



## Twitter in Brazil: Discourses on China in times of coronavirus

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### ARTICLE INFO

#### Keywords:

Coronavirus  
Twitter  
Brazil  
China  
Discourses

### ABSTRACT

The health crisis caused by the new coronavirus (SARS-CoV-2) exposes latent social tensions arising from the process of globalization. The battle for the history of the responsibility for the crisis opens new fronts in which, thanks to social media, the public seems to be actively engaged. The first case of coronavirus in Brazil was confirmed in February, followed by a rapid increase in cases, news, and discourses on social media. Against this background, this article examines the following research question: what themes and sentiments are evoked in tweets posted in Portuguese linking the COVID-19 pandemic to China? We conducted a time series study of tweets posted during the period 19 March to April 3, 2020, retrieving 1.6 million tweets. The data was filtered in three stages and thematic and sentiment analysis was performed across the data set. The findings show that the most frequently occurring themes were the “Chinese virus”, “virus from China”, use of chloroquine, cure, the press and quality of information, dictatorship, China, Bolsonaro, and communism. The content of the tweets on these themes clearly reveals user sentiment, with a predominance of negative sentiments (fear, sadness and anger) and low proportion of sentiments in the category trust. The themes and sentiments evoked in the tweets reveal elements that characterize the current context of political polarization in Brazil and its effects on Twitter users’ understanding of the COVID-19 pandemic.

### 1. Introduction: the battle for history

Seemingly confined to China at the beginning of the month, COVID-19 was declared a global health emergency on 30 January. Only weeks later, on 11 March, the World Health Organization (WHO) declared the outbreak a pandemic (Farias, 2020; Lewellyn, 2020). A debate has emerged in parallel with the spread of the virus in which authors from different ideological backgrounds draw the same conclusion: nothing will ever be the same again. However, it is too early to say whether this crisis will open the door to a new and more hopeful world order (Hutton, 2020) or whether we find ourselves before the penultimate systemic shift after the Great Recession of 2008. We will just have to wait and see. Meanwhile, thinkers and academics speculate about the future: “the discussion in global think tanks rages, not about cooperation, but whether the Chinese or the US will emerge as leaders of the post-coronavirus world” (Wintour, 2020). Faced with this reality, there

does not seem to be much cause for optimism. A cold war mentality still prevails among the governments that make up the Atlantic Alliance and the escalation of US-China tensions and unconditional realignment of emerging countries like Brazil with the Trump Administration are plainly evident.

China’s growth from a peripheral country to the world’s second largest economic power has given rise to a more assertive US foreign policy (Friedberg, 2014). The Obama administration had already drawn up the principles of a strategy to contain the Asian giant (Green, 2016) and there is no doubt that the Trump administration has adhered more aggressively to this strategy, having a number of commercial, diplomatic, and military implications for the region. In March 2019, the European Union added to tensions by branding China a “systemic rival” (European Commission, 2019). For its part, the People’s Republic of China (PRC) has gone from calling for a greater voice in the institutional architecture inherited from Bretton Woods to creating its own structures and a global

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<https://doi.org/10.1016/j.ssaho.2021.100118>

Received 30 April 2020; Received in revised form 11 January 2021; Accepted 12 January 2021

foreign policy focus culminating in the “Belt and Road Initiative”. This policy poses a challenge to the traditionally dominant powers in the world order and, since the end of the 1980s, the globalization process.

This context helps us to understand the bigger picture behind the black and white media narrative around what is happening in China, with emphasis on the Hong Kong protests and coronavirus crisis (Escobar, 2019; Pérez Mena, 2019; Poch, 2019; Shimizu, 2020). Pérez Mena (2020) suggests that the coverage of the coronavirus crisis exemplifies the “weaponization” of Western mainstream media. He bases his argument on the investigations of, among others, Vultee (2007), who has carried out an extensive analysis of the role played by the media in the process of securitization and its effect on public opinion. According to agenda-setting theory, the media significantly influences the process of deciding which public issues are the most important (McCombs, 2006). In other words, “the media agenda becomes the public agenda, public opinion” (Rubio Ferreres, 2009).<sup>1</sup>

With regard to public opinion, a look at the timeline of the initial phase of the COVID-19 pandemic reveals how the framing of the crisis has evolved. This takes place as a result of the differing emphasis the media places on particular topics or issues (McCombs, 2004): in this case, the reference to China and its links to the health emergency. From the outset, it is important to stress that an in-depth study of the influence of the topics or issues emphasized by the media is beyond the scope of this study. However, a predominant theme in the first months of the epidemic, both in the specialist and mainstream media, was China’s responsibility for the COVID-19 crisis (Ang, 2020).

In the first months of the pandemic, the framing of the crisis focused on Chinese eating habits (Arana, 2020) and the lack of transparency of the Chinese authorities (Campbell, 2020). Sars-CoV-2 was subsequently referred to as “Wuhan pneumonia”, the “chinky coronavirus” (Belluz, 2020), and the “Chines virus” (Budhwani & Sun, 2020; Shimizu, 2020). As China’s social distancing measures began to work, the media turned their gaze to the authoritarian nature of the Chinese regime. However, as reality has shown in Taiwan and South Korea, success in the fight against the coronavirus is rooted in the role of the state and collective experience rather than the form of government (Herrera-Feligeras and Pérez Mena, 2020).

The aid sent by China to Europe exactly when Italy and Spain became the epicenter of the coronavirus pandemic was strongly contested and portrayed as a propaganda operation (Walkowicz, 2020), resulting in the construction of another narrative suggesting that the WHO was China’s accomplice (Feldwich-Drentrup, 2020). The media also predicted the erosion of the mandate of Xi Jinping and the Chinese Communist Party (Pei, 2020) and described the COVID-19 crisis as “the Chinese Chernobyl” (Tharoor, 2020). Ultimately, as China reduced the number of COVID cases and deaths and the epicenters of the coronavirus pandemic shifted to Europe, the United States and Brazil, concern grew that China would come out of the crisis even stronger than before (O’Dea, 2020). On the other hand, other analysts have predicted that the crisis will have a negative impact on Beijing’s global political and economic standing (Esteban, 2020).

There are a lot of unknowns surrounding the narratives on China linked to the new coronavirus. However, there is one great certainty: we are witnessing a reporting battle in which adversaries are fighting to gain ground meter by meter. As Ríos (2020) points out: “new fronts are being opened up in which the coronavirus merely reflects a broader crisis that will echo well beyond the pandemic”.<sup>2</sup> One of these fronts is Latin America. On the one hand, this region has to deal with the political and

economic influence of the United States and the ever greater presence of the People’s Republic of China. On the other, although Washington has gradually reconstructed its political alliances in Latin America, the latter’s dependence on Beijing when it comes to trade and investment is much greater than the region’s anti-China rhetoric promoting leaders would like to admit.

Beyond the agendas of the news media, we are witnessing a battle in which the current public health emergency is bringing latent political and economic conflicts to the surface on social media. A case in point is Brazil, where President Jair Bolsonaro and the foreign minister Ernesto Araujo are known for their blunt anti-communist rhetoric. Despite this stance, Brazil is forced to adopt a pragmatic policy towards Beijing, as the Asian giant is the country’s primary trading partner and the Brazilian economy depends on China’s demand. Yet, despite trade agreements and treaties, underlying tensions could explode at any moment (Santoro, 2020). In this respect, on 18 March, Twitter was the stage of serious allegations made by Eduardo Bolsonaro – a federal deputy and the President’s son – blaming China for the coronavirus outbreak and triggering a diplomatic crisis between the two countries.<sup>3</sup> In this scenario ripe with possibilities, the aim of this study was to analyze the use of Twitter by Portuguese-speaking users and the production of discourses on the new coronavirus (SARS-CoV-2) in the face of political tension between Brazil and China.<sup>4</sup>

Against the backdrop of this diplomatic incident, this article investigates the following research question: what themes and sentiments are evoked in tweets posted in Portuguese linking the COVID-19 pandemic to China? This question is warranted in view of the implications of the deep political polarization in Brazil since the impeachment of Dilma Rousseff and other random political events (Moreira, 2018) tied to the massive spread of fake news and conspiracy theories on social media (Gonzaga & Nassif, 2020; Mariano & Gerardi, 2019; Nassif, 2020), including:

