Why Do People Spread Online Rumors? An Empirical Study

Jong-Hyun Kim[a], Gee-Woo Bock[b,*], Rajiv Sabherwal[c], Han-Min Kim[d]

[a] Leader, Fintech investment team, Korea Investment Partners Co., Korea
[b] Professor, Business School, Sungkyunkwan University, Korea
[c] Professor, Sam M. Walton College of Business, University of Arkansas, USA
[d] Doctoral student, Business School, Sungkyunkwan University, Korea

A B S T R A C T

With the proliferation of social media, it has become easier for people to spread rumors online, which can aggravate the issues arising from online rumors. There are many individuals and organizations that are adversely affected by malicious online rumors. Despite their importance, there has been little research into why and how people spread rumors online, thus inhibiting the understanding of factors that affect the spreading of online rumors. With attention seeking to address this gap, this paper draws upon the dual process theory and the de-individuation theory to develop a theoretical model of factors affecting the spreading of an online rumor, and then empirically tests it using survey data from 211 individuals about a specific rumor. The results indicate that the perceived credibility of the rumor affects the individuals' attitudes toward spreading it, which consequently affects the rumor spreading behavior. Vividness, confirmation of prior beliefs, argument strength, and source credibility positively influence the perceived credibility of online rumors. Finally, anonymity moderates the relationship between attitude toward spreading online rumors and the spreading behavior.

Keywords: Online Rumors, Dual Process Theory, De-individuation Theory, Perceived Credibility, Anonymity, Social Media

Ⅰ. Introduction

The growing reach of the internet, the proliferation of online media, and the wide availability of powerful mobile devices all serve to allow and enable people to access and distribute information without spatial and temporal constraints. Despite the tremendous benefits of electronic connectivity and interactivity, the available emerging communication technologies also have adverse side-effects, such as allowing people to easily propagate information that involves the unconfirmed elaboration or annotation of public topics,

events or issues (Zhao et al., 2011). Therefore, it is noted that such information, which is spread through online channels but cannot be verified as true or false during circulation, is characteristically referred to as online rumors (Kwan et al., 2013).

Prior research on this issue indicates that the spreading of online rumors may result in serious damage to an individual's, company's or brand's image, and undermines corporate credibility and consumer loyalty (Kimmel, 2004; Thomas, 2007). Even if the rumor is subsequently proved to be false, it may already have caused considerable damage to the reputation of the individual or the organization at the object of the rumor. Moreover, despite the falsification, the rumor would continue to float online, and continue to adversely affect the reputation of individuals or companies.

Researchers have used several perspectives to explain why people spread rumors online. Some research argues that people adopt and spread rumors online because information presented in the online environment lacks verification from professional gatekeepers, while others stipulate that anonymity – which enables people to plagiarize, alter, and misrepresent information – may motivate the spreading of rumors (Metzger et al., 2003). Also, Burbules (1998) suggests that the "leveling effect" due to the presentation of online information in a similar format places all information on the same level of accessibility, and therefore, all authors on the same level of credibility. Besides, for this reason researchers have explored how rumors are propagated through online networks, by focusing on the assessment of information credibility (Thomas, 2007), the network patterns of online rumors (Kwan et al., 2013), and the modeling of rumor dynamics (Zhao et al., 2011).

It is noted that, although much progress has been made in the examination of spreading rumors online,

most prior studies have produced fragmented and equivocal research findings mainly due to the lack of a coherent theoretical foundation (Ashkanasy, 2017). The qualitative studies of online rumor play a dominant role in online rumor research, with case and content analysis as the main method (Brandtzaeg and Følstad, 2017; Jong and Dückers, 2016). Quantitative studies of online rumors have been studied as a part of cyberbullying (Lowry et al., 2016) and there is a lack of research that clearly examines online rumors except for Oh et al. (2013) and Chua and Banerjee, (2018). In other words, scientific, systematic, and quantitative studies on online rumors are rarely used (Tian and Chen, 2013). Consequently, the conditions under which people may be more likely to spread rumors online remain unclear, and need to be further investigated (Liu and Yu, 2013).

To address this gap, this study develops a research model that explains individuals' behavior of the spreading online rumors. This paper posits that *the perceived credibility of a rumor* is a key to predicting this behavior because people tend to accept a rumor with a certain degree of probability depending on its importance and credibility (Agarwal et al., 2008; Walthen and Burkell, 2002). The dual process theory is adopted to explore the antecedents of the perceived credibility of a rumor (Deutsch and Gerrard, 1955). It examines how an individual or individuals judge the credibility of information, providing a broad guideline for identifying the antecedents of an individual's judgment of credibility. In addition, drawing upon the de-individuation theory (Spears et al., 2002) which explains how *anonymity* plays a significant role in shaping individuals' communication activities online (Jessup et al., 1990; Sproull and Kiesler, 1991), we posit that the degree of anonymity moderated the behavior of individuals when spreading online rumors. Based on these arguments, this

paper addresses the following questions: 1) What factors influence the perceived credibility of an online rumor? 2) How does anonymity play a role in shaping individuals' behavior of spreading online rumors?

The results of this research offer implications that can be applicable and useful for both the academia and the business. For the academia, the study contributes to a richer understanding of an individuals' behavior of spreading online rumors by identifying the antecedents of the credibility of a rumor, which affect the extent to which people spread rumors online. For the industry, the study provides some initial guidelines for identifying rumors that may be more likely to spread online, and thereby developing strategies to appropriately cope with and manage the influence of online rumors and their potentially adverse effects on a business or an individual's reputation and goodwill in the community.

Ⅱ. Literature Review

2.1. Definition of Online Rumors

We draw attention to the fact that authors in several disciplines have defined and identified the characteristics of a rumor. Knapp (1944) states that a rumor is "a proposition for belief of topical reference disseminated without official verification" while Allport and Postman (1947) define a rumor as "a specific proposition for belief, passed along from person to person, usually by word of mouth without secure standards of evidence being present." Jaeger, Anthony and Rosnow (1980) define a rumor as "a proposition for belief in general circulation without certainty as to its truth" and DiFonzo and Bordia (2007) define a rumor as "unverified and instrumentally relevant information statements in circulation that arise in

contexts of ambiguity, danger or potential threat and that function to help people make sense and manage risk." Therefore, the definition of a rumor should contain the following three elements: the rumor: (1) is a proposition of belief; (2) is officially unverified when issued; and (3) should deal with either current events or topical issues to express the emotional needs of community and/or to help people make sense in the context of ambiguity, danger or potential threat. In addition, it is necessary to state the specific means by which an online rumor is transmitted. Accordingly, this paper defines an online rumor as *a proposition of belief of topical issues to a society disseminated by online means without official verification (to express the emotional needs of community and/or help individuals to make sense in the context of ambiguity, danger or potential threat).*

2.2. Forms of Rumors

There are many ways to classify rumors. If we consider the forms of rumors according to the motivational scheme because this study is interested in investigating factors affecting spreading rumors, Knapp (1944)'s classification is perhaps the most popular as well as appropriate. Knapp categorized over 1,000 wartime rumors as either dread (fearful of a negative event), wishful (hopeful of a positive event) or wedge-driving (expressing hostility toward a people-group) (DiFonzo and Bordia, 2007, p. 37). In this study, we especially focus on the motivational factors for spreading wedge-driving rumors, which can be applied to group-organizational rumors, and may be most frequently seen today on the Internet. Moreover, a sample rumor chosen for this study is expressing hostility toward a person called Tablo, a Korean singer. The following news describes it (Abbott and Makowsky, 2010):

"Daniel Seon Woong Lee, better known in Korea as recording artist Tablo, graduated from Stanford with a seemingly uncontroversial record: two English degrees, a bachelor's in 2001 and a master's in 2002. But over the past ten months, an Internet campaign has launched attacking Lee's credentials and, he says, threatening him and his family. Lee received a master's degree in English through Stanford's co-term program in 2002. Lee, the front man of premier Korean rap group Epik High, became aware of the allegations that he was not a Stanford graduate in March, when he began receiving threats to his Twitter account. The sources of the attacks were netizens – vocal participants in an online community – who question the validity of Lee's Stanford degrees. An intervention from Stanford Registrar Tom Black and a letter from English professor Tobias Wolff did little to help stop the movement.

The campaign to discredit Lee's degrees exploded. One of the largest antagonists, the netizen group "We Urge Tablo to Tell the Truth," formed in May and now has more than 131,000 members. The allegations range widely – that Lee has exaggerated his grade point average and that he claims he was best friends with Reese Witherspoon when she attended Stanford, for example. Black said verifying a person's degree from the University is not an unusual practice, but he has never seen a case this severe. Black released a copy of Lee's transcript, and when that did not prove satisfactory, he wrote a letter vouching for Lee's attendance and graduation. Recently, Black allowed camera crews to film him printing a degree to show that none of the process is fraudulent. Black said that he does not think the netizens will stop asking questions. He has stopped responding to e-mails concerning Lee. "It's all just rumor and innuendo," Black said. "It's not truth they're after. It's just to ruin his life." Lee maintains that he is not

angry and even waited several months before pursuing legal action. He hopes a documentary airing on October 2, 2010 in Korea ("Tablo Goes to Stanford," on Korean network MBC) will vindicate his reputation."

After the nationwide Munhwa Broadcasting Corporation (MBC) network aired the documentary on October 2, 2010, the Korean police reported the results of the investigation about the verity of the Tablo rumor on October 8, 2010. The rumor was proved false by the concerned authorities, but it survived over a long period of time, and continued to be circulated on the Internet. The conventional notion that people spread rumors because they believe them to be credible regardless of the underlying truth. Walthen and Burkell (2002) proposed an iterative model explaining how people judge the credibility of online information. The assessment of information credibility occurs in three stages. First, the users form an impression of the overall credibility of information by examining its surface characteristics and organization. Next, the information content is evaluated for credibility by considering the characteristics of the source and message. The third stage involves the individual's cognitive state at the time of evaluation, which reflects the purpose in seeking the information, prior knowledge of the topic, and the time available to retrieve and process information.

Along the similar lines, other researchers have also identified that people evaluate the credibility of information based on three components: source, message, and receiver (Cindy et al., 2012; Zhang and Watts, 2003). All of the above factors primarily address how the individuals evaluate and judge the credibility of information from their own point of view. Therefore, this study is also built upon three major components: source (the characteristics of the source), message (the characteristics of message), and

receiver (a receiver's cognitive state such as the purpose in seeking the information, prior knowledge of the topic, and the time available to retrieve and process information).

Ⅲ. Theoretical Background and the Development of Research Model

3.1. The Dual Process Theory

In order to figure out how these factors can affect the credibility of rumor, and consequently, spreading of rumor, we have adopted the dual process theory (DPT) and the de-individuation theory. The dual process theory (DPT), proposed by Deutsch and Gerrard (1955), effectively explains that the credibility of information depends not only by informational influence (i.e., the information receiver's evaluation of the target information), but also on normative (i.e., social) influence. Prior studies have used this theory to many contexts such as neighborhoods, university settings, and workplace communities, demonstrating the significance of joint effects between informational and normative influences when examin-

ing the credibility of information (Kaplan and Miller, 1987). Researchers invoke DPT because of its comprehensive perspective in explaining individuals' behaviors in relation to online communication (Sia et al., 2002).

Drawing upon DPT in <Figure 1>, we posit that the evaluation of the credibility of an online rumor is determined by the combinatorial effect of two major dimensions: informational and normative influences (Deutsch and Gerrard, 1955). *Informational influence* arises from information obtained from others as evidence of reality. It is based on the receiver's self-judgment of the received information, and hence, the information-related components such as message (content), source and receiver (Hovland et al., 1953). Accordingly, the characteristics of such as argument strength, vividness, the characteristics of source such as source credibility, and the characteristics of a receiver such as prior knowledge, confirmation of prior beliefs in prior literature can fall on the information influence category. On the other hand, *normative influence* has not been actively studied in previous research in the context of online rumor spreading. It refers to the influence on the individual arising from the norms/expectations of others that are either
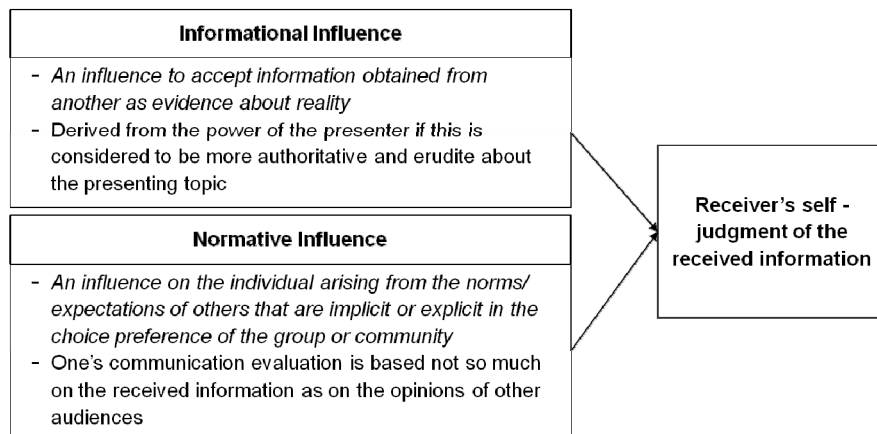
<Figure 1> Dual Process Theory
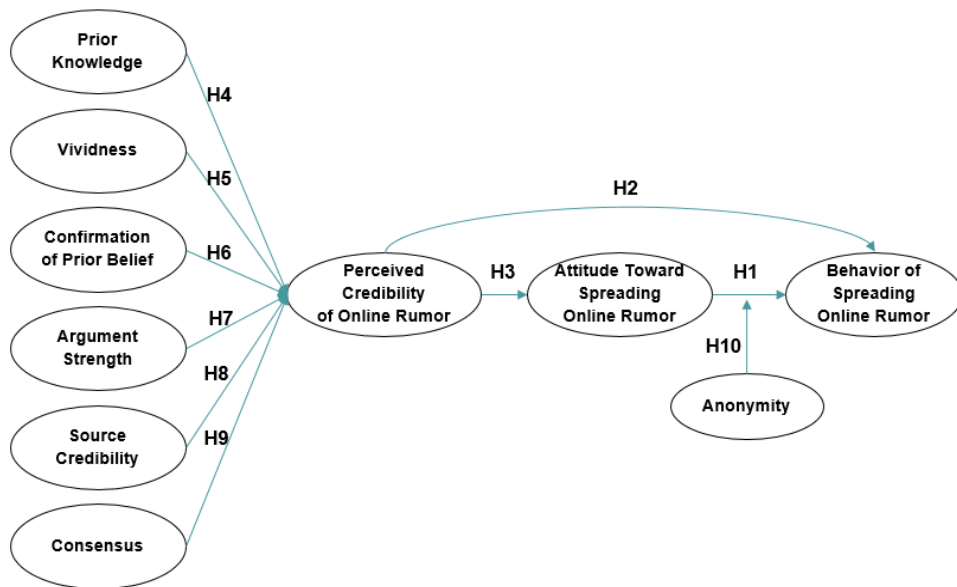
<Figure 2> Research Model

implicit or explicit in the choice of preferences of the group or community. From this point of view, consensus among receivers can be regarded as the normative influence (<Figure 1>).

Next, we argue that the attitude toward spreading online rumors is determined by the extent to which an individual perceives the rumor to be credible. This analytical framework characteristically offers a set of theoretical constructs for studying the determinants of rumors as in <Figure 2>.

3.1.1. Attitude and Spreading Behavior

Studies note that an individual's attitude is a psychological tendency that is expressed by evaluating a particular entity with degrees of "like" or "dislike" (Eagly and Chaiken, 1993). The Theory of Reasoned Action (Fishbein and Ajzen, 1975) suggests that a person's volitional behavior can be predicted by his or her attitude toward that specific behavior. This theoretical linkage has been empirically supported across a wide range of research contexts such as persuasion (Anderson, 1995), technology adoption (Connolly et al., 1990), and consumer behavior (Schiffman and Kanuk, 2004). Prior studies commonly state that individuals are expected to behave in such a way as to not to contradict their attitudes toward a particular object. In particular, communication studies have demonstrated that an individual's behavior of spreading rumors is determined by his or her attitude toward the spreading of the rumors (Kim and Bock, 2011). Therefore, with the application of this link between attitude and behavior.

H1: The attitude toward spreading online rumors will positively influence the behavior of spreading the online rumors.

3.1.2. Perceived Credibility of a Rumor

Although online media has changed the manner of rumor transmission from "hearing" by word of

mouth to 'seeing' via written online messages, the factors pertaining to the spread of online rumors are analogous to the factors proposed by earlier persuasion studies (Esposito, 1986) to the large extent that people are more likely to spread rumors when they are convinced by the information (Esposito, 1986; Jaeger et al., 1980). In other words, people spread a rumor because they believe that it appears to be credible regardless of the truth behind the rumor or what is being said or shared with others (Walthen and Burkell, 2002).

The credibility of a message is a receiver-based judgment that involves both objective judgments of information quality and subjective perceptions of the source's trustworthiness, expertise, attractiveness, and other qualities (O'keefe, 2002). Several studies in the communication literature suggest that the decision to transmit a rumor may be influenced by one's confidence in the truth of the rumor (Jaeger et al., 1980; Kimmel and Keefer, 1991; Rosnow et al., 1986). Esposito (1986) examined the relationship between belief and rumor transmission using questionnaire data collected from graduate and undergraduate students under unusually tragic circumstances. The results were consistent with those of Rosnow et al. (1986), and Kimmel and Keefer (1991)'s, which posited that people were more inclined to pass along rumors they believed to be true than those rumors that they believed were false. Some studies, of course, suggest that there is an association between belief in a rumor and rumor-specific attitudes (Scheper-hughes, 1990).

H2: Perceived credibility of online rumors will positively influence the behavior of spreading the online rumors.

H3: Perceived credibility of online rumors will positively influence the attitude toward spreading the online rumors.

3.1.3. Prior Knowledge

In the marketing literature, prior knowledge is defined as an individual's perception of how much (s)he knows about a product. In other words, prior knowledge of customers is considered a key factor affecting their processing of information (Alba and Hutchinson, 1987). Notably, there are previous studies that further posit that assessment of the message presentation and content depend on the users' prior knowledge of the topic and the time available for information retrieval and processing (Johnson and Russo, 1984). In this study, we measure whether an individual has sufficient preexisting knowledge on the rumor to understand it. Prior knowledge can be considered as important in influencing an individual's degree of confidence in the incoming information. Prior knowledge is also closely related to confidence in one's own decision making (Jingjun et al., 2011).

H4: Prior knowledge will positively affect the perceived credibility of online rumors.

3.1.4. Vividness

To enumerate, vividness refers to the extent to which information is emotionally interesting, concrete, image provoking, and proximate in a sensory, temporal, or spatial way (Nisbett and Ross, 1980). Additionally, vividness is defined as a mediated environment's representational richness based on its formal features, i.e., how the environment presents information to an individual's senses (Steuer, 1992). It includes two sub-dimensions: breadth, i.e., the number of different senses that a medium can engage, and depth, i.e., how closely a medium can replicate parts of the human sensory system (Steuer, 1992).

Not surprisingly, if websites effectively use rich media tools, they can attract more attention from online readers (Zeff and Aronson, 1997). Wasko and Faraj (2005) suggest that people who rate the quality of information as higher due to sophisticated representation formats are more likely to share it. For this reason, if an online rumor's receivers encounter vivid information for the rumor, they are more likely to pass it on.

H5: Vividness will positively affect the perceived credibility of online rumors.

3.1.5. Confirmation of Prior Belief

Previous research indicates that confirmation or disconfirmation of a prior belief significantly influences the perceived credibility of the received information (Fogg et al., 2001), i.e., the level of confirmation between the received information and the receiver's prior beliefs (Luo et al., 2009). The previous work on scientific reasoning and social cognition shows that people use their prior beliefs when evaluating new information, and such beliefs are often stubbornly held and resistant to change (Lord et al., 1979). In addition, confirmation-bias literature in psychology shows that people have greater confidence in new information that confirms their prior beliefs. In the e-WOM context, when consumers perceive information to be consistent with their prior expectations, they have more confidence in the belief of it (Zhang and Watts, 2003). Conversely, if the new information disconfirms to their prior beliefs, consumers are likely to refuse to accept the recommendation and discount its validity. Therefore, for this reason, this logic can also be applied to the credibility of online rumors.

H6: Confirmation of prior beliefs will positively affect the perceived credibility of online rumors.

3.1.6. Argument Strength

Argument strength is defined as the extent to which the message receiver views the argument to be convincing or valid in supporting its position (Cacioppo et al., 1983). Namely, argument strength is concerned with the quality of the received information, such as completeness and logic (Kim and Benbasat, 2009). If the received information is perceived to be made up of valid arguments, the receiver will develop a positive attitude toward the information and consider the received information to be credible (Cacioppo et al., 1983). On the other hand, if the received information appears to be comprised of invalid arguments, the receiver will apparently develop a negative attitude toward the information, and it can be predicted that the receiver will be inclined to treat it as not credible. Argument strength has been found to be an important element used by individuals in the evaluation of incoming communications (Nabi and Hendriks, 2003).

H7: Argument strength will positively affect the perceived credibility of online rumors.

3.1.7. Source Credibility

Several studies in persuasion show source credibility to be associated with attitude formation and change (Petty and Cacioppo, 1981). Additionally, studies show that attribution to a credible source is an important part of the typical formulation of a rumor (Bird, 1979; Blake et al., 1974). Moreover, rumors gain plausibility by the addition of authoritative citations and a media source from which the

rumor was supposedly heard (Blake et al., 1974). Accordingly, rumors are frequently ascribed to high-status community members (Bird, 1979).

H8: Source credibility will positively affect the perceived credibility of an online rumor.

3.1.8. Consensus

The normative influence occurs when information on the position preferred by other members is available (Kaplan and Miller, 1987). Kelly (2004) defined consensus as the agreement of two or more individuals on the performance level of a product. For example, if an individual finds that others experience the same effect with respect to the same object or person, (s)he will have greater confidence in the effect. If many other individuals think something is correct or good, an individual will be likely to think that way as well (Sundar, 2008). Consequently and for this reason, consensus information is considered likely to have a greater effect on interpersonal communication than non-consensus information (Pincus and Waters, 1977). In other words, people tend to believe what is believed by most even if it is not true (Deutsch and Gerrard, 1955). The strength of consensus is reinforced when more supportive viewpoints from different individuals are incorporated (Weiner, 2000). People automatically tend to trust sites and sources that are either recommended by known others or come from aggregated testimonials, reviews or ratings (Chaiken, 1987).

H9: Consensus will positively affect the perceived credibility of online rumors.

3.1.9. Anonymity and the De-individuation Theory

Anonymity ranges from complete anonymity to complete revealing of one's identity, in terms the extents of unlinkability and unobservability (Cho and Kim, 2012), which depend on the online media platform in which the individual is involved (Ma and Agarwal, 2007). The technical functions of the online medium influence individuals' perceptions of the degree to which the medium allows for disclosure, either by leading them to express their identities, share their personal information, and expose details of their activities, or by allowing them to completely close off their personal information (Ma and Agarwal, 2007). It is notable that anonymity is a key characteristic of computer-mediated communication and individual users have different levels of anonymity, an individual's online behavior may be explained by considering the degree of anonymity when interacting with others (Jessup et al., 1990; Kiesler et al., 1984; Moore et al., 2012).

Based on the *de-individuation theory*, the influence of anonymity on an individual's behavior of spreading online rumors can be explained by a two-fold process. First, anonymity may foster uninhibited behavior such as spreading rumors online, because being an unknown entity or individual hiding behind the veil of the Internet, enables people to feel less uncomfortable when they spread the rumors. Therefore, this result was identified because anonymity lessens the perception of appraisal from others and fosters anti-normative behaviors by diminishing self-awareness (Kiesler et al., 1984; Sproull and Kiesler, 1991). Second, given the conditions of anonymity and reduced observable social cues relative to face-to-face interactions, an individual's motivation to generate more interesting arguments is stimulated by the provision of anonymity (Connolly, 1990). Accordingly, the use of anonymity shapes individuals' behavior of spreading rumors online by amplifying the effects of undesirable social-psychological influences on

opinion-expression behavior. For this reason, we posit the following moderating effect, which is shown in <Figure 2> along with the above hypotheses:

H10: Anonymity will positively moderate the relationship between the attitude toward spreading online rumors and the behavior of spreading the online rumors.

Ⅳ. Methods

As mentioned earlier, a sample rumor on a Korean celebrity, with a nickname of Tablo, was selected. The reference to this rumor, and the reference to a specific target, and helping respondents recall their behaviors with respect to spreading the specific rumor were expected to increase the respondents' accuracy in the survey.

4.1. Measurements and Data Collection

The survey items were adapted from previous research with some modification to fit the context of the present research (Smith and Vogt, 1995; Zhang and Watts, 2003). For vividness, source credibility, consensus, spreading online rumors and anonymity, we worked to incorporate the online aspects into the items. Additionally, a multimedia feature of online medium was reflected in the measure of vividness, the names of online communities which were created to deal with Tablo's rumors were included in the items for source credibility. The consensus items ask the degree to which individuals agree on other people's opinions with respect to the same object.

After the modifications, a bilingual person was engaged to first translate the English version into Korean following Brislin (1970)'s approach for back translation. Another bilingual translator (who was

not aware of the original English version) was then engaged to translate the Korean version back into English. The two English versions as noted were then compared to ensure that there were no significant differences in the meanings of the versions used for the study. The translated Korean version was then finalized together upon collaboration by two of the authors, as well as the assistance from the two translators.

A preliminary test of the survey instrument was conducted prior to the main data collection, using two individuals with doctoral degrees and eight carefully selected doctoral candidates. The 10 individuals were asked to complete the paper questionnaire, interviewed to report any difficulties in understanding the questions, and invited to give suggestions. The results did not reveal any significant issue in understanding the survey instructions and items. The statistical results for the small sample were satisfactory. Based on the suggestions made from the 10 respondents, some minor changes were made, such as the addition of further explanations on items.

Thereafter, a pilot test of the online questionnaire was conducted in the portal of a leading university in Korea for the duration of one week. The online questionnaire included two main sections. The first section of the questionnaire provided an explanation of the general research purpose and a brief story about the Tablo rumor. This section also included explanations of some special terms used in the questionnaire. In the second section, the respondents were asked to answer the questions referring to the Tablo rumor as they had heard or read from various media sources. It is noted that out of the 63 pilot responses, 56 were considered complete. A paired t-test indicated a significant difference ($p < 0.01$) between the beliefs in the rumor before and after the police report. Based on the survey responses,

the survey items were restructured to focus on the situation before the police report to examine why people would spread rumors online in the first place, and the survey method was changed to a paper-based questionnaire in order to explain the purpose of the study and instructions of the survey sufficiently before the survey.

The respondents of the main survey were undergraduate students from three universities in South Korea, who were encouraged to recall the situation prior to the police report. A total of 211 responses were received. Extra academic points were given as an incentive to the survey participants to fill out and return the survey questionnaire. The questions were asked regarding the participants' perceptions of their prior knowledge, vividness, confirmation of prior beliefs, argument strength, source credibility, and consensus. The items on perceived credibility of the online rumor, attitude toward spreading the online rumor, and behavior of spreading the online rumor were also included in this section. Finally, the respondents were asked to provide some personal demographic information. The operational definitions and measurement items are shown in <Table 1>.

<Table 1> Definition and Measurement Items of the Constructs

Construct	Item	Definition and Measures
Prior Knowledge		Definition: The extent to which an individual has background knowledge required to understand a particular rumor (Rudell, 1979)
	Item1	I don't have any difficulty in understanding the Tablo rumor
	Item2	I don't need others' help to understand the Tablo rumor
	Item3	I think I have sufficient knowledge to understand the Tablo rumor
Vividness		Definition: The representational richness of a mediated environment as defined by its formal features; the way in which an environment presents information to the senses (Steuer, 1992)
	Item1	The information with concrete figures enhanced the reality of the Tablo rumor
	Item2	The information with a concrete case enhanced the reality of the Tablo rumor
	Item3	The information with multimedia enhanced the reality of the Tablo rumor
	Item4	The information with a motion picture enhanced the reality of the Tablo rumor
	Item5	The information with concrete evidence enhanced the reality of the Tablo rumor
	Item6	The information with jargon enhanced the reality of the Tablo rumor
Confirmation of Prior Belief		Definition: The level of confirmation between the received information and their prior beliefs (Cheung et al., 2009)
	Item1	Information about the rumor corresponded to what I had known before reading it Information
	Item2	about the rumor supported my impression of Tablo
	Item3	Information about the rumor confirmed information I had previously known about Tablo
Argument Strength		Definition: The extent to which the message receiver views the argument as convincing or valid in supporting its position (Cacioppo et al., 1983)
	Item1	The argument about the Tablo rumor was convincing
	Item2	The argument about the Tablo rumor was valid
	Item3	The argument about the Tablo rumor was persuasive
	Item4	The argument about the Tablo rumor was logical

<Table 1> Definition and Measurement Items of the Constructs(Cont.)

Construct	Item	Definition and Measures
Source Credibility		Definition: The information source's trustworthiness and expertise (Hovland and Weiss, 1951)
	Item1	I trusted the information that the Tajinyo provided
	Item2	I trusted the information that the Sangjinse provided
	Item3	I trusted the information that Whatbecomes provided
Consensus		Definition: The degree to which individuals agree on other people's opinions with respect to the same object (Kelley, 1967)
	Item1	I agree on the argument regarding the Tablo rumor that has a lot of hits
	Item2	I agree on the argument regarding the Tablo rumor that has a lot of comments
	Item3	I agree on the argument regarding the Tablo rumor that has a lot of recommendations
	Item4	I agree on the argument regarding the Tablo rumor that most people state identical opinions
Perceived Credibility of Online Rumors		Definition: A cognitive evaluation of the entity that constitutes an individual's beliefs about the object (Esposito, 1986; Jaeger et al., 1980; Rosnow et al., 1986)
	Item1	I thought the Tablo rumor was realistic
	Item2	I thought the Tablo rumor was plausible
	Item3	I thought the Tablo rumor was believable
Attitude toward Spreading an Online Rumors		Definition: An individual's degree of like or dislike for an object (Fishbein and Ajzen, 1975)
	Item1	I thought spreading the Tablo rumor was desirable
	Item2	I thought spreading the Tablo rumor was valuable to me
	Item3	I thought spreading the Tablo rumor was important to me
	Item4	I thought spreading the Tablo rumor was meaningful to me
Spreading an Online Rumors		Definition: An individual's observable response in a given situation with respect to a given target (Fishbein and Ajzen, 1975)
	Item1	I transmitted the Tablo rumor by online means
	Item2	I posted the Tablo rumor on SNS or BBS or a blog
	Item3	I transmitted the Tablo rumor by online means without editing the contents
	Item4	I posted the Tablo rumor on SNS or BBS or blog without editing the contents
	Item5	I transmitted the Tablo rumor by online means after editing the contents
	Item6	I posted the Tablo rumor on SNS or BBS or blog after editing the contents
Anonymity		Definition: The degree to which a communicator perceives own identity as unknown or unspecified (Scott, 1998)
	Item1	I don't reveal my real name when I do online communication
	Item2	I don't reveal my email address when I do online communication
	Item3	I don't reveal my telephone number when I do online communication
	Item4	I don't reveal my personal information when I do online communication

Note: Tajinyo = Cafe website 'meeting to ask the truth to Tablo', Sangjinse = Cafe website 'common sense is the truth world', Whatbecomes = Website nick name of a prime mover who spread Tablo rumor. A seven-point Likert scale ranging from "Strongly agree" to "Strongly disagree.")

4.2. Measures

The questionnaire was carefully ordered to prevent common-method bias. Common method bias is a measurement error (Podsakoff et al., 2012) that threatens the validity of conclusions drawn upon the statistical results. Among the various methods to test common method bias, Harman's single factor test is the most widely used in the literature (Podsakoff et al., 2003). If a single factor accounts for less than 50 percent of all the variables in the model, this indicates that the statistical results are not affected by common method bias. As 37.1 percent of the variance herein was explained by a single factor, common method bias was not a major concern in this study. This result was obtained by running unrotated, a single factor constraint of factor analysis in SPSS. This study also conducted another test for common-method bias. This test is to examine a correlation matrix. If correlation values among constructs exceed more than 0.90 it may have the common-method bias problem (Pavlou et al., 2007). However, this study has no high correlation values as shown in <Table 5> (the highest correlation: 0.66). Therefore, common-method bias is not a major concern in this study.

211 respondents include 141 (66.8%) males and 70 (33.2%) females. A large proportion of the participants were less than 25 years old (86.7%), as shown in <Table 2>. All the respondents were generally familiar with the Internet, with 178 (84.4%) reporting using the Internet for more than one hour per day on average.

Ⅴ. Analysis and Results

5.1. Measurement Model

The partial least squares (PLS) was used to test convergent validity. As shown in <Table 3>, the composite reliability and Cronbach's alpha of all constructs exceed the threshold of 0.70, recommended by Fornell and Larker (1981).

The discriminant validity describes the degree to which the measure of a construct is distinct from the measures of other constructs that it does not theoretically resemble. Prior literature recommends that the value of AVE (Average Variance Extracted) should be above 0.50 (Fornell and Larcker, 1981), and that the square root of every AVE of each construct should be larger than the correlation among any pair of constructs involving that construct (Fornell and Larcker, 1981; Fornell and Bookstein, 1982). As can be seen in <Table 4>, all values of the square root of AVE are above 0.50, and the square root of every AVE is larger than the associated correlations. Therefore, we conclude that the measures satisfy the criteria for convergent and discriminant validities.

<Table 2> Demographic Information of Respondents

Gender	Male	141 (66.8%)
	Female	70 (33.2%)
Age	Under 20	53 (25.1%)
	21-25	130 (61.6%)
	26-30	28 (13.3%)

<Table 3> Descriptive Results and Internal Consistency of Constructs

Construct	Number of Items	AVE	Composite Reliability	Cronbach's Alpha
Prior Knowledge	3	0.74	0.89	0.83
Vividness	6	0.82	0.96	0.96
Confirmation of Prior Belief	3	0.99	0.99	0.99
Argument Strength	4	0.91	0.97	0.95
Source Credibility	3	0.95	0.98	0.97
Consensus	4	0.81	0.94	0.92
Perceived Credibility of Online Rumors	3	0.94	0.98	0.97
Attitude toward Spreading Online Rumors	4	0.90	0.96	0.94
Behavior (Spreading Online Rumors)	6	0.96	0.98	0.98
Anonymity	4	0.71	0.91	0.87

Note: The factor loadings for all constructs are shown in the Appendix. The 211 responses are used.

<Table 4> Square Roots of AVE and Cross-Correlations

	AVE	ANMT	AGST	ATTD	COPB	PCOR	PKLG	SRCR	CSSS	BHVR	VDNS
ANMT	0.71	0.84									
AGST	0.91	0.18	0.95								
ATTD	0.89	0.19	0.50	0.94							
COPB	0.99	0.15	0.43	0.46	0.99						
PCOR	0.94	0.22	0.58	0.57	0.54	0.97					
PKLG	0.74	0.10	0.17	0.25	0.04	0.12	0.86				
SRCR	0.95	0.35	0.64	0.59	0.66	0.62	0.25	0.97			
CSSS	0.81	0.16	0.39	0.45	0.45	0.39	0.17	0.56	0.90		
BHVR	0.96	0.29	0.42	0.57	0.46	0.50	0.25	0.61	0.38	0.98	
VDNS	0.82	0.23	0.47	0.23	0.25	0.43	0.11	0.52	0.38	0.20	0.91

Note: Diagonal elements (in bold) are the square root of the average variance extracted (AVE). Off-diagonal elements are the correlations among constructs.

5.2. Test of the Structural Model

The PLS was also used to test the research model. The PLS is a latent structural-equation modeling technique that is used as a component-based approach for estimation (Lohmoller, 1989). It is particularly useful in respect to predicting a set of dependent variables from a large set of independent variables with less restrictive demands on the sample size and residual distribution (Chin, 1998). The results show that the model explains 46.6 percent of the perceived credibility of an online rumor and 32.5 percent of the variance in the attitude toward spreading the online rumor. The attitude toward spreading the online rumor and the perceived credibility of the rumor explains 42.7 percent of the variance in the behavior

<Table 5> Results for the Hypothesized Model

Hypothesis	Path Coefficient	t-value	Result
Perceived Credibility of Online Rumors	$R^2 = 0.47$		
Prior Knowledge (H4) ns	0.03	0.63	Not Supported
Vividness (H5)**	0.18	3.02	Supported
Confirmation of prior belief (H6)**	0.35	5.42	Supported
Argument strength (H7)**	0.34	4.65	Supported
Source Credibility (H8)**	0.53	8.82	Supported
Consensus (H9) ns	0.01	0.20	Not Supported
Attitude toward Spreading Online Rumors	$R^2 = 0.33$		
Perceived Credibility of Online Rumors (H3)**	0.57	9.69	Supported
Anonymity (H10)**	0.21	3.31	Supported
Behavior of Spreading an Online Rumors	$R^2 = 0.43$		
Attitude (H1)**	0.36	5.19	Supported
Perceived Credibility of Online Rumors (H2)*	0.17	2.51	Supported

Note: $*p < 0.05$, $**p < 0.01$, ns: insignificant at the 0.05 level

of spreading the online rumor.

The four determinants of informational influence on the perceived credibility of the online rumor are supported. Specifically, Vividness (H5), Confirmation of prior belief (H6), Argument strength (H7), and Source Credibility (H8) are all found to be statistically significant at the $p < 0.01$ level. On the other hand, Prior knowledge (H4) and Consensus (H9) do not significantly influence the perceived credibility of the online rumor. In addition, as expected, anonymity significantly moderates the relationship between attitude toward spreading an online rumor and behavior of spreading the rumor. Thus, all hypotheses except H4 and H9 are supported. <Table 5> presents the results.

Ⅵ. Discussion

This study's goal was to examine the conditions under which people are more likely to spread online rumors. To that end, this study offers explanations that "open the black box" toward a better under-

standing of the behavior of individuals in spreading online rumors. In particular, based on prior literature, the perceived credibility of an online rumor was identified as a key predictor of an individual's attitude toward spreading the online rumor, which in turn directly influenced the behavior of spreading the rumor. Second, employing DPT, the antecedents of the credibility of an online rumor were identified from the two main dimensions of influence (i.e., informational and normative influences), and the expected effects of a set of seven factors representing these two dimensions were proposed in the study. Third, it was hypothesized that anonymity would moderate the effect of attitude toward the rumor on the rumor spreading behavior based on the de-individuation theory. With this in mind, the proposed research model was empirically tested using the data from 211 survey responses in relation to the real case of an online rumor that was widely spread in South Korea and produced significant damage to one person and his family.

The main findings of this study are as follows: (1) the perceived credibility of an online rumor is,

indeed, a key predictor of an individual's attitude toward spreading the rumor, which in turn leads to the actual behavior of spreading it; (2) vividness, confirmation of prior beliefs, argument strength, and source credibility significantly influence the perceived credibility of an online rumor; and (3) anonymity strengthens the positive effect of the attitude toward spreading an online rumor and the actual spreading behavior.

The results of the study above should be interpreted in the light of its limitations. First, the data for testing the hypotheses were collected from South Korean students using a specific sample rumor that falls in the category of wedge-driving rumors (expressive of hostility toward a people-group), which might restrict the generalizability of the findings of this study.

Second, the rumor was about a specific individual, not about a company although it could be applicable to some extent according to the definition of the wedge-driving rumors. Future research could examine the spreading of corporate online rumors, which would allow more practical insights for the development of corporate strategies to cope with the spread of malicious corporate online rumors.

Third, the survey's timing relative to the appearance of the online rumor may have influenced the findings. Future research may benefit from surveys conducted at multiple time periods to examine whether the effects of various factors on perceived credibility of the rumor, attitude toward the rumor, and rumor spreading behavior change over time.

Finally, this study conducted the survey on the topic which had already been identified as false rumors. Although we tried to reduce the bias through careful questionnaire design and conducting of survey, the part of bias could have been persistent. Future studies may be conducted before and after the verity

of rumor turns out.

6.1. Implications for Research

The results of this research indicate that the spreading of rumors online is influenced by the individual's attitude toward the rumor (supporting H1) and the perceived credibility of the rumor (supporting H2). Moreover, people form attitudes toward a specific behavior (e.g., spreading a rumor) based on their beliefs about credibility of the information (supporting H3). These results are consistent with the findings of conventional rumor research from offline settings (Anderson, 1995; Kimmel and Keefer, 1991), implying that individual perception about the credibility of rumors is a critical factor in explaining the spreading behavior online as well. This suggests that individuals or companies should pay more attention to rumors that look more credible, and should address these rumors immediately once they are recognized to have appeared online.

Overall, this study is a response to the call for more in-depth research on rumor-spreading behaviors online, and offers several key implications for academia, especially because the study serves to broaden our understanding of the factors influencing the human behavior of spreading online rumors. The main theoretical contribution of this research is in the development of a model for predicting an individual's behavior of spreading an online rumor based on the DPT. While previous research has focused on face-to-face rumor spreading, few studies have systematically examined the factors influencing an individual's behavior of spreading online rumors based on the solid theory. This study appropriately suggests a holistic framework to explain an individual's behavior for the spreading of online rumors through DPT. This theoretical extension can contrib-

ute to providing a richer understanding of human behavior as seen in the use of online media or venues, suggesting that changing the attitude toward rumors would effectively restrain the spreading of this type of behavior online.

One of the results that we have to pay attention to in relation to the application of DPT is the insignificant effect of the consensus on the perceived credibility of a rumor. Does this mean that the normative influence is insignificant when it comes to the perceived credibility of online rumors? The answer is a resounding "yes," and we offer that it could be true because the informational cues are readily available and abundant on the Internet in the case of spreading online rumors. Another plausible interpretation of this data is that the source credibility plays a critical role than what we would have expected in this study. Consequently, since information from a few communities which have been dedicated to Tablo's rumor can be regarded as already credible to public, the impact of consensus may be limited. If this is the case, then we would need to investigate the impact of normative influence further in future research, because this could be considered to be a unique situation for this study.

Next, this study demonstrates the usefulness of modified measurements for a few constructs in the online context. The online features were reflected on vividness, source credibility, consensus, online rumor spreading behaviors and anonymity and the measurement items for all these constructs were proven to be useful statistically. We note that researchers may improve the items of these constructs based on this study's work.

In respect to the factors affecting the perceived credibility of online rumors, confirmation of prior belief, argument strength and source credibility have major influences on the perceived credibility of online

rumors. In that event, people are more influenced by the central cues of online rumors than peripheral cues such as vividness and/or consensus when they judge the credibility of online rumors. For this reason, these effects can also be explained by the fact that the memory of neutral stimuli decreases, but the memory of arousing stimuli remain the same or improve (Baddeley, 1982; Kleinsmith and Kaplan, 1963; LeBar and Phelps, 1998); that is, if people receive a stronger impulse, an impulse from a credible source, or an impulse that is reinforced by prior beliefs, the stimulus will live in their memory for a long time. On the other hand, prior knowledge turns out to be insignificant. Consequently, this result may be due to the characteristics of the rumor that is examined in this study. As the focal rumor does not require a profound knowledge for the respondents to be able to understand it, we note that the prior knowledge might not have been a significant barrier to understanding the rumor.

Finally, this study supports the strong moderating effect of anonymity on the relationship between the attitude toward and the behavior of spreading an online rumor based on the de-individuation theory. This result supports the expectation that anonymity increases behaviors that may be ordinarily considered as forbidden by diminishing self-awareness (Kiesler et al, 1984; Sproull and Kiesler, 1991).

6.2. Implications for Practice

In particular, with the growing popularity of online media and its potential to propagate misinformation, the ability to cope with and manage online rumor spreading is gaining importance. Individual Internet users and companies need to diagnose the impact and diffusion of online rumors, because the existence of an online rumor may cause serious harm to in-

dividuals and companies. Since it is impossible to delete or destroy all online statements of a rumor once it is initiated on the web, predicting the potential impact of a rumor and taking preventive actions in advance before the spreading of the rumor might be the most feasible ways to quash it. