

Portrayals of COVID-19 communication and responses on social media: An analysis
of Facebook posts from 2019-2022 in Macao, China

by

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Doctor of Philosophy in Communication

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PREVIEW

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The pursuit of a PhD degree is like running a marathon, and I would not have been able to finish it without the help and support of innumerable others who, in one way or another, contributed and extended their assistance. As such, I would like to take this opportunity to convey my deepest gratitude, appreciation, and thanks to the people listed below for their help in the completion of my study.

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Abstract

Objective:

This thesis aims to explore the role of social media in responding to the challenges of COVID-19 pandemic, with specific focuses on the positive discourse communicated on Facebook in Macao and the online engagement in vaccine promotion by government and non-governmental entities.

Method:

Automated content analysis was utilized throughout the two studies for content identification and classification. In Study 1, Facebook posts between December 1, 2019, and December 31, 2020, were collected to analyze the positive response of users to the COVID-19 challenges. Building upon the insights from Study 1, Study 2 collected Facebook posts ranging from January 1, 2020, to August 31, 2022, to investigate how different users communicated to facilitate vaccine promotion and the dynamic interaction between the government and non-government agendas.

Results:

Study 1 demonstrated that Facebook users in Macao posted 104,834 COVID-19 related messages during the time analyzed, with 58.07% (n=60,880) exhibiting positive emotions, and 23.65% (n=24,795) involving the examined positive themes. The messages emphasizing positive themes were most observed during the chronic stage of the outbreak, and themes such as “anti-epidemic,” “solidarity,” and “hope” were prominent at all stages. Messages expressing “gratitude” and “optimism” were more likely to attract user engagement than other themes. In Study 2, results indicated that Macao Facebook users posted 23,589 COVID-19 vaccine messages during the

examined period, with topics of “vaccine importance” and “COVID-19 risk” dominating vaccine communication on Facebook. The government was more inclined to emphasize “COVID-19 risk,” “vaccine effectiveness,” “vaccine accessibility,” and “vaccine affordability,” while regular users focused on “vaccine safety” and “vaccine distribution,” in their vaccine agendas. Vaccine promotion on Facebook in Macao involves a dynamic and multifaceted interaction between the local government and diverse entities.

Conclusion:

Overall, this thesis offers in-depth insights into the strategic use of social media for crisis coping, the implication of which could extend beyond the singular global crisis of COVID-19 to other emergencies that similarly represent health threats.

Declaration

I declare that the thesis here submitted is original except for the source materials explicitly acknowledged and that this thesis as a whole, or any part of this thesis has not been previously submitted for the same degree or for a different degree.

I also acknowledge that I have read and understood the Rules on Handling Student Academic Dishonesty and the Regulations of the Student Discipline of the University of Macau.

PREVIEW

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Chapter 1 Introduction

1.1 Background

The 2019 novel coronavirus (COVID-19) pandemic posed major threats to public health due to its high contagiousness and mortality risk. By the end of 2022, an estimated 90% (7.2 billion) of the world's population had experienced at least one infection with the coronavirus (The Guardian, 2022). Alongside its impact on public health, COVID-19 also led to widespread economic disruptions on a global scale with a dramatic increase in global unemployment and poverty. Approximately 390 million people were estimated to fall into extreme poverty in 2021 with a daily income of no more than \$1.90 (Sumner et al., 2022).

The major health risks, financial instability, and social disruption have converged to impose unprecedented challenges on the global population, including an increase in mental health issues (Hwang et al., 2020). According to the World Health Organization (WHO, 2022a), the COVID-19 pandemic has resulted in increased levels of mental distress among populations. In China, a survey found that around 35.1% (2,540/7,236) of respondents reported anxiety symptoms during the pandemic in early 2020, while 20.1% (1,454/7,236) reported depressive symptoms (Hwang et al., 2020). Prevalence of other mental health conditions, including chronic depression, panic attacks and psychomotor excitation also increased at the initial stage of the crisis (Newby et al., 2020; Su et al., 2021; Xiang et al., 2020). Besides the adverse effects on the mental well-being of individuals, mental health issues are also implicated in vaccine hesitancy. Although some degree of anxiety related to COVID-19 is normal, which has been identified to associate with higher vaccine acceptance (Bendau et al., 2021), there is evidence suggesting that a significant level of mental conditions such as stress, anxiety, and depression caused by the pandemic is associated with lower

vaccination intention (Palgi et al., 2021). This may be because people with depressive symptoms are more susceptible to negative thoughts and thus more likely to endorse COVID-19 vaccine misinformation (Perlis et al., 2022).

