

CONSPIRACY THEORIES ON THE ORIGIN OF THE CORONAVIRUS AND ITS IMPACT ON THE PERCEPTION OF CHINA AND CHINESE ON TWITTER¹

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DOI: 10.14679/2758

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1. INTRODUCTION

The COVID-19 pandemic, which has affected millions of people worldwide, has created a perfect breeding ground for conspiracy theories. As the virus spreads, there are unfounded claims, rumours, and unsubstantiated accusations. As the initial epicentre of the epidemic, China became the main target of these

¹ This publication is part of the Project 'NON-CONSPIRA-HATE!' (PID2021-123983OB-I00), funded by MCIN/AEI/10.13039/501100011033, and by "ERDF A way of making Europe". It also is part of the 'CONCERN' Project (PID2020-115095RB-I00), funded by MCIN/AEI/10.13039/501100011033. It also benefited from the European Union, nextGeneration-UE and the Ministerio de Universidades, and the support of ESEIS (Social Studies and Social Intervention Centre) and COIDESO (Centro de Investigación en Pensamiento Contemporáneo e Innovación para el Desarrollo Social) at the Universidad de Huelva, Spain.

theories, accused of being responsible for the outbreak and orchestrating a global cover-up.

Conspiracy theories suggest that a group of individuals secretly congregates to carry out malicious actions for a particular purpose (Van Prooijen, 2019). Douglas, Sutton and Cichocka (2017) define them as explanations for important events involving secret plots by powerful and malevolent groups. Typically, these theories involve powerful entities, such as prominent figures in society, high-level government bodies (e.g., intelligence agencies), influential industrial sectors (e.g., oil or pharmaceutical companies), or marginalized groups that have been subject to stigmatization (e.g., Muslim or Jewish communities) (Van Prooijen and Van Vugt, 2018).

Research on the psychology of conspiracy theories suggests that epistemic, existential, and social motives drive beliefs in conspiracies (Douglas et al., 2019). Among these, it has been argued that conspiracy theories flourish in times of instability, lack of control, and vulnerability. These are periods when people are in a vulnerable position, characterised by mistrust and an inability to understand difficult situations in which they lack control (Douglas et al., 2019). Social crises, defined as rapid and disruptive changes in society that challenge established power structures, norms of behaviour, or even the existence of certain individuals or groups, have led to conspiracy theories. The adverse feelings people experience during crises, such as fear, uncertainty, and a sense of lack of control, drive the need to find meaning in a situation, increasing the likelihood that they perceive conspiracies in particular social contexts (Van Prooijen and Douglas, 2017). People are more likely to endorse conspiracy theories when faced with existential threats, anxiety, or uncertainty (Van Prooijen, 2019), which is often triggered by distressing social events, such as the COVID-19 pandemic.

Some conspiracy theories emerge from pre-existing intergroup tensions that may be linked to prejudices towards specific groups (Douglas, 2021; Douglas et al., 2019), as at the core of conspiracy beliefs lies an attribution of malign intentions, which serves both to explain and make sense of complex social events and to point to the supposed culprit of negative events. Thus, the identification of this antagonist can trigger intergroup conflicts (Van Prooijen, 2019) manifesting in the form of racism and political and social tensions, among others. Additionally, people often have a deep need to maintain a positive perception of the groups to which they belong, such as their nationalities, political affiliations, and religious communities. Belief in the idea that others are conspiring against their own group tends to arise most likely when the group is perceived as undervalued, disadvantaged, or threatened (Uscinski and Parent, 2014).

