Sharing News About COVID-19: Media Exposure, Self-Perceived Knowledge, and the Gap of Perceived Susceptibility of Self/Strangers

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This research concerns information sharing during the first outbreak of COVID-19 in China. Back then, Chinese residents heavily relied on the Internet to acquire and disseminate information to connect with the outside because of the forced nation-wide lockdown. This study applies the O-S-O-R model to examine the mechanism from news exposure (S) to news sharing (R) with self-perceived knowledge as the mediator between S and R and the gap of perceived susceptibility of self/strangers as a moderator. An online survey of 517 Chinese college students was conducted. Results show that news exposure is positively related to news sharing, which is mediated by self-perceived knowledge about COVID-19. In addition, participants tend to share COVID-19-related news if they believe that they are more likely to be affected by the virus than strangers, showing that their online sharing behavior is arguably motivated by a pseudoaltruism. These findings contribute to the research on health news effects by applying the O-S-O-R model and supporting its utility in the context of a health crisis.

Keywords: COVID-19, O-S-O-R model, media exposure, self-perceived knowledge, news sharing, perceived susceptibility

Late January 2020 to early March 2020 was the early phase of the coronavirus pandemic in China. During this time, residents were confined to their homes because of the governmental restrictions aiming at slowing the spread of the disease. Citizens had to rely heavily on social media to obtain COVID-19 information and stay connected. Given the significance of news sharing on coronavirus prevention, treatment, and control measures (Mahmood, Jafree, Mukhtar, & Fischer, 2021), many scholars have shown interest in investigating the psychological factors behind individuals' online information sharing about

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COVID-19, such as source trust (Lu et al., 2021), gratifications (Apuke & Omar, 2021), and perceived information overload (Laato, Islam, Islam, & Whelan, 2020).

The effect of online health news exposure on news-sharing behaviors could be further examined. Political news studies have supported such an effect (e.g., An, Quercia, Cha, Gummadi, & Crowcroft, 2014; Kushin & Yamamoto, 2010). Health communication studies have examined media exposure and offline behaviors such as avoiding crowds and washing hands as prevention measures against epidemics (e.g., Melki et al., 2022; Zhang, Kong, & Chang, 2015) but neglected individuals' online behaviors. This research aims to expand the field by testing whether the relationship between media exposure and news sharing can be applied to health communication.

The role of self-perceived knowledge in this relationship is significant as people learn about COVID-19 and prevention measures primarily from the news (Lu et al., 2021). Inspired by the prominent "illusion of knowing," this research focuses on self-perceived knowledge, considering that news exposure may not increase one's actual knowledge as much as the impression of one's own knowledge (Park, 2001, p. 419). This individual's perception of knowledge can play a crucial role in shaping one's health behaviors (Rock, Ireland, & Resnick, 2003) and information-related behaviors such as pandemic information-seeking and processing (Avery & Park, 2021; Zhu, Wei & Zhao, 2016), and mediating the relationship between media consumption and prevention behaviors (Melki et al., 2022; Zhang et al., 2015). This study further examines the role of self-perceived knowledge in influencing information-sharing behavior.

Furthermore, people's perceived susceptibility to COVID-19 has been shown to be associated with news exposure, self-perceived knowledge (Levkovich & Shinan-Altman, 2021), and information sharing (Mahmood et al., 2021). Given the highly contagious nature of COVID-19, other people's risks of contracting the disease were associated with that of ours. People whom we might encounter but cannot predict when and where we would meet were normally called "strangers," a kind of outgroup, who were often suspected as potential carriers of COVID-19 (Bressan, 2020). It could be inferred that one's perception of the susceptibility of strangers was linked to one's awareness and actions about the epidemic. Inspired by this, we investigate how the perceived susceptibility gap between the self and strangers affects one's perception and information sharing.

Responding to the above concerns, the study applies the O (orientation)-S (stimulus)-O (orientation)-R (response) model from social psychology to the health communication context to investigate the mechanism from media exposure and news sharing during COVID-19 through incorporating self-perceived knowledge and perceived susceptibility. Specifically, this research positions self-perceived knowledge as the mediator (the second O, O2) between S and R and examines the further moderation of this relationship by perceived susceptibility. This model has been useful in analyzing the mechanism of media effects on political behaviors, such as political participation (e.g., Sotirovic & McLeod, 2001) and intentions or attitudes to engage in health behaviors (Namkoong, Nah, Record, & Van Stee, 2017; Paek, 2008). However, whether it can be used to explain the conditional factors influencing the relationship between media use and actual behaviors (i.e., news sharing) in a health crisis is underexplored.

This study fills these gaps with two purposes: First, this study considers students' online sharing as one important behavior in a global pandemic and tests whether the O-S-O-R model can be used to explain it in an emergent health crisis. Second, we introduce the gap of perceived susceptibility of self/strangers as a moderator into this model to understand what drives individuals' knowledge accumulation and sharing behaviors.

