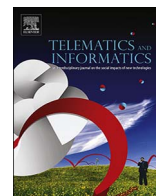Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Informed public against false rumor in the social media era: Focusing on social media dependency

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ARTICLE INFO

ABSTRACT

This study explores how the public's belief in false rumors about Middle East Respiratory Syndrome that spread across South Korea related to their accuracy-oriented information seeking as well as the moderating effects of people's reasons for using social networking services (SNS). The survey results show that perceived credibility of false rumors did not affect accuracy-oriented information seeking. However, a significant result was shown in the moderating effect, such that SNS informational dependency interacted with false rumor credibility on accuracy-oriented information seeking. Overall, this study specifically identifies and discusses differences in SNS dependency and accuracy-oriented information seeking in the context of rumor communication to examine the construction of an informed public. Theoretical contributions of this study are discussed.

1. Introduction

People often tend to seek more information in order to decrease their uncertainties in chaotic situations during which rumors are being widely spread (Wilson, 1997, 1999). Defined as finding 'missing' information, information seeking is motivated by people's necessity to search scant information (Case, 2012). In rumor communication, an informed public is hard to be formed if people do not seek accurate facts. During the spread of false rumors that could generate major social problems (Tanaka et al., 2012), a lack of accuracy-oriented information seeking can produce detrimental effects on a society because people may remain as a passive bystander, not an active searcher, letting false rumors confuse a society. Furthermore, if they show passive attitudes amid circulation of false rumors, social chaos is exacerbated.

The potential negative consequences of beliefs in false rumors in terms of information seeking are numerous. People should make the effort to actively check the accuracy of false rumors rather than passively responding to the rumors as bystanders and leaving those to be spread. This paper defines accuracy-oriented information seeking as a cognitive aspect of information seeking by finding accurate information (accuracy-aimed). People with accuracy goals tend to collect a wide range of information, thus reaching the most desired conclusions without prejudice (Hart et al., 2009; Taber and Lodge, 2006). Past research shows that rebutting the forged rumors, one of accuracy-aimed behaviors, could mitigate the negative impact of false rumors (Tanaka et al., 2012).

Research on the relationship between rumor and information seeking has rarely been conducted. Hence, the present study aims to establish the rumor communication model in the era of social network service (SNS) by exploring how perceived credibility of rumors affects accuracy-oriented information seeking. Indeed, past research which focuses on the effect of general messages credibility and information seeking shows mixed findings. Some studies argue that low credibility of the message motivates people to seek more

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information (Fedor et al., 1992; Wilson, 1999), whereas other studies assert that high credibility of the received messages prompts information seeking activities (Ho and Niederdeppe, 2008; Hou and Shim, 2010). Based on this, this study raises the key question: How does the perceived credibility of SNS rumors motivate people to seek additional accurate information during the crisis situation?

This study further aims to examine the moderating role of general SNS dependency, which is developed from media system dependency theory (Ball-Rokeach and DeFleur, 1976), in the relationship between credibility of rumors and information seeking. Although previous studies revealed that media dependency and credibility are closely linked to each other (Jackob, 2010; Johnson and Kaye, 2004; Perlmutter and Schoen, 2007), no studies have empirically tested the relationship in the context of rumors, particularly with a focus on Web 2.0 era to our knowledge. However, the extent to which people depend on SNS and their different reasons for using these services must be considered, given that today's rumors are largely disseminated through SNSs including Facebook, Twitter, and other online messaging services (Doerr et al., 2012). Examining this issue can provide a footstep in the rumor study by answering how people's different dependencies on SNS function in the accuracy-oriented information seeking of false messages.

The main purpose of study is to examine the relationship between the credibility of false rumor and accuracy-oriented information seeking, and how different patterns of SNS dependency affects this linkage. Many studies have been conducted on information seeking in the aftermath of adverse events (e.g., Spence et al., 2005), lending support to the significance of the current paper, which analyzes the public's accuracy-oriented information-seeking behaviors after Middle East Respiratory Syndrome (MERS) occurred in South Korea in 2015. We expect that the findings from this research will contribute to better understanding of the interactions between credibility of false rumors and SNS dependency on accuracy-oriented information seeking in the context of rumor communication. Exploring the mechanisms underlying the information seeking, in turn, can help curb the detrimental impact of the false rumors during hazard situations. The current research can be a groundwork for seeking out the relationship between false rumors beliefs, SNS dependency, and information seeking behaviors under risky situations. Furthermore, by differentiating the meaning of information seeking with accuracy-orientated information seeking, this research can open the venue to develop discussions on information seeking.

2. Literature review

2.1. Rumor in risky situation and credibility of rumors

Rumors are defined as unverified messages that circulate throughout the public (Sunstein, 2009) and that are easily formed during risky situations such as floods and terrorism, during which people are plunged into chaos that heightens their concerns over dangers (Danzig et al., 1958; Oh et al., 2010). Particularly, *false rumors*, which will be discussed in this study, have been noted as the main causes for social problems in high risky situations (Tanaka et al., 2012). False rumors are defined as baseless rumors spread during the crisis and later confirmed to be not true (Mendoza et al., 2010). It is not a new phenomenon that false rumors are circulated during disasters (i.e., Prasad, 1935; Sinha, 1952) because people tend to obviate their uncertainties by spreading the false rumors under the risky situations (DiFonzo and Bordia, 2007). This study will discuss about false rumors related to the spread of MERS virus.

