



# Enhancing publics' COVID-19 vaccine advocacy on social media: the role of dialogic government communication

Yeunjae Lee<sup>1</sup>

<sup>1</sup>Dept. of Journalism & Media Communication, Colorado State University, United States

## Abstract:

Based on dialogic and protection motivation theories, this study investigates the impact of governmental communication on publics' vaccine advocacy on social media in the era of COVID-19 pandemic. Results of two online surveys at two different time points that include publics who are not vaccinated (Survey 1) and vaccinated (Survey 2) suggested that dialogic government communication fosters trust among the public, which in turn, influences their perceived threats of COVID-19 and efficacy in receiving the vaccine. Efficacy was positively associated with vaccine advocacy on social media for publics who are not vaccinated during the time when the vaccine was not widely available, whereas perceived threats were significantly related to vaccine advocacy for those vaccinated at the later stage of the pandemic. Theoretical and practical implications for the disciplines of communication and public relations are discussed.

**Keywords:** Vaccine advocacy, social media, government communication, dialogic theory, protection motivation theory

**Received:** April 4, 2024

**Revised:** June 6 2024

**Accepted:** June 11, 2024

## Corresponding author

Yeunjae Lee

Department of Journalism & Media  
Communication, Colorado State  
University, United States

Email: [Yeunjae.Lee@colostate.edu](mailto:Yeunjae.Lee@colostate.edu)

## Introduction

As the unprecedented global crisis, COVID-19, has disrupted American society and public health tremendously, vaccination has become the most anticipated intervention in minimizing the risk and the spread of COVID-19 (Sallam, 2021). To effectively deal with public health crisis, along with increasing publics' vaccine uptake, the importance of fostering individuals' vaccine advocacy has been also highlighted (Vallée-Tourangeau et al., 2018). Vaccine advocacy, individuals' behaviors of recommending vaccinations and being vaccine advocates, can help address publics' vaccine hesitancy as it distributes powerful public health messages through informal channels, persuading others with personal experiences, knowledge, and behaviors (Kassianos et al., 2018; Nowak et al., 2015).

This behavior is particularly important during the COVID-19 era where social media becomes an important way of obtaining information and news about the vaccine (Mitchell & Liedke, 2021). As social media has facilitated the rapid and widespread sharing of false narratives questioning the safety and effectiveness of vaccines, adverse outcomes, and casting doubt on public health guidance (Chou et al., 2021), a proactive action to manage misinformation remains a priority as effective vaccine communication. Several state health departments have implemented vaccine advocacy programs through social media (e.g., paying social media influencers) as a way of increasing vaccination rates and monitoring the spread of vaccine misinformation (Hindi, 2021; Minnesota Department of Health, 2021). Given that personal anecdotes about the vaccine offered by social media are often seen as a more powerful information source than quantitative information offered by evidence-med-

ical literature on Internet platforms (Betsch et al., 2010), this study suggests that lay people's vaccine advocacy on social media can be a potential solution to successfully address vaccine hesitancy among publics and mitigate the impacts of inaccurate information, false claims, and conspiracy theories about the vaccine. Despite its importance, the motivations of individuals to become vaccine advocates, especially in social media setting, have not been fully explored.

In improving publics' vaccine uptake, the role of government and public health officials has been emphasized as a major communication source to ensure trust in government recommendations, thereby encouraging publics to take the vaccine (Quinn et al., 2013). Many recent studies investigated the government's role in predicting individuals' motivations to get vaccinated against COVID-19 (e.g., Schernhammer et al., 2021; Trent et al., 2021). Although both vaccination and vaccination advocacy require tailored interventions or communication (Nowak et al., 2015), limited studies focused on how governmental communication can affect publics' intentions to advocate the vaccine, especially on social media channels. Communication scholars highlighted the value of dialogues as strategic government communication in dealing with public health crises (Yang et al., 2015). Characterized by two-way interactive communication with openness and mutuality, dialogic communication has been suggested as a normative and ethical communication model (Kent & Taylor, 2002). To persuade publics to take the vaccine, governmental organizations have often used one-way communication, acknowledging the importance of the provision of useful, timely, truthful, and substantial information to the public (Quinn et al., 2013).

Although the value of two-way dialogues and listening has been highlighted for effective vaccine communication (Chou et al., 2021), there has been few empirical research on testing its impacts. Thus, this study explores the role of government dialogic communication considering the government as a critical source of vaccine information that may persuade publics to share COVID-19 vaccine-supportive information, especially in the social media environment.

In building a linkage between government communication and publics' vaccine advocacy, the current study further draws upon the protection motivation theory (PMT). The PMT is a useful theoretical framework to explain individuals' health-related behaviors (Floyd et al., 2000). Recent scholars adopted PMT in the COVID-19 pandemic context to explore the public's intentions to stay home or self-isolate (Farooq et al., 2020; Okuhara et al., 2020), social distancing (Adunlin et al., 2021), vaccination intentions and behaviors (Li et al., 2021). Extending this line of research, the current study attempts to investigate through what mechanisms publics are motivated to advocate for the COVID-19 vaccine using social media influenced by the government's strategic communication efforts. Integrating theoretical insights from the dialogic theory and PMT, this study incorporates two surveys at different time points during the COVID-19 pandemic to explore the role of government communication in motivating the public of vaccine advocacy on social media via enhanced efficacy and perceived threats. Findings of the current study contribute to the public relations literature by providing much-needed theoretical insights on government communication in encouraging public vaccine advocative behaviors in social media settings and by offering practical guidance on effective communications strategies during the public health crisis to promote individuals' advocacy on vaccine.

## Literature Review

### Vaccine Advocacy on Social Media

Vaccine advocacy, defined as individuals' vaccine recommendations and willingness to become an advocate for vaccination, is considered as an important resource in promoting publics' vaccine uptake because it serves as a powerful tool of information diffusion and potentially educate others (Shelal et al., 2019). The role of advocates, as opinion leaders, are valued in the health context and proven effective as they disseminate effective public health messages and potentially persuade others through their personal experiences, knowledge, and behaviors (Nowak et al., 2015). Public advocacy is different from advocacy messages about vaccine safety from credible authorities such as healthcare professionals, religious and community leaders, and local celebrities who have built truthful relationships with the community (Hong, 2023). It refers to individuals' voluntary and discretionary efforts to spread the word about the benefits of vaccination to their personal network and/or to proactively participate in social media campaigns (e.g., #CancelCOVID, HealingStartsHere, #VaccinesWork) to increase vaccine uptake. (Fuster-Casanovas et al., 2022). This advocacy may begin at the personal level, but broaden its scope by including group and public advocacy efforts. Given that individuals' decisions of taking the vaccine are highly affected by their social networks, prior studies highlighted the importance of encouraging publics' vaccine advocacy, individuals' health-protection and promotion behaviors, in addition to

publics' vaccine uptake (Shelal et al., 2019; Vallée-Tourangeau et al., 2018).

During the COVID-19 pandemic, the importance of vaccine advocacy on social media should be particularly noted. While people tended to rely on media channels, personal networks, or health professionals as critical information sources about the vaccine previously, social media has also become a key information source about the vaccine for publics in the COVID-19 era (Mitchell & Liedke, 2021; Puri et al., 2020). Given that social media allows transparency and social conversations around public health, it emerges as an easy and attractive tool for advocates to generate and distribute vaccine-advocative information. Therefore, using social media to share positive and persuasive information about the vaccine has become a way of normalizing vaccination (Manor & Israeli, 2021). In addition, as individuals' anecdotes and personal messages about vaccines are perceived as credible (Betsch et al., 2010), vaccine advocacy exhibited by individuals may also play a role in combatting misinformation about the vaccine on social media, which helps acceptance of vaccine among publics.

