

A Soft Power Challenge, or an Opportunity? A Big Data Analysis on Chinese Soft Power during COVID-19 Pandemic

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The Chinese government's rigorous efforts to enhance its soft power have confronted a major challenge during the COVID-19 pandemic. This study aimed to look at how the Chinese soft power changed throughout the pandemic using English news articles that covered China. The research took a data science approach to investigate the contents of articles using machine-learning-based sentiment analysis and Dirichlet-Multinomial Regression (DMR) analysis. The results show a gradual downturn in overall sentiment and that the topics related to political issues made the most significant impact. Nevertheless, the major increase in referencing Chinese social media implied that the sources of Chinese soft power have been diversified throughout the pandemic. In addition, this research has aimed to engage in major debates around soft power theory. Providing a multi-disciplinary approach for analyzing soft power, this research has tackled the difficulties in the quantitative conceptualization of soft power.

Los rigurosos esfuerzos llevados a cabo por el Gobierno chino para mejorar su poder blando han tenido que hacer frente a un gran desafío durante la pandemia de COVID-19. Este estudio tuvo como objetivo observar cómo fue cambiando el poder blando chino a lo largo de la pandemia mediante el uso de artículos de noticias en inglés relativas a China. La investigación adoptó un enfoque científico basado en datos con el fin de investigar el contenido de los artículos utilizando el análisis de sentimiento basado en el aprendizaje de máquina y el análisis de regresión multinomial

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de Dirichlet (DMR, por sus siglas en inglés). Los resultados muestran una desaceleración gradual con respecto al sentimiento general y que los asuntos relacionados con cuestiones políticas tuvieron un impacto más significativo. Sin embargo, el gran aumento en cuanto a la referenciación de redes sociales chinas significaba que las fuentes de poder blando chino se habían diversificado a lo largo de la pandemia. Además, esta investigación ha tenido como objetivo ser partícipe de los debates más relevantes en materia de la teoría del poder blando. Esta investigación ha abordado, proporcionando un enfoque multidisciplinario para analizar el poder blando, las dificultades en la conceptualización cuantitativa del poder blando.

Les rigoureux efforts de la Chine pour intensifier son « soft power » ont fait face à un défi d'envergure lors de la pandémie de COVID-19. Cette étude visait à analyser l'évolution du soft power chinois au cours de la pandémie à l'aide d'articles de presse anglais qui couvraient la Chine. Elle a adopté une approche de science des données pour examiner le contenu des articles au moyen d'une analyse des sentiments fondée sur l'apprentissage automatique et de l'analyse de régression multinomiale de Dirichlet (RMD). Les résultats indiquent une baisse graduelle de l'ensemble des sentiments, mais aussi que les sujets politiques avaient le plus d'effet. Néanmoins, l'augmentation massive du référencement des réseaux sociaux chinois implique une diversification des sources de soft power de la Chine tout au long de la pandémie. De plus, ce travail de recherche visait une implication dans les débats importants autour de la théorie de soft power. En fournissant une approche multidisciplinaire pour l'analyse du soft power, cette étude a traité les difficultés de la conceptualisation quantitative de ce pouvoir.

Introduction and Literature Review

According to Joseph Nye, soft power is the ability to affect others' actions and achieve desired outcomes "through attraction rather than coercion or payment (Nye 2008, 94)." Also referring to it as the "power of seduction (Nye 2008, 95)," Nye first coined and popularized the term soft power in "Bound to lead (Nye 1990)." When Nye came up with the term, soft power was more of an alternative form of power opposed to economic and military hard power (Lee 2009). The reason behind this was the geopolitical turmoil at the time. After the dissolution of the Soviet Union, the Cold War was coming to an end. While the United States did remain as the global super-power, its dominance was not as secure as before having lost its rival who was a major drive for growth. At the same time, Japan and Europe were rising as a new economic power based on their strength in manufacturing. In this context, Nye suggested the concept of soft power as a new rhetoric that can continuously empower the United States as a world leader (Lee 2009). It was the power originating from culture, political values, and foreign policy instead of military forces or money (Nye 2008).

In the decades, since Nye shed light on this power of seduction, soft power is no longer merely considered as an alternative for hard power. Combined with rapid globalization and an increasing volume of international interaction, soft power has become conceptualized as a major force in international dynamics from a theoretical perspective. Therefore, multiple scholars have joined the discourse, proposing various definitions of soft power. In addition to Nye's definition, Lee stated that soft power enables a state to achieve strategic imperatives "based on ideational and cultural attractiveness (Lee 2011, 11)." Rawnsley claimed that soft power is a "natural byproduct of cultural and political appeal," emphasizing a constant vigilance against the confusion between soft power and contrived propaganda (Rawnsley 2012, 123).

Rothman (2011) put soft power and hard power in a continuous spectrum and tried to overcome the dichotomy.