- o “Operation Car Wash” – Launched in March 2014, Operation Car Wash consists of a series of investigations into a huge money laundering scheme (Nassif, 2020). Led by Brazil’s Federal Police, these investigations emphasize the role played by the former federal judge, Sérgio Moro. According to Gonzaga and Nassif (2020), originally built around legitimate arguments supporting the fight against corruption, “Operation Car Wash has been totally distorted as a ministerial action, transforming it into an instrument of political interference and abuse of power, repeating practices from our arbitrary past”.
- o The murder of Marielle Franco – Rio de Janeiro councilwoman and human rights defender Marielle Franco was assassinated on March 14, 2018. Investigations into her murder have yet to be concluded. Franco stood up for poor people who suffered at the hands of militias and worked tirelessly to seek justice for the young people killed in a police operation in Acari (Andrade & Corrêa, 2020). Her murder reverberated widely in both social and mainstream media, becoming a leading topic on Twitter and sparking heated debate (Soares et al., 2019).
- o The imprisonment of former president Luiz Inácio Lula da Silva – Luiz Inácio Lula da Silva was imprisoned for 580 days (April 7, 2018 to November 8, 2019) after a federal court ruled that he was guilty of passive corruption as a result of the investigations of Operation Car Wash. According to journalist Maria Inês Nassif (2020), Operation Car Wash promised to end corruption in the country. However, it has shown itself to be simply a political instrument used by Brazil’s elites.

<sup>1</sup> Case study in Lu, Yu-Ting (2008) *La identidad del Estado como argumento electoral en Taiwán: La prensa en las elecciones presidenciales de 1996, 2000 y 2004*.

<sup>2</sup> Given its influence on our daily lives, we focus here on public opinion formation derived from the action of major Western media outlets. However, the dynamics of the renewal of Chinese diplomacy constitutes a possible direction for future research.

<sup>3</sup> Further details can be found at <<https://g1.globo.com/jornal-nacional/noticia/2020/03/19/eduardo-bolsonaro-culpa-china-por-coronavirus-e-gera-crise-diplomatica.ghtml>>.

<sup>4</sup> The open source version of the Twitter API allows analysts to filter publications by language, but not by location. However, the results show that the majority of the posts were made by Brazilians.

In Nassif's view, the Operation is nothing more than a scam to remove the Workers' Party from power, incarcerate former president Luiz Inácio Lula da Silva, and open the way for the ascension of the right. The journalist highlights that, as part of this scam, both the former president and the country itself were sacrificed, the result of electoral fraud using a cultural substrate cultivated by Operation Car Wash to develop a sordid social media campaign based on fake news directed against the Workers' Party candidate, Fernando Haddad.

The above events, among others, expose the battle of ideas between populists – underpinned by humanist discourse – and partisan elites – advocates of conservative Christian discourse – shaping a scenario marked by 'storms of intolerance' and threats to human rights and democracy (Freixo, 2019; Mariano & Gerardi, 2019; Nassif, 2020). Against this backdrop of extreme political polarization, the beginning of the COVID-19 pandemic in Brazil brought anti-China and anti-communist rhetoric to the forefront on social media. This social and political phenomenon was explored drawing on data obtained from Twitter over a specific time period – the beginning of the coronavirus pandemic. This article is organized into four parts. In the introduction, we present elements that characterize the geopolitical tensions in the relations between Brazil, the United States and China crosscut by political polarization in Brazil. In the methods section, we describe the procedures adopted in the thematic analysis and sentiment analysis of the data obtained from Twitter. In the results section, we present: a) a general overview of the results focusing on the terms "China" and "Chinese virus"; b) a description of the eight core themes identified in the thematic analysis and type of twitter users; and c) the results of the sentiment analysis of the tweets by core theme and the variation in sentiments over the study period. In the conclusion, we summarize the main results, highlighting that the narrative of the new coronavirus on Twitter is permeated by stigma and racist connotations manifested in the terms "Chinese virus" and "virus from China", which in turn are associated with negative sentiment, fear, sadness and anger.

## 2. Methods

The pandemic tests our capacity for communication and information provision, in this case to curb the increasing number of cases and deaths caused by the new coronavirus (SARS-CoV-2). It reveals our understanding of the different issues related to the virus and therefore the discourses produced by different information sources. Within this context, empirical evidence has shown the potential of web 2.0 technologies and social media such as Twitter for disseminating information and misinformation about health matters during the coronavirus pandemic (Ahmed et al., 2019; Giustini & Wright, 2014; Jahanbin & Rahmanian, 2020). Kostkova et al. (2014) showed that social media has attracted much interest as a source of huge amounts of data for epidemic intelligence. The authors of a study exploring the coronavirus and Twitter highlight that "one of the most effective ways to prevent and control epidemics is to monitor and track the news and social networks about the spread of infectious diseases" (Jahanbin & Rahmanian, 2020).

The literature reveals the importance of studying social media such as Twitter to better understand behaviors towards and the discourse on the coronavirus pandemic from different social perspectives. This is because, as Crosbie suggests (2002), social media has some unique characteristics: the capacity to deliver individualized messages to those with access; each person involved shares control over the content conveyed; and new media is dependent upon technology. As a social network and micro-blogging server, Twitter allows users to send messages and receive personal updates from other contacts using a limit of 280 characters.<sup>5</sup> Moreover, it provides large-scale data access, facilitating the study of different health-related topics during event peaks (Ahmed et al., 2019;

Kostkova et al., 2014; Llewellyn, 2020; Chew & Eysenbach, 2010; Lopez et al., 2020).

Twitter data is a valuable source of information for research in the time of coronavirus "because tweets are a source of rich data, and by locating patterns in data, it is possible to derive insight into how people respond to certain events and topics such as infectious disease outbreaks" (Ahmed et al., 2019, p. 61). From this perspective, Lopez et al. (2020) note that since the early stages of the disease caused by SARS-CoV-2 "people have expressed their opinion and shared both information and misinformation on social media platforms such as Twitter". To understand the opinions of Portuguese-speaking Twitter users, we conducted a search of tweets posted between 19 March and April 3, 2020, resulting in 1.6 million tweets. This period is based around the dates of a series of controversial remarks posted on social media by influential national and foreign politicians. In this regard, evidence shows that politicians wield significant influence on social media through the reproduction of their discourses by other users (Fernández Gómez et al., 2018; Mariano & Gerardi, 2019; Pérez-Curiel & Limón Naharro, 2019).

The following tweet published by President Donald Trump on 16 March illustrates this influence in relation to the new coronavirus: "The United States will be powerfully supporting those industries, like Airlines and others, that are particularly affected by the Chinese Virus. We will be stronger than ever before!" This tweet received 126,000 comments, 154,500 retweets, and 316,000 likes.<sup>6</sup> The use of the term Chinese Virus, which sparked a series of controversies on social media and in the news, was justified by Trump in an interview given on March 18, 2020 in which he claimed: "It's not racist at all", adding, "It comes from China, that's why."<sup>7</sup> Coming to his defense, congressional deputy Eduardo Bolsonaro endorsed Trump's words with the following tweet blaming China for the coronavirus pandemic: "once again, a dictatorship preferred to hide something serious rather than exposing [it], bearing the consequences and saving countless lives. China is to blame and freedom would be the solution."<sup>8</sup> This last tweet was decisive in defining the study period (19 March to April 3, 2020), with data collection beginning the day after Eduardo Bolsonaro's post and concluding two weeks later. This data was filtered in four stages using the Twitter API and an open source R software as described in Fig. 1.

The data was analyzed using thematic analysis. According to Braun & Clarke (2006, p. 6), "thematic analysis is a method for identifying, analyzing, and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail". Thus, this method allowed us to identify and analyze the main themes linked to the research aim, serving three specific purposes: a) to identify existing patterns in discourses on SARS-CoV-2 referring to China within the data set; b) to analyze the identified patterns and categorize them into themes; and c) to perform a sentiment analysis of the tweets. The sentiment analysis was conducted using a natural language analysis software developed by Manning et al. (2014). Using the R programming language, the software analyzes texts in different languages, including Portuguese. Based on polarity lexicons, sentiment analysis extracts information and identifies and categorizes reactions, attitudes, and emotions (Mohammad & Turney, 2010). We used the Syuzhet package, which provides a method for accessing the robust sentiment extraction tool. We used the National Research Council Canada (NRC) Sentiment and Emotion Lexicons, which assigns a sentiment type using 10 different emotions: anger, anticipation, disgust, fear, joy, sadness, surprise, trust, and negative and positive sentiment.