In light of the cascade of negative consequences caused by the pandemic, developing effective and appropriate strategies to address these challenges is of particular social significance. The urgent need for effective coping strategies has even become a focus of global consciousness (Kumar & Nayar, 2021). At the early stage of the COVID-19 pandemic, individuals often relied on media, particularly entertainment media (e.g., movies and music), to satisfy their psychological and social needs (Nabi et al., 2022). Social media, as a form of media, however, offers both challenges and opportunities to the government and medical professionals due to its interactive nature. On one hand, social media is a potential source of stress due to the provision of overwhelming COVID-19-related content including misinformation; on the other hand, using social media as a tool can be beneficial in assessing the public's emotional response to the crisis or for regulators (e.g., the Government) to encourage response actions (e.g., vaccination) among users. Targeted social media interventions have been suggested in health promotion to improve the rate of health behavior change (Moukarzel et al., 2020). Nevertheless, studies on the individual and institutional use of social media to cope with challenges associated with COVID-19, particularly in relation to vaccine promotion, appear to be sparse. Therefore, this thesis aims to examine the patterns of social media use in response to challenges caused by the COVID-19 crisis. As such, two studies are designed to achieve the research aims: Study 1 investigates the role of social media in sharing positive messages as a response to the challenges posed by COVID-19. As a regional analysis, Study 1 detects the prevalence, evolution and characteristics of positive messages as a means of

understanding positive communication in response to the COVID-19 crisis. In this sense, it could potentially elucidate trends in public morale during the COVID-19 pandemic and provide instrumental guidance on identifying best practices for fostering positive dialogue and collaboration, specifically understanding the mechanisms through which social media can be used to promote solidarity, resilience and hope to overcome adversity. Studying positive communication on social media as a response to the outbreak of COVID-19 is important. It may provide the government with a deeper understanding of health promotion, that a positive atmosphere in a socially mediated environment could generate more positive health attitudes. As a result, the stressful situation may be perceived as less threatening and more controllable and may improve the adoption of disease-preventative behaviors (e.g., vaccine uptake), as indicated by prior research (Karampas et al., 2020; Lazarus & Folkman, 1984). Following this line of reasoning, Study 2 focuses on the communication among social media users to facilitate coping efforts with the pandemic directly and the role of the government in this process, using vaccine promotion in Macao as a case.

In general, this thesis aims to investigate the role of social media in building solidarity and resilience among communities and supporting health promotion efforts during the COVID-19 crisis.

1.2 Potential Contribution

This thesis makes significant contributions in three main respects. First, it enhances the understanding of how social media is utilized to promote a positive mindset towards the COVID-19 crisis, thereby assisting in managing the challenges brought forth by future pandemic. Second, understanding of how vaccines are promoted through social media sheds light on the agenda-setting process for vaccine communication, which facilitates the development of effective strategies to increase

vaccine uptake. Third, this thesis enriches literature on crisis management and communication by examining the mechanism of positive messaging through emphasizing values such as hope, solidarity, grit, and optimism as well as different levels of public engagement with these messages during a crisis. By identifying this mechanism, there is potential to inform governments and health organizations to develop well-rounded and effective intervention plans that establish a positive framework for individuals to perceive healthy behaviors, including vaccination, as components of a common vision and collaborative objective towards achieving a better future.