One interesting development of the concept took place in China, where soft power became an important part of the agenda to build a national image that would match its rapid growth in hard power, and where more than \$10 billion a year was spent on its soft power strategy (Davidson 2017). Chinese scholars came up with a relatively fluid understanding of soft power, which encompassed more material resources and both international and domestic publics as the target audiences (Li 2019; Repnikova 2022). According to Repnikova, the Chinese debate often considered hard power as “symbiotic with or as the foundation of soft power (Repnikova 2022, 4).” Furthermore, along with the international goal of Chinese soft power, which is to persuade the international audiences that the rapid growth of China will be a “peaceful rise (Buzan 2010),” Li (2008) highlighted its domestic focus on rebuilding Chinese culture and strengthening national cohesiveness.

In terms of practice, ever since former president Hu Jintao stated that China needs to “enhance culture as part of the soft power (Hu 2007),” the Chinese government worked vigorously to strengthen its soft power and the goal is still solid under the Xi Jinping administration. President Xi said that China should “promote China’s cultural soft power by disseminating modern Chinese values and showing the charm of Chinese culture to the world (Xinhua 2014).” To do so, China has applied diverse public diplomacy tactics as an important tool to obtain soft power. According to Nye, public diplomacy is an instrument that mobilizes a country’s soft power resources such as its culture and attracts foreign audiences. This, in turn, produces soft power (Nye 2008, 95). Looking into Chinese examples, by 2017, the Chinese government invited more than 400,000 international students to China and established 500 “Confucius Institutes” to teach the Chinese language and culture outside China. Moreover, CCTV started to broadcast on television and radio using 5 different languages (Davidson 2017). As an example of more creative tactics, China also started building diplomatic relationships with foreign countries by sending pandas, the country’s national symbol (Hartig 2013).

In 2020, the outbreak of the COVID-19 pandemic hit the world, and the virus presented the Chinese soft power policy with a major challenge. According to a Reuters report, China considered the situation equivalent to the historical Tiananmen incident, which also caused a massive international backlash against China (Hirschberg 2020). Hence, the Chinese government has employed all its available public diplomacy resources to tackle the situation (Gill 2020). At the beginning of the pandemic, China quickly supported other epicenters of the virus by sending personal protection equipment and medical experts (Chen 2022; Qi et al. 2022). Moreover, in the later stage of the pandemic, China distributed 656 million doses of vaccines worldwide (Lee 2021). Covering this so-called “mask diplomacy” and “vaccine diplomacy,” the Chinese media also supported these efforts by creating a rhetoric that China was a “responsible leader” and a “savior” during the global pandemic (Repnikova 2022, 1).

However, the outcome has not been positive. According to a survey conducted by the Pew Research Center, unfavorable views toward China grew drastically in 2020. The research also reported that the majority of respondents think “China has done a bad job dealing with the coronavirus outbreak” and are losing “confidence in President Xi (Silver et al. 2020).” In addition, the spread of the virus was highly intertwined with international politics in 2020. In July, the Chinese government passed the Hong Kong security law, causing a massive protest in the special administrative region (Griffiths & Berlinger 2020). In the same month, countries like the UK banned Huawei from their 5G network (Gold 2020). In terms of the US–China relationship, the politicization of the virus intensified the tension between the two countries (Zhao 2020) and the US–China relationship reached its lowest point in

Table 1. List of news sources

Source	Country	N	Source	Country	N
National Post	Canada	2,040	The Age	Australia	159
The New York Times	US	939	Sydney Morning Herald	Australia	151
The Guardian	UK	888	The Sunday Times	UK	133
The Independent	UK	750	The New Zealand Herald	New Zealand	119
Financial Times	UK	665	Daily Mirror	UK	104
The Daily Telegraph	UK	409	The Sun	UK	88
The Times	UK	379	The Toronto Star	Canada	76
Australian Financial Review	Australia	356	The Sun Herald	Australia	15
The Australian	Australia	309	Sunday Age	Australia	15
The Washington Post	US	259	The Courier Mail	Australia	10
The Globe and Mail	Canada	218			

July as both countries shut down each other’s consulate over concerns about espionage (Wong et al. 2020).

Amid this period of major turmoil for China, the goal of this paper is to analyze the current situation based on soft power theory and big data analysis. Using big data analysis, the paper will demonstrate a systematic and interdisciplinary way to engage in academic debates of soft power. Moreover, it will look at the underlying signs of changes for China from the given data and suggest practical implications. In order to do so, the paper will utilize 8,082 English news articles that included the word “China” in the title. The news articles were collected from December 1st, 2019 to July 31st, 2020. This research employed a machine learning based sentiment analysis and Dirichlet-Multinomial Regression (DMR) topic modeling for analysis.