In literature, advocacy has often been conceptualized as a behavioral construct. Advocacy behaviors include nontransactional benefits of great value (Du et al., 2007) and resistance to negative information (Sen et al., 2016). In an organizational setting, advocacy indicates individuals' active promotion of an organization through such behaviors as positive word-of-mouth (WOM) and defense against critics (Men, 2014). Advocacy is inherently a voluntary behavior with the motives of helping organizations, which is not necessarily related to their job requirements and duties (Thelen, 2020). As communicative behaviors, advocacy indicates individuals' sharing and forwarding positive information about organizations to people close to them, such as family members or friends (Kim & Rhee, 2011) as well as supporting organizations' stance and defending organizations against offenders (Walden & Kingsley Westerman, 2018). Scholars noted that individuals also tend to advocate for organizations in social media environments by distributing positive information and defending the organization's position (Miles & Mangold, 2014; Thelen, 2020).

Based on this idea, this study views individuals' vaccine advocacy on social media as communicative behaviors in nature, conceptualizing it as their positive and supportive information sharing behaviors about vaccine voluntarily and defending vaccine against critics on social media. Previous studies explored diverse antecedents that increase individuals' vaccine advocacy such as knowledge or empowerment (Kassianos et al., 2018; Shelal et al., 2019), while paying little attention to the effect of organizations or government as a major knowledge source about the vaccine. As individuals' advocacy behaviors are mainly derived from organizations' communication efforts (Kang & Sung, 2017; Kim & Rhee, 2011; Men, 2014), this study focuses on governmental communication as a key antecedent of publics' vaccine advocacy on social media.

### Dialogic Government Communication

To increase the public's vaccine uptake, the role of government is critical as an information source for publics to increase knowledge on the severity of the disease and persuade them to follow the government's recommendations (Quinn et al., 2013). Government communication refers to "the role, practice, aims and achievements of communication as it takes place in and on behalf of public institution(s) whose primary

end is executive in the service of a political rationale, and that are constituted on the basis of the people's indirect or direct consent and charged to enact their will" (Sanders & Canel, 2013, p. 3). From the public relations standpoint, government communication manages and improves the quality of the government-public relationship (Hong et al., 2012; Liu & Horsley, 2007). As a strategic communication function, government communication encompasses issues and reputation management rather than communication tactics to influence and manipulate public opinion via media relations (Sanders & Canel, 2013).

Grounded in public relations theory, scholars highlighted the importance of dialogues in effective government communication (e.g., Canel, 2012; Ledingham, 2011; Kim & Krishna, 2018). As "one of the most ethical forms of communication" (Kent & Taylor, 2002, p. 22), the value of dialogue has been recognized in various communication settings such as conflict resolution, interpersonal relations, and organizational communication (Pearce & Pearce, 2004). Dialogue assumes people's conscious efforts to recognize the presence the value of the other (Kent & Taylor, 2002). Public relations is a dialogic process where the good chases out the bad, leading to concurrence between potentially competing groups (Spicer, 2000). In an organizational setting, a dialogue is a product of ongoing communication and relationships and a result of organizations' willingness and commitment to dialogic communication with its publics (Kent & Taylor, 2002).

In consideration of dialogue as an orientation that values sharing and mutual understanding (Taylor & Kent, 2014), Yang et al. (2015) provided definitions of government dialogic communication between the government and the public as the orientation of mutuality and climate of openness to generate mutually beneficial relationships. Hence, includes two major components, namely, mutuality and openness. Mutuality, which is the acknowledgment of mutual dependence of two parties in a communication loop, refers to the mutual confirmation of unique values in different perspectives that lead to concern and care for other parties. Openness refers to an open and honest climate of communication and emphasizes the importance of equal access to communication through ethical and transparent communication. The government's strategic communication based on principles of dialogues is a way of being responsive to the pressure from the public and understanding and incorporating their interests in the decision-making process, thus, responsible and ethical practices (Kim & Krishna, 2018). Mutuality and openness, as core attributes of government dialogic communication (Yang, 2018), have been suggested as key drivers in affecting the public's attitude, emotions, and behaviors (Kang et al., 2018). One example of a dialogic communication effort by the government includes running social media accounts to interact with the local publics by incorporating polls or encouraging followers to like or comment on their posts (Chen et al., 2023). Creating and spreading messages to mobilize publics, as well as using a conversational style with informal and affective language online, are also examples of government dialogic communication (Lai et al., 2020).

As the importance of dialogic communication by the government during a public health crisis has been demonstrated (Kang et al., 2018; Yang, 2018), its role as effective vaccine communication is also acknowledged. Previous research suggested that effective vaccine communication should go beyond

the provision of accurate information, thus a two-way process of listening and telling must be incorporated to understand the public's perspectives and their engagement by encouraging their participation in discussion and debate (Goldstein et al., 2015). Effective vaccine communication must also be tailored to the publics' values by listening to them, which allows co-development and dissemination of vaccination messages through trust-based relationships (Chou et al., 2021).

### Government Trust

Strategic communication contributes to building trust with the public (Goodman, 2002). From public relations perspective, organizational trust is defined as "one party's level of confidence in and willingness to open oneself to the other party" (Hon & Grunig, 1999, p. 3), including three dimensions, namely, integrity, dependability, and competence. Trust is often influenced by effective communication, such as honest and transparent communication (Goodman, 2002), thus has been a focal topic in public relations research (Auger, 2014; Yang et al., 2015; Yang & Lim, 2009). In public health context, trust in government refers to individuals' overall evaluations of the performance of political institutions and authorities (Miller & Listhaug, 1990). Trust helps governmental organizations to advance their agenda and implement policies effectively (Kowitt et al., 2017) and increase health-related behaviors like being vaccinated (Poland, 2010; Quinn et al., 2013). Therefore, scholars argued that the government should incorporate communication efforts to increase the public's level of trust (Kim & Krishna, 2018).

The government's dialogic communication, as an important tool to demonstrate mutuality and openness and manage relationships with publics (Yang, 2018) is expected to increase public trust in the government. Prior literature suggested that open and transparent communication positively affects public trust in the government (Fairbanks et al., 2007; Yang et al., 2015) because a culture of openness is created and the confidence of citizens in the government's abilities is increased (Beaumont, 1999). In the public health crisis context, the positive link between communication and trust to the government was well-demonstrated. For example, the government's openness about information fostered the public's perceived quality of information and trust in government actions during the H1N1 pandemic (Quinn et al., 2013). Sufficient, clear, and timely communication about the vaccine from government sources during the influenza pandemic helped maintain public confidence and trust level (Poland, 2010). Furthermore, in the MERS context, Kang et al. (2018) found that dialogic communication by the government reduces the level of public distrust against the government. The government's two-way and interactive vaccine communication by showing concerns and care as well as listening to publics informational needs, which is a dialogic communication in nature, also increased the public's trust level (Quinn et al., 2013). Therefore, this study expects that when the government practices dialogic communication about the COVID-19 vaccine, characterized by openness and mutuality, the public is more likely to trust the government. Thus, the following hypothesis is suggested:

- H1. Dialogic government communication is positively associated with the publics' trust level with the government.

Government trust, in turn, may motivate the public to advo-

cate for vaccination on social media. Previous studies showed the close link between trust and the public's health-related behaviors. Trust has been considered as an especially important condition during pandemic and public health emergencies as it determines their compliance with recommended actions (Quinn et al., 2013). Trust in government reduces the public's uncertainty and encourages them to adopt preventive behaviors (Rubin et al., 2009). Trust is particularly important for the individuals' vaccine uptake, especially during the pandemic (Bish et al., 2011; Poland, 2010). In the COVID-era, government trust was a consistent predictor of protective behaviors (Ayalon, 2021; Kim & Tandoc, 2021) as well as vaccination intentions (Soares et al., 2021; Trent et al., 2021). Not only that, but government trust is also a critical factor in enhancing publics' advocative behaviors. Organizational communication scholars noted that when individuals trust an organization, they are more likely to support the organization's stance and share positive information externally (Kim & Rhee, 2011; Men, 2014), including social media channels (Thelen, 2020). In the government setting, scholars (Kim & Krishna, 2018; Chon, 2019) demonstrated that people who trust the government whose communication strategies are meant to be dialogic and engaging tend to share advocative information about the government to people around them. Based on these prior works that demonstrated the positive effect of trust in government on the public's vaccination behaviors as well as advocative behaviors, this study expects that trust in government may help publics to support organizations' stance and action (i.e., vaccine uptake), thereby motivating them to actively share advocative information about the vaccine on social media. Thus, the following hypothesis is posed:

H2. Publics' trust level with the government is positively associated with their vaccine advocacy on social media.

