

**The Dissemination of False Information on Weibo and Twitter During the  
COVID-19 Pandemic**

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**Abstract**

This study aims to investigate the persistent presence of health-related false information on Weibo and Twitter during the COVID-19 pandemic. First, the study analyzed the morphological and logical features of 100 fake posts to assist users in better distinguishing false information. Second, eight participants were interviewed to understand why people were susceptible to being misled by false information during the pandemic, and this phenomenon was explained based on psychological concepts. Survey results revealed that high-frequency words in Weibo posts were mainly related to the COVID-19 pandemic, while Twitter posts involved more vocabulary related to vaccines and the government. Additionally, four psychological concepts were identified to explain why people are prone to believe false information, even highly educated users being susceptible to foolish false information. By analyzing the characteristics of false information on Weibo and Twitter and explaining them using psychological concepts, this study aims to enhance understanding of the dissemination of health-related false information on social media and provide ideas for reducing the impact of false information on individuals.

## **Introduction**

At the end of 2019, the world was shaken by the sudden COVID-19 pandemic (Brandon, 2020). However, three years later, the pandemic is still the subject of disputes regarding social health issues. Against the backdrop of global interconnection and the information boom, this public health security incident continues to fuel public opinion on the Internet (Sastre et al., 2021). The public, news media, and various organizations disseminate and obtain the latest news on the pandemic through social media (Brandon, 2020). Meanwhile, social media platforms such as China's Weibo and United States' Twitter have been overwhelmed by false information during the pandemic. This complex network of unverifiable information leads people to find no reliable sources when seeking information, thus misleading them and creating doubts and panic (Chou et al., 2020).

In order to better reduce the presence of misinformation on the Internet, this study aims to identify the characteristics of false information, such as word formation and logical characteristics, by collecting fake posts that have appeared on Weibo and Twitter during the pandemic. This will help users better distinguish false information. Additionally, this study included interviews conducted to understand why people are misled by misinformation during the pandemic. It also used psychological concepts to explain why false information is easily believed.

## **Researcher's Background**

I am an international student with Chinese nationality. During the first year of the pandemic, I pursued online courses in my home country, while in the second and third years of the outbreak, I went to the United States to complete my studies. Because I lived in two different countries as an international student, I have chosen the Chinese

social media platform Weibo and the U.S. social media platform Twitter as the focus of my research. I can analyze the reasons for the occurrence of false information on Weibo from a Chinese cultural perspective. Additionally, based on my real-life experiences in the United States, I can analyze the reasons for the presence of false information on Twitter in the United States. I am particularly intrigued by how these initially false pieces of information are widely circulated internationally, given the exaggeration of the US COVID-19 pandemic in Chinese news and the exaggeration of the Chinese COVID-19 pandemic in U.S. news. With my curiosity and the advantage of living in both countries, I aim to delve into this study into the impact of false information on the social media platforms Weibo and Twitter during the pandemic.

### **Background**

In the era of rapid information development, an increasing number of people are turning to social media for the latest information instead of traditional media such as newspapers and radio (Martin, 2018). The vast information system has made management a challenge, and some users take advantage of this opportunity to spread false information. False information refers to unverified information, and the dissemination of such information can have a negative impact on the lives of information recipients (Vraga & Bode, 2020). Indeed, whether during the COVID-19 pandemic or before, with the increase in the speed and scale of information dissemination and the expansion of participating groups, false information has always existed in the online world, causing confusion and misleading people (Shearer & Matsa, 2018). However, during the pandemic, health-related misinformation has had a more severe impact on people's lives (Kostarella & Kotsakis, 2022). The World Health Organization has proposed the concept of "infodemic," which refers to the

uncontrollable phenomenon of the dissemination of health-related misinformation on the Internet by users during the COVID-19 pandemic, either for a purpose or inadvertently (Kostarella & Kotsakis, 2022). This study will focus on misinformation, which refers to false or inaccurate information that is shared or spread, often unintentionally, leading to misunderstandings, confusion, or incorrect beliefs (Vraga & Bode, 2020).

### **Weibo in China and Twitter in the United States**

Weibo serves as a platform in China where users can quickly access the latest information, and the media can efficiently disseminate information (Hu, 2020). Similarly, Twitter is a platform in the United States where users and the media can freely express unrestricted information and opinions (Odabas, 2022). If these two platforms, which are used to disseminate the latest information, are filled with false information, users may not have a quick way to immediately find the reliable information they need. In this study, Weibo and Twitter will be the main research and comparison objects. Since some official news accounts use Twitter and Weibo to publish news, some classic cases of misinformation also appear on these two platforms. By analyzing the impact of misinformation on these two platforms, some conclusions can be drawn.