The O-S-O-R Model in COVID-19: Media Exposure, Self-Perceived Knowledge, and News Sharing

Originating in the research on social psychology, the O-S-O-R model was proposed by Markus and Zajonc (1985) to reveal the cognitive process from the stimulus (S) to the response (R). O (orientations) are the internal states that influence "what stimuli are attended to and what stimuli are ignored" (Markus & Zajonc, 1985, p. 138; the first O, O1) and that intervene between S and R (the second O, O2). When being applied to examine the antecedents and outcomes of media use (S), O1 was defined as "the set of structural, cultural, cognitive, and motivational characteristics" (McLeod, Kosicki, & McLeod, 2009, p. 238) carried by audiences, and O2 was cognitive orientations happening between S and R.

The O-S-O-R model has been useful in explaining why certain behaviors happen after media use in political communication studies. Diverse variables have been adopted as the components of this model. For instance, O1 could be social, structural, and individual factors, such as demographics, partisanship, values, political interests, and gratifications, sought from the news (McLeod, Scheufele, & Moy, 1999; McLeod et al., 2009); news from different media channels (Jung, Kim, & De Zúñiga, 2011) could be classified as S; Examples of O2 variables include political knowledge and efficacy (McLeod et al., 1999), attention, and information-processing strategies; R might be applied as behavioral effects like voter turnout and political and civic participation (McLeod et al., 2009). Considering that people relied on a large amount of media news during the pandemic to know about COVID-19 and how to prevent it, it is important to investigate the behavioral effects of media and the underlying mechanism within the O-S-O-R model. There are a few studies about health information or media use adopting this model for health outcomes such as reducing smoking intentions (Namkoong et al., 2017; Paek, 2008) and organ donation (Yoo & Tian, 2011). But the validity of the model in predicting information-related behaviors (i.e., news sharing) in an emergent health crisis still needs to be tested.

Following previous studies, this study applies the O-S-O-R model, considering O1 to include demographic characteristics and general news media use before receiving COVID-19 news as control variables (Jung et al., 2011; Namkoong et al., 2017). This study tests the relationship between exposure and online news about COVID-19 (S), self-perceived knowledge about COVID-19 (O2), and news sharing (R).

Media Exposure (S) and News Sharing (R)

News sharing is one important feature of Internet media use. User participation in news dissemination makes Internet news distinct from traditional media news (Beam, Hutchens, & Hmielowski, 2016). Moreover, social media sites have become the preferred online platforms for news sharing since they can increase interactions and personalized sharing (Lerman, 2007; Ma, Sian Lee, & Hoe-Lian Goh, 2014). As such, news sharing is defined as "the practice of giving a defined set of people access to news content

via social media platforms, as by posting or recommending it" (Kümpel, Karnowski, & Keyling, 2015, p. 2). News sharing involves not only forwarding news but also the attachment of personal thoughts for recommendation.

Previous studies have demonstrated the link between media exposure and online news sharing (e.g., An et al., 2014; Ma et al., 2014), but most of them are limited to the field of political news. Online sharing could be likened to political discussion (Kushin & Yamamoto, 2010) and affects political participation (Yamamoto, Kushin, & Dalisay, 2015). Health communication usually focuses on offline behaviors such as vaccination (Kim & Nan, 2015). However, in the digital age, individuals possess more alternatives to deal with a health crisis. This study examines the relationship between media exposure and news sharing within health news. Similar to the importance of news sharing for political participation, online sharing of health news has the potential to improve the adoption of preventative behaviors, as news of infectious diseases can be "informational, desirable, and beneficial for people to cope with this health threat" (Wei, Lo, & Lu, 2008, p. 265).

Self-Perceived Knowledge as O2 Between Health News Exposure and Behaviors

This study chooses self-perceived knowledge as the outcome orientation after receiving news and before news sharing. As one type of knowledge in existing research, self-perceived knowledge is a subjective self-assessment or a feeling of knowing (Park, Gardner, & Thukral, 1988); it refers to "the knowledge which people believe they hold" (Park, 2001, p. 419). By contrast, actual knowledge is an objective assessment of what people actually know (Zhang et al., 2015).

This selection of self-perceived knowledge as O2 is based on three considerations. First, self-perceived knowledge has been supported as a key antecedent of health, consumer, and information-processing behaviors. For example, students with lower self-perceived knowledge engaged in more risky sexual behaviors (Rock et al., 2003). Decision making about investment (Hadar, Sood, & Fox, 2013) was significantly related to self-perceived knowledge even when controlling actual knowledge. Furthermore, it is associated with information-related behaviors such as information search (Radecki & Jaccard, 1995), pandemic information seeking (Avery & Park, 2021), systematic processing (Zhu et al., 2016), and the willingness to engage in discussions (Schäfer, 2020).