### **Consequences of Government Trust: Perceived Risks and Efficacy**

In building a linkage between government communication and the public's vaccine advocacy on social media, this study draws upon PMT (Rogers, 1975) and explores the mediating roles of perceived threats and efficacy. PMT posits that individuals experience a threat and coping appraisal process when evaluating a potential response to an event. The threat appraisal includes one's assessment of how serious the situation (i.e., perceived severity) and the likelihood of the threat happening (i.e., perceived vulnerability), while the coping appraisal indicates how difficult the response would be to carry out (i.e., response efficacy) and one's ability to execute the recommended courses of action successfully (i.e., perceived self-efficacy). The theory postulates that when perceived threat and efficacy are high, individuals tend to adopt protective behaviors as a way of controlling dangers. The theory explicates why people engage in (un)healthy practices in a variety of settings (Milne et al., 2000).

Several research on public health crisis based on PMT predominantly focused on the message effects such as language use or source credibility in influencing the public's perceived threats and efficacy (Popova, 2012). An investigation on the role of government strategic communication in shaping threat and efficacy perceptions in their real crisis context has been limited. Given that government is a critical information source that affects the public's health behaviors, such as vaccination

during a crisis (Schernhammer et al., 2021; Trent et al., 2021), understanding how government communication is associated with risk perceptions and behaviors is vital in building effective communication strategies in times of public health crises. Extant studies have found this theory useful in understanding publics' risk preventive behaviors including vaccination in the context of COVID-19 (Kowalski & Black, 2021). As COVID-19 vaccine advocacy is considered as individuals' health-related behaviors in this study, PMT can serve as a useful theoretical framework to explore its motives.

Government trust increases the public awareness of risk situations, especially during a public health crisis (Quinn et al., 2013). The trust and confidence model suggests that trust in the government influences individuals' evaluations of risks (Siegrist et al., 2003), thereby motivating them to adopt preventive measures. In contrast, the public's skepticism toward public health warnings may occur when a lack of trust in the government exists (Vaughan & Tinker, 2009), which makes people underestimate the severity and vulnerability of a disease (Blair et al., 2017). Trust serves as the foundation of how pandemic communication is heard, interpreted, and responded to, hence can reinforce perceived threats of a disease (Slovic, 2000).

Furthermore, trust in organizations and the government functions as critical resources to help the public cope with uncertainty and unexpected contingencies (Gefen, 2002) and to have considerable control over certain behaviors (Pavlou & Fygenon, 2006). Trust, as an indicator of support for its actions, encourages individuals to overcome fears and barriers to engage in certain behaviors and helps them to cooperate as an expression of support (Hsu et al., 2007). Therefore, trust in government was positively associated with the public's perceived efficacy of officially recommended protective measures (e.g., washing hands, wearing masks) (Gilles et al., 2011). Similarly, government trust was found to reinforce the public's vaccine efficacy (Harris & Moss, 2021; Szilagyi et al., 2021). In the COVID-19 pandemic context, researchers provided empirical evidence that government trust positively influences the public's perceived susceptibility and severity as well as efficacy (Lee & Li, 2021). Trust increases individuals' evaluations of risks during a pandemic, thereby enhancing their acceptance of preventive measures (Siegrist et al., 2003). On the other hand, a lack of trust in the government generates public skepticism toward government health warnings and leads people to underestimate the threats of a disease (Blair et al., 2017). Therefore, publics who trust the government are more likely to take its messages seriously, reinforcing their perceived threats of a disease such as COVID-19. We expect that the people who trust the government's actions are more likely to perceive threats of the disease and high levels of efficacy in responding to the government's action and taking the vaccine, proposing the following hypotheses:

H3. Publics' trust level with the government is positively associated with their (a) perceived threats of the COVID-19 and (b) efficacy.

The PMT assumes that two appraisals, namely, threat and coping appraisals, play vital roles in encouraging one's behaviors. A rich body of research guided by PMT suggested that individuals' perceived threats and efficacy predict their preventive measures (e.g., Kowalski & Black, 2021), including

the COVID-19 vaccination behaviors (Li et al., 2021; Wang et al., 2021). To extend this line of research, this study proposes that individuals' vaccine advocacy on social media, as their health-protective and health-promotive communication behaviors, is drawn by protection motives. Perceived threats and efficacy are thus key factors in promoting this behavior. First, efficacy does not only increase one's vaccination intentions (Soares et al., 2021) but also communicative actions and advocative information sharing and forwarding (Chon, 2019). Individuals with heightened efficacy are highly motivated to share advocative information to promote and persuade others (Lee, 2019). Furthermore, as perceived threats of disease were found to be significantly related to vaccination intentions (Fridman et al., 2021), it was also shown to be a major driver of creating and sharing vaccine-advocative messages (Vallée-Tourangeau et al., 2018). Public relation scholars have also noted that when individuals perceive an issue is severe and problematic, they are motivated to share information with others to solve it together (Kim & Sung, 2016), suggesting that perceived severity and threats of a health issue such as COVID-19 can foster their advocacy. Therefore, this study expects that individuals are more likely to engage in vaccine-advocative behaviors on social media when perceiving threats of COVID-19 and having high levels of efficacy in responding to the government's recommendations by taking the COVID-19 vaccine:

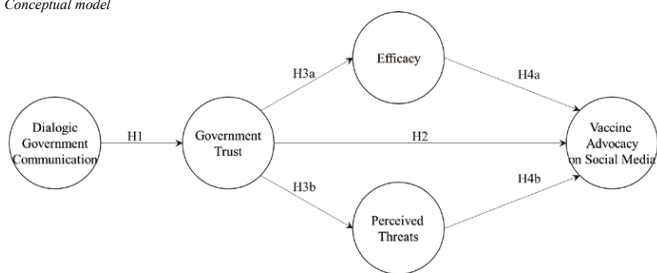
H4. Publics' vaccine advocacy is positively associated with their (a) perceived threats and (b) efficacy.

**Method**

**Participants and Procedure**

To test the hypotheses, the current study included two online

**Figure 1.**  
Conceptual model



surveys . The first survey (N = 441) was conducted during a one-week period in February 2021, when the COVID-19 vaccine was only available for limited populations, such as in Phase 1 (e.g., age 65+, frontline essential workers, health-care workers). The second survey (N = 402) was conducted in August 2021, during the time when the COVID-19 vaccine become more widely available to the general public. According to the CDC data, while approximately 8.2% of the U.S. population received at least one shot during the period of Survey 1, 70% of the U.S. adults have had at least one shot during the period of Survey 2 (Fry & Rapp, 2021; Lovelace & Rattner, 2021). For both surveys, a sampling company, Dynata, was used to recruit the participants according to the U.S. census data in terms of age, gender, and race/ethnicity. Only participants who use social media (e.g., Facebook, Twitter, and Instagram) were included. Participants who are eligible for the survey were invited to participate in a 15-minute-long survey

with a compensation of \$5. Upon receiving the consent form, they were guided to answer a series of questions in the survey. Note that participants in Survey 1 was not included in Survey 2. At the time of the data collection, all participants in Survey 1 were not vaccinated and 71.7% of them responded that they intend to receive the COVID-19 vaccine in the future. Meanwhile, 76.8% of the participants in Survey 2 responded that they were fully vaccinated and 17.2% received at least one dose. In terms of social media usage, the most frequently used social media channels include Facebook, Instagram, Twitter, and Snapchat in both surveys. Most of the participants responded that they spend at least one hour on social media channels (Survey 1: 92.5%, Survey 2: 91.4%). A large proportion of the participants (Survey 1: 52.2% and Survey 2: 41.9%) answered that they post something (messages and photos) on their own social media channels at least once every day. Table 1 provides details of demographic information about the participants.