Method

Data Collection and Preprocessing

To provide information on the data set, 8,082 English news articles, which included the search word “China” in their title were collected to investigate the international perception of China. The articles were collected from the news article database Lexis Advance,¹ using its “Major World Newspapers” category. Looking at the dataset, although the category included various English media from diverse countries, the majority of the articles were from English-speaking western countries. Therefore, in order to avoid the possible misrepresentation coming from the hidden bias in the dataset, this research has limited its scope and focused on western countries, which use English as their national language. As a result, twenty-one news sources from 5 countries (UK, United States, Canada, Australia, and New Zealand) were included as shown in table 1. The data collection period was from December 1st, 2019 to July 31st, 2020, covering the first wave of the COVID-19 pandemic. The collected news texts were preprocessed for DMR analysis using Natural Language Tool Kit (NLTK)² and spaCy.³ After removing stop words, this research used nouns, adjectives, verbs, adverbs, and pronouns for the analysis.

Sentiment Analysis

Using the collected data, this research conducted two main analyses which are sentiment analysis and topic modeling. In terms of sentiment analysis, the research used

¹<https://www.lexisnexis.com/>.
²<https://www.nltk.org/>.
³<https://spacy.io/>.

Google's natural language processing application programming interface (API).⁴ This is a pre-trained deep learning model for computing a sentence's sentiment. The API returns the sentiment score in a scale of -1 – 1 having each end as negative and positive, respectively (Andreev et al. 2021). An article's sentiment was extracted by getting the mean score of each sentence's sentiment. Using the calculated sentiment score, this research visualized the daily sum and mean of the sentiment score. While the daily mean of the sentiment score can show the general sentiment of that day, the daily sum of the sentiment score can reflect the number of articles published on that day. Therefore, it can be said that the mean graph focuses on the sentiment itself, and the sum graph puts more weight on the size or the popularity of a specific issue. Each graph included the actual sentiment scores and smoothed scores to which the Savitzky–Golay filter was applied. The smoothed result can be useful for indicating the general trend of the sentiment score. For other data visualization, a data visualizing website Infogram⁵ was utilized.

DMR Topic Modeling

The second analysis was DMR topic modeling using the sentiment analysis and month as metadata. Topic modeling is a text analysis approach that utilizes unsupervised machine learning to detect certain patterns of word use from the given text (Balakrishnan 2021). Under the assumption that a document consists of specific topics and the topic consists of certain words, topic modeling calculates the probability distribution of each topic's appearance (Liu et al. 2016). This is interpreted as the proportion of different topics within the given text data. While the traditional Latent Dirichlet Allocation (LDA) topic modeling extracts topics and calculates the distribution of each topic within the whole data set, DMR is an extended version of the LDA model, which extracts topics in the same way as LDA but combines the metadata of a given text into the analysis. According to Mimno and McCallum, text data often comes with metadata, which is the information on the text itself (Mimno and McCallum 2008). The DMR model takes these metadata into account by calculating the distribution of each topic within the boundary of the given metadata. Using this, the possibility of a specific topic's appearance based on the metadata can be inferred. In this research, two DMR analyses were conducted, and the articles' sentiment and month of publication were used as the metadata.

For the DMR model, Tomotopy Python package⁶ was used and several hyperparameters were found empirically. The number of topics k was set as 7 (we tested $k \in [3, 10]$) based on perplexity, salience, and readability when visualized. The term weight was set as TF-IDF. After identifying the contents of each topic and manually naming them, this research calculated each topic's distribution in 100 percent scale. The result presents how much of a portion each topic possesses within certain metadata by showing the possibility of each topic's appearance. As the results were normalized into 100 percent scale, it should be noted that the number of articles in each category of month or sentiment was not reflected.

Results

Sentiment Analysis

Looking at the result of the sentiment analysis, the highest sentiment score was 0.6, while the lowest was -0.8 (figure 1). Most of the articles showed a sentiment score below 0. However, what should be noted here is that the result of the sentiment

⁴<https://cloud.google.com/>.

⁵<https://infogram.com>.

⁶<https://pypi.org/project/tomotopy/>.