<sup>6</sup> See <https://twitter.com/realdonaldtrump/status/1239685852093169664>.

<sup>7</sup> The New York Times, available at <https://www.nytimes.com/2020/03/18/us/politics/china-virus.html>.

<sup>8</sup> For further details on this episode see <https://veja.abril.com.br/politica/ja-mais-ofendi-o-povo-chines-diz-eduardo-bolsonaro-sobre-coronavirus/>.

<sup>5</sup> Data available at: <<https://twitter.com/explore>>.

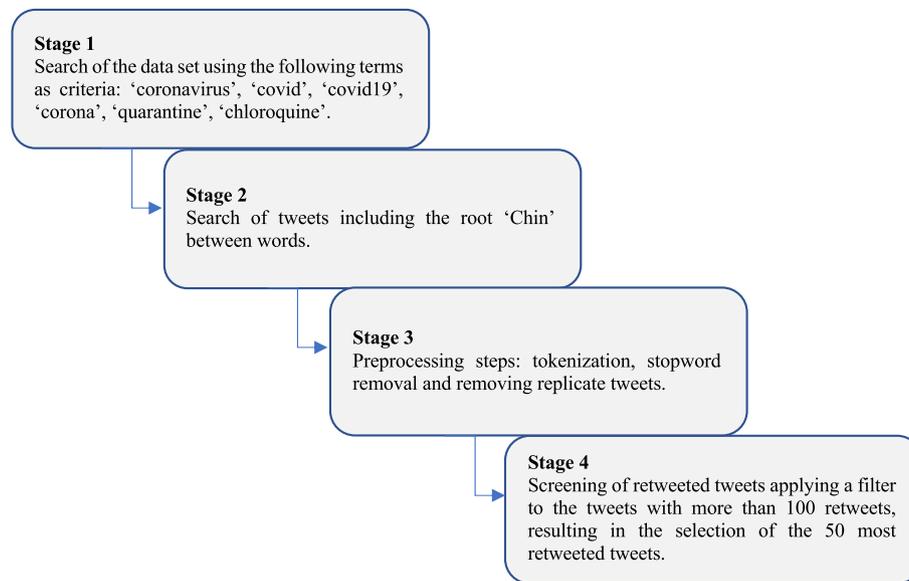


Fig. 1. Stages of data filtering.

### 3. Results and discussion

This section presents the study results. First, we provide a general description of the data set and then go on to outline the themes drawing on the current literature on the coronavirus pandemic and use of social media. Finally, we present the results of the sentiment analysis, highlighting the different elements that influence the production of tweets in the face of crisis. The methodology applied in this study was adapted from Kostkova et al. (2014), Ahmed et al. (2019), Llewellyn (2020), and Zhao (2020), who show the potential of social networks for analyzing and predicting behaviors and discourses along the different trajectories of the coronavirus pandemic. Given the current political tensions between Brazil and China, the sentiment analysis focused on the relation between the virus and the country where the first cases were identified.

Panel A in Fig. 2 shows the total number of tweets retrieved per day during the study period, totaling approximately 460,000. The data shows three peaks during the period (26 March and 2 and 3 April). Dates without data occurred either because the algorithm did not capture information relevant to the search criteria on that day or due to acquisition flaws. Panel B illustrates the tweets that contain the root 'chin' (11,000 tweets) and the term 'Chinese virus' (800 single tweets), shown in red and black, respectively. The first peak begins to rise on 24 March. This may be the result of the call that Jair Bolsonaro made to the Chinese president Xi Jinping in an attempt to calm the tensions caused by his son's declaration on Twitter on 18 March. One of the repercussions of this event was the national newspaper Folha de São Paulo's piece on 26 March headlined "Calls on Doria and expression 'Chinese virus' invade the discourse of Bolsonaroistas on social media".<sup>9</sup> The other peaks are the result of the tension created on Twitter: "Eduardo Bolsonaro's influencers enter fray with the Chinese ambassador"<sup>10</sup>.

Table 1 presents a detailed description of the eight core themes identified in the 50 most retweeted tweets during the study period. The 50 most retweeted tweets were identified by applying a filter to tweets with more than 100 retweets. These retweets account for 75% of all

retweets, a significant quantity showing the main themes related to the coronavirus circulating on Twitter during this period. Retweets – one of the unique characteristics of social media – highlight the lack of control over message content and the challenges of digital governance in determining the veracity of information and applying ethical standards to tackle cyber hate (Crosbie, 2002; Procter, 2019). The 50 most retweeted tweets were posted by different types of users, categorized as follows: journalists, alternative media, influencers, politicians, public officials, other profiles classified as personal profiles, and accounts that were suspended or deleted after the data collection period. One of the profiles included a high-ranking member of the judiciary who tweeted eight of the 50 most retweeted tweets.

The categories were identified and named according to the central themes across the data set (Braun & Clarke, 2006). As can be seen in the table, the discourses evoke various themes to link COVID-19 to China, ranging from messages of concern and hope to attack on the mainstream media and conspiracy theories. The themes represent different ways of understanding and interpreting reality in the face of the uncertainty generated by the coronavirus pandemic and other social problems. The messages conveyed in the tweets and retweets reveal the individual and collective political stance of users.

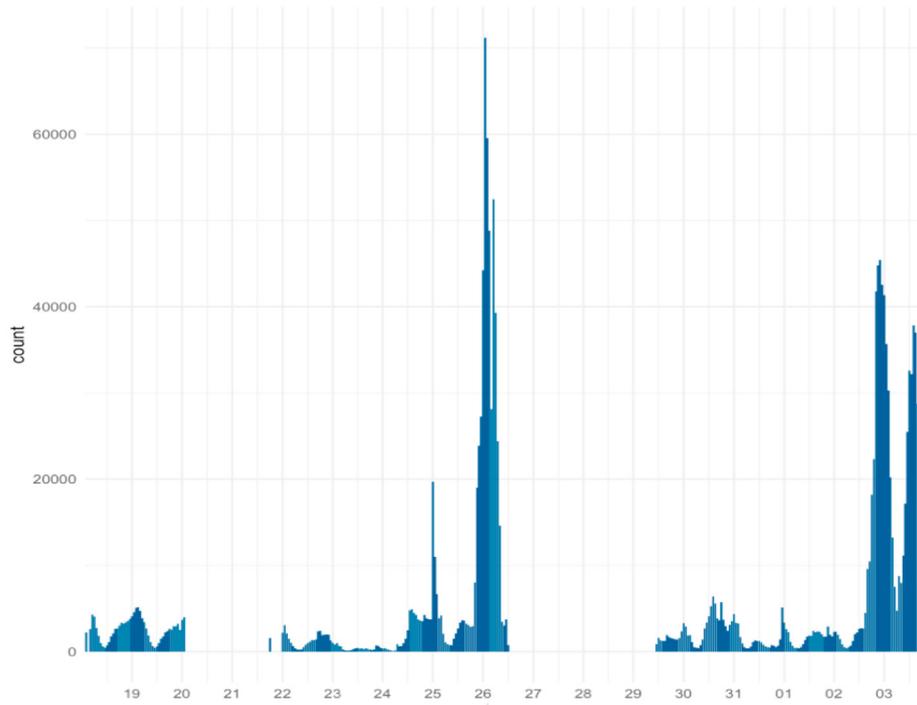
For practical reasons, we do not propose to describe the specific characteristics of each thematic category. Rather, we focus on the terms "Chinese virus" and "virus from China" used to refer to the coronavirus. Racist narrative develops when certain discourses, encouraged by politicians in positions of power, are reproduced, failing to respect the guidelines and best practices for the naming of new human infectious diseases established by the World Health Organization (WHO), whose aim is to "avoid causing offence to any cultural, social, national, regional, professional or ethnic groups" (WHO, 2015). Our findings show the frequent use of stigmatizing terms like the "Chinese virus" or the "virus from China" to refer to the new coronavirus, going against these strict guidelines.