1.3 Statement of Originality

The originality of this thesis is shown as follows: first, this thesis provides new insights into the use of social media as a means to cope with the challenges as a result of COVID-19. It extends prior work on social media use in health crisis communication by focusing specifically on positive messaging to inspire hope, solidarity, grit, gratitude and a sense of optimism among individuals and communities during challenging times from an emotion-focused coping perspective, and on building the agenda for vaccine promotion from a solution-focused perspective. It thus offers in-depth insights for crisis managers and health professionals to strategically develop emotion-based and solution-based coping strategies, which are not only applicable to the singular global crisis of COVID-19 but also to future emergencies that pose similar threats to health. In addition, this thesis utilized big data retrieved from Facebook and advanced computational approach to explore how vaccine communication operates in Macao, as well as examining the agenda-setting effect of the local government on the non-government subgroups. The findings of this work are unprecedented within the region of Macao.

Chapter 2 Patterns of Positive Communication (Study 1)

2.1 Background

At the end of 2019, a severe respiratory illness (known as COVID-19) broke out in Wuhan, a city in the Hubei province of China. The novel coronavirus, which is scientifically referred to as SARS-CoV-2, was identified as the primary source of the illness (Colizzi et al., 2020). Given the high contagiousness of the virus and the potential for serious health consequences following infection, on January 30th, 2020, the WHO declared the novel coronavirus a public health emergency of international concern and further characterized the outbreak as a pandemic to stress the urgency of the situation and to encourage all countries to take appropriate measures to detect infection and reduce its spread (WHO, 2020).

The global impact of the pandemic has been devastating, with a significant loss of lives and a substantial threat to public health and social and economic systems (Boyras & Legros, 2020). An unprecedented level of stress also occurred in the general population due to the lack of knowledge about the virus, the concerns for potential serious health effects, and economic disruption (Bueno-Notivol et al., 2021; Kawohl & Nordt, 2020; Lin et al., 2020; Witteveen & Velthorst, 2020). As a result, many people reported feeling overwhelmed, fearful, and uncertain. This was further heightened by media coverage of the pandemic, which focused on the negative aspects of the situation and provided little in the way of positive news (Liu et al., 2020). This is especially true for social media, where the rapid and convenient spread of information led to an information overload regarding the prevalence and mortality rates of the disease, the increase in confirmed cases, and tragic stories of patients and their families (Rathore & Farooq, 2020). Other negative content was also widespread on the social media platforms during the outbreak, such as xenophobic speech which apportioned blame

to certain groups for spreading the virus and endangering native populations (Devakumar et al., 2020). Exposure to such information on social media can not only result in poor mental health outcomes, such as increased feelings of sadness, hate, anxiety, and depression (Chao et al., 2020; Gao et al., 2020) but has been said to result in hazardous behaviors, such as violence or attempting suicide in some cases (Ammerman et al., 2021).

Although the COVID-19 pandemic created a significant level of emotional distress, positive messages, particularly those that contain uplifting expressions, are known to co-occur in a variety of forms, including inspirational quotes and phrases (Zhang, 2022). For example, a popular hashtag, #StayStrong, was used in social media communications during COVID-19, aiming to motivate people to remain strong in adversity (Kontis et al., 2021). Similarly, phrases, such as “Stand in solidarity against COVID-19”, were incorporated into daily communications by the public during the pandemic to promote a sense of community and encourage others to feel that “we are all in this together” and that “we can get through the difficulty together” (Chang et al., 2022). By studying messages posted on social media at the initial phase of the COVID-19 pandemic, Azizan and colleagues (2020) even identified several positive themes in Facebook content including faith, patriotism, bravery and public awareness.

Positive messaging, as identified in some studies, refers to disseminating content that provides positive perspectives to help people reframe negative experiences and remain strong in times of difficulty (Handley & Lassiter, 2002; Keller et al., 2003). During the COVID-19 health crisis, it has been used to promote resilience, induce feelings of hope, and provide motivation, and emotional support to enable people to better cope with challenges (Oliver et al., 2021; Zhang, 2022). Such

messages, therefore, can be regarded as a source of strength and solace for those affected by the pandemic.