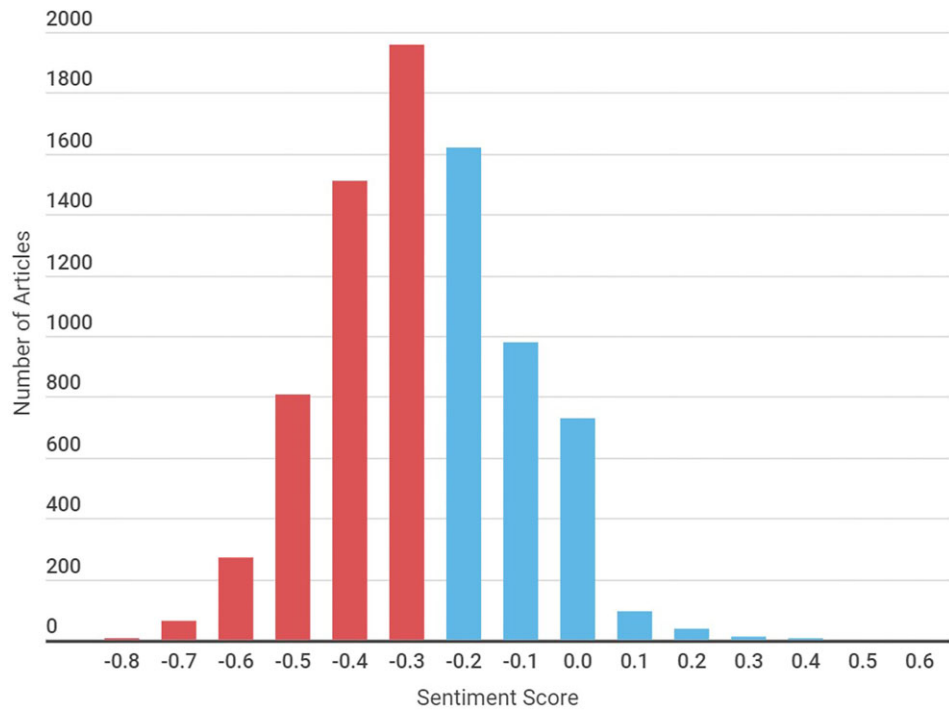


Figure 1. Number of articles for each sentiment score.

Table 2. Examples of news titles reviewed for setting the sentiment threshold

Sentiment score	Date	Title	Source
−0.2	May 12	Bye-bye bears: Calgary Zoo returning pandas to China due to bamboo barriers	National Post
	May 14	Coronavirus has presented China with a historic opportunity—will it take it?	The Guardian
−0.3	Jun 6	China donates five ventilators	Daily Mirror
	December 1	China has lost Taiwan, and it knows it	The New York Times
	May 16	Conscious decoupling; The pandemic has made clear the urgent need for the West to unite in confronting an aggressive Beijing and to reduce its reliance on China	The Times
	May 17	US–China trade tension drives worst week since March	The Washington Post

analysis can differ based on the context. Hence, Google’s guideline suggests that the threshold for deciding positive or negative sentiment should be heuristically adjusted ([Google Cloud n.d.](#)). After reviewing the daily mean of the sentiment score and the actual text, this research set the threshold for negative sentiment as −0.3. As seen in [table 2](#), articles with sentiment score −0.2 included a relatively positive article that depicted the pandemic as an opportunity for China and an article that covered soft issues like Chinese pandas. Also, while the articles with sentiment score

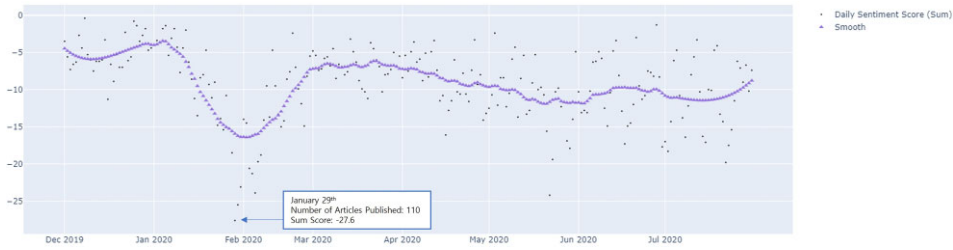


Figure 2. Sum of daily sentiment score.



Figure 3. Mean of daily sentiment score.

−0.2 showed a neutral tone reporting cases in China, articles with sentiment score −0.3 expressed direct opinions that were negative toward China.

From the graphs of sentiment score trends over time, the daily sum of sentiment score demonstrated a sharp decrease in January (figure 2), and the mean showed a gradual decrease until mid-July (figure 3). On the 29th of January, the sum of the sentiment score hit the lowest point. And while the actual lowest point for the mean score was on the 8th of December, it was found out that only one article was published on that date. Therefore, considering the statistical significance, 7th of June was marked as the lowest for the mean graph.

DMR

Descriptive Analysis On Topics

For the DMR analyses, seven topics were extracted from the given data set. While the DMR model returns the clusters of words for each topic, it is the researcher's job to identify what each topic is about and read the narrative behind it. Based on this process of identifying each topic, the DMR analyses demonstrated seven topics, which were COVID-19 in China, COVID-19 worldwide, international politics, Chinese politics and human rights issues, economy, technology and social media, and culture (table 3).

Topics 1 and 2 showed groups of words that are all related to COVID-19 and the fact that two out of seven topics were related to COVID-19 shows how the issue of the virus took a major role on world's perspective on China. While topic 1 covered the spread of the virus within China including words such as "Wuhan" and "Sars," topic 2 included words that were related to the international response to the virus such as "flight" and "Italy."