These terms were identified in 54% of the 50 most retweeted tweets. In the themes "attacks on mainstream media" and "humor and sarcasm" they were found in 80% of the retweets, while in the categories "conspiracy theories" and "political polarization" they were present in 67% and 78% of the tweets, respectively. The following tweet is an example of the use of these stigmatizing terms: "a few days ago, the New York Times published that chloroquine 'doesn't work against the Chinese virus'. But it backtracked! It published an article in which it recommends the early use of the medicine to cure patients with COVID-19. Well now! Who

<sup>9</sup> Businessman João Doria is the governor of São Paulo. Further details can be found at <<https://www1.folha.uol.com.br/poder/2020/03/cobrancas-a-doria-e-expressao-virus-chines-invadem-discurso-de-bolsonaristas-nas-redes.shtml>>.

<sup>10</sup> Further details can be found at <<https://blogs.oglobo.globo.com/lauro-jardim/post/os-influenciadores-de-eduardo-bolsonaro-na-briga-com-o-embaixador-chines.html>>.

Panel A: Total number of tweets retrieved per day



Panel B: Total number of tweets referring to the roots 'chin' and Chinese Virus" per day

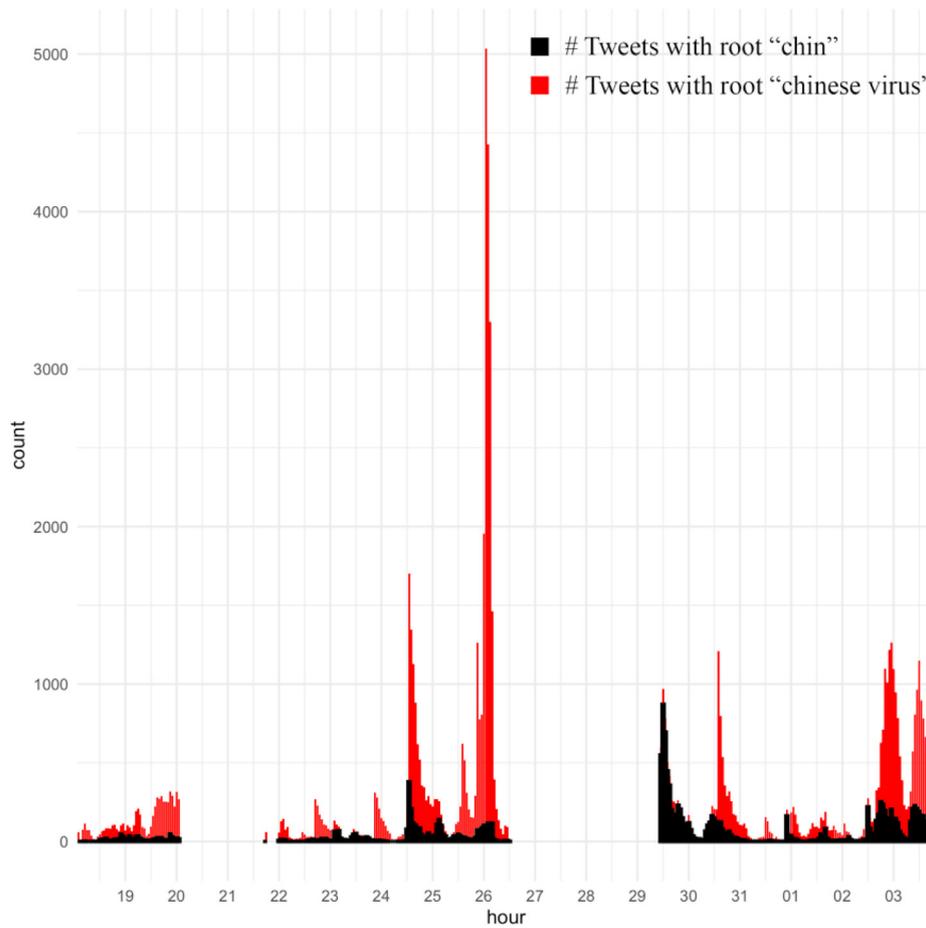


Fig. 2. Graphical representation of the tweets retrieved during the study period.

**Table 1**  
Description and examples of the identified themes.

Themes	Description	No. tweets	Examples of Tweets	User profile
Concerns	Tweets about concerns regarding government decisions, social and economic issues, health coverage, and information quality	4 tweets	<i>"If the governor can't guarantee the payment of salaries because of the confinement of people using the #CoronaVirus #ChineseVirus as a pretext, then how can health professionals continue working against the virus?"</i> .	Journalists (3) Public officials (1)
Humor and sarcasm	Tweets involving elements of humor and sarcasm related to matters of faith, political polarization, social events, and day-to-day life associated with the pandemic	5 tweets	<i>"Truck with hand gel stolen in RJ [Rio de Janeiro]; within hours the goods were sold at a market in Pavuna. Didn't the governor of RJ decree that the thieves should stay in home quarantine to protect themselves from the #CoronaVirus #ChineseVirus?"</i>	Journalists (1) Alternative media (1) Public official (2) Personal profiles (1)
Hope	Tweets about new cases of cure and low transmission, actions of solidarity between countries, and improvement in environmental quality	6 tweets	<i>"China sent masks to Italy in boxes featuring a quote from a Roman poem: \"We are waves of the same sea\" (...) Japan donated supplies to China featuring a quote from a Chinese poem: \"We have different mountains and rivers, but we share the same sun, moon and sky\". #COVID19 <a href="https://t.co/nWonJm1dey">https://t.co/nWonJm1dey</a>".</i>	Journalists (2) Personal profiles (3) Suspended or deleted (1)
Information	Tweets with diverging information on the effectiveness of the treatment of COVID-19 using chloroquine and other measures adopted by the health authorities	9 tweets	<i>"Ministry of Health authorizes chloroquine for severe cases of #CoronaVirus #ChineseVirus <a href="https://t.co/xDuiJZBLKo">https://t.co/xDuiJZBLKo</a> #R7 via @portabr7".</i>	Journalists (3) Alternative media (2) Influencers (1) Public official (1) Personal profiles (2)
Distrust	Tweets showing distrust regarding data on the number of cases and deaths caused by the virus presented by China, Italy and Brazil	6 tweets	<i>"Oxford study disputes Italian data on coronavirus deaths. Imprecision due to the method used to classify deaths used in Italy, which may be underestimating the lethality of the Chinese virus <a href="https://t.co/rjjaDV90i8">https://t.co/rjjaDV90i8</a>"</i>	Alternative media (1) Influencers (1) Public official (2) Personal profiles (2)
Attacks on the mainstream media	Tweets that mischaracterize and question the intentions and truth of information conveyed by mainstream media/newspapers	5 tweets	<i>"There is a cure for the Chinese virus disease, despite the fact that the mainstream media is openly rooting against it. <a href="https://t.co/o4I3jxiFou">https://t.co/o4I3jxiFou</a>".</i>	Journalists (1) Alternative media (2) Personal profiles (2)
Political polarization	Tweets highlighting the political polarization of the pandemic involving messages of support or disapproval for the decisions taken by President Jair Bolsonaro	6 tweets	<i>"Up yours parasites, when President Bolsonaro mentioned it, everyone criticized him and now it has been confirmed: Chloroquine was 100% effective in treating the Chinese virus. I'll say it here; I'll always support Jair Bolsonaro".</i>	Politicians (1) Journalists (3) Suspended or deleted (1) Non-personal profiles (1)
Conspiracy theories	Tweets about conspiracy theories highlighting the interests and power of China to manipulate the decisions taken by international agencies, politicians in positions of power, and other sectors with the purpose of obtaining economic gains from the spread of the virus	9 tweets	<i>"Servant of China's Communist Dictatorship commands the WHO, the organization that governors and mayors of Brazil say continues to tackle the #ChineseVirus #CoronaVirus pandemic. But, no one voted for this individual to command states and municipalities in Brazil".</i>	Alternative media (2) Influencers (3) Public official (2) Suspended or deleted (1) Personal profiles (1)

Source: authors' elaboration. Study data.

