have joined efforts to challenge populist politicians and their strategies of disinformation and science denial (Pasternak and Orsi 2021). As a result, blaming the far-right for antagonizing experts and denying “objective facts [with] appeals to emotion and personal belief” became a common trope in university *campi* and public debates (Oxford Dictionary 2016; see also McIntyre 2018; Nichols 2017).

In Brazil, “post-truth politics” gained relevance and nuances during the COVID-19 pandemic. In 2020, while the World Health Organization (WHO) recommended states to promote social distancing policies, former President Jair Bolsonaro questioned the organization’s advice and confronted the state governors who imposed quarantines, thus engendering a dispute which was later characterized as an “ideological battle” against “rational arguments” (Caponi 2020, 210). Bolsonaro was widely regarded as “the

biggest threat to Brazil's COVID-19 response" (*The Lancet* 2020, 1461), and his policies were not only blamed for the country's high mortality rate but were also said to "erode the very core of the enlightenment: the idea that critical thinking, open debate, and evidence will promote human flourishing and good governance" (Holman 2020, 372).

Although Bolsonaro had harmful impacts during the pandemic, we argue that the president did not depreciate expertise and science *per se*. Instead, we raise evidence that both Bolsonaro and his opponents engaged in a dispute for the epistemic authority of science, so the controversies regarding the benefits of social distancing and "alternative treatments" (i.e. chloroquine) can hardly be said to oppose "science" and "ideology" (Carvalho 2020, 13). During the pandemic, the president and his allies criticized the political bias of specific scientific institutions and positioned themselves as defenders of an allegedly true science, which, in their perspective, should be purified and detached from economic interests. Thus, we claim that instead of debunking science, post-truth politics in Brazil is better described as a dispute for who should speak for science.<sup>1</sup> As Michael Lynch (2020, 55) explains,

far from being an opposition to "science," [this kind of politics] makes selective use of emblems and idioms of scientific authority. [...] [T]he problem is not anti-science *per se*, but the collapse of more nuanced debate into over-generalized "scientific" claims.

Accordingly, if we are to understand the challenge posed by far-right populists to scientific institutions, we need to take up analytical instruments which help us to complicate easy demarcations of facts and stark binaries of science/anti-science (Shapin 2019).

The first part of the article analyzes recent literature on post-truth and "scientific populism," mapping the concepts mobilized by critics of Bolsonaro's administration and pointing out their limitations. In the second part, we closely observe how disputes for epistemic authority rolled out during controversies regarding the efficiency of chloroquine (HCQ) for COVID-19 patients. We argue that Bolsonaro and his allies sought to support their arguments with references to the traditional markers of science, including published studies, experts, and renowned research institutions. In this context, we do not contend that conspiracy theories and "alternative epistemologies" are entirely foreign to Bolsonaro's discourse (Mede and Schäfer 2020). Instead, we present evidence suggesting that post-truth politics in Brazil is more intricate and nuanced than what most criticisms allege.

## 2. The relations between the far-right and science

Long before the COVID-19 pandemic, critics accused far-right movements of waging a war on science and expertise to advance anti-establishment agendas (Mooney 2006). Populist leaders, including Bolsonaro, were often portrayed as self-proclaimed representatives of the common people engaged in a struggle against the "lies" told by intellectual and

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<sup>1</sup>While the *Oxford Dictionary's* (2016) definition of post-truth gained popularity in both public and scholarly debates, recent research has contested this understanding, contributing to the concept's polysemy. Fuller (2018), for instance, argues that post-truth is a consequence of the STS assertion that truth is a contingent result of disputes between different epistemic rules. In this perspective, post-truth stems from claims of universal symmetry and epistemic democratization, which STS scholars should embrace. For a more extensive discussion on opposing definitions of "post-truth," encompassing the role of emotions, questions of expertise, and the emergence of "bullshit" (casual dishonesty or pure demagoguery) in political life, see: Sismondo (2017).

political elites (Mede and Schäfer 2020; Mudde 2017). Furthermore, the challenge to the established roles of mainstream media and universities as truth-making institutions has been seen as a key element in the populist assault on science, thus politicizing the boundaries between scientific and non-scientific claims (Gieryn 1983).