Second, considering that SARS-CoV-2 was a new virus, knowledge about COVID-19 could no longer be a preorientation but an outcome orientation of media use. Previous health communication research using the O-S-O-R model sometimes incorporated knowledge as O1, such as actual knowledge about organ donation before consuming related TV programs (Yoo & Tian, 2011). COVID-19 was different as it suddenly interrupted human life. Individuals' knowledge could not be prepared but must rely on media reports. This research was conducted at the beginning stage of the pandemic when most people in China were staying at home and were not directly experiencing the health risk. News media served as the primary information source to enhance public awareness about the disease. Following several pandemic studies positioning self-perceived knowledge after news exposure (e.g., Melki et al., 2022; Zhang et al., 2015), this study considers how self-perceived knowledge (O2) intervenes between media use and behaviors.

Third, the mediating role of self-perceived knowledge between media exposure and behaviors needs to be explored within health news. Existing literature applying the O-S-O-R model usually adopted actual knowledge while ignoring the other type of knowledge, the self-perceived knowledge, despite that the impact of self-perceived knowledge on health behaviors was supported (e.g., Rock et al., 2003). For instance, actual political knowledge could mediate the relationship between news exposure and political participation (Jung et al., 2011; McLeod et al., 1999; Sotirovic & McLeod, 2001).

One area that has yet to be examined is whether a mediating relationship exists between media exposure, self-perceived knowledge, and information-related behaviors in the context of a global pandemic. Several studies have indicated the effects of news exposure on self-perceived knowledge and further on political and health behaviors. For instance, self-perceived knowledge mediated the effects of exposure to news on willingness to engage in discussion (Schäfer, 2020). Frequent exposure to specific epidemic news was associated with higher levels of perceived knowledge, which was translated into preventative behaviors (Melki et al., 2022; Zhang et al., 2015).

Furthermore, it is time to examine whether self-perceived knowledge could mediate the relationship between exposure to health news and news sharing, considering that what people think they know is so influential on learning and information-related behaviors (Rock et al., 2003; Zhang et al., 2015). Scholars mainly investigated the characteristics of users, motivations (Spiliotopoulos & Oakley, 2021), content-related factors, and social network structures (Kümpel et al., 2015) for news sharing. About COVID-19, scholars have discussed various antecedents, including trust of different sources and emotions aroused by information (Lu et al., 2021), gratifications and information seeking (Apuke & Omar, 2021), and perceived information overload (Laato et al., 2020). This study examines the role of self-perceived knowledge in the process of news exposure to news sharing.

The selection of self-perceived knowledge could be further clarified in comparisons with actual knowledge, as the former is more suitable for exploring the antecedents and consequences of knowledge. First, increased self-perceived knowledge was more prominent during the pandemic. When people can monitor the social climate and are concerned with the issue's social importance, they will exhibit higher self-perceived knowledge than actual knowledge (Park, 2001). Individuals tend to view themselves as knowledgeable about a topic when it is important to them (Radecki & Jaccard, 1995). COVID-19 undoubtedly was a critical health issue at both the societal and personal levels, which suggested a larger increase in self-perceived knowledge than actual knowledge.

Second, media exposure may not always enhance actual knowledge but does increase self-perceived knowledge (Mondak, 1995). The relationship between news exposure and self-perceived knowledge has been demonstrated (e.g., Mondak, 1995; Park, 2001).

Third, self-perceived knowledge leads to related perceptions or behaviors when the validity of actual knowledge is affected in some cases. For instance, self-perceived knowledge was most closely associated with consumers' decision making even when actual knowledge failed (Raju, Lonial, & Mangold, 1995). Furthermore, self-perceived knowledge was more related to information search (Radecki & Jaccard, 1995) and political participation on social media (Lee, Diehl, & Valenzuela, 2022) than actual knowledge.

This research will treat self-perceived knowledge as O2 to fill in these gaps and apply the O-S-O-R model to the new context of a health crisis. The following hypotheses are related to the links between news exposure, self-perceived knowledge, and sharing news about COVID-19.

H1:   Exposure to news about COVID-19 is positively related to self-perceived knowledge.

H2:   Self-perceived knowledge about COVID-19 is positively related to news sharing.

H3:   Self-perceived knowledge mediates the relationship between exposure to news about COVID-19 and news sharing.

Self/Strangers Discrepancy in Perceived Susceptibility Moderating the O-S-O-R Model

This research further advances the O-S-O-R model by introducing the gap of perceived susceptibility of self/strangers as the moderator. As McLeod et al. (2009) stated, subjective orientations could act as either a mediator or a moderator by "directing the extent of use of the messages or . . . magnifying or diminishing the strength of effect" (p. 238). Perceived susceptibility is a cognitive orientation and can function as a moderator of media effects.

Perceived susceptibility refers to "the extent to which an individual believes that he or she is susceptible to a particular health problem" (Kim & Nan, 2015, p. 1034), and it is often characterized by cognition (e.g., threat perception), emotional elements (e.g., fear and anxiety; Inbar & Shinan-Altman, 2020), and behavior motivations. In practice, individuals tend to take preventative measures like getting vaccines and wearing masks if they feel susceptible to certain conditions (Rosenstock, 1974).