In today's society, rumors are heavily spread through SNS. In the era of Web 2.0, when people are interconnected through two-way online social media, rumors are spreading faster than ever before. SNSs facilitate false information to be spread due to their fast-forwarding characteristic (Adachi and Toda, 2015; Zhang and Leung, 2014), and consequently creates nationwide panic (Tanaka et al., 2012). However, despite these negative aspects of social media, some studies have argued that SNS can function as useful means of communication in the context of rumor communication. For example, Twitter can allow real-time updates and information transmission during disasters and other emergencies (Mills et al., 2009). These contradictions show that the role of SNS in rumor communication should be thoroughly examined as the spread of rumors using SNS is increasing.

In the context of rumors, perceived credibility of rumors is regarded as participant's perception of the rumor's veracity or likelihood of being true and is linked with how people perceive and react to rumors (Grewal et al., 1994; Sternthal et al., 1978). In this vein, it is important to examine rumor credibility in seeking how informed public is formed, which has rarely been examined in extant research. This study opens the gateway for research on the effects of rumor credibility by predicting diverse results. As previous research noted (Tanaka et al., 2012), if people easily believe false rumors, they are not likely to find corrective information that are critical in blocking the spread of false rumors. That is, people with high beliefs in false rumors can easily accept the message without having awareness. However, another possibility is that high level of false rumor credibility can facilitate information seeking behaviors by stimulating people's curiosity, which could even lead them to find more accurate information. They may also hold cynical attitudes toward rumors and ignore them, not trying to check facts. Although we can predict different possible results of false rumors credibility, those remain as unsolved issues as no prior studies have empirically examined these possibilities. Hence, now is the time for communication scholars to examine the perceived credibility of false rumors and how the credibility functions in forming an informed public against the spread of false rumors through social media.

2.2. Accuracy-oriented information seeking and an informed public

Information seeking is defined as "a conscious effort to acquire information in response to a need or gap in one's knowledge" (Case, 2012, p.5), which posits that audiences are active searcher. When facing risks, people tend to seek abundant and accurate information to mitigate their uncertainties, as Allport and Lepkin (1945, p.14) stated, "the more information he has, and the more carefully he thinks, the less chance that he will be led into believing by his inner, and often unrecognized, impulses."

However, merely spending a lot of time to seek information does not fully explain the meaning of information seeking. Especially regarding rumor communication, efforts to find accurate information against false rumors takes high importance (Crescimbene et al., 2012), which is termed as accuracy-oriented information seeking in this study, because those effortful behaviors can prevent the circulation of false rumors. This study defines the accuracy-oriented information seeking as people's efforts to find accurate information.

There is a clear difference between accuracy-oriented information seeking and a general term of information seeking; the former stems from cognitive gratification needs but the latter encompasses cognitive gratification as well as people's diverse needs in a more generic term (i.e., hedonic needs, social integrative needs, etc.). That being said, accuracy-oriented information seeking is oriented toward finding information that can fill-in person's intellectual and cognitive needs. In contrast, information seeking does not take account of people's specific needs, only measuring how much information people found; but this can include diverse motivations for seeking more information such as to have fun, join societal relationships, or check the accuracy of the messages.

Theoretically, *motivated reasoning theory* further supports the explanation of accuracy goal-directed information-seeking (Johnson, 1997). According to the concept of motivated reasoning, an individual is motivated to achieve goals when they process information (Chaiken et al., 1996). Of the two dimensions of motivation (i.e., accuracy and direction), accuracy goals heighten cross-cutting exposure while lessening selective exposure, thus prompting people to collect diverse pieces of information to reach the most accurate conclusions (Fiske and Taylor, 1991; Hart et al., 2009; Taber and Lodge, 2006). As noted in politics studies, accuracy motivated individuals try to search for various issues of candidates and evaluate each candidate's characteristics without having any bias (Leeper and Slothuus, 2014). In contrast, people with directional goals tend to selectively expose themselves to information that corresponds with their opinions. Such directional motivated reasoning affects rumor rebuttals; that is, an individual is likely to ignore the rumor which contradicts his or her beliefs (Kunda, 1990). Following these discussions, the concept of the accuracy-oriented information seeking, a developed term to be used in this study, corresponds to having accuracy goals when finding additional information in terms of the motivated reasoning theory. Furthermore, although studies have shown that accuracy motivation reduces *congeniality bias* (selecting one's supporting view rather than opposing view) while increasing *uncongeniality bias* (selecting one's opposing view rather than supporting view) (Hart et al., 2009) because it facilitates people's tendencies to uncover the truth by holding objectiveness and open-mind (Chaiken et al., 1989; Kunda, 1990), no research has not directly linked the discussions of motivated reasoning theory with information seeking.

In context of rumor communication, past studies have revealed that verifying information and rebutting false rumors which is a core behavior of accuracy-aimed information seeking (Leeper and Slothuus, 2014), make people have critical thoughts (e.g., Allport and Postman, 1947; Bordia et al., 2000; Iyer and Debevec, 1991), which could ultimately curb the negative impact of false rumors (Tanaka et al., 2012). Therefore, seeking information with accuracy in mind is essential in minimizing the circulation of false rumors. Such accuracy-oriented information seeking is a step toward finding alternative accurate messages to eliminate uncertainties and to judge whether rumors contain truthful information or not. Particularly, Shibutani (1966) argued that under the situation of great uncertainty and danger, people are accuracy motivated because they realize accurate intelligence determines their survivals. Despite these discussions, it is still unknown whether people sought accurate information in a reality-based risky situation, which raises the needs to focus on the actual incident, MERS virus, in this study to find out answers for the unsolved matters.

2.3. Perceived credibility of rumors and accuracy-oriented information seeking

The underlying assumption of information seeking behavior is that individuals actively seek additional information if they are uncertain about the information they have (Wilson, 2000). From this perspective, high perceived credibility of false rumors decreases motivations to find additional information because people might feel certain about the false rumor contents. Given that information insufficiency is a premise of low perceived credibility of that information (Flanagin and Metzger, 2000), if individuals think that rumors lack sufficient information with having low level of credibility of the given rumors, they would seek more accurate information (Case, 2012).

As discussed before, we differentiate a general term of information seeking from the accuracy goal directed information seeking, and assert that individuals who are engaged in accuracy-oriented information seeking make effortful behaviors to verify the accuracy of rumors. Metzger and Flanagin (2015) argued that different information seeking situations are motivated by different people's needs to search information. For example, people's accuracy goals (i.e., searching for information about important health-related issues) move them to seek out accurate information but other goals (i.e., searching for information about music groups) do not (Metzger and Flanagin, 2015). Particularly, chaotic and dangerous situations also motivate people to be accuracy-aimed (Shibutani, 1966), but no research to date has addressed the relationship between perceived credibility of rumors and accuracy-oriented information seeking under risky situations. Hence, we take this matter as the first research question.

RQ1. In a high risk situation, how is the perceived credibility of rumors associated with the accuracy-oriented information seeking?

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2.4. SNS dependency (social, informational)

The conceptualization of SNS dependency has evolved from the media system dependency theory (MSD) proposed by Ball-Rokeach and DeFleur (1976). MSD explains that mass media affects individuals because they rely on media to achieve their everyday

goals. The theory presumes the media, audiences, and society form an organic, interdependent structure (DeFleur and Ball-Rokeach, 1989) in a tripartite relationship. Similarly, research has demonstrated that SNS dependency affects individuals' achievement of personal goals (Kim et al., 2015; Kim and Shin, 2013). SNS dependency generally comprise six subsets that are not mutually exclusive: personal understanding, social understanding, personal action orientation, social action orientation, solitary play, and interaction play, which refer to the goals that individuals aim to attain by using media (Ball-Rokeach, 1985; Kim and Jung, 2014; Kim et al., 2015; Loges and Ball-Rokeach, 1993). The different subsets of SNS dependency posit that individuals have different purposes for using SNS. Among various subsets of SNS dependency, we adopt SNS social dependency and SNS informational dependency as core values of SNS uses.

First, people mainly use SNSs to build or maintain social relationships (Ancu and Cozma, 2009; Chu and Kim, 2011), which is termed as SNS social dependency in this study. SNS social dependency is regarded as people's tendencies to depend on SNSs to gain social interactive gratification through interpersonal communication (Ha et al., 2015, p. 432). In this vein, SNS social action orientation dependency and SNS interaction play dependency commonly explain the core reasons for using SNS as social connectivity. SNS social action orientation dependency indicates that people depend on SNS in their daily lives in order to identify better ways to communicate with others, to consider how to improve relationships with acquaintances, and to figure out the ways to communicate with others in important or difficult situations (Kim et al., 2015). In the same vein, SNS interaction play dependency explains that people depend on SNS as something to do with their friends or to participate in enjoyable events through SNS (Kim et al., 2015; Kim and Jung, 2014). These two subsets collectively explain SNS users' social interactions which makes individuals to "feel at ease and comfortable to engage in interpersonal communication exchanges through the technology-enabled space" (Phang et al., 2009, p.729).

On the other hand, people could rely on SNS for obtaining information to satisfy their cognitive needs. In this study, we newly term people's dependencies on SNS to acquire knowledge as SNS informational dependency that focuses on cognitive gratification through SNS usage. Indeed, linking between media dependency and information acquisition is a not new topic. Existing research has highlighted the role of media in helping knowledge acquisition (Ha et al., 2015; Humphreys, 2007). Media users try to understand a society and their communities by relying on news media (whether it is a print, online, or television) (Ball-Rokeach et al., 1984; Loges and Ball-Rokeach, 1993; Patwardhan and Yang, 2003). For example, they use Facebook or Twitter as an information source of news. Patwardhan and Yang (2003) found a positive relationship between social understanding and online news reading, concluding that people rely on Internet to understand the current society. These lines of research support the need to explore people's dependency on media for information acquisition purposes. These discussions imply that SNS per se do not affect individuals' behaviors. Rather, it is individuals' different motivations for using SNS that affect behaviors (Gil de Zúñiga et al., 2011).