In general, this critical literature rests on two main assumptions. Firstly, authors often emphasize that populists distrust experts and scientists, suspecting them of participating in conspiracies or pursuing personal advantages and ideological goals (Ylä-Anttila 2018). Secondly, populists are said to question the validity of the scientific method, replacing it with an “I-pistemology,” the idea that individuals’ non-mediated experience is more valuable than evidence generated by reproducible and falsifiable tests (Van Zoonen 2012). Hence, populists thrive on the antagonism between the people, who supposedly embody the virtuous attributes of common sense and authentic knowledge, and the elites, who are organized around hidden interests and “disparage the simple, naturalistic, and reliable epistemology of ordinary people” (Mede and Schäfer 2020, 481).

Research on the role of the internet in shaping public debates adds another dimension to the perceived populist assault on science. Social media not only provides an unprecedented opportunity for fake news to permeate public conversations (Empoli 2019), but it also generates “filter bubbles” where counterarguments are conspicuously absent (Pariser 2011). Accordingly, the far-right exploits new communication architectures to deploy deceitful strategies, such as the “firehose of falsehood,” which combine “high numbers of channels and messages and a shameless willingness to disseminate partial truths or outright fictions” (Paul and Matthews 2016). The results are parallel conversations, which ensue an epistemic chaos and the loss of trust in institutions that used to anchor claims for scientific authority and expertise.

Thus, Bolsonaro has been blamed for polarizing the country between those who still believe in science and experts’ advice, and those radicalized by social media and who disregard scientific evidence (Fonseca et al. 2021). During the COVID-19 pandemic, Silva and Ventura (2020, 74), for example, argued that because of Bolsonaro’s populist rhetoric “technical issues such as the use of drugs with no proven effectiveness and the adoption of quarantine measures have been highly politicized amid conspiracy theories and fake news.” Similarly, Caponi (2020, 22) claimed that Bolsonaro’s strategies were based on “hate, irrationality, and antiscientific discourse ... which were imposed over rationality, solidarity, and scientifically-informed debates.” In short, Bolsonaro was frequently described as an “authoritarian president that ha[d] very little regard for science” (Duarte 2020, 290).

According to the above descriptions of anti-science populism, one might expect that Bolsonaro’s politics would discredit scientific epistemology and replace evidence-based policies with personal or religious convictions. However, recent studies have problematized this conclusion (Costa 2021; Duarte and Benetti 2022). Opinion polls show that trust in science among Brazilians rose during the pandemic, reaching 89 percent (above the global average) (Andrade 2020). Additionally, 91 percent of the population considers that scientists are the most reliable source of information on COVID-19. These numbers indicate that among Bolsonaro’s electorate (approximately 49 percent of voters in the 2022 elections), there are many people who hold strong pro-science stances. We argue that far from being a contradiction, this phenomenon is explained by Bolsonaro’s nuanced approach to the matter, which does not advocate

for the pure rejection of science but focuses on discrediting particular scientists and institutions.

Against the literature on populism, research on public controversies during the COVID-19 pandemic indicates an organized effort to appropriate science's symbols of epistemic authority (Oliveira et al. 2021; Ruediger 2021). Oliveira et al. (2021), for instance, mapped interactions on Twitter during the pandemic and found that the content read and shared by Bolsonaro's supporters was often produced by renowned experts and broadcast on mainstream media. Furthermore, Bolsonaro's discourse

appropriates scientific authority in different ways to strengthen the argument. It did not oppose science, nor did it deny the validity of scientific knowledge ... [There is an ongoing] project to occupy the scientific field and sought authority through the use of scientific language and standards. (Oliveira et al. 2021, 170)

Similarly, Marco Ruediger (2021, 9) points out that the groups accused of being anti-science have been "resorting to scientific and/or pseudoscientific sources and repertoire in search for epistemic legitimacy." In his study on the "social uses of scientific authority," Ruediger (2021, 9) concludes that "claims of scientificity" were incorporated to the disputes about public health policies during the pandemic.

Moreover, arguments about anti-science populism have a central limitation: they induce a sharp opposition between "good science," which supposedly follows the Mertonian *ethos* and is detached from society, and "bad science," which gets corrupted by mundane politics and the market (Lasco 2020; Oreskes and Conway 2011).<sup>2</sup> This dichotomy not only ignores the multiple, decades-old research on symmetrical explanations (Bloor 1976) and laboratory ethnographies (Latour and Woolgar 1986), but it also reproduces an idealized notion of science which can only disappoint those who observe everyday scientific practices.