Topics 3 and 4 covered the international and domestic politics of China. Topic 3 depicted the western point of view on various events that happened in Chinese politics, including the Hong Kong national security law and the human rights violations in Xinjiang Uyghur autonomous region. Topic 4 focused more on the international conflicts by including words like "Australia" and "India", which were the countries that engaged with territorial disputes. Also, from words like "Trump," "election," and "pandemic," it can be inferred that topic 4 also included the 2020 presidential

Table 3. Topics extracted for DMR analyses

Topic name	Selected words from the word cluster	Example article titles
Topic 1 COVID-19 in China	wuhan, virus, health, outbreak, hospital, spread, disease, city, patient, epidemic, medical, human, sars, coronavirus, case	<ul style="list-style-type: none"> · Losing Track of Time in the Epicenter of China's Coronavirus Outbreak; wuhan dispatch · Five new cases reported in wuhan; China · No more virus cases in wuhan: health official; China
Topic 2 COVID-19 worldwide	case, flight, confirm, coronavirus, covid, uk, death, health, infection, travel, test, lockdown, italy, quarantine, passenger	<ul style="list-style-type: none"> · British Airways suspends flights to mainland China for a month · To lift the lockdown, Britain should follow China's example; Data from east Asia shows testing, tracing and isolating people with coronavirus is the best way to tackle the pandemic · Main virus spreaders outside of China travelled from Italy
Topic 3 Chinese politics and human rights	hong_kong, law, uk, security, protest, xinjiang, uighur, freedom, journalist, legislation, human_rights, foreign, national, sanction, beijing, protester	<ul style="list-style-type: none"> · Pompeo warns China over interference with US journalists in Hong Kong · Britain and West urge China to scrap HK security law, open Xinjiang · Protests over arbitrary detentions as China hosts global lawyers forum; Rights advocates describe event as 'a mockery' and condemn human rights lawyers being 'forcefully disappeared'
Topic 4 International politics	trump, australia, india, taiwan, american, president, huawei, us, administration, trade, military, relationship, pandemic, washington, election	<ul style="list-style-type: none"> · India says China hindered Indian border patrols in latest flare-up · United States and China clash at WHO over Taiwan participation · Trump fires new volley in war of words with Biden over China
Topic 5 Economy	company, market, economy, bank, growth, trade, tariff, business, stock, investor, price, export, deal, factory, economic	<ul style="list-style-type: none"> · Rio says China's economy will roar back · Coronavirus will change the shape of the global economy · 'Diversify markets away from China'
Topic 6 Technology and social media	canada, student, app, meng, child, university, school, tiktok, police, young, user, education, arrest, internet, friend	<ul style="list-style-type: none"> · China calls on Canada to release Huawei executive Meng · Teenagers' app TikTok suffers growing pains; The controversial video platform from China is trying to clean up its act · White House to force China's ByteDance to separate from TikTok in United States
Topic 7 Culture	animal, meat, wildlife, game, dog, arsenal, player, eat, club, league, food, river, football, season, tea	<ul style="list-style-type: none"> · Mesut Ozil disrupted the silence with his views on China and Arsenal fans should follow · China Vowed to Keep Wildlife Off the Menu, a Tough Promise to Keep · China and Espanyol striker Wu Lei thanks 'heroes' on frontline after recovering from coronavirus

election in the United States where both candidates took a tough stance against China. This is in line with the intensifying confrontation between the United States and China along with the spread of the virus. As stated before, debates over COVID-19 have been highly politicized by the governments and China has also worked on creating the rhetoric of “us versus US” (Zhao 2020, 1).

Topic 5 included words related to the economy and covered diverse news about the market. In December 2019, the US–China trade war was coming to an end causing a bullish stock market. However, during the pandemic, the world economy went into a historical recession. The world economy has been fluctuating since, influenced by governments’ expansionary policies and the development of the pandemic. Topic 6 focused on a more specific field of technology companies and social media. In 2020, Chinese companies went through tough times due to major restrictions on Huawei and TikTok. Keywords like “Canada” and “Meng” depicted the detainment of Huawei’s board deputy chair Meng Wanzhou, and while the keywords like “TikTok” and “student” represented the international popularity of the app in the young generation, the articles also covered the concerns on data protection.

Topic 7 included words that were related to some of the cultural aspects such as food and sports. However, due to the characteristics of the data sources which are news media, the articles related to culture still included some controversial issues like the wildlife food market in China and the Arsenal football player Mesut Ozil’s criticism on China.

Topic Distribution Analysis

The distribution of each topic based on different metadata in 100 percent scale is demonstrated in figures 4 and 5. From figure 4, the 2 topics related to COVID-19 showed similar fluctuations in their distribution. These topics related to the pandemic started to increase from January and peaked in March. After that, along with