As individuals' motivations for using SNS vary, SNS social dependency and informational dependency have clear differences. That is, while some individuals use SNS for building their social relationships, some use SNS as important information sources, spending time obtaining information through SNS (Wise et al., 2010). SNS informational dependent users focus on gaining information while SNS social dependent users depend on SNS to better understand their communities. That is, SNS social dependency includes both SNS cognitive and hedonic gratification while SNS informational dependency merely focuses on cognitive gratification (Ha et al., 2015). Numerous studies have found that using SNS for social purposes has positive effects on information acquisition (cognitive gratification) as well as enjoyment (hedonic gratification) (Ha et al., 2015; Humphreys, 2007; Lin and Lu, 2011). Particularly, SNS users who are relationship-oriented decrease boredom and feel enjoyment while engaging on social interactions, thus obtaining hedonic benefits from the media (Okazaki, 2008), as *affective social exchange theory* noted that engaging in interpersonal communication has a positive effect on affective outcomes by satisfying hedonic gratification (Choo and Petrick, 2014; Ha et al., 2015). Unlike SNS social dependency, SNS informational dependency is exclusively related to cognitive gratification, such as searching for information, learning, and knowledge acquisition (Nambisan and Baron, 2007).

In this light, two types of SNS dependencies should act differently in the relationship between perceived credibility of rumors and accuracy-oriented information seeking. Compared to SNS social dependent users, SNS informational dependent users can be more pertained to the accuracy-oriented information seeking to fully understand their current situations with accurate knowledge. Following this line of logic, we postulate that the effects of perceived credibility of rumors on information-seeking behavior will differ depending on the different levels of SNS dependency under the high risk situation in which MERS occurred. Specifically, we expect that persons who rely on SNS for their information will be more motivated to verify facts than persons who rely on SNS for social purposes. Based on these expectations, the hypotheses and research questions are posed:

H1. In a high risk situation, SNS dependency (social and informational) will moderate the relationship between perceived credibility of rumors and the accuracy-oriented information seeking.

RQ2. Does SNS social dependency moderate the relationship between the perceived credibility of rumors and the accuracy-oriented information seeking? If so, does the moderating effect of SNS social dependency differ from the moderating effect of SNS informational dependency?

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To summarize the above hypotheses and research questions, the proposed designed model is presented in Fig. 1 below.

2.5. The case of MERS in South Korea

MERS hit South Korea in 2015, and the whole nation has been suffering from MERS since May 20 of that year; of the infected 186, 38 people have died of the epidemic, the largest outbreak outside of the Middle East.
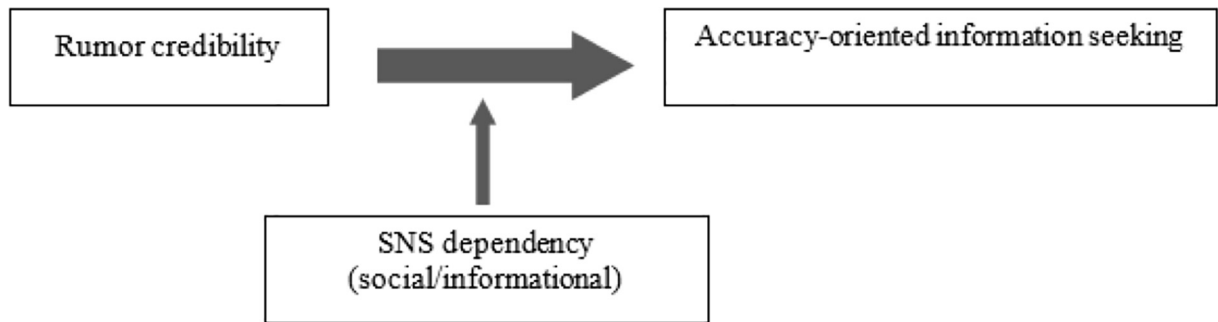
Fig. 1. Proposed research model.

Over two months, the public was afraid of being infected by the syndrome and was in panic. The South Korean government was criticized by the public for not handling the syndrome in a timely manner. In addition, the government did not immediately disclose key information about the status of the syndrome to the public. According to a *Washington Post* report released on June 8, 2015, the government specifically did not share the list of hospitals where the infected had been treated, which contributed to the people's lack of faith in the government. The nation's former health minister Moon Hyung-pyo made official apologies to the public at a news conference, saying, 'The spread could have ended much earlier if we had reacted more thoroughly in the initial stage. I feel very sorry about that' (Seo and Fifield, 2015).

Amid growing uncertainties and fear among the public, rumors were circulated across the nation, largely via social media. For instance, one rumor said, 'The MERS patient was confirmed at Yeouido St. Mary's Hospital so you should not visit' and was spread through SNS, but the hospital later refuted the message (Jhoo, 2015). That applying petroleum jelly would prevent MERS infection was also disseminated among online users; calling himself a Middle East expert, one user posted in an online message that a fat-soluble substance such as petroleum jelly would block the water-soluble MERS from permeating throughout the body. The message was, however, countered by medical experts (Ahn, 2015). Such false rumors created chaos around the country, confusing the public.