Despite being one of the world's most populous cities and an economic powerhouse with thriving tourism and gambling sectors, Macao had maintained a relatively low rate of COVID-19 infections (Liu et al., 2021). In response to the health crisis, the Macao Government implemented various preventative measures to control the transmission of the virus. These initiatives included practices such as mask wearing, social distancing, and self-quarantine, all of which have demonstrated their effectiveness (McCartney & Pinto, 2021). Given the major impact of the virus on many aspects of life, the satisfactory outcome Macao achieved provides an opportunity to explore the presence, prevalence and characteristics of positive discourses that can help mitigate stress and cope with the challenges posed by COVID-19.

Generally, this study aims to explore the patterns of positive communication, with a specific focus on the use of positive expressions within social media messages during the COVID-19 pandemic, using Macao as a case study. The outcomes of this research contribute to the existing body of knowledge by expanding our understanding of how positive discourses manifest, evolve and function within a crisis context. By exploring these mechanisms, this study lays the foundation for the creation of a positive communicative environment that is conducive to the promotion of collaboration and resilience within communities for addressing and mitigating the impact of pandemic. Beyond its immediate context, this research also serves as a valuable resource for the development of effective crisis communication strategies in response to future emergencies.

2.2 Literature Review

This section provides the context for Study 1, which focuses on the mechanism of positive communication in the midst of the COVID-19 pandemic, and examines its impact on user engagement across different time periods on social media. This part includes a general introduction and review of literature on social media, positive emotions, and social media engagement. The Uses and Gratifications Theory (UGT), the theoretical basis of this study, is also reviewed.

2.2.1 Social Media

Online activities have witnessed an unprecedented surge in recent years due to the popularity of social media (Ferrara & Yang, 2015). As described by Boyd and Ellison (2007), social media refers to the web-based platforms that enable users to create a personal profile within a specific system and connect with others in their network. Additionally, they can explore and view the connections made by other users within the same platform. From 2000 to 2023, the growth of the internet on a global scale has seen an increase of 1,392% (Internet World Stats, 2023). This dramatic surge has laid the foundation for the popularity of social media, which has substantial growth not only in its quantity but also in the range of purposes and users that it caters to (Anderson & Rainie, 2017).

In Macao, approximately 619.2 thousand people have access to the internet, equating to approximately 88.5% of the total population (Datareportal, 2023). Social media usage in this region stands at around 386.4 thousand citizens, accounting for 55.2% of the population. The availability of multiple social media platforms provides users the opportunity to choose an adequate channel through which they engage with others. According to Statcounter (2023), Facebook stands as the most popular social media platform in Macao, with a majority of 60.38% of the entire Macao population

engaging with it. In contrast, other social media channels exhibited lower usage rates, with Twitter being recorded at around 14.69%, followed by Pinterest at 10.66%, Instagram at 8.03%, and Youtube at 3.66% (Statcounter, 2023). The distribution of users among different social media platforms indicates significant variations in the number of social media users, and Facebook is shown to be the most representative user base among the Macao population in comparison to other social media platforms.

Established in 2004, Facebook aims to empower individuals with the ability to establish communities and foster a sense of global interconnectedness (Facebook, n.d.). As of the first quarter of 2023, Facebook has reported a significant number of 2.04 billion daily active users, with a 3.9% increase in comparison to the previous year (Statista, 2023a). Another increasingly prevalent platform, Twitter, is an online social networking service that allows individuals to post and interact with messages that are limited to 280 characters (Ferrara & Yang, 2015). According to Demandsage (2023), Twitter has recorded 237.8 million active users on a daily basis during the first quarter of 2023. There are distinctions between these widely used social media platforms in terms of purposes. Twitter is primarily used to disseminate information, whereas Facebook is typically utilized for conversation and information exchange with others (Ferrara & Yang, 2015). The growing popularity of social media has led to increasing interest in the motivation behind individuals using these platforms.

Various theories or frameworks have been widely adopted by scholars to shed light on the reasons behind social media usage. For instance, some scholars who focused on the cognitive aspect of social media use have employed the Theory of Planned Behavior (e.g., Lee et al., 2012). Others who explored diversified motives for media usage have employed the UGT (e.g., Dolan et al., 2016; Hossain, 2019; Kamboj, 2020). As the current study shares a similar research path with Dolan's (2016), their

approach was adopted. Consequently, this study is underpinned by the UGT perspective, which will be elaborated on in the forthcoming section.