**Measures**

All the measures in this study were adopted from previous studies. A 5-point Likert scale was used from strongly disagree

**Table 1.**  
Participants profile

Variables	Survey 1 (N = 441)		Survey 2 (N = 402)	
	n	%	n	%
<b>Age</b>	M = 36.6 (SD = 11.16)		M = 35.8 (SD = 10.28)	
<b>Gender</b>				
Male	212	48	205	51
Female	229	52	197	49
<b>Race/Ethnicity</b>				
Caucasian	267	60.5	277	68.9
Hispanic/Latino	65	14.7	47	11.7
Black/African American	70	15.9	53	13.2
Asian/Asian American	33	7.5	20	5.0
Others (e.g., American Indian/Alaska Native)	6	1.4	5	1.2
<b>Education Level</b>				
High school diploma or equivalent	18	4.1	14	3.5
Some college	20	4.5	20	5.0
Bachelor's degree (4-year) or equivalent	288	65.3	272	67.7
Master's degree or equivalent	106	24.0	91	22.6
Doctoral or professional degree or equivalent	9	2.0	5	1.2
<b>Income Level</b>				
Less than \$20,000	26	5.9	21	5.2
\$20,000 to \$39,999	54	12.2	61	15.2
\$40,000 to \$59,999	81	18.4	68	16.9
\$60,000 to \$79,999	80	18.1	76	18.9
\$80,000 to \$99,999	118	26.8	98	24.4
\$100,000 or more	82	18.6	78	19.4
<b>Political Identification</b>				
Conservative	168	38.1	154	38.3
Independent	63	14.3	55	13.7
Liberal	210	47.6	193	48.0

(1) to strongly agree (5), except for vaccine advocacy. To measure dialogic government communication, a total of 13 items (Survey 1:  $\alpha = .962$ ; Survey 2:  $\alpha = .969$ ) adopted from Yang et al. (2015) was used, including the two components: openness (five items, Survey 1:  $\alpha = .929$ ; Survey 2:  $\alpha = .938$ ) and mutuality (eight items, Survey 1:  $\alpha = .951$ ; Survey 2:  $\alpha = .954$ ). Next, government trust was measured with seven items adopted from Hon and Grunig (1999) (Survey 1:  $\alpha = .929$ ; Survey 2:  $\alpha = .886$ ). To measure individuals' perceived threats and efficacy, items from Johnston and Warkentin (2010) were adopted and modified to the current study's context. For perceived threats, three items of perceived severity (Survey 1:  $\alpha = .883$ ; Survey 2:  $\alpha = .884$ ) and three items of perceived vulnerability to COVID-19 (Survey 1:  $\alpha = .907$ ; Survey 2:  $\alpha = .917$ ) were used. For efficacy, four items of self-efficacy (Survey 1:  $\alpha = .909$ ; Survey 2:  $\alpha = .876$ ) and three items of response-efficacy (Survey 1:  $\alpha = .841$ ; Survey 2:  $\alpha = .826$ ) were used.

Finally, individuals' vaccine advocacy on social media was measured with nine items (Survey 1:  $\alpha = .944$ ; Survey 2:  $\alpha = .931$ ) adopted from previous studies on advocacy and social

media behaviors and modified to the current study's context (Kim & Rhee, 2011; Chon & Park, 2020). Items began with "For the past three weeks, how often have you done the following activities?" and ended with each statement with a 5-point Likert scale from (1) Never to (5) Always. Given the timing of the data collection, individuals' intentions to advocate for vaccine on social media were measured on Survey 1, while individuals' behaviors of advocacy were measured in Survey 2. Appendix summarizes all measurement items.

**Controls.**

After a series of t-tests, ANOVA, and regression analysis, this study included participants' age, gender, race/ethnicity, and political identification as control variables as they were shown to significantly affect the key variables included in this study. In addition, individuals' social media efficacy, referring to individuals' level of social media content production and consumption, perceived social media skills and confidence in their ability to successfully consume and produce information on social media (Hocevar et al., 2014), which was found to be a critical factor in increasing their social media behaviors (Chon & Park, 2020), was also controlled. Four items (Survey 1:  $\alpha = .882$ ; Survey 2:  $\alpha = .886$ ) adopted from Chon and Park (2020) were used to measure this construct (e.g., "I can use social media to offer other people important and interesting information by posting").

**Data Analysis**

The current study used a structural equation modeling (SEM) via Mplus program. Following Anderson and Gerbing (1988), a two-step procedure was implemented: the measurement model was firstly evaluated, followed by assessing the structural model. The conceptual model (Figure 1) was tested twice, with each survey data. To assess the model fits, Hu and Bentler's (1998) criteria was used: the root mean square error of approximation (RMSEA) < .08; comparative fit index (CFI) > .90; Tucker-Lewis index (TLI) > .90 (Hair et al., 2004); and standardized root mean square residual (SRMR) < .09 (Hu and Bentler, 1998).

**Results**

**Preliminary Data Analysis**

Table 2 provides descriptive statistics in both surveys and Table 3 presents correlations among the study variables. Participants in Survey 2 overall had higher levels of government trust and perceived efficacy and were more likely to advocate vaccine on social media ( $p < .001$ ). Participants in Survey 1 were shown to perceive more threats of the COVID-19 than those in Survey 2. The correlations among the variables were all positive and significant, thus providing preliminary support for the hypotheses.

**SEM Analysis**

**Measurement Model.**

According to the results of CFA, the measurement model showed acceptable model fits for both surveys (see Table 4). All factor loadings were higher than .6 ( $p < .001$ ). To identify internal consistencies and convergent and discriminant validity of the variables, the composite reliabilities (CR) and the average of variance extracted (AVE) were calculated. The values of CR ranged from .81 and .94 and the AVE values of all variables were satisfactory (> .50). The square root of AVE was greater than the correlations among the variables, providing

**Table 2.** Descriptive statistics (M/SDs) and independent sample t-test results comparing Survey 1 and Survey 2

Variables	Survey 1		Survey 2		t	df
	M	SD	M	SD		
Dialogic government Communication	3.16	0.89	4.05	0.67	11.53***	841
Government trust	3.15	0.95	4.08	0.70	11.40***	841
Efficacy	3.72	0.91	4.21	0.64	5.68***	841
Perceived threats	4.26	0.71	3.95	0.64	4.78***	841
Vaccine advocacy on social media	2.92	1.00	3.86	0.87	9.67***	841

Note: Two-tailed significance levels \*\*\* $p < .001$

**Table 3.** Correlations among the study variables

	1	2	3	4	5	6
<b>1. Dialogic government Communication</b>	-	.568**	.572**	.527**	.541**	
<b>2. Government trust</b>	.580**	-	.505**	.414**	.496**	
<b>3. Efficacy</b>	.195**	.177**	-	.395**	.332**	
<b>4. Perceived threats</b>	.277**	.260**	.252**	-	.489**	
<b>5. Vaccine advocacy on social media</b>	.235**	.262**	.446**	.151*	-	

\* $p < .05$ ; \*\* $p < .01$   
Note: Correlations below the diagonal are from Survey 1, while those above the diagonal are from Survey 2

**Table 4.** Summary of model fit indices

	CFI	TLI	RMSEA	SRMR	df	$\chi^2$
Measurement Model	.959	.942	.068 [.062, .073]	.041	580	1218.733
Hypothesized (Baseline) Model	.949	.933	.068 [.062, .073]	.048	583	1223.173
<b>Survey 1</b>						
Alternative Model 1 (Added path from communication to efficacy)	.941	.931	.070 [.065, .075]	.051	582	1238.228
Alternative Model 2 (added path from communication to threats)	.942	.930	.070 [.065, .075]	.050	582	1235.663
Alternative Model 3 (added paths from communication to vaccine advocacy)	.943	.930	.069 [.066, .073]	.049	582	1233.131
Measurement Model	.958	.946	.074 [.069, .079]	.044	580	1251.387
Hypothesized (Baseline) Model	.947	.935	.074 [.069, .079]	.050	583	1263.568
<b>Survey 2</b>						
Alternative Model 1 (Added path from communication to efficacy)	.947	.935	.074 [.069, .079]	.051	582	1275.665
Alternative Model 2 (added path from communication to threats)	.944	.931	.074 [.069, .079]	.051	582	1281.361
Alternative Model 3 (added paths from communication to vaccine advocacy)	.945	.934	.074 [.069, .079]	.050	582	1272.333

Note: CFI (comparative fit index); TLI (Tucker-Lewis index); RMSEA (root mean square error of approximation); SRMR (standardized root mean square residual)

evidence for convergent and discriminant validity. The structural model then was tested.