A classic example is the case of anti-semitic conspiracy theories. Jews have been the subject of numerous conspiracy theories throughout history, including the idea that they conspire to dominate the world and attempt to establish a secret world government (Swawi, 2012). Recently, they have also been accused of organising and engineering the coronavirus as a biological weapon (Gerstenfeld, 2020). Swawi (2012) found that belief in Jewish conspiracy theory was associated with anti-Israeli attitudes, modern racism directed at the Chinese, right-wing authoritarianism and social dominance orientation. Muslims have also been the subject of conspiracy theories such as Eurabia (Carr, 2006), a secret project between European politicians and the Arab world for the Islamisation of Europe, or the Great Replacement (Davey and Ebner, 2019), which claims that there is a conspiracy to replace the native populations of Europe and elsewhere with Muslim immigrants, supposedly leading to the destruction of Western culture and identity. In such situations, hatred and racism are intertwined with conspiracy theories. In worst-case scenarios, they can even motivate acts as serious as the Oslo massacre of 2011 (Fekete, 2012). These conspiracies are seen as false, misleading, or misinformation, and function as a way of constructing a collective identity by identifying as one group in opposition to another (Gagliardone et al., 2021).

Conspiracy theories on COVID-19 have varied. Some have pointed to alleged plots between the Chinese government and international bodies, such as the World Health Organisation (WHO) (Kalil et al., 2021), while others have implicated politicians, businessmen, and public figures in a global plot to establish a 'new world order' (Campana, 2021). All these theories share their ability to sow hatred and mistrust between people in both online and offline contexts. Social media, particularly Twitter, are platforms where cyber-racism and hostility towards Asians have spread. Several studies have analysed the presence of negative sentiments and anti-Chinese/Asian attitudes in coronavirus-related tweets (Dubey, 2020; Nguyen et al., 2020). Other studies that investigated the main themes on Twitter related to COVID-19 in the early-to the mid-2020s also identified racism as a recurring theme (Abd-Alrazaq et al., 2020; Chandrasekaran et al., 2020). Offline hate has manifested itself in acts of discrimination and physical assault against Asian Americans (Stop AAPI Hate Reporting Center, n.d.). Olesky et al. (2021) found that general conspiracy theories were associated with the acceptance of anti-democratic policies towards people of other ethnic groups and negative attitudes towards people from countries associated with the spread of COVID-19. These included not only China, but also Italy, which was one of the first major outbreaks outside China (Sorokowski et al., 2020). Exposure to conspiracy theories can lead to discriminatory actions that can spill over to other groups not involved in the conspiracy, suggesting a generalisation of negative attitudes (Jolley, Meleady and Douglas, 2020).

This chapter deals with a paradigmatic case study in the context of racism experienced during the COVID-19 pandemic, focusing specifically on the English-speaking population and their perception of the Chinese population in the virtual environment. The period of analysis focused on a critical moment: the publication of the World Health Organization's (WHO) preliminary report on the origin of the SARS-CoV-2 virus at the end of March 2021. The purpose of this study is twofold. It seeks to reconstruct the virtual portrait that has emerged of the Chinese population throughout the COVID-19 pandemic, specifically regarding the controversy surrounding the origin of the virus. On the other hand, it seeks to understand the relationship between conspiracy theories and hate narratives in an anti-Chinese context during a health crisis.

This study makes use of a combined methodology that includes natural language processing and unsupervised machine learning techniques through topic modeling and sentiment analysis, along with qualitative analysis to delve deeper into the themes obtained through computational methods. A sample of 75 thousand tweets related to the COVID and China themes from the end of March to the end of April 2021 will be examined to shed light on the complex relationship between conspiracy theories and expressions of dislike directed towards the Chinese community during the pandemic. This study seeks to provide a deeper understanding of how online narratives and attitudes can fuel and reflect racism and xenophobia during times of crisis.

2. METHODS

2.1. Case study selection and data collection

On 30 March, 2021, the WHO released a preliminary report on «the zoonotic origin of the virus and the route of introduction into the human population, including the possible role of intermediate hosts, including through initiatives such as scientific and collaborative field missions» (WHO, 2021). Tentatively, this report intended to settle the controversy that underpinned the international health crisis over the possible origins of the SARS-CoV-2 virus and the main reason for the creation and spread of multiple conspiracy theories.