In sum, research on far-right populism and anti-science movements often reproduces the fiction of a modern separation between power and knowledge (Latour 1993). From this perspective, economic interest and political motivation are contradictory to truth-seeking and scientific statements. Hence, this literature argues that Bolsonaro and his ideological incentives are on one side, and the scientific institutions and their politically unbiased propositions are on the other. However, as we will argue in the next section, Bolsonaro explores the gaps between the idealized notion of science as an a-social practice and the actual scientific production to question the epistemic authority of his critics. In other words, the modern fiction of science is also at the base of current science denial movements.

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<sup>2</sup>Several authors have investigated the politics of "manufactured controversies" and "strategic unknowns" (Oreskes and Conway 2011; Ceccarelli 2011). These authors argue that while much attention has been directed at the power/knowledge nexus, we have failed to anticipate that anti-science movements would draw on politically induced ignorance, which "help both to maintain and to disrupt social and political orders, allowing both governors and the governed to deny awareness of things it is not in their interest to acknowledge" (McGoey 2012, 4). Thus, uncertainty is not a cognitive state nor a "lack of knowledge," but an effortful social construction, as "facts and evidence which contradict or undermine strongly held opinions and beliefs are denied, obstinately contested or simply ignored" (Perl, Howlett, and Ramesh 2018, 5). However, binary distinctions between "pure science" and "junk/fake science," still fail to capture the complexity of everyday scientific practices and controversies. For more on this, see: Ceccarelli (2011, 2013) and Fuller (2013).

### 3. The dispute for truth: Bolsonaro's "scientific" discourse

Aradau and Huysmans (2019, 50) emphasize that, in the process of validating scientific knowledge, "the critical issue is not simply epistemological or methodological but an engagement with how credibility of knowledge is assembled today – how knowledge is accredited and discredited." As lay people are not capable of assessing the intricacies of scientific research and the accuracy of different studies to take an informed stand about a given controversy, their engagement with science occurs through mechanisms of epistemic trust. Thus, the authority and legitimacy of scientists require unflinching confidence in the process of accumulation of qualified knowledge.

In this section, we analyze disputes for the construction of scientific credibility during the COVID-19 pandemic in Brazil. Specifically, we investigate the controversies over the use of chloroquine as an experimental treatment against the effects of the coronavirus. We indicate that Bolsonaro and his allies exploited the gaps between the ideal of modern science and the actual making of scientific claims to put under suspicion the multiple experts and institutions which opposed the government's policies.

#### 3.1. Politicization of the treatments

In January 2020, the WHO classified COVID-19 as a Public Health Emergency of International Concern (PHEIC). The organization recognized that information was still lacking about the virus but opted to advise countries to implement control strategies defined in the International Health Regulations, including "isolate and treat cases, trace contacts, and promote social distancing measures commensurate with the risk" (WHO 2020, 1). In Brazil, anti-contagion policies soon became a matter of dispute. While several states passed emergency bills to suspend non-essential activities and monitor crowds, the federal government defended less restrictive actions.

The main controversy surrounded the effectiveness of social distancing and its consequences in the medium and long terms. According to the president, the WHO's PHEIC protocols not only restricted personal freedoms, but also harmed the economy, potentially breaking private companies and increasing poverty rates (Mazui 2020). In his words:

the consequences [of a radical quarantine] will be much more harmful than the virus itself. We cannot have a remedy that, in the end, the dosage will be so large that the number of problems will be much worse than [those by] the virus itself. (Bolsonaro cited in Carvalho and Colletta 2020)

Moreover, Bolsonaro's allies claimed that WHO's proposals were built upon modest evidence and were politically unfeasible in Brazil. Even if the government had agreed to promote a lockdown, its capacity of ensuring social distancing was limited by cultural issues and the urban design of large cities. As a former minister of Bolsonaro's government stated:

There is no social distancing in the *Complexo do Alemão*, there is none in the *Complexo da Maré*. That is a theoretical construction [which serves] only for the middle classes to think they are protected ... there is no scientific study showing any impact. (Terra cited in G1 2020)<sup>3</sup>

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<sup>3</sup>Complexo do Alemão and Complexo da Maré are large favelas in Rio de Janeiro.