Faced with the highly infectious COVID-19, mandatory social distancing was a constant reminder of the invisible threat that other people posed to ourselves. Compared with familiar others within the same groups such as family and friends, we usually thought that unknown people posed a higher infectious risk of COVID-19 (UC Davis Health News, 2021). This intriguing phenomenon reminded us of the role of strangers, who were "physically proximate but socially distant" (Horgan, 2012, p. 608) to us. We might meet strangers in real life but know nothing about them, that is, we could not tell if they were sick and predict when and where we would encounter them. This uncertainty aroused a pervasive "stranger danger," by which we suspected strangers to be potential carriers of COVID-19 who negatively affected our lives (Bressan, 2020). In this sense, strangers closely relate to how we perceive the risks of the pandemic.

Although there have been emerging studies on perceived susceptibility to COVID-19, the perceptual risk discrepancy of self/others and resultant cognitions and behaviors could be further investigated. Current relevant research has two main focuses. The first highlights whether or how personal traits such as gender, age, race, and education level influence perceived susceptibility to COVID-19 (e.g., Levkovich & Shinan-Altaman, 2021). The other concerns about the correlations between perceived susceptibility and individuals' personality traits, attitudes, and behaviors (e.g., Venema & Pfattheicher, 2021). Perceived susceptibility could be positively related to one's willingness to take protective actions like vaccination (Guidry et al., 2021). However, the role of one's perception on others' susceptibility to the infectious disease has been

underexplored, although the impact of self-other differences on one's perceived susceptibility has been supported (Twigg & Byrne, 2015; Weinstein, 1988). Even studies that have taken "others" into consideration normally fail to specify the "others" in analyses (Han, Zhang, Chu, & Shen, 2014) and end up focusing on whether the "self-other difference" exists or not rather than how such discrepancy acts on actual behaviors.

   To fill these gaps, this study focuses on self/stranger differences in perceived susceptibility to COVID-19. We purposely specify "others" as "strangers" for three reasons. First, this could help participants to clearly identify the comparison objects (i.e., myself versus strangers) and give related risk judgments. Second, strangers were those we might encounter occasionally. Their susceptibility to COVID-19 was crucial for one's perception of the outbreak because we did not know where they had been and whether they were infected or not. Third, social media enabled an individual to connect and share with strangers purposefully and accidentally, especially when the prevention measures toward a pandemic were collectively oriented. The targets of news sharing could be friends and/or followers, which is related to platforms' characteristics and one's breadth of social networks (Kümpel et al., 2015). During the pandemic, Chinese college students primarily relied on social media platforms, especially Sina Weibo (similar to Twitter), to access and exchange information about the outbreak (The Paper, 2020). Through Weibo, people could share the news publicly with unknown followers, forming a public space for individuals to inform strangers of information about COVID-19.

   This study integrates the perceived susceptibility gap of self/strangers as the moderator of the O-S-O-R model. Studies on consumer behaviors have determined the moderating role of perceived risks in the process of Stimulus (environmental stimulus)-Organism (mental and emotional reaction of an organism)-Response (behavioral responses). Although this Organism is framed differently from the O-S-O-R model, the two share many similarities as they are both concerned with mental processes after the stimulus that is translated into behaviors. For instance, higher risk perception could intensify the negative effect of crowding limited in certain spaces (S) on the attractiveness of destinations (O; Yin, Cheng, Bi, & Ni, 2020) and influence the relationship between negative emotions (O) and behaviors of advertising avoidance (R; Wang et al., 2022). An individual's perceived susceptibility could be used as equivalent to perceived risks in the context of COVID-19. Perceived susceptibility is an essential part of and is sometimes used interchangeably with perceived risks (e.g., Ferrer & Klein, 2015). Risk perception usually consists of perceived susceptibility, perceived likelihood, and perceived severity (Darker, 2013). Faced with severe disease, compared with the latter two that remain at the societal scale, the level of one's perceived susceptibility largely determines his or her risk perception to the pandemic.

   Following this logic, this study investigates the moderating role of the gap of perceived susceptibility of self/strangers in COVID-19-related knowledge acquisition and news sharing. At the early stage of this global outbreak, when individuals came across COVID-19 news that was closely related to their well-being and health, they were more likely to recognize their susceptibility to the pandemic. Meanwhile, considering that health coverages are informational, desirable, and beneficial (Wei et al., 2008), people may hold an optimistic bias, believing that they could better internalize the news while others could not (Lee & Park, 2016). This belief of the gap between oneself and strangers may influence people's cognitions (e.g., attitudes) and/or behaviors based on the value-expectancy theory that could explain people's cognitions (e.g., attitudes) and/or behaviors both for oneself and for others to avoid negatively valued outcomes based on certain belief (Kirscht, 1974; Palmgreen & Rayburn, 1982).