3. Methodology

3.1. Research procedure and demographics of the survey participants

This study collected rumors that were actually spread during the MERS attacks in South Korea and conducted an online survey of South Koreans in their 20 s through a South Korean research company. Previous research on social media shows that more than 90 percent of undergraduates are Facebook users (Lampe et al., 2008) with largely focusing on college students (e.g., Stutzman, 2006). With the existing research in mind, this study assumed that social media dependency is explicitly shown among young adults and expanded participants to twenties across the nation. This is because MERS was not a small issue for certain universities but a huge issue for the whole nation (Song, 2015). The company used proportionate-stratified sampling weighted on gender based on the 2015 South Korean in their 20 s population census data (723,000 for men and 725,000 for women for a total of population in 20 s; 155 for men and 157 for women participated in the survey). Participants were randomly selected from the company's survey poll. Survey participants received a small monetary reward (approximately $1) as a form of appreciation for their participation in the research.

Before survey begins, researchers first asked, 'The below are false rumors about MERS that spread through SNS in 2015. Have you ever received at least one of the five rumors presented below?' The survey respondents were confined to those who had received at least one false MERS rumor through SNS among the five rumors which were presented. A total of 312 persons answered the survey questionnaires. After invalid answers were eliminated, the survey data from 297 respondents were analysed. Detailed items for each variable are presented below.

3.2. Questionnaire

3.2.1. Perceived credibility of rumors

Researchers asked respondents, 'During the spread of MERS, how much credibility did you place in the aforementioned MERS rumor messages?' The perceived credibility of the MERS rumors was measured in the current study with six questions: 'At that time…' (a) I thought the rumors that I received were believable; (b) I thought the rumors that I received contained accurate information; (c) I thought that the rumors that I received were based on truth; (d) I thought that the rumors that I received contained enough information; (e) I thought that the rumors that I received provided objective information; (f) I believed the rumors that I received (Flanagin and Metzger, 2000; Roberts, 2010; Rosenthal, 1971). These questions were answered on a 5-point Likert-type scale that ranged from 1 (*not at all agree*) to 5 (*very strongly agree*). Internal consistency for the perceived credibility of the rumors was measured using Cronbach's α, with reliability coefficients of 0.953. After summing all scores of the items, we divided by the number of items to create the mean value. ($M = 2.58$, $SD = 0.89$).

3.2.2. SNS dependency (social, informational)

Following Kim et al. (2015), we measured SNS dependency on a 5-point scale that ranged from 1 (*not at all useful*) to 5 (*very useful*). SNS social dependency measurement items were: (a) consider how to act with friends, relatives, or people you work with; (b) get ideas about how to approach others in important or difficult situations; (c) have something to do with your friends; (d) have fun with family or friends; (e) be a part of social events you enjoy without having to be there (Cronbach's α = 0.829. *M* = 3.21, *SD* = 0.75). In contrast, SNS informational dependency, which focuses on obtaining information by using SNS to better understand the situation, was composed of three items: (a) I usually get information through SNS; (b) I utilize information gained from SNS; (c) I immediately update information received from SNS. All items were measured on a 5-point scale that ranged from 1 (*not at all agree*) to 5 (*strongly agree*) and calculated as a mean value (Cronbach's α = 0.664. *M* = 3.19, *SD* = 0.75).

3.2.3. Accuracy-oriented information seeking

As noted, information seeking is defined as people's overall information-related activities (Wilson, 1999) motivated by the desire to find missing information (Case, 2012). Given that the current study particularly aims to examine the accuracy-oriented information seeking, the items were rated on a 5-point Likert-type scale that ranged from 1 (*not at all agree*) to 5 (*very strongly agree*). Referring to previous studies (i.e., Hart et al., 2009), I created the items to measure how carefully the respondents sought additional information after they heard the MERS rumors in order to find accurate information, asking "After I received the MERS rumors, I made the effort to…" (a) find out more facts about the message contents; (b) check whether the messages contained factual information; (c) find rebuttals regarding the message contents; (d) check the accuracy of the information; (e) reach the best conclusion; (f) know additional facts about the message contents. Items were summed and divided by a number of items (Cronbach's α = 0.914. *M* = 3.16, *SD* = 1.09).

3.2.4. Control variables

As the control variables, this study used gender (0 = *male*, 1 = *female*), the perceived credibility of the South Korean government, and feelings toward MERS. The perceived credibility of the government was included because trust in the South Korean government was closely linked with the nationwide spread of rumors, such that low trust in the government prompted the spread of rumors. The item was measured using a 5-point Likert-type scale (1 = *do not trust the government at all*, 5 = *strongly trust the government*). Lastly, feelings toward MERS were measured using four elements: uncertainty, fear, anxiety, and feeling terrified and also were measured on a 5-point scale (1 = *do not feel at all*, 5 = *strongly feel*), based on the consideration that different levels of feelings affect information seeking (Johnson et al., 2002).