In contrast, Bolsonaro based his initial response to COVID-19 on two strategies. On the one hand, he defended the so-called “vertical distancing,” which granted most services and the productive sector the right to keep regular operations. On the other hand, the individuals infected by the virus were submitted to an experimental treatment with chloroquine (HCQ).

Following this strategy, the Ministry of Health published a Technical Note in March 2020 promoting HCQ for patients diagnosed with COVID-19. The ministry recognized that uncontroversial studies on the benefits of the drug were still lacking but informed that patients were to sign consent forms acknowledging that: “there have not been, up to this point, enough studies to ensure clinical improvement in patients with COVID-19” (Brazil Ministry of Health 2020). The note also stated that the treatment could generate side-effects, but “in light of the insufficiency of therapeutic alternatives” and “considering ... it is a treatment with low cost and easy access,” chloroquine should be available for physicians working both in private and public healthcare systems (Brazil Ministry of Health 2020).

Despite the drug’s experimental nature, the ministry argued that many studies had already indicated strong evidence that HCQ contributed to stopping the virus from taking over new cells, thus improving chances of full recovery. Yet, meta-analyses of preliminary research on HCQ soon found that results were mostly null. A review published by Singh et al. (2020), for example, claims there is “no benefit on viral clearance, although a significant increase in death was observed with hydroxychloroquine in patients with COVID-19, compared to the control group.” Randomized Control Trials (RCTs) performed in the US (Boulware et al. 2020), Canada (Skipper et al. 2020) and Spain (Mitjà et al. 2020) presented similar findings. Even one of the articles cited in the note published by the Brazilian Ministry of Health stated that, after systematic reviews of seventeen articles, “the effectiveness and safety of hydroxychloroquine ... in COVID-19 patients is uncertain and its routine administration for this situation may not [be] advised until findings of ongoing studies may assess its effects appropriately” (Riera and Pacheco 2020, 2).

When questioned about the uncertainties looming over HCQ and the risks for patients already debilitated by COVID-19, Bolsonaro reiterated that the ongoing scientific controversy and the urgency imposed by the pandemic justified experimental treatments: “It is not my opinion, because I am not a doctor. It is the opinion of many doctors in Brazil and abroad that understand chloroquine can and must be used ... despite knowing that there is no scientific confirmation of its efficiency” (Bolsonaro cited in Maia 2020).

Pasternak and Orsi (2020) mapped the controversies surrounding HCQ and found that a study published by Didier Raoult, a renowned French microbiologist, was the main reference for those who pushed for experimental treatments in Brazil. Members of the Brazilian government often quoted Raoult’s study to support debatable claims that individuals treated with HCQ presented clinical improvement or full recovery from the viral infection (Million et al. 2020). However, Raoult and his co-authors were later accused of manipulating data to produce positive results (Rosendaal 2020). Indeed, many scholars claimed that studies on HCQ and other potential treatments were frequently damaged by ill-advised methods and elusive findings (Jones, Woodford, and Platts-Mills 2020).

Moreover, clinical trials with HCQ could put patients at serious risk. A study conducted by Marcus Lacerda in Manaus, Brazil, identified that large dosages of the drug could have severe coronary side effects in COVID-19 patients. After analyzing the initial data and



identifying a considerable risk of death, Lacerda and his team opted to interrupt clinical trials and publish the partial results (Borba, Val, and Sampaio 2020). However, later experiments with lower dosage presented much less significant side effects (Wessel 2020), which raised suspicions among far-right groups that Lacerda had distorted his research design to induce negative results and corroborate those who criticized Bolsonaro's policies. Eduardo Bolsonaro (2020), a congressman, and the President's son, accused Lacerda of "leftist medical militancy," since he supposedly administered high dosages to intentionally "disqualify [the use of] chloroquine."

The controversy rolled out for a few more months as public suspicions against crooked scientists only intensified. In May 2020, the WHO advocated for the interruption of treatments and research with HCQ. However, the organization's decision relied on an article published on the *Lancet* which was later retracted by the editors under charges of fraud. After analyzing ninety-six thousand patients, the study by Mehra et al. (2020) concluded that there was no evidence of clinical improvement and that many patients had developed cardiac arrhythmia. Yet, the results were not made available for peer-review and could not be confirmed. This fraud fueled accusations against the WHO, as Bolsonaro and his allies argued that politically-oriented institutions and experts were "preventing access to medication due to ideological radicalism – and doing so on behalf of science – [configuring] a crime against humanity" (Motta 2020).