This study examines the moderating role of the gap of perceived susceptibility of self/strangers in two aspects: First, this study examines if the gap influences the association between news exposure and self-perceived knowledge. Online COVID-19 information was suggested to be associated with people's perceived knowledge of COVID-19 and risk perceptions (Mahmood et al., 2021). As stated, when realizing that oneself was more susceptible to COVID-19, people tended to adopt kinds of ways based on a strong motivation to protect themselves. In this condition, we expect that people would take the informational news seriously and be more likely to believe that they have learned enough from the news to deal with the health threat and to reduce the uncertainty that comes along with strangers. Thus, we propose a hypothesis:

H4:   *When the perceived susceptibility to COVID-19 of oneself is higher than that of strangers, this gap in susceptibility perceptions will strengthen the relationship between exposure to news and self-perceived knowledge.*

Second, this research pays attention to how the gap in perceived susceptibility influences the relationship between self-perceived knowledge and news sharing. Risk perception was positively related to perceived knowledge (Zhu et al., 2016) and seeking and sharing pandemic information (Ratu, Susilowati, & Moerad, 2022). However, in a meta-analysis of health beliefs and behaviors, perceived susceptibility as one health belief was nonrelevant to behaviors and thus suggested to be used as a moderator (Carpenter, 2010). Previous studies showed that the self-other perceptual bias might induce behaviors directed at others such as promoting beneficial messages for insensitive others (Sun, Shen, & Pan, 2008). Inspired by this, we expect that when people think that they are more susceptible to COVID-19 than strangers, people who believe that they possess related knowledge will trust in their own abilities in information processing and are more likely to share related information with others. This sharing might also be related to a stronger motivation to protect themselves when oneself is more susceptible. That is, when more people know deeply about COVID-19, the community will be safer for themselves. This reminds us of the discussions about whether sharing news is driven by selfish or altruistic motives. Altruism implies voluntary practices intended to help and benefit others at some cost of oneself (Fang & Chiu, 2010; Ma & Chan, 2014). However, in the context of a globally contagious disease, we doubt whether altruism is sufficient to understand the motivation behind news sharing as an individual's health is related to others'.

It should be noted that we do not intend to test altruism as a variable but rather as a window through which to understand the implications of the self/stranger perceptual gap of susceptibility to COVID-19. Specifically, will individuals be inclined to acquire and share pandemic-related knowledge if they perceive themselves as more vulnerable to COVID-19 than strangers? If so, can this sharing still be considered altruism? By investigating the moderation effects of the perceptual gap, this study seeks to advance the understanding of why people share news online amid a global pandemic. A hypothesis is proposed:

H5:   *When the perceived susceptibility to COVID-19 of oneself is higher than that of strangers, this gap in susceptibility perceptions will strengthen the relationship between self-perceived knowledge and news-sharing behaviors.*

Method

College students in China made up the sample for this study as they were among the most active social media users during the pandemic. A survey (The Paper, 2020) showed that Chinese college students were concerned much about COVID-19-related information. About 83.21% of participants relied on Weibo (the Chinese equivalent of Twitter) for acquiring information; and 64.59% of them actively disseminated information from authoritative institutions. Furthermore, they showed higher levels of anxiety about COVID-19 than the national average (Wang & Zhao, 2020).

Sampling

Participants were recruited from an Internet consumer panel of Wenjuanxing (www.wjx.cn), one of the most popular online survey companies in China. The company had more than 2.6 million national panel members, and participants were invited through online advertisements, search engines, and social media. All participants were requested to complete an online questionnaire between March 14 and March 24, 2020. The proportions of undergraduate and postgraduate students were controlled following the latest national education data.

A total of 517 valid responses were obtained. The sample included 226 men (43.7%), and 291 women (56.3%) with an age range from 18 to 30 (M = 21.84, SD = 2.31). For education, 86.3% of the participants were undergraduate students (n = 446), including students from year one to year four, and 13.7% were postgraduate students (n = 71), covering master and doctoral students. Their majors comprised humanities, social sciences, medicine, agriculture and forestry, engineering, business, and science. The geographic makeup of the sample included a wide range of cities across the country such as Beijing, Lanzhou, Shanghai, Guangzhou, Chengdu, and Xi'an.

Measurement

Exposure to Online News About COVID-19 (EONC; S in O-S-O-R)

Given that Internet news can be conveniently shared on social media platforms compared with news from traditional media (e.g., television, newspaper), this study estimates the level of exposure to online news about COVID-19. Participants were asked how often they got news about the disease through the Internet in the past 30 days (1 = never to 5 = several times a day). This measurement of media exposure with one item focusing on one type of media referred to a longitudinal study of dengue fever prevention and control of Thai people that asked the frequency of watching related television programs (Boonchutima, Kachentawa, Limpavithayakul, & Prachansri, 2017). And one item was sufficient to capture the online news exposure. The range of answers was highly skewed (M = 4.55, Mdn = 5.00, SD = .70. skewness = −1.44). This skewness was reasonable since there were numerous reports about COVID-19 at that time. Exposure to online news about COVID-19 was transformed using the natural logarithm (M = .12, Mdn = .00, SD = .18, skewness = .97).