4. Results

4.1. Respondent profile

Table 1 shows the demographic profiles of the respondents in the current study. Survey responses from a total of 297 participants (male 49.8%, female 50.2%) who were in their twenties were analysed in the study, and the respondents reported perceiving the South Korean government's credibility as relatively low (*M* = 1.98, *SD* = 0.87). The mean value of the respondents' feelings toward MERS—uncertainty, fear, anxiety, and feeling terrified—was high above the median (*M* = 3.42, *SD* = 0.98) (See Table 2).

4.2. Partial correlations result for analysed variables

Partial correlational analyses, controlling for gender, South Korean government credibility, and feelings toward MERS, revealed that all of the analysed variables have low level of correlations. The correlation value between rumor credibility and SNS social dependency (*r* = 0.047, *p* = ns), rumor credibility and accuracy-oriented seeking (*r* = 0.059, *p* = ns), SNS informational dependency and accuracy-oriented seeking (*r* = 0.108, *p* = ns) was not significant. Meanwhile, SNS informational dependency showed a significant relationship with SNS social dependency (*r* = 0.319, *p* < .001) and rumor credibility (*r* = 0.314, *p* < .001) at low levels.

Table 1
Descriptive statistics for the demographic and other control variables (*N = 297*).

	Frequency & Means	%
Gender		
Male	148	49.8
Female	149	50.2
Age	*M* = 24.68 (*SD* = 2.61)	
Government credibility	*M* = 1.98 (*SD* = 0.87)	
Feelings toward MERS	*M* = 3.42 (*SD* = 0.98)	
Uncertainty	*M* = 3.52 (*SD* = 1.06)	
Fear	*M* = 3.25 (*SD* = 1.08)	
Anxiety	*M* = 3.68 (*SD* = 0.10)	
Feeling terrified	*M* = 3.23 (*SD* = 1.08)	

Table 2
Partial correlation result for analysed variables.

	Rumor credibility	SNS social dependency	SNS informational dependency	Accuracy-oriented information seeking
Rumor credibility	–			
SNS social dependency	0.047	–		
SNS informational dependency	0.314[***]	0.319[***]	–	
Accuracy-oriented information seeking	0.059	0.181[**]	0.108	–

[**] $p < .01$.
[***] $p < .001$.

4.3. Research questions and hypotheses results

In order to examine the effect of the independent variables on the dependent variable and the interaction effects of SNS dependency, this study used hierarchal multiple regression from Step 1 through Step 3. We first entered gender, the South Korean government's credibility, and feelings toward MERS in Step 1. The independent variable and moderators were entered in Step 2. Then, the interactions were entered in Step 3. Before we tested for any interaction effects, the perceived credibility of rumors and the SNS dependency values were all mean-centered in order to reduce the variance inflation factor and consequently displayed no multicollinearity (Field, 2009).

The effect of rumor credibility and the moderating effects of SNS dependency on the accuracy-oriented information seeking were tested in order to examine RQ1, H1, and RQ2. All of the control variables were found to influence the accuracy-oriented information seeking (gender: $\beta = -0.122$, $t = -2.074$. $p < .05$; government credibility: $\beta = 0.101$, $t = 1.774$. $p < .10$; feelings: $\beta = 0.329$, $t = 5.353$. $p < .001$). The findings indicated that women were more likely than men to seek additional information with the aim of verifying the accuracy of the rumors. Additionally, people with strong beliefs in the government and more negative feelings toward the syndrome sought additional information to verify the accuracy of the rumors.

RQ1 concerns whether the credibility of rumors would be associated with people's seeking additional information to verify the accuracy of the rumors. The results showed that rumor credibility did not affect accuracy-oriented information seeking (see Table 3).

Then, we added regression results in Table 3 to ModGraph-I program Ver. 3.0 developed by Jose (2013). As shown in the graph, the three straight lines represent different categories of SNS informational dependency (high, mid, low). Regarding H1 and RQ2, SNS informational dependency interacted with rumor credibility ($\beta = 0.107$, $t = 1.915$. $p = .056$). The P-value of the R^2 change in Step 3 was found to be marginally significant at the traditional 0.05 level, indicating that the moderators statistically affected the relationship between rumor credibility and the accuracy-oriented information seeking. However, SNS social dependency was not found to be a moderator in the accuracy-oriented information seeking. These findings partially supported H2.

Fig. 2 presents how SNS informational dependency moderated the relationship between rumor credibility and the accuracy-oriented information seeking. The lines depicted in the graph show that high levels of SNS informational dependency had a stronger effect on the positive relationship between rumor credibility and the accuracy-oriented information seeking than lower levels. The interaction indicates that users who depend on SNS for information were more affected by rumor credibility than participants who did not rely on SNS for information when finding accurate information regarding the MERS. For the respondents who did not use SNS

Table 3
Regression results for the moderating effects of SNS dependency on the accuracy-oriented information seeking.

Predictor	Accuracy-oriented information seeking					
	Step 1		Step 2		Step 3	
	β	t	β	t	β	t
Gender	−0.118	−2.002[*]	−0.129	−2.184[*]	−0.122	−2.074[*]
Government credibility	0.136	2.432[*]	0.091	1.603	0.101	1.774[+]
Feeling toward MERS	0.365	6.265[***]	0.312	5.083[***]	0.329	5.353[***]
Rumor credibility			0.037	0.613	0.027	0.447
SNS social dependency			0.160	2.706[*]	0.157	2.672[*]
SNS informational dependency			0.044	0.689	0.038	0.597
Rumor credibility × SNS social dependency					−0.091	−1.628
Rumor credibility × SNS informational dependency					0.107	1.915[+]
R^2	0.129		0.161		0.176	
Adjusted R^2	0.120		0.144		0.153	
R^2 change	0.129[***]		0.032[*]		0.015[+]	
F	14.483[***]		9.286[***]		7.679[***]	

Note: Rumor credibility, SNS social dependency, and SNS informational dependency were centered at their means.
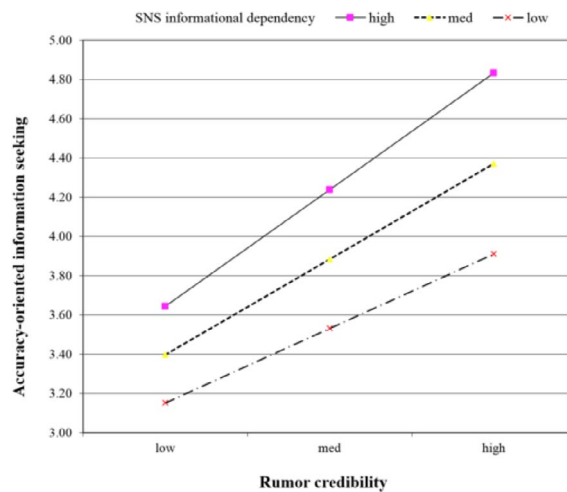[+]$p < .10$; [*]$p < .05$; [**]$p < .01$; [***]$p < .001$.

Fig. 2. The moderating effects of SNS informational dependency on the relationship between rumor credibility and the accuracy-oriented information seeking.

mainly to seek information, their beliefs in the rumors had little impact on their accuracy-oriented information seeking.

5. Discussion

The primary objectives of this study were to better comprehend rumor communication in the SNS era and to explore how rational communication was actually constructed during the 2015 spread of MERS in South Korea. Specifically, this study set a goal to examine how false rumor credibility affects accuracy-oriented information seeking and further, whether SNS social and informational dependency moderate this relationship. Based on the assertion that accuracy-oriented information seeking is essential in a desirable society where deliberative democracy is materialized by an informed public (Weeks, 2000), this study began with the premise that it is important to learn how people seek additional accurate information after they hear false rumors that are later found to be not true. Hence, this paper placed emphasis on accuracy-oriented information seeking based on previous arguments that accuracy goals help people to reach the most desirable conclusions (Chaiken et al., 1996) and have critical viewpoints toward rumors (Crescimbene et al., 2012).

Overall, the findings for the proposed hypothesis and research questions were as follows. With regard to RQ1, regarding the relationship between rumor credibility and accuracy-oriented information seeking, rumor credibility did not influence accuracy-oriented information seeking. This result implies that when people believe rumors, they may find more information to gratify their interests and curiosity (hedonic gratification) or to build a sense of closeness (integrative gratification), rather than to acquire accurate knowledge (cognitive gratification). Particularly in a risky situation, high levels of perceived rumor credibility may prompt curiosity and interest in the contents of rumors, leading people to seek additional information to satisfy their information needs. As behaviors of spreading rumors stem from the feelings of curiosity and intimacy with others (Fine et al., 2005), those who have high credibility of rumors also want to feel close intimacy with others and to satisfy curiosities by searching over what others have talked over the rumors. This result represents that people do not always seek for accurate information when they are uncertain.

The culture as well as politics of South Korea can also explain the non-significant result between rumor credibility and accuracy-oriented information seeking. After an outbreak of MERS, the then conservative South Korean government was found to control key public information, generating people's concerns, anger, and anxiety (Power, 2015). Given such confusing situations, rumor credibility itself could have not led people to find accurate information. Rather, many other factors including political orientation (conservative or liberal) may prompt accuracy-oriented information seeking. In general, as liberal people tend to distrust the current South Korean government compared to conservative side, they may try to find more accurate information, regardless of how much rumors credibility they have. Additionally, the collectivistic culture of South Korea can cause them to seek out information in order to more satisfy their hedonic needs instead of cognitive needs. People living in a collectivist culture tend to put more emphasis on intermingling such as relationships with family, friends, colleagues, and etc. (Cho and Cheon, 2005; Kim et al., 1998). Therefore, they may want to stick with their acquaintances by getting know more about rumors-related stories. In this sense, rumor fact-checking can be done by many other factors, rather than perceived credibility of rumors.

Regarding H1 and RQ2 which questioned the moderating effect of SNS dependency on the relationship between rumor credibility and the accuracy-oriented information seeking, SNS informational dependency showed an interaction effect with rumor credibility on the accuracy-oriented information seeking. Cognitive gratification stems from the U&G theory offers a good starting point for explaining how SNS informational dependency moderates the relationship between perceived credibility of rumors and the accuracy-oriented information seeking. It can be inferred from the finding that people who use SNS mainly for obtaining information and have high beliefs in SNS rumors perceive the rumors as imperative information rather than merely social gossips. Once SNS informational dependent users believe rumors, they feel more needs to gratify their desires to learn, which prompt their motivations to find accurate information. Their perceptions of rumor credibility affect their desires to find accurate information because they use SNS for verifying

the contents of rumors and for acquiring more knowledge and information, focusing on cognitive gratification. For SNS informational dependent users, high levels of credibility of rumors reflects *need for cognition*, which explains the extent to which people think deeply about received information, thus making an effort to assess the information critically (Metzger and Flanagin, 2015). Also, the credibility of rumors motivates SNS informational users to think flexibly, termed as *flexible thinking* (Metzger and Flanagin, 2015), thus increasing their intentions to search more contradictory information as an effort to evaluate the given rumors critically. Different from using SNS for social purposes that results in increasing affections as affective social exchange theory notes, SNS informational dependency can lead individuals to have critical thoughts under ambiguous situations. Building from these deductions, additional studies would be of interest regarding how information-dependent SNS users have different motivations and how their behaviors relate to information-seeking behaviors.

Taken together, this study has significant conceptual implications in a number of aspects. Aiming to expand the understanding of rumor communication, this study focused on the credibility of rumor messages as the independent variable in an effort to determine the effect of credibility on information seeking. Perceived credibility of rumors is imperative for studying the context of rumor communication because it is related to the formation of reasoned communication under risky situations. In this sense, understanding how rumor credibility helps to construct or endanger an informed public is critical. Second, this paper extends the understanding of rumor communication by examining SNS. In contemporary society, the ways in which rumors are disseminated have undergone drastic changes. People are more likely to use SNS than ever before to disseminate false rumors that are spread quickly through SNS (Doerr et al., 2012), which raises the necessity to examine SNS rumors in today's society.

Third, in examining the participants' SNS dependency, this study differentiated between social and informational dependency. The strength of this study is the consideration of individual differences in the functions that SNS provides for users, and the recognition of different aims that information seeking behavior may be attempting to accomplish. The results indicate that the two types function differently in the interactions with rumor credibility, supplementing previous studies regarding SNS dependency, which has not been elaborated in depth on the different dimensions of SNS dependency (e.g. Kim et al., 2015). Lastly, examining people's behaviors with the aim of constructing rational communication after they receive rumors is another imperative step that this study performed in extending the understanding of rumor communication. By dividing information-seeking behaviors into the quantity and accuracy-oriented, this study distinguished itself from previous rumor studies that did not deeply consider people's actual efforts to eradicate irrational communication behaviors that includes non-accuracy motivated rumor spreading behavior. Because an informed public is a prerequisite for constructing a deliberative democracy (Weeks, 2000), determining people's actual efforts to build up rational communication against irrationalities is imperative for communication researchers to contribute to societies' well-being.

In conclusion, this paper offers valuable implications for understanding the public's actual behaviors in seeking information in the context of rumors and for how credibility and SNS dependency affect these behaviors in the era of Web 2.0. It underscores how certain factors affect the formation of an informed public. At the same time, this paper found that SNS can play a role in constructing a public sphere depending on individuals' motivations for using it. Thus, it is difficult to perceive SNSs as merely unofficial channels because of the lack of professional gatekeepers, which was argued in previous studies (Leberecht, 2010; Mendoza et al., 2010). The role of SNS in rumor communication is differentiated depending on the motivations for using SNS and on psychological factors including the credibility of rumors. In this way, SNS can function in both positive and negative ways in constructing an informed public.

To our knowledge, this study made a first attempt to assess the effects of people's perception about specific incorrect information on their information seeking behaviors. This study contributes to the growing field of research on information seeking through social media platforms. From the findings of the present paper, in the context of rumor communication, the dearth of information that leads to low perceived credibility is not an exclusive factor in seeking more and accurate information, which is essential in a rational society. Considering that SNS dependency affects information seeking behavior, especially in the era of Web 2.0, the important point is individuals' effortful attempts to be exposed to as much accurate information as possible in order to block false rumors from being circulated and to use SNS in an informational way. From these efforts, SNS can function positively as providing a true public sphere in which laypeople can receive and share accurate information and build up rational communication against the spread of false rumors.

Despite seminal findings, this study also contains some limitations. First, participants were limited to 20 s in this study. Although the selection of participants was based on past research showing people in their 20 s are heavy social media users, generalization of this study is limited. Second, although other types of information seeking can be found, the present study only focused on accuracy-oriented information seeking. Additional research on exploring different types of information seeking can expand discussions on information seeking. In line with this limitation, this study only examined SNS social and information dependency. Because people use SNS for many different reasons, future studies are required to expand the discussions. Finally, the present study is based on the certain incident and limited to South Koreans. Future research is required to examine other incidents and compare between people in different cultures.

Disclosure statement

The authors have no conflict of interest to declare.

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