Controversies were not limited to the political arena. The questions raised over the studies by Raoult, Lacerda, and Mehra inflamed disputes in the Brazilian medical community and among scientific associations about the risks and benefits of HCQ. In August 2020, the federal government organized a public event in Brasília – "Brazil beating COVID-19" – in which Bolsonaro received a letter signed by ten thousand physicians in favor of HCQ and other experimental treatments. At the event, Bolsonaro (2020a) declared: "if chloroquine hadn't been so politicized, many lives could have been saved." The president considered that the level of evidence demanded for HCQ had no precedence in other health emergencies.

I always heard from Mandetta [former minister of health]: "There is no scientific proof." Oh well, I know there is none. As I have always cited from military history: the Korean War, the Pacific War, when soldiers were wounded and no one was available to donate them blood, they ended up getting coconut water in their veins. And it worked. If they had to wait for scientific proof [they would die] ... It is the same thing here with chloroquine. (Bolsonaro 2020a)

Bolsonaro was careful enough not to question the relevance of scientific research. He often claimed that, in the face of a pandemic emergency and the absence of therapeutic alternatives, the compassionate use of chloroquine seemed adequate. In fact, the Brazilian Federal Council of Medicine (CFM 2020) validated the government's stance and determined that physicians should have autonomy in prescribing treatments to their patients. The CFM was followed by the Brazilian Medical Association (AMB), which also approved the treatment protocol for COVID-19 patients as proposed by the federal government. In contrast, the Brazilian Society of Infectious Diseases (SBI) published a note criticizing the use of HCQ. The SBI (2020) stated that there was no scientific evidence about its effectiveness and safety, so "it [was] urgent and necessary to interrupt [the treatment with] hydroxychloroquine." The Brazilian Society of Pulmonology and Phthisiology (SBPT 2020) released public statements opposing the treatment as well. The SBPT was

especially worried about healthcare workers who used their public profiles in social media platforms to suggest medications against the advice of technical agencies. This criticism, however, was rebuffed by the government's allies at the AMB (2020) who accused professional entities of ideologizing the debate and abandoning the very scientific parameters they were supposed to protect. In a particularly revealing note, the AMB (2020) stated: "The political derby around hydroxychloroquine will leave a dark legacy for Brazilian medicine ... Many professionals and entities will come out of the pandemic belittled, mainly those which chose to manipulate science to use it as a weapon in political disputes."

The controversy regarding HCQ in Brazil indicates that the literature on "scientific populism" has a few analytical limitations (McIntyre 2018; Nichols 2017). In Bolsonaro's discourse, the drug was not portrayed as a "silver bullet" against COVID-19 symptoms, nor was it characterized as a sort of miraculous "panacea" as critical scholars pointed out (Pimentel 2020). Bolsonaro and his allies did encourage the use of HCQ, but they admitted that the drug's benefits had yet to be proven and that more research was necessary. Moreover, the government did not seek to legitimize its policies by questioning science or advancing religious beliefs. Actually, the president engaged in public debates claiming that his position on HCQ was supported by medical and scientific institutions.

Meanwhile, Bolsonaro and his allies invested in delegitimizing the WHO. The episodes of scientific fraud were often raised as evidence that the organization had lost its scientific credentials and should not be trusted. As Bolsonaro asserted, the WHO "leaves much to be desired. People talk so much about science, but the least scientific [of all] is the WHO. It feels like they get nothing right" (Bolsonaro cited in Schuch 2020). In this sense, Bolsonaro claimed the federal government had to put a lot of effort in identifying reliable interlocutors in the scientific field and only listen to those who could speak on behalf of scientific evidence without political biases. As stated by a former minister of Bolsonaro's government:

The WHO is too politicized. The guy who is the director-general of the WHO is from the Tigray People's Liberation Party in Ethiopia ... They are Marxists, Leninists, Maoists ... I want to talk to the CDC [Centers for Disease Control and Prevention] from the United States ... the greatest scientific center in the world. (Terra cited in Almeida Filho 2020)

This brief description of the disputes around alternative treatments for COVID-19 in Brazil reveals that Bolsonaro appropriates scientific discourse and fundamentally aims at proving that his detractors are not doing proper science. Bolsonaro and his allies repeatedly claimed that science should be conducted without political interests, which was the opposite of what the WHO and other institutions were arguably doing. In this sense, those who blame Bolsonaro for seeking religious or non-scientific support for his policies miss the intricacies of his discourse. Instead of antagonizing science, Bolsonaro attacked those who supposedly corrupted it for the benefit of obscure ideological agendas. As such, Bolsonaro presented himself as science's true champion, which explains why opinion polls show that even a far-right populist president may be responsible for increasing people's confidence in science. For Bolsonaro (2020b), "disinformation is more deadly than the virus. Time and science will show us that the political use of COVID-19 [...] brought us deaths which could have been avoided."

#### 4. Populism, anti-science, and the fiction of modern science

In the preceding section, we argued that the Bolsonaro administration was not characterized by a skeptical rejection of the value of scientific knowledge. His discourses often incorporated “elements proper to scientific symbols – such as lab coats, studies published in prestigious journals, and the academic reputation of those who perform scientific research – as a way of validating” the government’s policies (Oliveira, Quinan, and Toth 2020, 104). This became evident during the controversies surrounding chloroquine, which did not put scientific consensus against pure charlatanism. Bolsonaro contested the scientific authority of those criticizing his policies but acknowledged that decisions on various forms of treatment should be made by scientists and experts, not politicians, religious figures or laypeople.

Moreover, similar to critical STS scholars, Bolsonaro has cast a critical light on the internal processes of science and the various mechanisms employed for knowledge validation. In order to debunk his opponents, he compared the everyday making of scientific facts to the fictional narratives of modern science, revealing that his adversaries were all but unbiased role-models. As actual scientists and experts, they were inevitably influenced by political inclinations, economic interests, and societal pressures.

Research on the modern “boundary-work” (i.e. the attempts at isolating the domains of politics from science, technique, and facts) precede present concerns with “post-truth” and “scientific populism” (Gieryn 1983). Latour (1987), for one, proposed that successful scientists (i.e. individuals who earned scientific credibility) are not necessarily those better able to understand and describe nature, but those who acquire more “allies” to their networks, thus translating the interest of others to become their representatives. Science, in this perspective, is a powerful assembling tool, which produces strong associations among laboratory practices, data, viruses, visualization and measuring techniques, politicians, and institutions to produce statements about nature which are difficult to contest. Consequently, the authority and legitimacy of competing scientific claims can only be assessed by their capacity of building networks inside and outside the laboratory.

While ethnographies of scientific practices have already documented the social determinants of science inside the traditional spaces of knowledge production (Latour and Woolgar 1986), the role of multitudes of actors, disputes, and power relations in the making of epistemic authority is even harder to ignore during public debates on scientific controversies, as we have witnessed in the case of COVID-19 treatments in Brazil. Furthermore, the sociology of science and expertise has shown that the construction of strong hypotheses on trans-scientific issues, such as climate change, the risks of long-term use of tobacco, and the trade-offs of different anti-contagion policies, requires much more than experiments, data, peer-reviews, and scientific publications (Eyal 2019; Knorr-Cetina 1999).<sup>4</sup> The accumulation of credible expertise on these issues hinges upon the

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<sup>4</sup>Epistemic disputes hold significance within the domain of science as well. Taking climate change as an illustrative case, Sarewitz (2006) posits that political uncertainty often lies not in a lack of scientific knowledge but rather in an “excess of objectivity.” The multifaceted nature of environmental issues prompts various disciplines to offer divergent, and at times, incommensurable perspectives. Consequently, policy-makers find themselves confronted with the complexity of delineating a cohesive body of pertinent knowledge and establishing priorities for addressing the problem. In this context, scientific recommendations are entangled with competing interests and values. Thus, Sarewitz (2006, 104) argues that “the most constructive role for science in facilitating decision-making emerges only after values are elucidated through political discourse and after aspirations for the future are collectively agreed upon through democratic processes.”

unstable entanglements of technical, political, legal, economic, and moral aspects (Aradau and Huysmans 2019). In other words, the strength of scientific facts – and the credibility and legitimacy of individuals and institutions that speak in their name – stems neither from pure discoveries about nature (as the modern fiction would like us to believe), nor simply from the rhetorical quality of a given discourse (as a stereotypical relativist would propose). Scientific knowledge and authority are both contingent results of socio-technical assemblages.

The COVID-19 pandemic was a privileged moment for the observation of science as such a process of composition. Every day, newspapers and the social media discussed new findings, debunked hypotheses which seemed plausible, celebrated evidence raised by newly-published articles, and tried to make sense of the debates between contradictory statements. As Burdick (2021) claimed: “never has science been so evidently a process, more muscle than bone.” Public controversies on different policy-responses to COVID-19 in Brazil mobilized huge contingents of actors (politicians, journalists, scientists), knowledge (epidemiology, microbiology, infectiology, sociology), instruments (data collection, measure, and visualization) and institutions (the WHO, scientific associations, class corporations). Thus, instead of reaffirming an a-social image of science, critical scholars should disentangle these elements, retrace the controversies, and explore the actual work involved in stabilizing and legitimizing scientific claims.

Finally, the analysis of Bolsonaro’s populist performance during the pandemic in Brazil reveals that he understood the process of accumulation of scientific credibility, even more so than his critics and traditional scientific players. He engaged in public disputes equipped with the symbols of science, as Oliveira, Quinan, and Toth (2020) and Ruediger (2021) explained, and managed to push his agenda in detriment to the WHO’s recommendations. His politics aimed not at a radical relativism in which the epistemic authority of science is replaced with incommensurable narratives. On the contrary, Bolsonaro pointed out the social conditions of possibility of the not-so-scientific claims advanced by his adversaries and positioned himself as a border guard responsible for keeping the gates between truth and politics hermetically shut.

STS scholars have repeatedly shown that contradictory results, mistakes, ethical conundrums, and political incentives are not antithetical to science, but inherent elements of the everyday scientific enterprise, and even more so when scientists are pushed to come up with solutions to social emergencies. Bolsonaro’s anti-science strategy is the promise to fulfill the modern fiction of pure science when the frontiers between science and society are proved obviously porous (Costa 2021).

## 5. Final remarks

It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power. “Liberate scientific research from the demands of monopoly capitalism,” maybe it’s a good slogan, but it will never be more than a slogan. (Foucault 2019, 231)

Bolsonaro’s critics often blame him for spreading “fake science” and assert that civil society should put a lot of effort in defending a universal truth, for it “more than ever, cannot be treated as an option” (Lima 2020). Against these arguments, we raised evidence that Bolsonaro did not attack science *per se* but claimed that his policies were supported by scientific statements. He explored the controversies in the production of scientific facts

and questioned the credentials of the WHO, indicating that the organization and its experts had politicized the research on potential treatments for COVID-19. In this sense, we argued that “science denial” is less an analytical concept than a category employed in the blame-game in which politics, esoterism, and irrationality are always assigned to the opposition (Costa 2021).

The challenge for current research is not to restore old epistemological hierarchies and authority structures which placed science above politics, nor to “retrace the borders between science and politics” as many authors insist (Roque 2021), but to find the means of raising relevant social concerns within the imbroglis of scientific production. Should science continue to be seen as a sort of out-of-this-world, magical revelation of truth, citizens will be forced to choose between dogmatic narratives measurable only by the rhetorical skills of those announcing them. And this is the game in which Bolsonaro and other populists perform well.

Although the post-truth era precipitates the loss of authority of traditional institutions of science, we can still have informed conversations on scientific controversies and evidence-based policies. In this article, we suggested that the research paths opened long ago by Foucault, Latour and others may offer a better understanding of the multiple elements and mediations which compose scientific facts (Aradau and Huysmans 2019; Eyal 2019; Knorr-Cetina 1999). Thus, an understanding of science as a sociotechnical assemblage may induce critical reflexivity and a better capacity of evaluating the mechanisms which produce competing statements. Honest explanations and detailed descriptions of how scientific consensus is achieved (including mistakes, trials, historical limitations, market demands, political influences, etc.) will necessarily reveal that not all statements are constructed the same way. In a sense, scientific facts stand as spokespersons of the innumerable elements combined, and their authority and strength derive from this composition. As Latour (1987, 72) reminds us: “It may be easy to doubt one person’s word. Doubting a spokesperson’s word requires a much more strenuous effort however because it is now one person ... against a crowd.” Thus, in order to fight anti-science we need a more *social* understanding of science.

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