2.2.2 Uses & Gratifications Theory

The UGT, initially proposed by Blumler and Katz (1974), attempts to elaborate on why individuals use specific media and how such usage satisfies their intrinsic needs. According to the UGT, instead of being passive consumers of media, individuals actively engage in the process of media content selection that can cater to their desires and needs for fulfillment. Such framework is deemed as an extension of Maslow's (1954) Needs and Motivation Theory, which contends that individuals proactively strive to meet their needs based on a hierarchy.

The UGT has come under some criticism such as the ambiguities and inconsistencies in its definition (Swanson, 1979), the assessment of gratifications (Becker, 1979) and even its contribution as O'Donohoe (1994) argued that the UGT has limitations as it simply provides reasons to explain why people choose to engage in certain media platforms. Despite these criticisms, the UGT still has significant influence as one of the key theoretical frameworks in communication research, providing an understanding of what individuals need, where these needs arise from, and how their needs can be satisfied (Hossain, 2019; Kamboj, 2020).

UGT was developed based on the analysis of traditional media (Katz et al., 1973). However, recent studies have increasingly applied the UGT framework to new media, validating the appropriateness of employing the UGT framework in online settings and its potential effectiveness in understanding user behavior on new media platforms (e.g., Apaolaza et al., 2014; Kamboj, 2020). While the forms of online media have varied, many of these studies provided similar outcomes in terms of media motivations. For example, in Raacke and Bonds-Raacke's (2008) research, they

illustrated that the use of friend-network sites is motivated by socialization, entertainment, self-expression, and information seeking, whereas Lee and colleagues (2010) identified entertainment, information seeking, and social interaction as the driving forces for sharing mobile media content. Similarly, Lee and Ma (2012) found that individuals had specific motivations for sharing news on social media with motives such as information-seeking, socializing, and status-seeking. By examining user-generated content from three different levels, Shao's (2009) research indicated that information, entertainment, and mood management influenced content consumption, whereas social connections and self-expression encouraged user interaction and content production respectively.

One typical study using the UGT perspective was conducted by Papacharissi and Rubin (2000) to examine Internet use, user attitudes, and satisfaction. By surveying 279 college students, the authors identified primary motivations for Internet usage which include interpersonal purposes, entertainment, information seeking, pass time, and convenience. Among these outcomes, seeking information and entertainment were the most prevalent reasons for Internet usage, indicating that Internet users tend to be selective and goal-oriented when engaging in online activities. This study was significant in shedding light on the diverse motives behind Internet use, but there are limitations in its research method. Since its survey sample consisted of college students from the same class, there may be potential sample bias and questions about generalizability.

Xu and colleagues (2018) developed a Uses and Gratifications Scale to assess users' social media motives. In their research, they surveyed 311 college students from China and Japan on three aspects of media motivations on social media platforms, namely deepening existing relationships, expanding current interpersonal networks,

and information sharing and exchange. The findings indicated that the primary motives for using social media were to communicate with others, to build or maintain social connections for networking, and receive and share information within online communities. The outcomes of this study align with prior research from western countries analyzing media use, motives, and gratifications (e.g., Papacharissi & Rubin, 2000), indicating that socialization and information-seeking are major reasons for using social media. Although Xu and colleagues (2018) addressed concerns about sample bias in Papacharissi and Rubin's (2000) work by using two subsamples from China and Japan, they also raised concerns about the differences in social media use motives across cultures in terms of their structural and contextual aspects.

Overall, academic literature has predominantly classified the motivations of online media use into three categories: informational, emotional, and social needs. These categories represent the cognitive, psychological, and social dimensions of online media interaction. While there is an extensive body of research dedicated to the informational and social aspects, the emotional dimension remains comparatively underexplored. This disparity becomes especially salient in crisis situations, where emotional needs are accentuated. Given that crises often elicit profound emotional responses (Apaolaza et al., 2014), and individuals may turn to social media as a means of support or expression, understanding of social media gratification during crisis situations is important to provide insight into user behaviors. Thus, the gratifications literature in crisis scenarios will be discussed next.