In another recent study by authors Rebollo-Díaz and Taboada-Villamarín (in press), in which three million tweets were collected from 2020 to 2022 containing the words “COVID” together with “China”, “Chinese” or “Wuhan”, an increase in the publication of tweets containing racist attitudes and rejection of the Chinese population was detected after the dissemination of this report. Therefore, in this paper, we want to explore this case study starting from the findings of the aforementioned publication and taking the tweets published from 30 March 2021 to 30 April 2021 from the total set of three million tweets, which were downloaded using the free Twitter API v2 for researchers with the

help of the Python programming language and the “tweepy” library. The sample for this study comprised 75,328 tweets. The criteria for downloading tweets are summarised in Table 1.

Table 1. Data collection features

Access Api	Api v2 Twitter
Search syntax	“COVID” AND (“china” or “chinese” or “wuhan”)
Language of tweets	English
Time window	30/03/2021 - 30/04/2021
Total number of tweets in the sample	75.328
Retweets	No

Source: Authors.

2.2. Data analysis

The sample was studied using a mixed model to carry out content analysis of the narratives expressed in the tweets under study. To this end, a first quantitative computational approach was integrated, applying natural language processing techniques and unsupervised machine learning through topic modeling and sentiment analysis. These analyses were performed in the programming languages Python 3.11.5 and R-4.3.1, respectively. Second, an in-depth analysis of a part of the sample was conducted following a qualitative approach to exemplify and empirically argue the results obtained through the computational models.

2.2.1. Text cleaning and tokenisation

Data preprocessing was performed using text cleaning and tokenisation. To enable the application of unsupervised learning techniques to data stored in text form, it is necessary to normalise and purify the text corpus, eliminating empty words such as conjunctions and prepositions, as well as links and emoticons that did not form part of the analysis. Text cleaning was performed by applying the NLTK Python library (Bird et al., 2009) in two phases. After the preliminary results, the keywords used in the download syntax “China”, “Chinese”, “COVID” and “Wuhan” were removed, as they were reiterated in the results of the models and did not provide relevant information in line with the objectives of this study. After debugging, the text was fragmented into smaller units following the tokenisation process (Saleem et al., 2021). This process was performed using the Python Gensim library considering two lengths: unigrams (n=1) and bigrams (n=2).

2.2.2. *Topic classification and modeling*

Unsupervised learning approaches were used to identify the main topics of discussion present in the sample, as well as the quantitative distribution in the analysed tweets and the degree of homogeneity or heterogeneity of these topics. A first classification exercise required the application of the K-means statistical model through the “metrics” module of the Sklearn library. Its implementation requires the prior specification of the number of clusters into which the tweets will be grouped. The result of the classification was evaluated by creating groupings composed of two to fifteen different clusters. According to the quantitative and theoretical evaluation, the total number of four clusters turned out to be suitable for this research. The application of the K-means model made it possible to classify each of the tweets into similarity clusters, as well as to visualise their distribution in a scatter plot (see Figure 1).

In the context of topic modeling, the algorithm known as LDA (Latent Dirichlet Allocation) was implemented through the “LDA” module provided by the “pyspark.ml.clustering” library. The LDA algorithm is widely used in text mining to identify patterns in word usage, which in turn enables the labelling and categorisation of text sets according to the topics addressed. The choice to carry out clustering before the implementation of topic modeling was based on empirical evidence of improved results, as documented in previous research (Gualda, Taboada-Villamarín and Rebollo-Díaz, 2023). Finally, the deduction of the titles assigned to each topic is based on the keywords that the model suggests as the most relevant (see Table 2). After the analysis of these keywords, the evaluation was carried out by two experts, who examined a random sample of the tweets included in each grouping to carry out a detailed analysis of them.

2.2.3. *Sentiment analysis*

To identify and understand in greater depth the predominant emotions in the tweets submitted for analysis, the tool provided by the “syuzhet” library was used in the context of the R programming language (Isasi, 2020). This multilingual package allows sentiment analysis to be applied with the NRC Emotion Lexicon from the same package (Mohammad & Turney, 2010). It represents an essential resource in the field of emotional analysis of texts, allowing a detailed assessment of up to eight different emotions. The emotions it can detect include fear, anger, joy, disgust, sadness, anticipation, trust and surprise. These emotions provide a nuanced emotional context that sheds light on the underlying reaction and tone of the analysed tweets. The “syuzhet” library works by assigning weighted values to the different emotions present in the text. In our case, this was achieved by processing and analysing the cleaned text corpus.

3. MAIN ISSUES SURROUNDING THE ORIGIN OF THE CORONAVIRUS

The sample analysed has provided insight into the significance of the publication and dissemination of the Official Global Report on the origins of the SARS-CoV-2 virus produced by the World Health Organisation (WHO, 2021) in the virtual public discussion environment, shedding light on the representation that civil society in English-speaking countries has outlined about the Chinese population and the health crisis. During April 2021, the classification and Topic Modeling allowed for the identification of four central axes of public discussion concerning China and COVID-19, through which various points of view were expressed. Table 2 shows the classification of the main topics resulting from the application of the LDA (Latent Dirichlet Allocation) model and the respective names given by the researchers to each cluster to identify the content of the tweets grouped in each category: 1) China’s role in the debate on the origin of the SARS-CoV-2 virus, 2) China’s impact on the perception of the pandemic in the United States, 3) India-China geopolitical rivalry in the context of the health crisis, and 4) Evaluation of Chinese vaccination strategies and their global impact.

Table 2. Topic Modeling result by cluster

Cluster number	Cluster name	Tweets	%	Keywords
1	China’s role in the debate on the origin of the SARS-CoV-2 virus	24.528	32,5	“lab”, “report_origins”, “lak”, “investigation”, “animal”
2	China’s impact on perceptions of the pandemic in the United States	20.766	27,6	“virus”, “people”, “trump”, “us”, “government”
3	India-China Geopolitical Rivalry in the Context of the Health Crisis	19.796	26,3	“coronavirus”, “india”, “world”, “uk”, “control”
4	Evaluation of Chinese vaccination strategies and their global impact	10.238	13,6	“vaccines”, “data”, “cases”, “health”, “sinopharm”

Source: Authors.

3.1. China’s role in the debate on the origin of the SARS-CoV-2 virus

The predominant theme in the analysis corresponds to the debate on the origin of the SARS-CoV-2 virus, comprising 32.5% of the tweets examined. The narratives investigated exhibit a critical attitude towards the publication of the report on the origin of the SARS-CoV-2 virus, expressing significant distrust towards the World Health Organisation and the government of the People’s Republic of China. Questions are raised about possible prior alliances motivated

by conflicts of interest, both economic and political, and alternative theories are proposed concerning the “creation” or spread of COVID-19. The content analysis shows that the mention of ‘China’ on numerous occasions carries a direct reference to the government of the People’s Republic of China and thus to the Chinese Communist Party (CCP). The remarks include a pejorative discourse on the policies implemented in the Chinese population to address the health crisis, delineating a government characterised by manipulation, censorship of its researchers and withholding of information. This government is portrayed as dehumanised, with masked objectives, such as consolidating its position as a leading economic and technological power through the virus, which also exerts significant influence and dominating power over other governments and institutions with global reach.

3.2. China’s impact on the perception of the pandemic in the United States

Second, the tweets grouped under the cluster “China’s impact on the perception of the pandemic in the United States” represent 27.6% of the total sample set. In this cluster, China’s responsibility for the adverse effects of the pandemic experienced by the US population is examined. The content analysis points to a marked disagreement in terms of how different political representatives have handled policies related to the health crisis in different US states, and a discordance between the political parties that have been in power from the beginning of the pandemic until the time of analysis. In particular, reference is made to the alleged connection between the US Democratic Party and Chinese Communist government elites, based on relations between the US president’s former medical adviser, Anthony Fauci, and Chinese leader Xi Jinping. Mentions of a conspiracy between the Chinese party and the Democratic party to unseat President Trump in the last election are frequent, even going so far as to hint at an alleged Communist Party-financed “theft” of the election.

3.3. India-China Geopolitical Rivalry in the Context of the Health Crisis

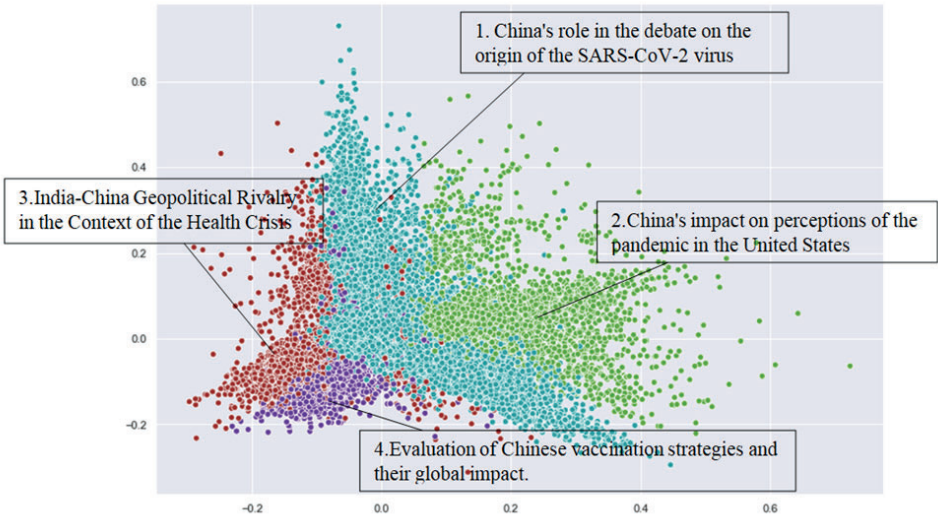
In third place, with 26.3% of the tweets in the set analysed, a latent geopolitical conflict between India and China stands out as another of the central topics of discussion. The predominant theme in the messages is related to a historical conflict in terms of territory and political autonomy between the two countries. The main perspective of these tweets is that of the Indian population and is directly linked to the idea of China’s creation of a biological weapon to exert control over a part of Indian territory. In addition, China’s interest in achieving economic domination of India through economic support and medical supplies to combat COVID-19 is mentioned. Allusions are also

made to internal conflicts on Indian territory related to these relations. The People’s Republic of China is depicted as a political rival that needs to be defended against because of its quest for silent colonisation.

3.4. Evaluation of Chinese vaccination strategies and their global impact

Finally, the fourth cluster comprises 13.6% of the total number of Twitter posts under analysis. This theme is characterised by divergent opinions expressed in the tweets regarding the vaccination strategies adopted by the Government of the People’s Republic of China and their impact on Western countries. Content analysis reveals concerns about the reliability of Chinese vaccines, raising questions about why other governments are willing to use them. The tweets include information about possible side effects and portray the Chinese government as a suspicious actor, referring to the theory that it may have introduced the COVID-19 virus and then presented a premature solution. Recurrent in these tweets are links and news stories mentioning faulty vaccines, their possible redundancy and the possibility of a hidden agenda that the Chinese government does not disclose.

Figure 1. K-means Scatter Graph

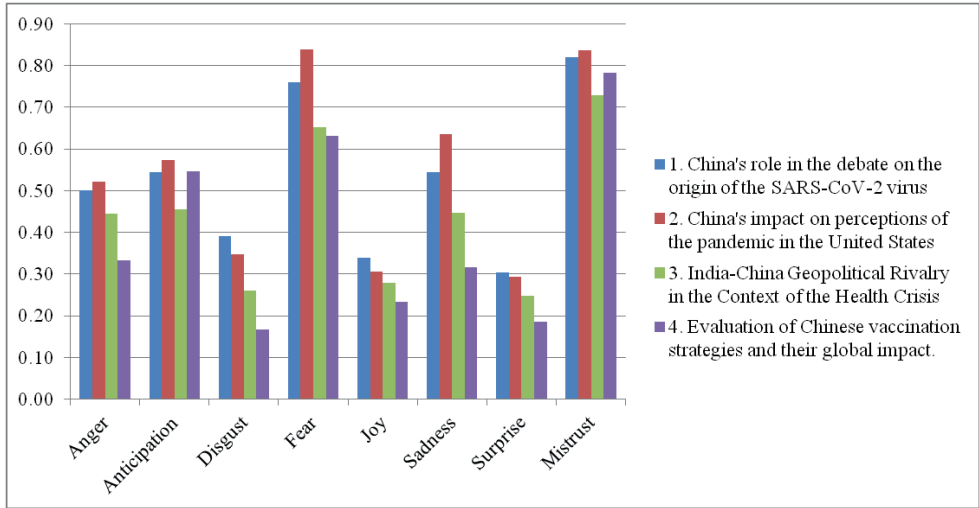


Source: Authors.

It is important to highlight that each identified theme shares transversal axes or perspectives. The scatter graph (Figure 1) provides a visualisation of the distance between the themes, represented in different colours, indicating

or uncertainty around China’s actions on these issues. On the other hand, in the theme “India-China Geopolitical Rivalry in the Context of the Health Crisis,” negative emotions such as fear (0.65) and distrust (0.73) are relevant, reflecting a perception of conflict and mistrust in India-China relations in the context of the health crisis. There is also a moderate presence of emotions such as anger and sadness. In the theme “Evaluation of Chinese vaccination strategies and their global impact,” the emotion of mistrust stands out (0.78), suggesting a high degree of scepticism about Chinese vaccination strategies and their influence globally. Anticipation is also relevant in this context, which could indicate an expectation regarding China’s future actions in the field of vaccination.

Figure 3. Sentiment analysis by cluster



Source: Authors.

Additionally, a close examination of the tweets in the sample revealed both direct and indirect mentions of conspiracy theories. Two conspiracy theories have emerged recurrently in all thematic areas and have been widely disseminated at the national level during the period of the health crisis. These two main theories are intrinsically related to the origin of the virus and are intertwined with the particular nuances of China observed in each cluster. In Table 3, we add representative examples of the tweets analyzed in the sample that contain the highest score in emotions such as mistrust and fear.

Table 3. Examples of tweets in the sample

COVID-19 as biological weapon	<i>@indiatvnews The second wave of Covid 19 is a biological warfare created by China to destabilise India and China. make India lag behind with the support of India's Anti Modi Group. Even the idea was to blame the central government. It was started on Decem</i>
	<i>@POTUS Now China starts biochemical world war 3ed, get ready to send medical teams to all countries. Covid is not a pandemic, it's a biological weapon and China made more and harder weapons.</i>
	<i>Breaking news: China caused the covid. It knowingly spread it to the world. Yet it faced no consequences. We all seem to have forgotten. Related: Politicians from 100 countries exploited the tragedy to seize power on a grand scale.</i>
	<i>Fauci funded Wuhan research that created Covid-19 Republican Representative Scott Perry of Pennsylvania said it is deeply troubling that the federal infectious disease research organisation headed by Dr Anthony Fauci has bypassed federal oversight of a grant...</i>
	<i>The WHO report on Covid's origins is best understood as a cover-up strongly influenced by the Chinese Communist Party and Westerners with conflicts of interest."</i>
	<i>Fauci funded the Wuhan lab and authorised the procurement of genetically engineered functions at Wuhan to make bat viruses more dangerous. If SARS-CoV-2 came from the Wuhan lab, Fauci is the father. American biologist Bret Weinstein's 90 per cent chance that it leaked from the lab.</i>
COVID-19 as a result of a leak from the Wuhan laboratory	<i>What a coincidence: "Bill Gates linked to Chinese company 'extracting' DNA data from Americans through covid testing"</i>
	<i>There is no firm conclusion on the origins of Covid, World Health Organisation report. stop lying cv19 came from the wuhan lab, we all know that, in fact, the question is whether they did it on purpose.</i>
	<i>Wuhan lab aided Chinese military in secret project to find animal viruses #Newsmax via @Newsmax</i>
	<i>Why do the mainstream media quote Chinese Communist Party-funded consultants to discredit theories of the origin of the COVID laboratory?</i>
	<i>WHO report on Covid-19 written by the Chinese Gestapo government - WHO officials must be held accountable for the whitewashed rubbish they will publish tomorrow! The true origins of the virus are the Wuhan laboratory.</i>
	<i>26 out of 27 scientists who dismissed the Wuhan link, leading to the Wuhan theory being framed as a racist conspiracy", had links to the Wuhan lab, yet these reports had been classified as "conspiracy". Bullshit. Journalism is there to challenge official narratives.</i>

Source: Authors.