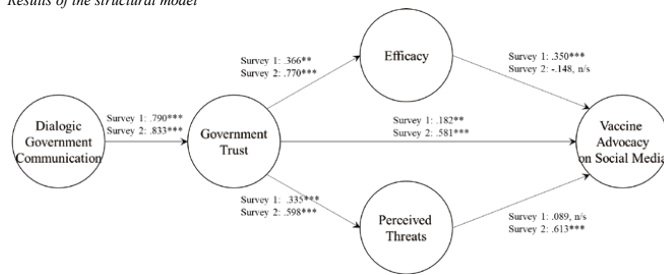
**Structural Model.**

The structural model showed good model fits for both surveys (see Table 4). To find the best-fitting model, the baseline model (Figure 1) was compared with several alternative models through nested model comparison. In the first alternative model, the direct path from dialogic government communication to efficacy was added and in the second alternative model, the direct path from dialogic government communication to perceived threat was added. In the third alternative model, the direct path from dialogic government communication on the final DV, vaccine advocacy on social media, was added. The alternative models were found to have acceptable model fits but were not significantly better than the baseline model. The chi-square differences were as follows: Survey 1 (15.06, 12.49, and 9.96, respectively) and Survey 2 (12.10, 17.79, and 8.77, respectively). All the direct paths were also shown to be insignificant. Therefore, the baseline model, which is the most parsimonious model, was selected as the final model and the path coefficients were interpreted (see Figure 2).

**Hypotheses Testing**

In H1, this study expected a positive association between dialogic government communication about the COVID-19 vaccine and publics' trust level toward the government. The path was positive and significant in both surveys (Survey 1: .790, Survey 2: .833,  $p < .001$ ), supporting H1. H2 examined how government trust is associated with publics' vaccine advocacy

**Figure 2.**  
Results of the structural model



on social media. They were positively and significantly related (Survey 1: .182,  $p = .005$ ; Survey 2: .581,  $p < .001$ ). Thus, H2 is supported. H3 expected the positive effects of government trust on publics' perceived threats and efficacy. As shown, government trust positively influenced both efficacy (Survey 1: .366,  $p = .003$ ; Survey 2: .770,  $p < .001$ ) and perceived threats (Survey 1: .335; Survey 2: .598,  $p < .001$ ). H3a and H3b are thus all supported. In H4, the associations between publics' vaccine advocacy and their perceived threats and efficacy were investigated and the findings were mixed. In Survey 1, efficacy was positively associated with publics' vaccine advocacy intentions (.350,  $p < .001$ ), while perceived threat (.089,  $p = .207$ ) had no significant effect. In Survey 2, however, efficacy had no significant effect (-.148,  $p = .088$ ), while perceived threats had a positive and significant impact on vaccine advocacy on social media (.613,  $p < .001$ ). H4a and H4b are thus partially supported.

The study also tested the mediation effects in the SEM model. Results showed that the indirect path from dialogic government communication to vaccine advocacy on social media via government trust and efficacy was found to be significant in Survey 1 (.101,  $p = .008$ , S.E. = .024) but not in Survey 2 (.094,  $p = .087$ , S.E. = .07). The mediating effect of government trust and perceived threats in a relationship between dialogic government communication and vaccine advocacy on social media was found to be insignificant in Survey 1 (.024,  $p = .221$ , S.E. = .11), while it was found to be significant in Survey 2 (.305,  $p < .001$ , S.E. = .25).

## Discussion

This study explored the role of government communication in enhancing publics' vaccine advocacy on social media in the context of COVID-19. Findings of the current study revealed that publics' trust level to the government enhanced by dialogic government communication fostered their perceived threats of the COVID-19 and efficacy in following the government's guidance and taking the vaccine, hence increasing vaccine advocacy on social media. While the effect of efficacy was significant for those who were not vaccinated in the early stage of vaccine production, the effect of perceived threats was more important for those who were vaccinated in the later stage. This study provides important theoretical and practical implications in public relations studies.

First, this study theorized public advocacy toward the vaccine, conceptualizing it as individuals' communicative and health-promotive behaviors. Such behaviors of sharing positive information, where individual communication agents advocate for the vaccine, are particularly important in the social media environment. As many people find social media as a convenient and efficient tool to receive vaccine information in the COVID-19 era (Mitchell & Liedke, 2021), information and

knowledge created by lay individuals' advocacy behaviors may persuade publics to take the vaccine by reducing their vaccine hesitancy. Moreover, by defending vaccine-related information against critics and correcting anti-vaccine information, vaccine advocates as lay individuals may play an important role in combatting misinformation about the vaccine on social media and helping build trust and acceptance of vaccine among publics.

The current study is among the first empirical attempts that tests the effect of the government's strategic communication in motivating such behaviors of publics. Prior studies largely focused on how the government can encourage publics to adopt recommended behaviors (e.g., wearing masks, social distancing, vaccine uptake) during a public health crisis. This finding is unique as it advanced our understanding of the government's communication role in motivating the public's discretionary rather than recommended behaviors by voluntarily communicating with others and sharing advocative information about an important health matter in the new media environment. In addition to implementing large-scaled campaigns and/or using certain communication tactics (e.g., developing persuasive messages), this study highlights that practicing strategic communication through dialogues can be a powerful vaccine communication tool for the government. Findings not only demonstrate the effectiveness of dialogic communication as ethical communication practices with publics in terms of vaccine and as proactive actions to mitigate the impacts of vaccine misinformation on social media by generating vaccine advocates, as volunteer communication agents, who disseminate vaccine-advocative information and combat and correct false claims about the vaccine.

Second, this study contributes to dialogic theory in public relations, focusing on strategic government communication as a critical function of public relations. In encouraging vaccine uptake among the public during a public health crisis, the government has often adopted the traditional use of one-way model of communication in which the information flows solely from the source to receiver (Liu & Horsley, 2007). Although such communication practices highlight providing accurate, reliable, and timely information that is grounded on truthfulness and honesty, public participation is limited due to the lack of interactivity. Establishing dialogues for open conversations with publics by allowing them to communicate and ask questions helps the government effectively identify public needs and reduce public distrust. In addition to the previous studies that demonstrated the value of dialogic communication in dealing with public health crises (e.g., Kang et al., 2018), this study emphasized dialogues that encourage public engagement and involvement as a crucial element for effective vaccine communication practices. The government, as a major knowledge source about the vaccine, plays a vital role in persuading publics to be voluntary communicative agents, especially with their dialogic communication. Engaging in dialogues with the public via two-way communication and listening for building a mutually beneficial relationship may help the government to provide better information about the vaccine to the publics, which facilitates their trust level. As a result, the public may be more likely to understand and accept the government's actions better, form a favorable attitude toward their policies and actions (e.g., vaccine uptake), thereby motivated to voluntarily advocate for the vaccine by sharing positive information and correcting offensive information against the vaccine on social

media. Therefore, integrating the principles from dialogic theory of public relations, this study identifies the value of governmental dialogic communication as effective communication interventions for the public's vaccine advocacy, especially on social media.

Third, the current study further contributes to health communication literature with the theoretical advancement of PMT. The PMT was used for explaining people's motives of engaging in (un)healthy behaviors. In applying the theory to the context of public vaccine advocacy, this study suggested that vaccine advocacy is also drawn by individuals' protection motives. As coping and threat variables place relative importance over others depending on specific health problems (Floyd et al., 2000), this study showed that the effects of efficacy and perceived threats were different depending on the contexts.

Specifically, efficacy played a vital role in increasing publics' vaccine advocacy in Survey 1. During the early stage of vaccine production, publics may believe that the vaccine, as a critical tool to bring the pandemic under control, can be the only way to avoid the potential danger of coronavirus and help them to go back to their normal lives. Their high levels of confidence in responding to the government's recommended action (i.e., vaccine uptake) and efficacy in taking the vaccine thus effectively motivate them to promote taking the vaccine to others using social media for improving overall health and well-being. In contrast, as the vaccine becomes widely available, most people become vaccinated during the summer in the year 2021. During this period, compared with the earlier stage, the public may consider getting vaccinated as a social norm, thus less motivated to promote it, assuming that most people already know the importance of getting vaccinated to overcome the crisis.

However, while the COVID-19 vaccines are shown to be effective, no vaccine is 100% effective at preventing illness, thus some fully vaccinated people get sick, hospitalized, or die from the virus. Even after the vaccine becomes widely available, the COVID-19 confirmed cases did not significantly decrease (CDC, 2021). Therefore, the degree to which people believe that getting COVID-19 is still fatal and detrimental to their health (i.e., high levels of perceived threats) was found to motivate publics to advocate for the vaccine in this stage. In addition, those who perceive the seriousness of the coronavirus when the vaccine was widely available tend to be concerned about personal roles (Funk & Tyson, 2021). Perceived threats of the disease thus help these people to take personal responsibilities and encourage them to continue promoting and advocating the vaccine using social media to persuade others, even if they are vaccinated.

### Practical Implications

The current study provides important practical implications for the government and public health professionals to prepare for, effectively communicate, and manage vaccine-related issues. Dialogic communication practices by the government were shown to influence the public's trust level in the government, motivating publics to become vaccine advocates on social media. Such findings can serve as a guide for governments, public health officials, and health communicators and provide the value of dialogues as a communication training tool for vaccine promotion. Hence, it is recommended to develop and implement government communication that is two-way, open,

responsive, and public-centered. Establishing open discussion with the public through diverse communication channels, in-person or virtually, to understand their concerns, feelings, and needs about the vaccine and the government's plans is particularly necessary. Listening to the public's concerns and hesitancy and answering questions via dialogic communication will help the government to identify what they need and feel about the vaccine and to better deliver tailored information to the public. Soliciting their feedback and concerns regarding the information also allows the government to have the opportunities to clarify and correct possible confusions, rumors, and misinformation.

Furthermore, according to the study results, publics perceived threats and efficacy positively predicted vaccine advocacy on social media. Thus, these should be enhanced and the government's dialogic communication that highlights mutual understanding, openness, transparency, and ethicality may help. In particular, during the early stage of vaccine production, engaging in dialogues with publics will help the government to develop tailored messages to the intended audience. Through open conversations, emphasizing vaccine safety and the individual and collective benefits of vaccine that outweighs the risks differently to diverse groups of people is necessary to increase individuals' vaccine efficacy. In the later stage, creation and provision of information that highlight the seriousness and risks of COVID-19 would help to keep motivating the public to be active communicators as vaccine advocates on social media channels. Such dialogic communication by the government may function as a proactive step to mitigate the spread of vaccine misinformation on social media, which is a significant public health concern in the COVID-19 era (Chou et al., 2021), as it creates lay individuals who voluntarily monitor the vaccine discourse, advocate for the vaccine, and fight against and correct misinformation.

### Limitations and Future Studies

This study has several limitations that need to be addressed. First, our findings should be interpreted with caution due to the cross-sectional, self-reported nature of the survey data. Employing more adaptive methodologies that can account for the rapidly changing context of public health crises (e.g., experimental, longitudinal, repeated measures designs) in future studies could help establish causal relationships. In line with this, using more objective measures or third-party data sources (e.g., social media analytics) could help validate self-reported data and provide a more accurate picture of public behaviors. Second, our conceptualization of dialogic communication was limited to openness and mutuality. Future research should explore more comprehensive and multi-dimensional measures of dialogic communication to better understand its impact on public trust and advocacy behaviors. Third, incorporating a comprehensive theoretical model is recommended in future research to better understand the variability in public responses on social media. For example, individuals' social media behaviors are highly affected by individual-level variables (e.g., personalities) and social media-relevant variables. Other than individuals' social media efficacy, future studies may thus explore how individuals' intrinsic motives in sharing messages on social media (e.g., self-enhancement) and their personal network on social media play a role in influencing their vaccine advocacy. Moreover, individuals' political identification



(Li & Lee, 2024) or cultural and social contexts (DiRusso & Stanberry, 2022) may play a critical role in vaccination-related behaviors. Future studies could examine these diverse factors for a holistic understanding of publics' vaccine advocacy behaviors.

### Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### Funding Information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411.
- Auger, G. A. (2014). Trust me, trust me not: An experimental analysis of the effect of transparency on organizations. *Journal of Public Relations Research*, 26(4), 325–343.
- Ayalon, L. (2021). Trust and compliance with covid-19 preventive behaviors during the pandemic. *International Journal of Environmental Research and Public Health*, 18(5), 2643.
- Beaumont, E. (1999). Democracy and public administration reform linked. *The Public Manager: The New Bureaucrat*, 28(1), 47–51.
- Betsch, C., Renkewitz, F., Betsch, T., & Ulshöfer, C. (2010). The influence of vaccine-critical websites on perceiving vaccination risks. *Journal of Health Psychology*, 15(3), 446–455. 0
- Bish, A., Yardley, L., Nicoll, A., & Michie, S. (2011). Factors associated with uptake of vaccination against pandemic influenza: a systematic review. *Vaccine*, 29(38), 6472–6484.
- Blair, R. A., Morse, B. S., & Tsai, L. L. (2017). Public health and public trust: Survey evidence from the Ebola Virus Disease epidemic in Liberia. *Social Science & Medicine*, 172, 89–97
- Canel, J. (2012). Government communication: an emerging field in Political Communication research. In H. Semetko & M. Scammell (Eds), *The Sage handbook of Political Communication* (pp. 85–96). London: Sage.
- CDC. (2021). COVID-19 vaccine breakthrough case investigation and reporting. Retrieved from <https://www.cdc.gov/vaccines/covid-19/health-departments/breakthrough-cases.html>
- Chen, Q., Zhang, Y., Liu, H., Zhang, W., & Evans, R. (2023). Dialogic communication on local government social media during the first wave of COVID-19: Evidence from the health commissions of prefecture-level cities in China. *Computers in Human Behavior*, 143, 107715.
- Chon, M. G. (2019). Government public relations when trouble hits: exploring political dispositions, situational variables, and government–public relationships to predict communicative action of publics. *Asian Journal of Communication*, 29(5), 424–440.
- Chon, M. G., & Park, H. (2020). Social media activism in the digital age: Testing an integrative model of activism on contentious issues. *Journalism & Mass Communication Quarterly*, 97(1), 72–97.
- Chou, W. S., Burgdorf, C. E., Gaysynsky, A., & Hunter, C. M. (2021). COVID-19 vaccination communication: Applying behavioral and social science to address vaccine hesitancy and foster vaccine confidence. *National Institutes of Health*. Retrieved from [https://obssr.od.nih.gov/sites/obssr/files/inline-iles/OBSSR\\_VaccineWhitePaper\\_FINAL\\_508.pdf](https://obssr.od.nih.gov/sites/obssr/files/inline-iles/OBSSR_VaccineWhitePaper_FINAL_508.pdf)
- DiRusso, C., & Stansberry, K. (2022). Unvaxxed: A cultural study of the online anti-vaccination movement. *Qualitative Health Research*, 32(2), 317–329.
- Du, S., Bhattacharya, C. B., & Sen, S. (2007). Convergence of Interests--Cultivating Consumer Trust Through Corporate Social Initiatives. *ACR North American Advances*.
- Fairbanks, J., Plowman, K. D., & Rawlins, B. L. (2007). Transparency in government communication. *Journal of Public Affairs: An International Journal*, 7(1), 23–37
- Farooq, A., Laato, S., & Islam, A. N. (2020). Impact of online information on self-isolation intention during the COVID-19 pandemic: cross-sectional study. *Journal of Medical Internet Research*, 22(5), e19128.
- Floyd, D. L., Prentice-Dunn, S., & Rogers, R. W. (2000). A meta-analysis of research on protection motivation theory. *Journal of Applied Social Psychology*, 30(2), 407–429.
- Fridman, A., Gershon, R., & Gneezy, A. (2021). COVID-19 and vaccine hesitancy: A longitudinal study. *PloS one*, 16(4), e0250123.
- Fry, E., & Rapp, N. (2021). Map: 4 states have reached more than 10% of their populations with the vaccine. *Fortune*. Retrieved from <https://fortune.com/2021/02/03/covid-vaccine-by-state-map-vaccination-rates-alaska-west-virginia-new-mexico-connecticut-coronavirus/>
- Funk, C., & Tyson, A. (2021). Growing share of Americans say they plan to get a COVID-19 vaccine-or already have. *Pew Research Center*. <https://www.pewresearch.org/science/2021/03/05/growing-share-of-americans-say-they-plan-to-get-a-covid-19-vaccine-or-already-have/>
- Fuster-Casanovas, A., Das, R., Vidal-Alaball, J., Lopez Segui, F., & Ahmed, W. (2022). The# VaccinesWork hashtag on Twitter in the context of the COVID-19 pandemic: network analysis. *JMIR Public Health and Surveillance*, 8(10), e38153.
- Gefen, D. (2002). Reflections on the dimensions of trust and trustworthiness among online consumers. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 33(3), 38–53.
- Gilles, I., Bangerter, A., Clémence, A., Green, E. G., Krings, F., Staerkle, C., & Wagner-Egger, P. (2011). Trust in medical organizations predicts pandemic (H1N1) 2009 vaccination behavior and perceived efficacy of protection measures in the Swiss public. *European Journal of Epidemiology*, 26(3), 203–210.
- Goldstein, S., MacDonald, N. E., & Guirguis, S. (2015). Health communication and vaccine hesitancy. *Vaccine*, 33(34), 4212–4214.
- Goodman, M. B. (2002). Guest editorial. *Corporate Communications*, 7(4), 204–205
- Harris, P., & Moss, D. (2021). Public affairs and communicating coronavirus vaccine risk: The role of government in maintaining public trust. *Journal of Public Affairs*, 21(2).
- Hindi, S. (2021). Colorado pays 126 influencers to advocate for COVID vaccinations. *The Denver Post*. <https://www.denverpost.com/2021/07/27/colorado-social-media-influencers-covid-vaccinations/>
- Hocevar, K. P., Flanagan, A. J., & Metzger, M. J. (2014). Social media self-efficacy and information evaluation online. *Computers in Human Behavior*, 39, 254–262.
- Hon, L. C., & Grunig, J. E. (1999). Guidelines for measuring relationships in public relations. Paper for the Commis-

- sion on Public Relations Measurement & Evaluation. *Institute for Public Relations Research*, Gainesville, FL
- Hong, H., Park, H., Lee, Y., & Park, J. (2012). Public segmentation and government-public relationship building: A cluster analysis of publics in the United States and 19 European countries. *Journal of Public Relations Research*, 24(1), 37–68.
- Hong, S. (2023). COVID-19 vaccine communication and advocacy strategy: a social marketing campaign for increasing COVID-19 vaccine uptake in South Korea. *Humanities and Social Sciences Communications*, 10(1), 1-9..
- Hsu, M. H., Ju, T. L., Yen, C. H., & Chang, C. M. (2007). Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations. *International Journal of Human-Computer Studies*, 65(2), 153–169.
- Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424.
- Johnston, A. C., & Warkentin, M. (2010). Fear appeals and information security behaviors: An empirical study. *MIS quarterly*, 549-566.
- Kang, M., Kim, J. R., & Cha, H. (2018). From concerned citizens to activists: A case study of 2015 South Korean MERS outbreak and the role of dialogic government communication and citizens' emotions on public activism. *Journal of Public Relations Research*, 30(5-6), 202-229.
- Kassianos, G., Kuchar, E., Nitsch-Osuch, A., Kyncl, J., Galev, A., Humolli, I., ... & Vallée-Tourangeau, G. (2018). Motors of influenza vaccination uptake and vaccination advocacy in healthcare workers: A comparative study in six European countries. *Vaccine*, 36(44), 6546-6552.
- Kent, M. L., & Taylor, M. (2002). Toward a dialogic theory of public relations. *Public Relations Review*, 28(1), 21-37.
- Kim, H. K., & Tandoc Jr, E. C. (2021). Wear or not to wear a mask? Recommendation inconsistency, government trust and the adoption of protection behaviors in cross-lagged TPB models. *Health Communication*, 1-9.
- Kim, J., & Sung, M. (2016). The value of public relations: Different impacts of communal and exchange relationships on perceptions and communicative behavior. *Journal of Public Relations Research*, 28(2), 87-101.
- Kim, J. N., & Rhee, Y. (2011). Strategic thinking about employee communication behavior (ECB) in public relations: Testing the models of megaphoning and scouting effects in Korea. *Journal of Public Relations Research*, 23(3), 243-268.
- Kim, S., & Krishna, A. (2018). Unpacking public sentiment toward the government: how citizens' perceptions of government communication strategies impact public engagement, cynicism, and communication behaviors in South Korea. *International Journal of Strategic Communication*, 12(3), 215-236.
- Kowalski, R. M., & Black, K. J. (2021). Protection motivation and the COVID-19 virus. *Health Communication*, 36(1), 15-22.
- Kowitt, S. D., Schmidt, A. M., Hannan, A., & Goldstein, A. O. (2017). Awareness and trust of the FDA and CDC: Results from a national sample of US adults and adolescents. *PLoS One*, 12(5),
- Lai, C. H., Ping Yu, R., & Chen, Y. C. (2020). Examining government dialogic orientation in social media strategies, outcomes, and perceived effectiveness: A mixed-methods approach. *International Journal of Strategic Communication*, 14(3), 139-159.
- Ledingham, J. A. (2011). Political public relations and relationship management. In J. Strömbäck & S. Kiousis (Eds), *Political public relations. Principles and applications* (pp. 235–253). New York: Routledge.
- Lee, Y., & Li, J. Y. Q. (2021). The role of communication transparency and organizational trust in publics' perceptions, attitudes and social distancing behaviour: A case study of the COVID-19 outbreak. *Journal of Contingencies and Crisis Management*, 29(4), 368-384.
- Li, J. Y., & Lee, Y. (2023). Predicting public cooperation toward government actions in the early stages of an influenza pandemic in the United States: The role of authentic governmental communication and relational quality. *Communication research*, 50(2), 230-257.
- Li, L., Wang, J., Nicholas, S., Maitland, E., Leng, A., & Liu, R. (2021). The Intention to Receive the COVID-19 Vaccine in China: Insights from Protection Motivation Theory. *Vaccines*, 9(5), 445.
- Liu, B. F., & Horsley, J. S. (2007). The government communication decision wheel: Toward a public relations model for the public sector. *Journal of Public Relations Research*, 19, 377–393.
- Lovelace, B., & Rattner, N. (2021). U.S. reaches 70% Covid vaccine milestone for adults about a month behind Biden's goal. *CNBC*. Retrieved from <https://www.cnn.com/2021/08/02/covid-vaccine-us-reaches-bidens-70percent-goal-for-adults-a-month-behind.html>
- Manor, S., & Israeli, T. (2021). Friends get vaccinated: The power of social media groups in the COVID-19 vaccination campaign. *First Monday*.
- Men, L. R. (2014). Why leadership matters to internal communication: Linking transformational leadership, symmetrical communication, and employee outcomes. *Journal of Public Relations Research*, 26(3), 256-279.
- Miller, A. H., & Listhaug, O. (1990). Political parties and confidence in government: A comparison of Norway, Sweden and the United States. *British Journal of Political Science*, 20, 357–386.
- Milne, S., Sheeran, P., & Orbell, S. (2000). Prediction and intervention in health-related behavior: A meta-analytic review of protection motivation theory. *Journal of Applied Social Psychology*, 30(1), 106-143.
- Minnesota Department of Health (2021). Retrieved from <https://www.health.state.mn.us/diseases/coronavirus/vaccine/communitytk.html>
- Mitchell, A., & Liedke, J. (2021). About four-in-ten Americans say social media is an important way of following COVID-19 vaccine news. *Pew Research Center*. Retrieved from <https://www.pewresearch.org/fact-tank/2021/08/24/about-four-in-ten-americans-say-social-media-is-an-important-way-of-following-covid-19-vaccine-news/>
- Nowak, G. J., Gellin, B. G., MacDonald, N. E., & Butler, R. (2015). Addressing vaccine hesitancy: The potential value of commercial and social marketing principles and practices. *Vaccine*, 33(34), 4204-4211.
- Okuhara, T., Okada, H., & Kiuchi, T. (2020, December). Predictors of staying at home during the COVID-19 pandemic and social lockdown based on protection motivation theory: a cross-sectional study in Japan. In *Healthcare* (Vol. 8, No. 4, p. 475). Multidisciplinary Digital Publishing Institute.
- Pavlou, P. A., & Fygenson, M. (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS Quarterly*, 30, 115–143.
- Pearce, W. B., & Pearce, K. A. (2004). Taking a communication perspective on dialogue. *Dialogue: Theorizing*