Note: The tweets have been translated to facilitate understanding.

would say?" From the series "Torcendo pelo Vírus" or "Rooting for the Virus" (Tw8<sup>11</sup>). This tweet was grouped into the category "attacks on mainstream media" due to the explicit reference to the media.

The discourses in the category "humor and sarcasm" contain varying elements ranging from faith, the carnival, political polarization, day-to-day, and negative remarks about the political regime in China. The following tweet highlights these elements: "this business of releasing delinquents because of the corona, the famous Chinese virus, besides being legally irrational, is utter nonsense. They are already isolated. The only prisoner who traveled abroad was Lula" (Tw28). Besides humor and sarcasm, the elements evoked in this tweet reflect the minefield of political polarization, with the discourse on the new coronavirus being

shaped by intolerance towards diversity and pluralism, threats against human rights, and political insults – in this case against the former president Luiz Inácio Lula da Silva (Mariano & Gerardi, 2019). Another feature of this category of tweets that reflect political polarization was support for Jair Bolsonaro: "take that you bunch of parasites, when President Bolsonaro talked about the topic everyone criticized [him] and now it has been confirmed chloroquine had a 100% success rate in the treatment of the Chinese virus. I say here, I support Jair Bolsonaro, always" (Tw11).

Political polarization also permeates discourses in the category "conspiracy theories", as the following tweet illustrates: "governors and mayors say that they follow WHO recommendations for tackling the #CoronaVirus #ChineseVirus pandemic, the same entity that followed the guidelines of China's communist dictatorship on hiding the gravity of the infestation until March 11, 2020" (Tw26). This tweet also highlights elements that extend beyond political polarization, alluding to

<sup>11</sup> Code assigned to the tweets according to the chronological order in which they appear in the dataset.

conspiracy theories, especially when questioning the actions of governors and mayors and WHO recommendations for controlling the COVID-19 pandemic. At the same time, it presents insinuations about China's lack of transparency with regard to the release of information on the spread of infections. A more in-depth analysis of the Tw26 reveals negative sentiment towards China and its political regime, in which the term “#ChineseVirus” is loaded with stigmatizing and discriminatory undertones. In this regard, a study conducted by Xu and Liu (2020) warns:

“Naming a contagious disease, such as COVID-19, by the geographic locality where the disease originates or starts, for example, Wuhan or China, may stigmatize specific ethnic groups related to that locality, and such stigmatizing behavior will further lead to legitimized discrimination, prejudice, and group conflicts”.

Our findings, illustrated by the above tweets grouped into the categories where the terms “Chinese virus” and “virus from China” were most frequent, leave no doubt as to the stigmatizing and discriminatory nature of the posts directed at China. The results presented in Table 1 are consistent with the conclusions of Budhwani and Sun (2020), who suggest that “the rise in tweets referencing ‘Chinese virus’ or ‘China virus’, along with the content of these tweets, indicate that knowledge translation may be occurring online and COVID-19 stigma is likely being perpetuated on Twitter” (Budhwani & Sun, 2020). Our data show that the “Chinese virus” and/or “virus from China” stigma was observed in 54% of the 50 most retweeted tweets.

Besides stigma and racism, the findings show that the narratives on Twitter reflect other social, economic, and political phenomena experienced in Brazil. One such phenomenon is the rise of authoritarianism, which operates in the uppermost echelons of power (Santos & Tanscheit, 2019; Gonzaga & Nassif, 2020; Nassif, 2020), discrediting scientific evidence, attacking the media and other sources of information and, consequently, spreading hate and barbarism in the face of the coronavirus pandemic. The diversity of themes in the tweets referring to the virus as the “Chinese virus” or “virus from China” reveals the politicization of the coronavirus pandemic. It would appear that this politicization occurs as a result of the discourse of denialism adopted by the Brazilian president in relation to the coronavirus,<sup>12</sup> his underestimation of the risks, and defiance of distancing guidelines (Farias, 2020). The underlying prejudice of the terms “Chinese virus” and “virus from China” deepens tensions between Brazil and China (Farias, 2020; Santoro, 2020) and questions should be raised about the effects of this prejudice on the mental health and self-esteem of the Chinese people (Sheth, 2020; Zheng et al., 2020, pp. 1–4). Within this context, we considered it appropriate to conduct a sentiment analysis of the 50 most retweeted tweets bearing in mind that the use of stigmatizing terms like “Chinese virus” and “virus from China” may be motivated by different sentiments.

The results of this analysis (Fig. 3) show that the terms “Chinese virus” and “virus from China” have strong negative connotations associated with feelings of fear, sadness, anger, and disgust. The sentiment analysis was also conducted manually<sup>13</sup> to crosscheck the results, paying special attention to the tweets in the category “humor and sarcasm” and ironic tweets. No important discrepancies in results were found between the manual and automatic analyses. The results also indicate that the tweets combine adverse information with positive sentiments, characterizing the political tension between Brazil and China and therefore the wider effects of this tension on the dissemination of negative sentiment

through social media. The following tweet in the category “conspiracy theories” illustrates this: “Servant of China’s Communist Dictatorship commands the WHO, the organization that governors and mayors of Brazil say continues to tackle the #ChineseVirus #CoronaVirus pandemic. But, no one voted for this individual to command states and municipalities in Brazil” (Tw25).

The following tweet categorized in “conspiracy theories” also demonstrates negative sentiment: “EXTREME PRESS AND CHAOS PROPHETS Oh, this Bolsonaro can’t copy Trump and use chloroquine to save lives in Brazil, who does he think he is to scupper China’s plans and prevent Brazilians from dying? Genocide!” (Tw30). This type of sentiment extends across all categories, including “attacks on the mainstream media”, as the following tweet shows: “#ExtremePressDay US health agency FDA approves the use of chloroquine to treat the Chinese virus. Suck on that globolixo (or ‘globogarbage’, referring to the television network O Globo)! <https://t.co/uYDKQb9V9E>” (Tw33). Both tweets mention the press, questioning their role in promoting the universalization of information during the coronavirus pandemic. These discourses reveal sentiments such as anger and hate, while at the same time discrediting the work of journalists and broadcasters, stigmatizing them with terms such like “chaos prophets” and “Globo garbage”.

The tweets in the theme “hope” reveal other types of sentiment involving positivity: “China sent masks to Italy in boxes featuring a quote from a Roman poem: ‘We are waves of the same sea’ (...) Japan donated supplies to China featuring a quote from a Chinese poem: ‘We have different mountains and rivers, but we share the same sun, moon and sky’”. #COVID19 <https://t.co/nWonJm1dey>” (Tw13). This tweet emphasizes sentiments of joy and trust in relation to the cooperation and solidarity between China and Italy and Japan and China during the peak of the coronavirus pandemic in the first two countries. However, positive sentiments were associated primarily with the hope of a treatment based on the use of chloroquine – despite the lack of consensus among the scientific community about its effectiveness.<sup>14</sup> This is reflected in twitter users’ agreement with the government initiative to increase the production of chloroquine, as shown by the following tweets: “good news: treatment with chloroquine had a 100% success rate against the #ChinaVirus [https://t.co/TyLHThr4pj\(cure\)](https://t.co/TyLHThr4pj(cure))” (Tw35); “Ministry of Health releases 34 MILLION UNITS of the medicine chloroquine to treat patients against the Chinese plague for all states. <https://t.co/Cd7AREjr3O>” (Tw19).

Fig. 4 presents the results of the sentiment analysis by theme, showing the predominance of negative sentiment over positive sentiment. Positive sentiments stand out in relation to other sentiments in the categories “hope” and “political polarization”. The results reveal multiple tweet content features, including strong support for government actions in the tweets in the “political polarization” theme, as shown by the following tweets: “Humph ... Yesterday they were criticizing the president about a live in which he was talking about the medicine! HYPOCRITES! Hospitals in Ceará start using hydroxychloroquine and chloroquine to treat people infected with the Chinese virus - Noticia Brasil Online <https://t.co/hXeWBiU6kp> via” (Tw14); “72-year-old lady and mother of the Director of Prevent Senior Hospital show surprising improvement after treatment using chloroquine against #ChineseVirus. Congratulations Pres @jair-bolsonaro for your wise decision to increase the production of this drug, will save many lives!! #PraCimaDelesPresidente” (Tw2).

Although the above tweets evoke sentiments of trust, they can be analyzed from a number of perspectives, including that of political polarization (Freixo, 2019; Mariano & Gerardi, 2019; Moreira, 2018),

<sup>12</sup> According to data published by the Brazilian government, 5912 deaths had been registered up to 30 April, the date on which this article was submitted. On 22 July, the date on which the corrections were submitted, the number stood at 81,487, which represents an increase of  $\approx 1287\%$  in deaths in 84 days. Further details can be found at <https://COVID.saude.gov.br>.

<sup>13</sup> The manual analysis was performed by three researchers from the field of human sciences who had no relationship with the study. The categories of analysis adopted by this study were those used in the natural language analysis software developed by Manning et al. (2014).

<sup>14</sup> During the study period, members of the Brazilian and US government speculated and made a number of declarations about the effectiveness of hydroxychloroquine for treating COVID-19. However, evidence from a major study conducted in New York shows the ineffectiveness of this drug, emphasizing that “the results do not support the use of hydroxychloroquine” (Geleris et al., 2020).

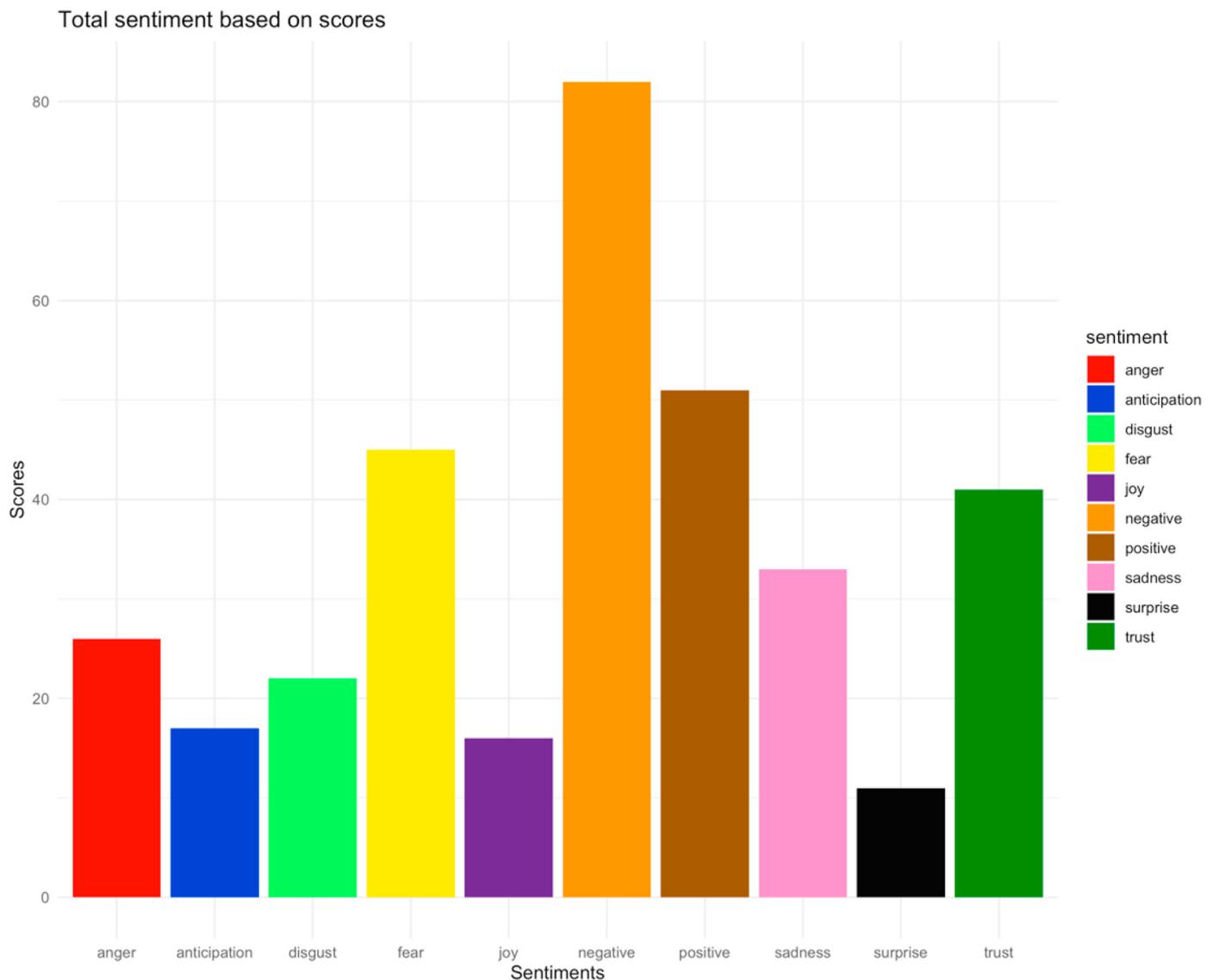


Fig. 3. Sentiment analysis of the fifty most retweeted tweets during the period 19 March to 3 April.

which influences Twitter users' perceptions and understanding of elements associated with the coronavirus pandemic. These elements include treatment with chloroquine and the use of stigmatizing terms such as the "Chinese virus" and "virus from China". In relation to this stigmatization, Budhwani and Sun (2020) conclude that "if these stigmatizing terms persist as malicious synonyms for the novel coronavirus, reparative efforts may be required to restore trust by marginalized communities".

In the "humor and sarcasm" category, the most prominent sentiments are fear, anger, and sadness, in contrast to joy, which was not identified. The following tweet illustrates these sentiments in this category: "in the fight against the Chinese virus, anything goes, even repressing another person's faith. You can't, under any circumstances, ask the people to fast or pray .... It would be futile if it wasn't so vile to police the faith of Brazilians in a time of fragility" (Tw5).

Sentiments of anger are prominent in the categories "distrust" and "attacks on the mainstream media". In the latter, anger is the predominant sentiment, followed by sadness associated with the context of political polarization in Brazil: "BOLSONARO AND CHLOROQUINE: The Folha insisted on belittling Bolsonaro's decision regarding the production of the medicine, which has had results in China and France. + <http://t.co/Gi79DsnyPH>" (Tw31). This tweet refers to the attempts made by Brazil's largest national newspaper, Folha de São Paulo, to inform the

population about government actions in the fight against the COVID-19 pandemic.

Trust is a prominent sentiment in the categories "information", "attacks on the mainstream media", "political polarization", and "conspiracy theories", where it appears primarily in posts that talk about the treatment and cure of infections caused by the new coronavirus. To obtain a better understanding of the evolution of the spread of information through tweets containing the term "Chinese virus", we also performed an analysis of the variation in sentiment over the study period.

Fig. 5 shows the variation in the 10 sentiments categorized in Figs. 3 and 4 over the study period. The results of each sentiment are presented as percentage of the overall total of words captured by the algorithm, as described in the methods section, in 1-h intervals. On March 18, there was a strong presence of negative sentiment and anger, probably due to the statement published on Twitter by Eduardo Bolsonaro blaming China for the coronavirus pandemic. Negative sentiment associated with sadness and disgust are present on March 24, probably as a result of the peak of tensions between Brazil and China, when President Jair Bolsonaro needed to call President Xi Jinping to pacify the situation so as not to affect trade relations. As a result, on March 25, sentiment was predominantly positive, being associated with confidence. However, negative sentiment predominated once again on March 30, possibly due to the