Weibo and Twitter are two popular social media platforms that have similarities and differences in terms of management policies, operations, government regulation, ownership, and the way posts are published. First, in terms of management policies, Weibo is operated by the private Chinese company Sina, and it is subject to strict management and censorship by the Chinese government. To comply with Chinese laws, regulations, and policy requirements, Weibo has stricter content censorship than

Twitter (Hu, 2020). On the other hand, Twitter is a company headquartered in the United States that values freedom of speech both before and after Elon Musk's involvement with the company, although it also has certain rules and regulations (Odabas, 2022). Second, in terms of operations, Weibo and Twitter have some similarities. They are both user-generated content platforms that allow users to post various forms of content such as text, images, and videos. Users can follow other users, like, comment, and retweet others' content, enabling interaction and communication. However, there are differences in the way posts are published. Weibo users can post by writing text and uploading images and videos, and they can choose to make their posts public or visible only to their followers. On the other hand, Twitter users publish posts by writing tweets limited to 280 characters and can use hashtags to categorize topics (Odabas, 2022). In terms of government regulation, Weibo is subject to strict management and censorship by the Chinese government. According to Chinese internet regulations, Weibo must adhere to specific content censorship standards and cooperate with government regulatory requirements (Hu, 2020). Twitter may also be subject to government regulation and censorship in certain countries, but it generally values freedom of speech and user privacy (Odabas, 2022). Regarding ownership, Weibo is operated as a private company by Sina, which has control over the Weibo platform (Hu, 2020). Twitter, on the other hand, is a publicly traded company owned by shareholders (Odabas, 2022).

### **False information during the COVID-19 pandemic**

In July 2020, rapper Kanye West said in an interview that they want to implant microchips into each of us by injecting the COVID-19 vaccine. West would seriously consider running for president and endorsed the conspiracy theory about the COVID-

19 vaccine. He said these actions are brutal and that he would take an extremely cautious attitude towards the COVID-19 vaccine. Some conspiracy theories about vaccines originated on social media platforms, and some users claimed that Microsoft's board of directors advocated installing microchips in everyone's body and getting economic profits by vaccinating people (Brown & Weise, 2020). However, as early as June 2020, Bill Gates responded, "I have never set foot in the field of microchips. But I cannot refute these rumors because they are weird in themselves, and I repeat them only to add credibility to the rumors." (Brown & Weise, 2020)

Similarly, in the early days of the COVID-19 pandemic in China, one news spread across the country on Weibo. A person claiming to be a health expert stated that a drug called Shuanghuanglian Oral Liquid could treat the coronavirus (Ni et al., 2021). This message became widely known overnight, and the Shuanghuanglian Oral Liquid was sold out within a week due to an unverified Weibo post. However, soon after, the National Medical Products Administration refused the rumor. Although the official health organization came to refute the rumors, it did not completely convince everyone that Shuanghuanglian Oral Liquid could not treat the coronavirus. Due to the threat to people's health caused by the COVID-19 pandemic, people could not calmly think about the authenticity of the information when receiving health information related to the pandemic (Naeem and Boulos, 2021). According to the social media data analysis platform Sprinklr, the number of mentions of coronavirus on social media exceeded 19 million times in March 2020, and Twitter reported in early April 2020 that tweets related to the COVID-19 pandemic were shared every 45 milliseconds (Brandon, 2020).

Misinformation about the pandemic has caused huge hidden dangers to public health care. Specifically, misinformation creates a significant barrier to vaccination (Di Domenico et al., 2022). Whether on Weibo or Twitter, some users have raised the

negative impact of vaccines on people, such as infertility, cerebellar atrophy, and reduced immunity (Domenico et al., 2022). Due to the simultaneous emergence of speeches and opinions on social media, users could not judge the authenticity of information based on their cognition (Naeem and Boulos, 2021). Health-related misinformation seriously affects users' ability to evaluate and receive information (Naeem and Boulos, 2021). Although some studies have studied the negative impact of false information on society and the country through case studies, few studies have analyzed the composition of false information.

### **Persistence of false information**

Although many studies have proposed methods to address the spread of misinformation, it remains challenging to eliminate the dissemination of false information. Even as the COVID-19 pandemic has subsided, fake posts related to the pandemic continue to emerge on the internet. Two psychological concepts can explain why misinformation persists.

The first concept is the continued influence effect. It suggests that even after misinformation has been corrected, its impact persists, indicating that corrections are somewhat unsuccessful (Lewandowsky et al., 2017). A psychological concept related to "correction" is belief echoes, which describes the phenomenon that once people are exposed to false information, it becomes difficult for them to expel it from their minds (Lewandowsky et al., 2017). The presence of false information related to the COVID-19 pandemic is similar to this aspect: even if individuals are informed that certain information is incorrect, they are likely to forget the process of its refutation and correction and continue to perceive it as a fact when recalling it later.

The second concept is the implied truth effect. It refers to the tendency of



individuals to believe that information not corrected is accurate once they become aware of the existence of corrective mechanisms (Swire-Thompson & Pennycook, 2017). In reality, platforms often fact-check only a portion of the information rather than all of it. A study found that when news articles are labeled on social media as "fact-checked and disputed," people tend to place more trust in articles not marked as such, even though there is no guarantee from platforms and institutions regarding the accuracy of the unverified news (Swire-Thompson & Pennycook, 2017). If users see a post on Weibo or Twitter that has been verified as incorrect, they will assume that all other information, except for that particular post, is correct. However, the platform may have simply not thoroughly checked all the information.

The existence of these two psychological phenomena makes it challenging for platforms and users to completely eradicate false information. However, this study will delve into the characteristics of misinformation formation, enabling users to identify false information through certain characteristics and reduce its inadvertent dissemination. Additionally, this research will explore how individuals are misled by misinformation in order to identify the root causes of its spread.

## **Literature Review**

### **The severe impact of false information**

Health-related false information persists on the Internet and widely disseminates on social media, which poses a potentially significant threat to public health (Heley et al., 2022). The researchers propose that health misinformation is defined as, based on the best evidence available at the time, the relevant information being false, inaccurate, or misleading (Heley et al., 2022). Some researchers also suggested that false information refers to misinformation that occurs when people hold incorrect beliefs and

do so with confidence (Vraga & Bode, 2020). Users not only accept false information on social media but also propagate false information.

False information has been proven to propagate faster and farther than accurate information, and research has shown that misinformation can have negative real-world consequences (Chou et al., 2020). Misinformation can amplify debate about an event or spread unproven solutions and theories. Additionally, a large amount of literature examines how people respond to conflicting health advice. Research indicates that when the public is exposed to conflicting health information, people not only experience confusion about specific guidelines but may also reduce trust in the scientific community that issues this conflicting information (Vraga & Bode, 2020).

### **The "infodemic" during the COVID-19 pandemic**

The world has been affected by the COVID-19 pandemic in the past three years. So far, 99,252,425 confirmed cases of COVID-19, with 121,015 deaths in China, have been reported to the World Health Organization (NA, 2022). In the United States, there have been 103,343,569 confirmed cases of COVID-19 with 1,125,209 deaths reported to the World Health Organization. United Nations Secretary-General Antonio Guterres said the spread of the COVID-19 pandemic "has also unleashed the second pandemic of misinformation, from harmful health advice to wild conspiracy theories" (Arao et al., 2020). Almost at the same time, the term "infodemic," coined by the political scientist David Rothkopf in 2003, was first used by the World Health Organization in the context of COVID-19 to refer to the flood of fake news, conspiracy theories, and misleading advertisements that have flooded the news in the wake of the COVID-19 outbreak (Sastre et al., 2021). With the emergence of a pandemic in 2019, false information related to health on social media appeared more frequently and affected

users' lives more seriously. Social media is now one of the most common tools people in many countries use to get information (Shearer & Matsa, 2018). However, while the power of social media is to disseminate factual information quickly and widely, it also implies that unverified information—information that is partially inaccurate or entirely fabricated—can quickly spread and reach a wide audience (Sangwon et al., 2022).

Although false information touches nearly all areas of healthcare, the most high-profile contemporary manifestation of the problem in the United States is vaccine misinformation (Cornwall, 2020). In the days after the first confirmed case of coronavirus in the United States, anti-vaccine activity people have already hinted on Twitter that the coronavirus is a hoax — part of a plot to profit from an eventual vaccine (Cornwall, 2020). Encouraging Americans to vaccinate against COVID-19 has become a major headache for the World Health Organization. The widespread emergence of different views on vaccines on social media has made it uneasy for people to judge the authenticity of the information and accept the requirement of being vaccinated against the coronavirus. Similarly, Chinese researchers have shown that when the COVID-19 pandemic first broke out in 2019, debates about drugs to treat the coronavirus flooded the whole network. Researchers have shown that Shuanghuanglian Oral Liquid, debated on social media platforms for a long time, has not been included in the diagnosis and treatment plan for new coronavirus pneumonia (Zhou et al., 2020). Although many studies have proposed related solutions to solve the propagation of false information, they have not guided users on the right path because dealing with false information is challenging. For example, psychological factors, including emotional and cognitive biases, may render direct efforts to counter misinformation by providing accurate information ineffective (Chou et al., 2020).

The complexity of health information, the role of expert intermediaries in disseminating information, and the information dynamics of social media create an environment in which harmful misinformation can spread rapidly (Di Domenico et al., 2022). In modern society, individuals must navigate complex health web systems to make the right health decisions (NA, 2019). Some health experts are increasingly appearing in the "information market". They use more professional terms to make the information seem more reliable. However, a counter argument was raised in a study that legitimate health information is increasingly presented as misinformation in information marketplaces (Di Domenico et al., 2022). Research shows that some people who spread misinformation use the name of experts to legitimize the information on some platforms, such as online book markets, and then enhance the dissemination through social media (Di Domenico et al., 2022). Since people know little about how information is legitimized, users are more likely to trust posts with the names of experts.

A recent study found that much false information about the COVID-19 pandemic is characterized by misanalysed text, in which misinformation agents recontextualize the content for their purposes (Brennen et al., 2021). A study supports this point. The study attempts to reveal different patterns of news practices between old or new media and social media, using the Greek information ecosystem as a case study (Kostarella & Kotsakis, 2022). Specifically, the study compares news and Twitter posts about the outbreak in Greece and shows that both print and electronic news outlets follow traditional news reporting patterns. In contrast, Twitter was more emotional. The language and visual style of the Twitter platform favor short, catchy messages, making it easier to retweet them (Kostarella & Kotsakis, 2022). When false information occurs naturally on Twitter through a tongue-in-cheek tone, it leads to higher retweet rates.

In general, many studies have shown the negative impact of misinformation on social media during the COVID-19 pandemic. However, few studies have addressed the generation and dissemination of misinformation by comparing different social media in different countries and have not considered false information in combination with psychological factors.

### **Research Question**

From the above, it can be seen that the dissemination of false information related to the pandemic not only poses significant risks to public healthcare but also confuses and misleads people's understanding. To better address the issue of false information, the first research question to be tackled is:

RQ 1: "Especially during the COVID-19 pandemic, what are the characteristics of false information that appear on Weibo and Twitter? "

This will involve analyzing the commonalities and differences in the false information posted on Weibo and Twitter during the pandemic period.

As humans are one of the mediators influencing the spread of false information, if people were not easily inclined to believe false information, they would not be negatively impacted by it. Therefore, the second research question to be addressed is:

RQ 2: "Why do users easily believe health-related false information on social media during the pandemic?"

For individuals who accept false information, it is important to understand the process by which they receive such information. For those who disseminate false information, it is crucial to determine whether they are aware of their incorrect behavior and how they further propagate false information. The research will involve interviewing individuals who have either received or shared false information during

the pandemic to gain insights into their thoughts and behaviors. Additionally, psychological concepts will be employed to explain these phenomena.

### **Method One**

This study used content analysis to identify the characteristics and expressions of false information, such as identifying the most frequently occurring words or phrases in fake posts on both Weibo and Twitter and analyzing the similarities and differences in the expression of false information between the two platforms. The study design was reviewed and approved by the University of Washington's Internal Review Board (IRB) with Exempt Status (IRB ID: STUDY00017527). According to Cole (1988), content analysis is a method for analyzing written, verbal, or visual communicative messages (Croucher & Cronn, 2022). The focus of the analysis in this study will be on text-only posts, making content analysis an appropriate tool as it converts text into numerical data (Croucher & Cronn, 2022). Compared to surveys, content analysis enables the acquisition of objective, evidence-supported data rather than subjective survey data based on subjective feelings.

First, the study collected 100 text-only fake posts related to the COVID-19 pandemic from Weibo and Twitter, with 50 posts from each platform, by utilizing databases from websites that curate misinformation, such as FactCheck, BBC News, firstdraftnews.org, etc. Subsequently, the content of these 100 posts was categorized based on their platform (Weibo or Twitter) and pasted into an Excel spreadsheet. The first column of the spreadsheet represents the post number, the second column indicates the source of the post, and the third column contains the original text content of the post. It is worth mentioning that the original posts on Weibo were in Chinese. For the purpose of readability and analysis, this study used Google Translate to translate the

Chinese fake posts into English, which is recorded in the fourth column. AI translation was chosen over manual translation to avoid subjective translation errors.

Second, this study analyzed fake posts from Twitter. Initially, a quick reading was conducted to identify any logical or content-related issues with the fake posts. These observations were noted in the corresponding remarks column for the purpose of summarizing common logical flaws in the false information. Subsequently, using the advanced search function in Excel, the study identified the top twenty most frequently occurring words among the 50 fake Twitter posts. Text search tools were then employed to mark the total occurrences of each high-frequency word. The words were sorted in descending order based on their frequency of occurrence. The study distinguished between function words and content words for further analysis. Function words encompassed all meaningless words, such as determiners, conjunctions, prepositions, pronouns, and auxiliary verbs. Content words, on the other hand, included all words except for function words. Ultimately, the study highlighted the top five most frequent function words and the top ten content words in red for subsequent analysis.

Third, the same analysis method was applied to the 50 fake posts from Weibo. Similarly, logical flaws were identified and the top five most frequent function words and top ten content words were listed. However, unlike the analysis method for Twitter fake posts, the Weibo database included an additional column containing the translated English content of the posts. To minimize errors caused by the translation of Chinese Weibo fake posts into English, the study conducted a dual verification process. Specifically, there are differences in the translation between Chinese and English. For example, the phrase "得到肯定答案" could be translated as "received a positive answer" in English, which may be ambiguous and potentially misunderstood as "得到

了一个肯定的答案" in Chinese. However, in Chinese, there is no specific emphasis on the use of measure words, and it does not necessarily imply that only one positive answer was received. The presence of the measure word "a" in the English translation could impact data statistics. To reduce errors introduced by translation or language/cultural factors, the study also conducted data analysis on the original Chinese Weibo posts to identify the most frequently occurring Chinese words. Fortunately, the results obtained from both methods were almost identical.

### **Method Two**

The second method used in the study is the semi-structured interview method. This method refers to a qualitative research technique that combines predetermined questions with the flexibility to explore additional topics and gather in-depth information (Berger, 2011). This study involved interviewing individuals who have experienced false information to gain specific insights into their psychological thoughts and feelings during those experiences. However, since the interviews require participants to recall their experiences, feelings, and thoughts caused by false information, recollecting unpleasant experiences can potentially induce stress or diminish self-esteem (Berger, 2011). To minimize psychological harm resulting from the experiment, the study adopted an open-ended interview approach, using the semi-structured interview method. Compared to structured interviews that use fixed questions, semi-structured interviews offer researchers more flexibility and the ability to ask follow-up questions in a more detailed manner. Employing a communicative interview style helped create a comfortable atmosphere for interviewees, particularly when discussing negative experiences (Berger, 2011). Additionally, the semi-structured



interview allows interviewees to freely share their authentic experiences with false information and express their opinions without constraints (Berger, 2011). By allowing interviewees to narrate their personal experiences of encountering false information without being limited by specific questions, the study was designed to obtain more detailed information regarding their psychological state, thought processes, and areas of conflict during such encounters.

The interview subjects in this study are divided into two categories. The first category consists of those aged 18 to 35 who primarily rely on Weibo or Twitter to quickly access information, such as those who only like or browse posts. Since they are not familiar with the platform's operating rules, they can only rely on their own understanding to distinguish between true and false information. Through interviews, the study aimed to understand how these users perceive and differentiate information from the perspective of information recipients.

The second category comprises frequent users of Weibo or Twitter from China or the United States. These are young people aged 18 to 35 who actively post on Weibo or Twitter, have a considerable number of followers, and are familiar with the platform's operating rules. This group of users is included in the interview subjects because they possess a comprehensive understanding of the platform. Through interviews, the study sought insights into how these users assess and trust information. People who frequently post on Weibo or Twitter can contribute to the rapid spread of misinformation, especially because people with a large number of followers have a significant influence (Hazell, 2019).

The study selected a total of eight interviewees, including four individuals from China who are users of Weibo. Among them, two are sometimes users, and the other two are frequent users. Additionally, four interviewees are users of Twitter from the

United States, with two sometimes users and two frequent users. The choice to focus on Weibo users from China is because the audience of Weibo primarily consists of Chinese individuals. This selection ensures that the interviewees have a deep understanding of Weibo. Similarly, as Twitter's main user base is composed of Americans, selecting Twitter users from the United States as interviewees will yield more authentic results.

The second method used in this study was conducted through the distribution of questionnaires and online interviews. First a Google Forms survey to the Communication Department and fellow students at the University of Washington. The questionnaire included inquiries about age, nationality, frequency of using Weibo or Twitter, manner of using Weibo and Twitter, exposure to false information, and contact information. After two weeks, a total of 28 students filled out the questionnaire, and the data collection for the study was concluded. The study gathered all the questionnaire responses into an Excel spreadsheet and randomly selected eight respondents to serve as interviewees for the research. The interviewees were required to meet the following criteria: a) aged between 18 and 35, b) received false information during the COVID-19 pandemic, c) infrequent users of Weibo from China, or d) frequent users of Weibo from China, e) infrequent users of Twitter from the United States, or f) frequent users of Twitter from the United States.

Once the eight potential interviewees were identified, an email was sent to all of them. The email included an introduction to the research purpose, the reasons for requiring their cooperation, an informed-consent form, and a request for their availability for the interview. Fortunately, all eight candidates were willing to participate in the interviews. Within a two-week timeframe, all eight were interviewed.

The interviews were conducted online via Zoom. The duration of each interview

ranged from 20 to 30 minutes. Chinese individuals who are users of Weibo were interviewed in their native language--Mandarin Chinese--to avoid any potential information loss due to non-native language communication. When interviewing American users of Twitter, the interviews were conducted in English. Before the interviews, all participants were informed about the potential negative experience questions they may be asked, as well as the purpose and direction of the study. It was also emphasized that participants had the right to refuse or withdraw their consent to participate at any time without facing any penalties (IRB Online Tutorial). Once the participants agreed to proceed, the interviews commenced. The first set of questions asked of the participants was as follows:

- How long have you used Weibo/Twitter?

-[Follow-up] Why choose Weibo/Twitter to receive or post information?

-Did you receive false information from Weibo/Twitter during the COVID-19 pandemic?

-(Answer is yes) What kind of false information?

- What was your feeling at the time?

- Could you tell me about your experience?

Due to the reluctance of many individuals to admit that they have spread false information, the researcher introduced the topic in the interviews by sharing their own unintentional instances of forwarding or receiving false information. By repeatedly asking the question, "Have you also had similar experiences?" The researcher aimed to encourage the interviewees to share their own experiences.

At the end of the interviews, some open-ended questions were asked, such as "Is

there anything else you want to share with me?" and "Do you have any additional emotions or stories you would like to express?"

After the interviews concluded, the study sent a gratitude letter to each participant, expressing appreciation for their participation and the positive impact it had on the research. Additionally, the participants were assured that any personal information would not be included in the research report.

## Results

### Content analysis

After reading and analyzing all 100 Weibo and Twitter fake posts, this study has drawn the following conclusions regarding the forms and content of false information and has compared the characteristics of fake posts between Weibo and Twitter.

First, with regards to the characteristics of high-frequency function words in fake Weibo posts, the top five most frequently used function words are "the" (occurring 151 times), "and" (occurring 78 times), "of" (occurring 61 times), "in" (occurring 48 times), and "to" (occurring 47 times). These function words serve to connect sentences and do not carry any real meaning. In contrast, the top five most frequently used function words in fake Twitter posts are "the" (occurring 51 times), "a" (occurring 39 times), "to" (occurring 32 times), "and" (occurring 31 times), and "in" (occurring 18 times). Compared to Twitter posts, those who publish false information on Weibo are more accustomed to using "the". This could suggest that the topic of the text is more specific and needs to emphasize particular things or concepts. Besides, the total number of function word occurrences in fake Weibo posts is much higher than that in Twitter's data. According to linguistic and literary research, a greater tendency to use function words may indicate that the sender focuses more on the structure and fluency of

language rather than on specific content (Halliday & Matthiessen, 2014). Some senders may prefer to use function words to make their language more fluent, rather than using more specific vocabulary to describe certain content.

Secondly, the characteristics of high-frequency content words are evident from the data analysis of fake Weibo posts. The top ten frequently occurring words are "covid-19" (25 occurrences), "can" (24 occurrences), "has" (16 occurrences), "virus" (9 occurrences), "blood" (9 occurrences), "been" (9 occurrences), "beijing" (8 occurrences), "coronavirus" (6 occurrences), "singapore" (4 occurrences), and "zhong nanshan" (4 occurrences). The high-frequency words predominantly relate to the COVID-19 pandemic, indicating that Weibo users are highly concerned with discussions surrounding the pandemic, vaccines, and preventive measures. Additionally, some place names and expert names with higher frequency also appear, which may be related to the role of relevant regions and experts in pandemic prevention and control. From the data analysis of fake Twitter posts, the top ten frequently occurring words are "covid-19" (11 occurrences), "vaccine" (8 occurrences), "plot" (8 occurrences), "coronavirus" (8 occurrences), "all" (7 occurrences), "created" (4 occurrences), "government" (4 occurrences), "people" (4 occurrences), "it" (4 occurrences), and "their" (3 occurrences). Both Weibo and Twitter's high-frequency words contain COVID-19-related terms, such as "covid-19" and "coronavirus." However, Weibo also includes some place names and expert names, such as "Beijing" and "Zhong Nanshan," which may be related to the role of relevant regions and experts in pandemic prevention and control. On the other hand, Twitter includes some vaccine-related words, such as "vaccine," as well as terms related to the government and people, such as "government" and "people." From this perspective, Weibo users seem to be more focused on the pandemic itself, while Twitter users are more interested in the

Third, in terms of content form, false information is often concise and straightforward, with a clear emphasis so that users can quickly understand and address the problem. For example, "COVID-19 is a scam created by Big Pharma to sell more drugs and make more money" and "Lactoferrin can prevent the novel coronavirus." When the language is simple enough, readers can read the information and remember its content quickly for propagation. Besides, this study found that fake posts often have logical problems, such as the use of "but" to connect sentences where there is no contrast. Using "but" can increase readers' interest in the text. Finally, misspellings are common in fake posts, especially in Weibo posts. Since it is easy to make spelling mistakes in Chinese, such as words with the same pronunciation but different spellings, many Weibo fake posts frequently have simple spelling mistakes.

According to data analysis, this study has derived a formula for the spread of misinformation: Fake post = (Information)Importance \* (Information)Ambiguity. This implies that misinformation with sufficient importance, coupled with ambiguity, has sufficient conditions for rapid dissemination.

### **Semi-structured Interview**

After identifying the characteristics of false information through the analysis of fake posts, this study used interviews to further identify specific reasons why false information is easily accepted; the interviews were analyzed in conjunction with psychological concepts. Eight interviewees reported that during the pandemic, the information on Weibo and Twitter was very unreliable, and they often came across posts that were later proven to be incorrect. For four sometimes users who do not often use Weibo and Twitter, they reported that they usually browse and like some

informative posts on the platforms. They rarely express their opinions on the platform because they do not want to reveal their personal opinions, such as political views related to the pandemic. One interviewee mentioned that he was more likely to believe information with a high repetition rate, such as information that appeared repeatedly on Weibo. This is consistent with the Dual Process Theory, which states that humans have two ways of processing information: implicit, unconscious, automatic processing, and explicit, conscious, and controlled processing (Evans, 2003). People typically use the former, as it is faster, and once formed, this type of processing is not easy to change, which increases the risk of being influenced by false information. When people use a more relaxed way of processing information, they are more likely to make easy judgments. For example, when information is repeated, people process it more quickly and tend to believe it is accurate. However, this type of information processing can lead to missing some key details. In addition, the four sometimes users also reported that they usually read a large amount of information quickly and rarely forward it to friends or family. Therefore, when they browse information, they only accept information that seems reasonable on the surface, rather than thinking deeply and verifying it. One important reason why some people are vulnerable to false information is that they become "cognitive misers". Cognitive miserliness allows the human brain to operate more efficiently, without spending too much time on every issue, but if it becomes a habit, it often cannot invest enough effort when serious thinking is required (Soriano et al., 2018). Sometimes users of Weibo or Twitter, form a habit of browsing a large number of posts and do not think deeply about the process of accepting information, which makes it difficult to detect false information.

The other four interviewees who often use Weibo or Twitter express their personal opinions by commenting, forwarding, and posting on the platforms. They reported that

if they see interesting information, they will post it on their own account to increase traffic or fans. Two participants said they had posted false information on Weibo or Twitter. One person found a false post to be interesting and believed it could attract followers, thus they retweeted it. The other person shared a false piece of information because it was related to vaccines, and they were personally interested in vaccines at the time. However, both participants said they did not consider the information they retweeted to be false, which led them to share the posts on social media. The interviewees also reported that they often forward posts that are consistent with their own cognition. For example, one interviewee was a religious believer and he reported that he would repost anything related to religion that was consistent with his beliefs. The psychological concept of cognitive dissonance explains this behavior. Cognitive dissonance is a negative feeling, and people feel anxious and frustrated when in a state of cognitive dissonance (Kendra, 2022). When this disharmonious state is reconciled or eliminated, people feel relieved and satisfied. Therefore, people tend to believe information that is consistent with their own way of thinking and reject information that conflicts with it to avoid cognitive dissonance, even if that conflicting information is true and reliable.

Additionally, all eight interviewees expressed that despite considering themselves to have high information discernment abilities, they unintentionally retweeted or believed false information. When the false information was debunked, they still found it astonishing and were shocked by the debunking of certain false claims. For example, one interviewee mentioned that she had seen people online claiming that household bleach or disinfectants could prevent COVID-19. As a result, she went on to disinfect all the items in her home. However, when this information was debunked, the interviewee felt extremely shocked and started questioning her previous



actions. The psychological concept of the third-person effect suggests that when assessing the degree to which oneself and others are affected by misinformation, individuals tend to believe that others are more susceptible to influence, while they possess stronger abilities to discern false information (Sundar & Kim, 2013). This "confidence" can sometimes lead people into the trap of information contagion. Just like a "contagious disease," once false information is propagated by someone, it spreads rapidly. The third-person effect also explains why even highly educated users of Weibo or Twitter may be misled by some false information.

### **Discussion**

Through reading and analyzing 100 Weibo and Twitter posts, this study has summarized some important conclusions from two aspects: the textual form and the content form of false information. First, the study observed that in terms of textual form in false information, there are differences between the two platforms. On Weibo, individuals who publish fake posts are more inclined to use the function word "the," while on Twitter, words such as "a," "to," and "and" are more commonly used. This may reflect that individuals who publish fake posts on Weibo pay more attention to language structure and fluency, while those on Twitter focus more on expressing specific content. Additionally, the total frequency of function word occurrences in fake Weibo posts is higher than that in Twitter posts. Some individuals who publish posts may be more inclined to use function words to make the language flow smoothly rather than employing more specific vocabulary to describe particular content.

Regarding the content form of false information, the study observed that false information is often presented in a concise and clear manner, with emphasis placed on key points, so that users can quickly understand. This simple language expression helps

readers browse through the information quickly, remember the content, and subsequently spread it. Additionally, the study found that fake posts often exhibit logical issues. Finally, spelling mistakes frequently occur in fake posts, especially on Weibo.

It is important to acknowledge that this study's sample is limited to only 100 posts from Weibo and Twitter, which may impose certain limitations on capturing the full extent of false information on social media platforms. Future research could expand the sample size and include a wider range of social media platforms and data sources to obtain more comprehensive and accurate results. Additionally, the study of false information could incorporate more text features and machine learning methods to enhance the detection and classification of false information. This study also focused solely on text-related fake posts, but future research could explore characteristics of false videos or images to uncover more features of misinformation. Analyzing the use of emojis in texts or videos could also provide insights into temporal variations and trends related to false information.

On the other hand, this study delved into the dissemination and reception of false information on social media platforms through interviews, while incorporating psychological concepts for explanation and analysis. By conducting interviews with eight participants, the study uncovered key reasons and patterns that elucidate why some individuals are prone to accepting and spreading false information. Firstly, the researchers discovered that even if some users are aware of the unreliability of such information, they are still drawn to it. This partially explains why some interviewees shared false information, as they believed it would attract more attention and followers.

Furthermore, the study indicates that people tend to employ a more effortless and reflexive approach to processing information, which makes them more susceptible to

the influence of false information. Additionally, people often overestimate their own discernment abilities and believe that others are more prone to being influenced by false information, thus falling into the trap of information contagion.

However, this study also has certain limitations. In future research, it is worth considering the following two aspects to further expand and deepen the understanding of the dissemination and reception of false information.

Firstly, it would be beneficial to expand the sample size and diversity in future research. The current study interviewed only eight participants, which constitutes a small sample size. In future research, increasing the number of interviewees and encompassing a broader range of individuals, including those from different age groups, educational backgrounds, occupations, and geographical locations, would provide a more comprehensive understanding of how different populations receive and disseminate false information on social media, as well as the potential variations and influencing factors that may exist.

Secondly, it is important to delve into the impact of social media platform design and algorithms on the dissemination of false information. The design and algorithms of social media platforms play a significant role in shaping user behavior. Future research could explore the specific design features of different platforms and how they influence users' reception and dissemination of information. Additionally, studying the technological and strategic approaches employed by social media platforms in identifying and filtering false information would provide insights into their effectiveness and limitations in addressing this issue.

## **Conclusion**

This study analyzed 100 Weibo and Twitter posts during the COVID-19 pandemic

that contained false information and interviewed eight participants who either received or spread false information. The study identified linguistic characteristics of false information on Weibo and Twitter, including function words and content words. The study applied four psychological concepts to explain why users are susceptible to misinformation. Based on these findings, the research enables future Weibo and Twitter users to quickly identify false information, thus reducing the unintentional spread of false information. The study hopes that users will become aware of the subconscious influences at a psychological level and minimize the disturbance caused by receiving false information.

However, the study has some limitations. As mentioned earlier, the sample size is small. Future research can increase the number and scope of texts analyzed, as well as the number of participants interviewed. Additionally, the focus of the research can be expanded to include other types of false information, not just limited to COVID-19-related content. Different types of false information may exhibit different textual and content characteristics, and in-depth analysis of these can provide better insights into the forms and mechanisms of false information dissemination. Lastly, future research can also summarize the actions taken by social media platforms during the COVID-19 pandemic to reduce the spread of false information and prepare for the potential outbreak of false information related to significant public health events in the future.

Finally, addressing and preventing false information requires collaboration from multiple stakeholders. Governments, social media platforms, academia, and the public all have their respective responsibilities to fulfill. Governments can strengthen regulation and the establishment of laws and regulations regarding false information. Social media platforms can enhance their algorithms and human review capabilities. Academia can conduct in-depth research and provide expert advice. The public, on the

other hand, needs to improve their ability to discern false information and cultivate critical thinking skills.

False information is a complex and serious issue that has significant negative impacts on both society and individuals. Through in-depth research on the textual forms and content characteristics of false information, we can gain a better understanding of its dissemination mechanisms and effects, thereby formulating appropriate strategies and preventive measures. Future research should continue to explore various aspects of false information to build a healthier and more reliable information environment.

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