- difference in communication studies*, 39-56.
- Poland, G. A. (2010). The 2009–2010 influenza pandemic: effects on pandemic and seasonal vaccine uptake and lessons learned for seasonal vaccination campaigns. *Vaccine*, 28, D3-D13.
- Popova, L. (2012). The extended parallel process model: Illuminating the gaps in research. *Health Education & Behavior*, 39(4), 455–473
- Puri, N., Coomes, E. A., Haghbayan, H., & Gunaratne, K. (2020). Social media and vaccine hesitancy: new updates for the era of COVID-19 and globalized infectious diseases. *Human Vaccines & Immunotherapeutics*, 16(11), 2586-2593.
- Quinn, S. C., Parmer, J., Freimuth, V. S., Hilyard, K. M., Musa, D., & Kim, K. H. (2013). Exploring communication, trust in government, and vaccination intention later in the 2009 H1N1 pandemic: results of a national survey. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, 11(2), 96-106.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, 91(1), 93-114.
- Rubin, G. J., Amlôt, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: cross sectional telephone survey. *Bmj*, 339.
- Sallam, M. (2021). COVID-19 vaccine hesitancy worldwide: a concise systematic review of vaccine acceptance rates. *Vaccines*, 9(2), 160.
- Sanders, K., & Canel, M. (Eds.). (2013). *Government communication: Cases and challenges*. New York: Bloomsbury Academic
- Schernhammer, E., Weitzer, J., Laubichler, M. D., Birmann, B. M., Bertau, M., Zenk, L., ... & Steiner, G. (2021). Correlates of COVID-19 vaccine hesitancy in Austria: trust and the government. *Journal of Public Health (Oxford, England)*.
- Sen, S., Du, S., & Bhattacharya, C. B. (2016). Corporate social responsibility: A consumer psychology perspective. *Current Opinion in Psychology*, 10, 70-75.
- Shelal, Z., Cho, D., Urbauer, D. L., Lu, Q., Ma, B. Y., Rohrer, A. M., ... & Ramondetta, L. M. (2019). Knowledge matters and empowers: HPV vaccine advocacy among HPV-related cancer survivors. *Supportive Care in Cancer*, 1-
- Siegrist, M., Earle, T. C., & Gutscher, H. (2003). Test of a trust and confidence model in the applied context of electromagnetic field (EMF) risks. *Risk Analysis: An International Journal*, 23(4), 705–716.
- Slovic, P. E. (2000). *The perception of risk*. Earthscan publications.
- Soares, P., Rocha, J. V., Moniz, M., Gama, A., Laires, P. A., Pedro, A. R., ... & Nunes, C. (2021). Factors associated with COVID-19 vaccine hesitancy. *Vaccines*, 9(3), 300.
- Spicer, C. H. (2000). Public relations in a democratic society: Value and values. *Journal of Public Relations Research*, 12(1), 115-130.
- Szilagyi, P. G., Thomas, K., Shah, M. D., Vizueta, N., Cui, Y., Vangala, S., ... & Kapteyn, A. (2021). The role of trust in the likelihood of receiving a COVID-19 vaccine: Results from a national survey. *Preventive Medicine*, 153, 106727.
- Taylor, M., & Kent, M. L. (2014). Dialogic engagement: Clarifying foundational concepts. *Journal of Public Relations Research*, 26(5), 384-398.
- Thelen, P. D. (2020). Internal communicators' understanding of the definition and importance of employee advocacy. *Public Relations Review*, 46(4), 101946.
- Trent, M., Seale, H., Chughtai, A. A., Salmon, D., & MacIntyre, C. R. (2021). Trust in government, intention to vaccinate and COVID-19 vaccine hesitancy: a comparative survey of five large cities in the United States, United Kingdom, and Australia. *Vaccine*.
- Vallée-Tourangeau, G., Promberger, M., Moon, K., Wheelock, A., Sirota, M., Norton, C., & Sevdalis, N. (2018). Motors of influenza vaccination uptake and vaccination advocacy in healthcare workers: Development and validation of two short scales. *Vaccine*, 36(44), 6540-6545.
- Vaughan, E., & Tinker, T. (2009). Effective health risk communication about pandemic influenza for vulnerable populations. *American Journal of Public Health*, 99(S2), S324–S332.
- Walden, J. A., & Kingsley Westerman, C. Y. (2018). Strengthening the tie: Creating exchange relationships that encourage employee advocacy as an organizational citizenship behavior. *Management Communication Quarterly*, 32(4), 593-611.
- Wang, P. W., Ahorsu, D. K., Lin, C. Y., Chen, I. H., Yen, C. F., Kuo, Y. J., ... & Pakpour, A. H. (2021). Motivation to have covid-19 vaccination explained using an extended protection motivation theory among university students in china: *The role of information sources*. *Vaccines*, 9(4), 380.
- Yang, S. U. (2018). Effects of government dialogic competency: The MERS outbreak and implications for public health crises and political legitimacy. *Journalism & Mass Communication Quarterly*, 95(4), 1011-1032.
- Yang, S. U., Kang, M., & Cha, H. (2015). A study on dialogic communication, trust, and distrust: Testing a scale for measuring organization–public dialogic communication (OPDC). *Journal of Public Relations Research*, 27(2), 175-192.
- Yang, S. U., & Lim, J. S. (2009). The effects of blog-mediated public relations (BMPR) on relational trust. *Journal of Public Relations Research*, 21(3), 341–359.