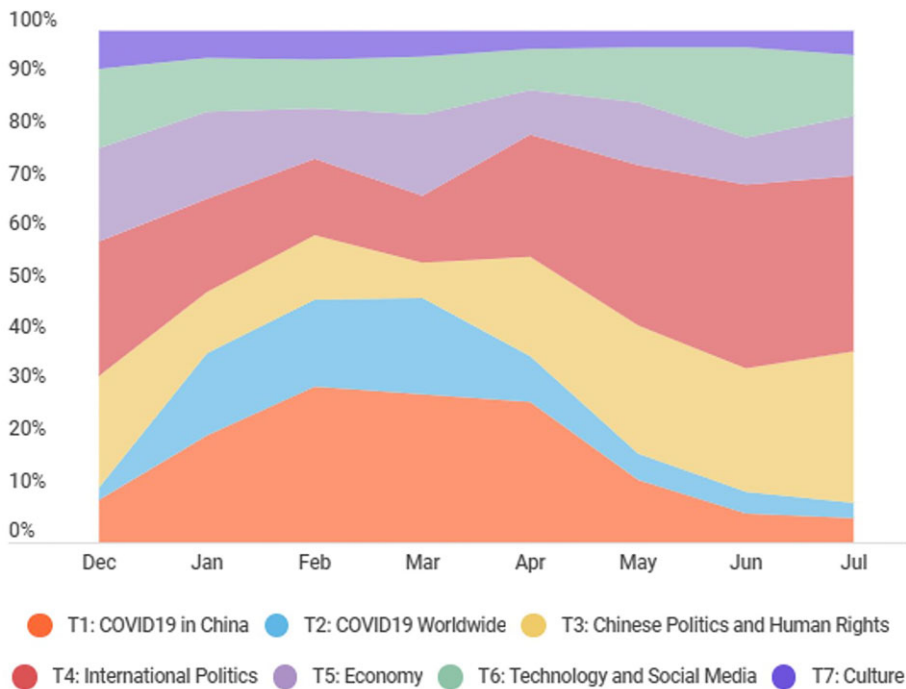


Figure 4. Distribution of 7 topics for each month.

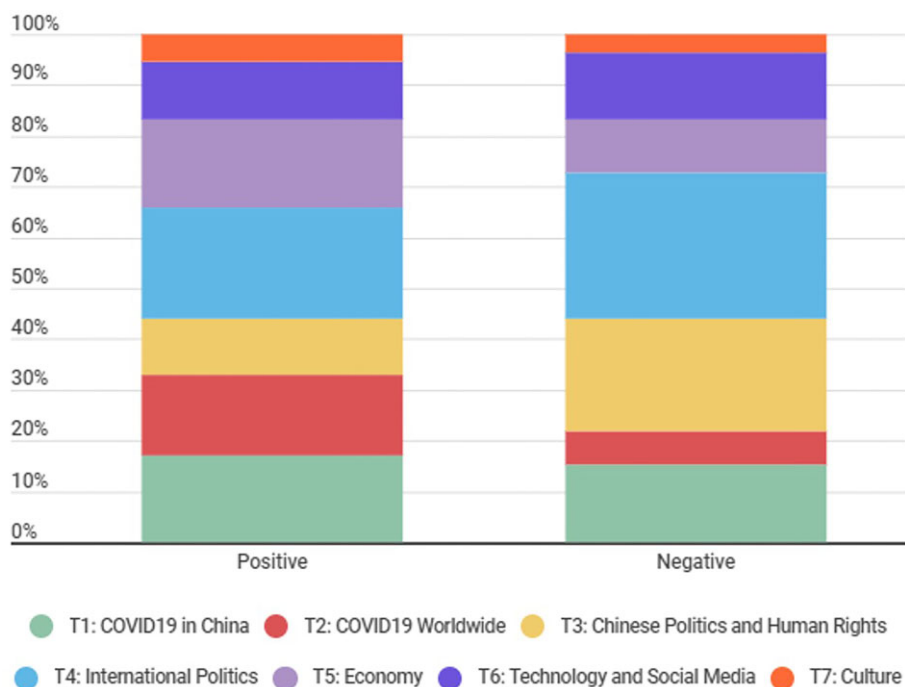


Figure 5. Distribution of 7 topics for each sentiment.

the drastic decrease in COVID-19 related topics, topics related to Chinese and international politics constantly grew from April to July. This suggests that the lowest point from the daily sum graph of the sentiment score and the lowest point from the daily mean graph were linked to the issues of COVID-19 and politics respectively.

The contrast between the COVID-19-related topics and the politics-related topics was shown in figure 5 as well through their dominance in different sentiments. For the articles with negative sentiment, the two topics related to politics took more than half of the topic proportion. Topic 4 related to international politics possessed the largest proportion (28.92 percent) among the articles that exhibited a negative sentiment score. Topic 3 on Chinese politics and human rights issues showed the second-highest percentage (22.06 percent). From the articles that showed a positive sentiment score, the two topics related to COVID-19 showed a high percentage especially compared to their proportion from negative articles. Topic 1 which covered the outbreak of COVID-19 in China took 17 percent and topic 2 on the global spread of the virus showed 15.88 percent, which makes the proportion of COVID-19 32.88 percent in total.

Discussion

Academic and Practical Implication

Based on the results, this research can pose several implications for the academic and practical discourses on Chinese soft power. First of all, while the sentiment toward China showed a gradual decrease throughout the data collection period, it was shown that the outbreak of COVID-19 itself was not the main source of the negative sentiment. Instead, the political issues regarding China's human rights violation and international relations had a bigger impact on the constant downturn of the sentiment score. From the sentiment analysis, the gap between the daily sum and

the mean score, especially in January, indicated that the articles on COVID-19 were high in number but relatively neutral in tone. At the same time, the high proportion of topics 3 and 4 for articles with negative sentiment and the articles published in June and July demonstrate that the political issues were the main source of the negative sentiment. Among them, it is also observed that the topic on Chinese politics and human rights issues possessed an exceptionally high proportion in negative sentiment compared to its proportion in positive sentiment. Therefore, it can be concluded that the human rights issues in Hong Kong and Xinjiang have made a significant contribution to the negative sentiment. Moreover, the political issues, especially around the human rights violation in Xinjiang and Hongkong were pervasive enough to affect other issues like culture as many of the articles covered a sports star's criticism against China's human rights problems.

What this implies is that the soft power strategy should focus on the long-term political issues that exhibit the nation's value system rather than releasing propaganda messages focusing on imminent isolated issues. It is true that the topics related to COVID-19 showed a dramatic increase during February and March. However, regardless of the size of the issue, the topic proportion quickly decreased, and the sentiment related to the issue was also comparatively neutral. While the Chinese government invested its diplomatic resources to engage in the rhetorical conflict to deal with this issue of COVID-19, what really contributed to the negative sentiment toward China was its domestic politics and human rights violations. This is in line with Rawnsley's claim that it is the "national values, principles, political culture, and the style/outcomes of governance" that truly constitute a country's soft power (Rawnsley 2018, 5). Similarly, Mor also claimed that public diplomacy "seeks to persuade foreign elites and publics that the values, policies, and actions of the state deserve their support (Mor 2006, 157)." From this point of view, public diplomacy tactics are interpreted in the form of an entanglement with the country's political culture and value system. Therefore, it can only be effective when the audiences feel that the country's political culture and value system are aligned or at least compatible with their own. This is also supported by Qi et al. (2022), who argued that China's mask diplomacy during the pandemic was understood through certain frames (e.g., an authoritarian frame), which were influenced by the preexisting debates on Chinese political ideologies and values.

Second of all, this research suggested a multidisciplinary approach for analyzing soft power and provided both quantitative and qualitative explanations for the current situation of Chinese soft power. The debate on the definition of soft power is ongoing, and the discourse is still evolving as the age of the internet and globalization are constantly changing the environment. In this situation, Joseph Nye emphasized that it is important to distinguish the soft power resources from the actual soft power to avoid the term meaning everything, and the key aspect of soft power is in the "target's mind" and its "voluntarism (Nye 2021, 203)." However, due to the subjective nature of these aspects, Davis and Ji (2017) claimed that it is difficult to measure a country's soft power or evaluate a certain soft power strategy and Hall (2010) stated that it is a challenge to prove the mechanism of soft power that links the attraction and the foreign policy outcomes. Moreover, Wilson even criticized those proponents of soft power for presenting "politically naïve and institutionally weak" arguments (Wilson 2008, 110). In this sense, the sentiment analysis through computation can be an effective tool that provides systematic evidence of voluntarism as sentiments can have a profound impact on people's behavior and decision-making (Chen et al. 2017). For a systematic understanding of people's sentiment, Li and Hovy (2014) conducted a sentiment analysis on the People's Daily, and Goldsmith and Horiuchi (2012) connected the public's sentiment with the foreign policy outcomes.

At the same time, it is also true that the soft power analysis should entail a comprehensive qualitative analysis as it is highly context-specific for the historical and

cultural background (Ohnesorge 2020). By extracting the relevant topics, the current research also fulfilled this indispensable necessity for qualitative analysis. Also, connecting these two analyses on sentiment and topics through investigating the topic proportions in each sentiment, this research provided a quantitative link between certain issues and their impact on the Chinese soft power. These attempts eventually can provide a tool for generating more concrete evidence for arguments related to soft power. Additionally, in the era of overflowing data in the online space, the big data analysis conducted in this research can incorporate the huge amount of data to become a resource for analyzing soft power and eventually enrich the current discourse.

Prospects For Chinese Soft Power

Based on the suggested results, one might conclude that China has suffered damage to its soft power during 2020. However, when it comes to data analysis, it is crucial to read a hidden sign from the dataset. From this research, it was the diversification of China's soft power resources.

One defining feature of Chinese soft power can be its government-oriented strategies. As stated before, the Chinese government is investing billions of dollars to promote soft power, and even if China uses the same soft power resources as other countries like media and celebrities, they are mostly state-controlled (Hooghe and Jan 2005). Nye (2021) has also mentioned this weight on government initiatives as he was pointing out the lack of civil society engagement in Chinese soft power. Due to this distinctive feature, Chinese soft power is sometimes even treated as something substantially different from other countries' soft power. According to Barr (2011), analyses on Chinese soft power are prone to slipping into the realm of hard power as such analyses often incorporate the Chinese government's economic influence. For example, Kurlantzick (2007) stated that the growth of Chinese soft power can cause disastrous outcomes in Southeast Asian countries as their economic dependency on China can influence their governance.