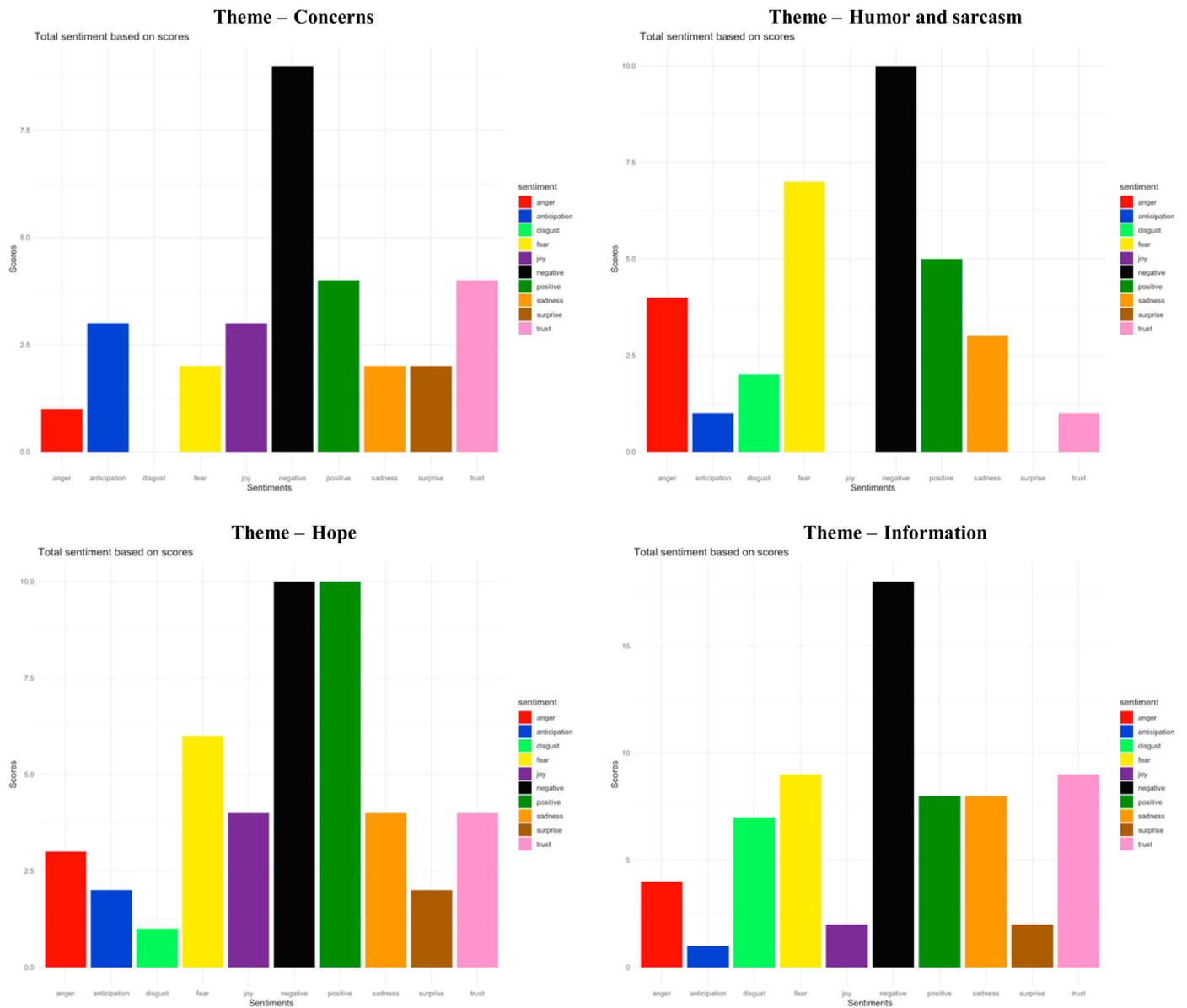


Fig. 4. Sentiment analysis of the eight categories used to classify the fifty most retweeted tweets during the study period.

spread of conspiracy theories on social media linking China to the coronavirus pandemic, as highlighted by the national newspaper *Jornal Folha de São Paulo*.<sup>15</sup> From this moment on, the mainstream news media (for example, the newspapers *Jornal Folha de São Paulo*<sup>16</sup> and *Estadão*<sup>17</sup>) began to report the dangers of fake news in combating the new coronavirus. This may explain the increase in sentiments of anger, sadness and fear. Overall, the results point to a low presence of sentiments of joy, anticipation and surprise.

The results of the sentiment analysis reveal elements that are inscribed in the social imaginary of the Portuguese-speaking Twitter users. The

<sup>15</sup> Further details can be found at <https://www1.folha.uol.com.br/colunas/pablo-ortellado/2020/03/o-virus-chines.shtml>.

<sup>16</sup> Further details can be found at <https://www1.folha.uol.com.br/colunas/bruno-boghossian/2020/04/bolsonaro-insiste-em-desinformacao-para-manipular-debate-sobre-virus.shtml>.

<sup>17</sup> Further details can be found at <https://politica.estadao.com.br/blogs/fausto-macedo/cpmi-das-fake-news-abre-frente-para-investigar-informacoes-falsas-sobre-coronavirus/>.

50 most retweeted tweets point to sentiments that extend beyond the fear caused by uncertainty about the future, clearly illustrating the impact of past and present politics in Brazil – in which journalism and the universal right of access to information have become the subject of controversy among Twitter users – and aversion to China and its political regime. The findings also reflect the exhaustive coverage of the coronavirus pandemic by the traditional and social media (Shimizu, 2020). In this regard, since China issued a public warning about coronavirus in January, various doubts have been cast in the international scientific community and other segments of society. Ever since the alert, the media has been busily reporting on coronavirus pandemic scenarios and potential impacts. One important observation in this respect is that “the mass media must also take responsibility for providing correct information and creating comprehension among citizens” (Shimizu, 2020, p. 686).

The author adds that “journalists have an important role in health communication and should acknowledge that their strong but inaccurate and misleading headlines agitate members of the public, cause fear, impinge on public communication, and diminish countermeasures for the outbreak” (Shimizu, 2020, p. 686). With regard to the United States,

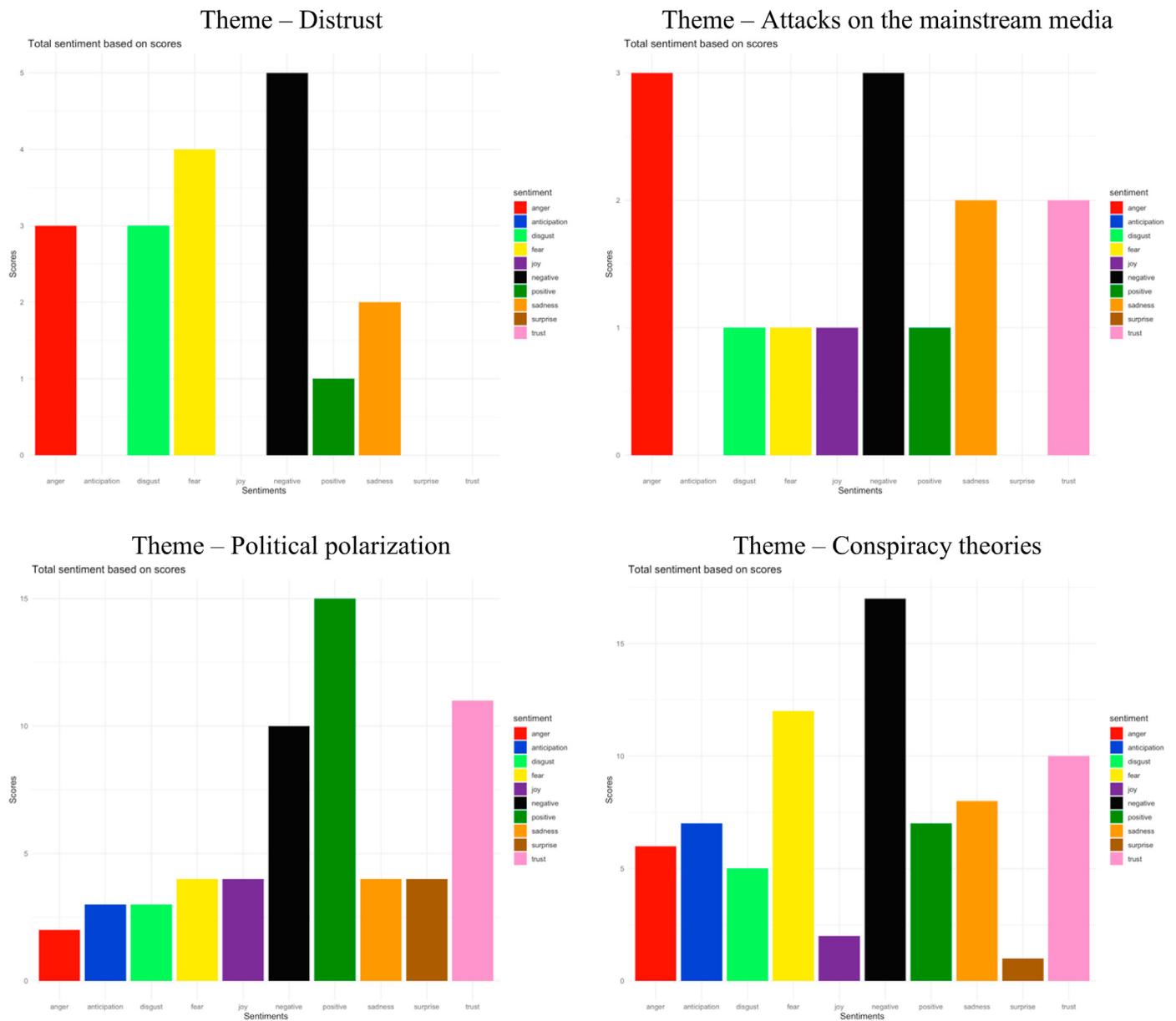


Fig. 4. (continued).

Donald Trump has repeatedly referred to the new coronavirus as the “Chinese virus” in press briefings and in social media spaces, fueling systemic racism (Sheth, 2020; Zheng, 2020). In Brazil, government officials and ministers have reproduced this racism on Twitter, attributing responsibility for the coronavirus pandemic to China and alluding to conspiracy theories. Discourses of this nature only serve to deepen political and economic tensions and fuel negative sentiment on social media, spreading information that leads to racism, xenophobia, and stigmatization against Chinese people travelling or living in the country, ultimately affecting their mental health (Sheth, 2020; Zheng, 2020).

#### 4. Conclusions

This article reaffirms the potential of social media as a tool for understanding discourses produced during the coronavirus pandemic. Our results emphasize the different forms of understanding of the social phenomenon in question and thus the variety of themes and sentiments evoked in tweets linking the COVID-19 pandemic to China. In addition,

the data presented highlight the advantages of Twitter as a source of a huge range of information, thus allowing for the identification of potential themes and sentiments such as those presented in Table 1 and Figs. 3–5. This study analyzed these themes as responses to the public health crisis in Brazil caused by the new coronavirus. The findings show that, influenced by discourses that expose the wider ramifications of power, the economy, and geopolitics, tweets were used to spread stigma, racism, and negative sentiment against China. The results of the sentiment analysis of the 50 most retweeted tweets show that the term “Chinese virus” reflects the political stance of the Twitter users in the face of the polarization of coronavirus crisis. The most frequently occurring themes that did not include the terms “Chinese virus” or “virus from China” include the use of chloroquine, cure, the press and quality of information, dictatorship, China, Bolsonaro, and communism. The content of the tweets including the terms “Chinese virus” or “virus from China” clearly reveals user sentiment, with a predominance of negative sentiments (fear, sadness and anger) and low proportion of sentiments in the category trust. Both the themes and sentiments evoked in the tweets

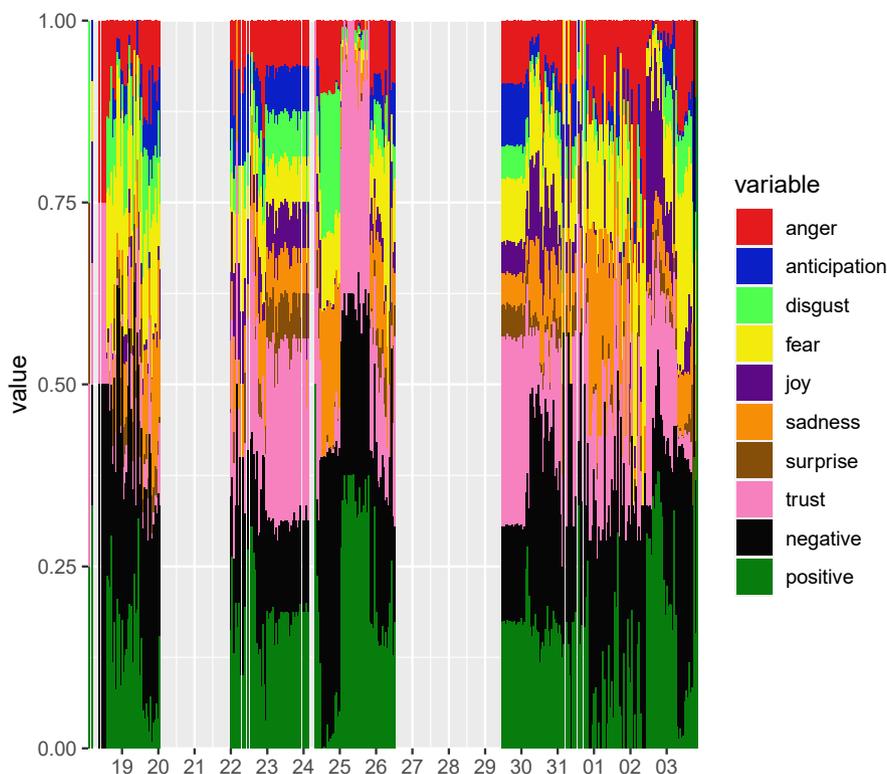


Fig. 5. Analysis of variation in sentiment over the study period based on the eight categories used.

linking China to the COVID-19 pandemic reveal elements that characterize the current scenario in Brazil, including political polarization and its effects on Twitter users' understanding of the coronavirus pandemic.

The findings also suggest that one of Twitter's weaknesses is its failure to regulate tweeters and ensure that information comes from reliable sources, corroborating the findings of other studies. On the contrary, at least in the case in question, Twitter appears to have become a hotbed of conflict among different people or groups, some of whom use the platform to discredit traditional media, underplay the risks of the coronavirus pandemic, sow scientific skepticism, and spread stigma and racism against Chinese people to justify conspiracy theories. The stigmatization and racism manifested in the terms "Chinese virus" and "virus from China" may have a number of other motives, including the lack of available information at the beginning of the coronavirus pandemic, meaning that users had little resources to reflect more deeply on their remarks. Nonetheless, the findings suggest that the root of this stigmatization and racism, which goes against WHO guidelines for the naming of new human infectious, may be discourses of hate and intolerance against diversity. Such discourses in some of the tweets analyzed may be seen as a characteristic of the current political conjuncture in Brazil, reflecting a strong aversion to China's political regime. The evidence reveals the need for further research into the governance of social media focusing on editorial guidelines and data-driven decision making and user and bot profiles. This topic is proposed because hateful and racist discourses and fake news disseminated through Twitter circulate freely through other social media platforms such as WhatsApp and Telegram with limited filtering to stop the threats of misinformation.

#### CRedit authorship contribution statement

**Francisca Marli Rodrigues de Andrade:** Formal analysis, Data curation, Writing - original draft, Conceptualization, and design of study, Analysis and/or interpretation of data, Drafting the manuscript: Revising the manuscript critically for important intellectual content, Approval of

the version of the manuscript to be published. **Tarssio Brito Barreto:** Formal analysis, Data curation, Writing - original draft, Conceptualization, and design of study, Analysis and/or interpretation of data, Drafting the manuscript: Revising the manuscript critically for important intellectual content, Approval of the version of the manuscript to be published. **Andrés Herrera-Feligueras:** Writing - original draft, Conceptualization, and design of study. Drafting the manuscript, Revising the manuscript critically for important intellectual content, Approval of the version of the manuscript to be published. **Andrea Ugolini:** Formal analysis, Data curation, Writing - original draft, Funding acquisition, of data, Conceptualization, and design of study, Analysis and/or interpretation of data, Drafting the manuscript, Revising the manuscript critically for important intellectual content, Approval of the version of the manuscript to be published. **Yu-Ting Lu:** Formal analysis, Data curation, Writing - original draft, Funding acquisition, of data, Conceptualization, and design of study, Analysis and/or interpretation of data, Drafting the manuscript, Revising the manuscript critically for important intellectual content, Approval of the version of the manuscript to be published.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Acknowledgements

We are grateful to the Editor, the associate editor and two anonymous reviewers. Andrea Ugolini is also grateful to the Brazilian National Council for Scientific and Technological Development (CNPq) and the Coordination of Improvement of Higher Education Personnel (CAPES) – Funding Code 001 – for their financial support.

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