First, significant weight is given to the theory that the SARS-CoV-2 virus was created as a biological weapon devised by China. This theory hypothesises the artificiality of the virus and its intentional creation by the Chinese state, with the aim of using it as a biological weapon in other countries, with objectives

ranging from territorial issues to control, surveillance and even anti-democratic objectives, among others. Secondly, there are multiple mentions of the theory that the virus escaped unintentionally from a laboratory. In this theory, it is argued that the spread of COVID-19 among the civilian population was the result of an accidental leak at the Wuhan Institute of Virology, where it is assumed that the virus was already being handled and studied beforehand.

5. CONCLUSIONS

In this work, our aim was to analyze the online representation that has emerged in relation to China during the COVID-19 pandemic, with a particular focus on the controversy surrounding the origin of the virus and associated conspiracy theories. The analysis of the sample of tweets has provided insight into the main narratives and emotions present in the online public discourse.

The discussion on Twitter following the release of the WHO report has primarily centered around the origin of the virus, its impact on international relations, and Chinese vaccination strategies. In all these topics, there is a notable expression of high distrust towards the Chinese government (as well as towards the WHO), which is attributed with hidden agendas, malicious intentions, and secret conspiracies with other actors, leading to belief in various conspiracy theories. Particularly, the theory of intentional creation of the virus as a biological weapon and the theory of accidental leakage from a laboratory play significant roles in Twitter conversations and contribute to the distrust towards China. Furthermore, geopolitical tensions and rivalries between countries, such as China and India, have also been reflected in the discussions. An interesting aspect of these beliefs is reflected in the second cluster (Impact of China on the perception of the pandemic in the United States) about a supposed alliance between the Democratic Party and the Chinese government. These results confirm what has already been discussed by Uscinski and Parent (2014) and Smallpage, Enders, and Uscinski (2017) regarding how people on the losing side of political processes also seem more prone to believe and spread conspiracy theories about their political opponents.

The data has revealed the presence of negative emotions such as fear and distrust, suggesting a negative perception in discussions and opinions surrounding China's actions in various aspects of the health and geopolitical crisis. Lack of trust is primarily directed towards China and the WHO, while fear may also be related to the spread of the virus and geopolitical implications. For example, the conflict between India and China and the belief that the virus is a biological weapon to exert control over the country may be responses to feelings of threat, vulnerability, and lack of control, creating a fertile ground for conspiracy theories (Douglas et al., 2019). Additionally, anticipation also

plays a relevant role in the perception of China's future actions in these areas. Sentiment analysis can be a useful resource when approaching large unlabeled datasets where conspiracy theories may exist, as it can help detect them through emotions related to this type of discourse (feelings of fear, distrust, and anticipation).

Despite the increase in racism and Sinophobic attitudes during the COVID-19 pandemic, in our results, it is difficult to determine the extent to which a racist or hateful attitude is shown towards the Chinese civilian population as opposed to criticism directed at their government. In other words, distrust, aversion, and hostile attitudes are primarily directed towards the Chinese Communist Party. This may be due to the historical-political relationships that some Western countries like the United States have had with China due to geopolitical and economic competition, which can portray China as a threat. However, it is important to highlight the risk this poses when these sentiments permeate the perception of the Chinese population as a whole in a context of intergroup conflicts.

There are further opportunities to investigate the online representation of China during the COVID-19 pandemic in different contexts and platforms, which would provide a more comprehensive understanding of how public perceptions may vary worldwide. For example, since this study focused on English-language data with an emphasis on the American and Indian context, it would be valuable to conduct similar analyses in other languages and countries with different political and cultural relationships with China. This could shed light on variations in public perception and online narratives in different regions of the world. In addition to Twitter, exploring other social media platforms such as Telegram, Instagram, or Weibo in China could provide a more complete view of how the Chinese population is represented online and how conspiracy theories are disseminated in different digital environments.

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