However, the rapid development of digital technologies is shifting the dynamics of soft power and giving rise to new diplomatic actors (Manor 2019). Also, the networked society is inviting a "globally-connected public that is volatile, unpredictable, and yearning to be heard" into the game (Manor 2019, 31). The case of China is not an exception. According to Repnikova (2022), along with the decentralization of China's soft power initiatives, Chinese companies are becoming an important channel through which China's image is formed. Reflecting this trend, topic 6 of the DMR analysis on the issues related to Chinese technology companies and social media platforms demonstrates that Chinese companies like Huawei and Bytedance are at the center of attention for global media. Most importantly, in the case of Bytedance, its distancing strategy from the Chinese government was the key element. Other articles on TikTok were covering specific events on this Chinese platform paying attention to the public behavior and attitude.

Moreover, due to the outbreak of the COVID-19 pandemic, it is shown that there was a rapid increase in the western media's reference to Chinese social media. As seen in figure 6, the frequency of using the word "Weibo" increased sharply during January and February, and the frequency of "Wechat" also increased in February as many articles were referring to these Chinese social media for the information on the virus at the beginning of the pandemic. According to Joseph Nye, in the age of overflowing information, "attention rather than information becomes the scarce resource (Nye 2008, 99)." As a new actor in the dynamics of soft power, it can be said that Chinese social media has gained its currency for soft power during the pandemic. Therefore, the major framework of government orientation for analyzing Chinese soft power is facing an inevitable change as well.

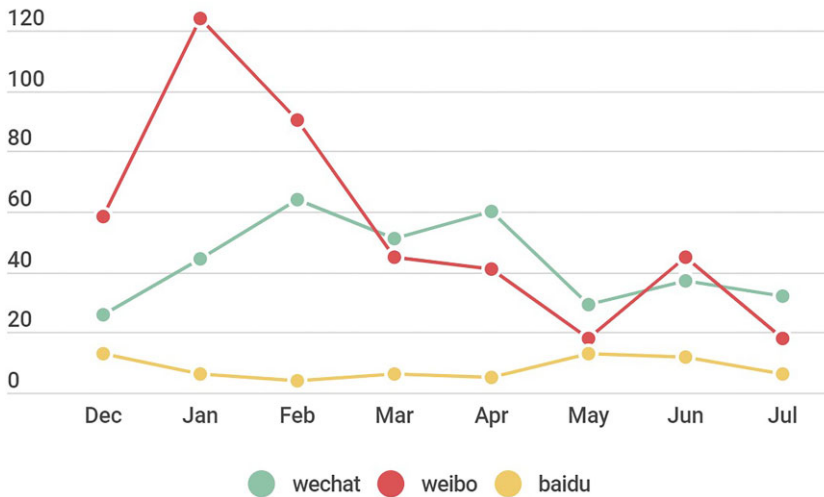


Figure 6. Reference for Chinese online media.

Conclusion and Future Research

In conclusion, this research delved into how China was covered by the western media during the first wave of the COVID-19 pandemic. Using big data analysis of English news articles, this research observed a general downturn in sentiment score throughout the data collection period. The news articles were covering various issues related to China, which were the COVID-19 outbreak in both China and the world, domestic and international politics, technology and social media, economy, and culture. Among these topics, it was shown that politics took a major role in forming the overall negative sentiment. On the other hand, the issue of COVID-19 was covered in a relatively neutral tone. The huge influence of the topic in the beginning of the pandemic was more down to the quantity of the related articles. Moreover, the discourse on the Chinese technology company Huawei and social media platform TikTok demonstrated certain signs of diversification in Chinese soft power resources. In the same vein, the number of references to Chinese social media WeChat and Weibo also increased during the pandemic.

The current research used a machine learning based sentiment analysis and a DMR topic modeling for the analyses. By doing so, this research tried to tackle the major debates of soft power theory, which faces difficulties in quantifying the intangibles. While this quantitative method cannot be applied to all soft power discourse, it can be a useful approach for analyzing overall trends or finding hidden signs from a large set of data.

To further develop the findings of this research, a similar analysis using different data can be suggested. For example, social media data can be considered since people are more vocal about their feelings on social media (Jung et al. 2020). Also, while the topic proportion of culture from this research was relatively small due to the characteristics of the news media, the result from social media can demonstrate different outcomes. Similarly, while this research covered 5 English-speaking western countries' news media, future research can cover the view of other regions such as Asia or focus on a specific country's perspective through qualitative research. Last but not the least, simply extending the data collection period can suggest new implications as it can offer comparative information based on the development of the pandemic.

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