Self-Perceived Knowledge About COVID-19 (SPKC; O2)

This study adopts self-perceived knowledge, the self-assessment of COVID-19 knowledge, as the mediator between media exposure and sharing behaviors. This variable was measured with one overall assessment question with an 11-point rating scale ranging from 0 = not at all knowledgeable to 10 = extremely knowledgeable. This item was based on the measurement of perceived knowledge about birth control/nutrition in Radecki and Jaccard (1995): "How much do you think you know about COVID-19 (such as disease prevention and COVID-19 transmission)?" (M = 6.62, SD = 1.66).

News Sharing About COVID-19 (R)

Participants were asked to indicate their experiences of sharing information about COVID-19 in the past month, specifically how often they (1) posted news links or information on a social networking site, and (2) shared thoughts or opinions about the news on a social networking site (Beam et al., 2016). Responses were coded from 1 = never to 5 = several times a day. A scale of news sharing was constructed by averaging the two items (Spearman-Brown Coefficient = .70, M = 2.71, SD = .96).

The Gap of Perceived Susceptibility of Self/Strangers (GPSOS)

This is the difference between the perceived susceptibility of the self and of strangers to COVID-19. Perceived susceptibility of the self was measured with two items adapted from Witte's Risk Behavior Diagnosis Scale (Witte, Meyer, & Martell, 2001): "It is likely that I will contract COVID-19" and "I am at risk for getting COVID-19." These items were ranked on a scale of 1 = not at all likely to 5 = very likely. A scale of perceived susceptibility to COVID-19 of the self was created by adding the two items and then dividing by 2 (Spearman-Brown Coefficient = .86). A scale of perceived susceptibility to COVID-19 of strangers was constructed by testing these two items through replacing "I" with "strangers" (Spearman-Brown Coefficient = .88).

The difference in scores between perceived susceptibility of the self and perceived susceptibility of strangers was calculated to generate a measure of the gap of perceived susceptibility to COVID-19 (M = −.67, SD = .91). The higher the score, the greater the perceived susceptibility of the self than that of strangers.

Control Variables (O1)

In addition to demographic characteristics including gender, age, household income, and residential districts of urban or rural areas, general news media use was also used as a control variable. General news media use has been adopted in research relevant to health communication (Asamoah, Asamoah, & Agardh, 2017). In this research, general news media use was measured by an index averaging the amount of use of six items for news and information: newspapers, television, mobile phones, desktop computers, social media, and news websites. Answers were ranked on a scale from 1 = never to 5 = several times a day (M = 3.48, SD = .51).

Statistical Analysis

To test the proposed hypotheses, a cross-sectional design, and the PROCESS macro for SPSS (Hayes, 2013) were used. The first purpose of this study was to assess the indirect effect of exposure on news sharing mediated by self-perceived knowledge (H1–H3). The Model 4 template from Hayes's (2013) PROCESS macro with 5,000 bias-corrected bootstrap samples and 95% confidence intervals (CIs) was conducted.

The next purpose was to investigate the mediating relationship moderated by the gap of perceived susceptibility to COVID-19 between the self and strangers (H4–H5). Accordingly, Hayes's (2013) PROCESS macro with the Model 58 template was employed.

Results

The results support H1 that online news exposure is positively related to self-perceived knowledge about COVID-19 (B = 1.524, standard error [SE] = .424, p < .001). Furthermore, self-perceived knowledge is positively related to sharing news about COVID-19 (B = .083, SE = .024, p < .001), supporting H2. And online news exposure is positively related to news sharing (B = .494, SE= .235, p < .05; see Table 1).

Table 1. Regression Model for Self-Perceived Knowledge and News Sharing Behaviors.

	SPKC			News Sharing		
	B	SE	β	B	SE	β
General news media use	.431	.146	.131**	.502	.081	.265***
Gender	−.072	.150	−.022	−.050	.082	−.026
Age	.057	.054	.080	.007	.030	.016
Districts	.173	.162	.049	.019	.089	.010
Education level	−.035	.095	−.027	.080	.052	.110
Household income	−.035	.071	−.023	−.020	.039	−.022
EONC	1.524	.424	.161***	.494	.235	.091*
SPKC	-	-	-	.083	.024	.144***
R²	.062			.156		

Note. EONC: exposure to online news about COVID-19; SPKC: self-perceived knowledge about COVID-19. *p < .05. **p < .01. ***p < .001. Estimates were calculated using the PROCESS macro (Model 4).

Based on the mediation analysis, the relationship between online news exposure and news sharing mediated by self-perceived knowledge of COVID-19 is supported as proposed in H3. The results indicate that SPKC significantly mediates the relationship between exposure to online news and news sharing of COVID-19 (B = .126, SE = .055, 95% CI = .034 to .247).

The mediating relationship demonstrated in H3 moderated by GPSOS is proposed in H4 and H5. Findings of the moderated mediation model indicate that the interaction effect of GPSOS influencing the

relationship between news exposure and SPKC is not significant (B = .317, SE = .457, p = n.s.). Thus, H4 is not supported. However, the relationship between SPKC and sharing news about COVID-19 is conditionally moderated by GPSOS as proposed in H5 (B = .056, SE = .026, p < .05).

Table 2 reports the different degrees of indirect effects on news sharing depending on GPSOS. The indirect effect of news exposure on news sharing through SPKC is not significant when GPSOS is at a low level. However, the moderated mediation effect is significant when GPSOS is at a middle or high level. Furthermore, the indirect effect is stronger at the high level than at the middle level of GPSOS, which means that the bigger the gap of perceived susceptibility of the self in comparison to strangers, the greater the indirect effect on enhancing news sharing about COVID-19.

Table 2. Moderated Mediation Model: Indirect Effect of EONC on News Sharing through SPKC Moderated by GPSOS.

Mediator: SPKC	News Sharing			
			Bootstrap (95% CI)	
Moderator: GPSOS	Effect	SE	LL	UL
Low	.041	.053	−.042	.171
Middle	.138	.057	.042	.266
High	.199	.084	.060	.389

Note. SE: standard error; CI: confidence interval; SPKC: self-perceived knowledge about COVID-19; GPSOS: gap of perceived susceptibility of self/strangers; LL: lower bound; UL: upper bound. Entries are unstandardized regression coefficients. Bootstrap resample = 5,000. Conditions for the moderator (GPSOS) are the mean ± 1 standard deviation from the mean. Estimates were calculated using the PROCESS macro (Model 58). Control variables are included.

Discussion

This study contributes to the research on health news effects by examining the mechanisms underlying exposure to online news about COVID-19 and people's online sharing behaviors based on a moderated O-S-O-R model. Two dimensions of internal perceptions are incorporated: people's assessment of their knowledge of the health issue and the gap in perceived susceptibility of the self in comparison to strangers. Findings show that the relationship between online news exposure and news sharing is mediated by self-perceived knowledge about the disease, which is conditionally moderated by the gap of perceived susceptibility of self/strangers (see Figure 1).
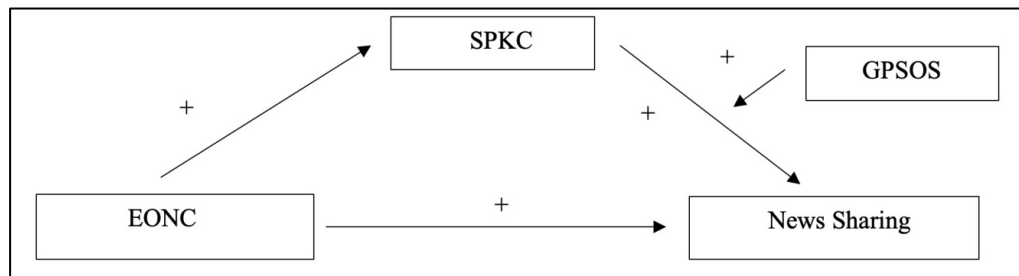
Figure 1. The final moderated mediation model.

Note. EONC: exposure to online news about COVID-19; SPKC: self-perceived knowledge about COVID-19; GPSOS: gap of perceived susceptibility of self/strangers.

The findings first demonstrate the validity of the O-S-O-R model in examining the mechanism of behavioral effects of media use in a health crisis: News exposure is positively related to individuals' self-perceived knowledge about COVID-19, which then increases news-sharing behavior. Here, self-perceived knowledge has important psychological implications such as enhancing the feeling of self-efficacy (Rock et al., 2003). That is, people will be more familiar with the disease and believe that they are well-informed as they have more exposure to COVID-19 news. This higher perceived competence makes them believe that they know what news is beneficial to cope with the disease and encourages them to disseminate the believed helpful information toward others. Future researchers can apply this model to other disease contexts and incorporate more types of preorientations and outcome orientations across different nations.

Second, the results of this study shed light on health communication research by integrating online sharing into behavioral outcomes. Compared with previous investigations of preventative behaviors, this study chooses online news sharing. This is especially important when people were forced to stay at home and many offline preventative behaviors, such as avoiding taking public transportation and wearing masks outside, played a limited role. It is reasonable that if people read and internalize news about how to deal with the situation for self-protection (Wei et al., 2008) when faced with a global epidemic, then sharing news can strengthen their internal protection belief and become a critical approach to protect themselves and others by persuading others to take prevention practices.

Third, online sharing during the intense lockdown could be motivated by a form of "pseudoaltruism." We found that participants were more likely to share news online when they perceived that they were more susceptible to the epidemic than strangers. This is understandable.

The pandemic is highly infectious, and an individual's health is linked to that of strangers or say unknown others. Arguably, when strangers I might meet learn more about pandemic prevention, the community around me will be safer, and I will be less likely to get infected. Sharing COVID-19-related news helps to reduce the risk at both societal and personal levels. As such, sharing COVID-19 news can be not only altruistic but also self-serving, and this ambivalence can be seen as "pseudoaltruism." That is, people voluntarily share health knowledge with others in hopes of reducing their own susceptibility to COVID-19. Future studies could further investigate the motivations of altruism and egoism behind disease-related knowledge accumulation and sharing during pandemics.

This study has several limitations that need to be acknowledged. First, our findings are based on a panel sample that can be representative of only a specific group of college students on Wenjuanxing. But with the intentional control of proportions of undergraduate and postgraduate students following the national education data, our sample covered students from all grades, a wide range of regions, diverse majors, and a relatively balanced gender distribution, which showed a high similarity with and relevance to our focus on Chinese college students and made this sample valuable.

Second, the current study tested only how self-perceived knowledge mediated the relationship between news exposure and news sharing. The O-S-O-R model has been developed into the O-S-R-O-R model that adopts expressive behaviors such as messaging, expression, and discussion as the Reasoning (the first R; Chen, 2021; Namkoong et al., 2017). This study paid attention to the moderation of SPKC by the gap of perceived susceptibility of self/strangers and news sharing that was akin to expressive behaviors and thus did not adopt the O-S-R-O-R model. Future researchers could consider other factors such as interpersonal communication and information processing.

Third, this study focuses on the perceptual gap between oneself and strangers. Further study using more detailed dimensions of "others" such as the gaps among oneself, family members, and neighbors may establish a more comprehensive understanding of individuals' perceptive reasons for behaviors like online sharing information during a pandemic.

In addition, the data for this study were collected in March 2020, the first outbreak of the pandemic in China. This timing may explain the high level of the "stranger danger" and social media use for COVID-19 information. The findings may not be applicable to all phases of COVID-19. However, the gap of perceived susceptibility of self/strangers as a moderator could provide a boundary condition for us to understand the functioning of the proposed model. It is crucial to test whether the gap is prominent in the relationship between media exposure and news sharing at other times and for other pandemics.

Fourth, this research relied on cross-sectional data, and the causal directions between variables were deduced by the theoretical model. Future researchers could use experimental or longitudinal designs with clear temporal orderings of the variables to test the causal relationships.

Fifth, there were some limitations about the measurement. This study considered Internet news exposure as a whole and ignored news exposure on different channels such as social media, video-sharing communities, and search engines. Further research should take exposure to different online platforms into consideration. Moreover, this study used a single item to measure self-perceived knowledge as O2 and did not incorporate actual knowledge that may have different consequences. The use of one item was based on two considerations. On the one hand, other projects have adopted a one-item measurement of self-perceived knowledge about television violence to predict third-person perceptions (Salwen & Dupagne, 2001) and knowledge about sexuality before/after sex education of college students (Rutledge, Siebert, Chonody, & Killian, 2011). On the other hand, COVID-19 was a central issue with numerous news reports from many perspectives. Clearly defining aspects of COVID-19 knowledge might require too many questions, which would increase the time cost of each participant and discourage them from answering detailed questions about the self-stranger perceptual gap.

Although this was reasonable considering that people were in a health crisis, it might bring some statistical issues affecting our result. Furthermore, although we incorporated examples of SPKC such as disease prevention and COVID-19 transmission in the questionnaire, it was possible that participants had different information in mind when responding to the item that might impact the validity of the measurement. In addition, the omission of actual knowledge might hide some interesting findings. Previous studies have shown that actual knowledge and self-perceived knowledge could relate to each other in a complex way. Raju et al. (1995) detected significant positive correlations between the two types of knowledge of products, while Radecki and Jaccard (1995) found a weak correlation. Different types of knowledge might also be related to different behaviors. Future researchers can investigate how types of knowledge correlate with each other and influence individuals' behaviors in a different way.

Despite the limitations, this study has both theoretical and practical implications for understanding media use related to preventative behaviors. For example, this study applies the O-S-O-R model and demonstrates its utility in a health crisis context by successfully adopting self-perceived knowledge as the O2 and incorporating perceived risks as one moderator. The findings advance our understanding of how media exposure about pandemic disease increases the likelihood of engaging in behaviors like news sharing. In addition, the underlying mechanism of reading news and behavior outcomes during COVID-19 can be applied during future infectious disease outbreaks. Media agencies and public health organizations can think about possible cognitive processes before and after media use to make the information more influential and promote preventative behaviors more effectively by considering the gap in perceived risks between the self and strangers.

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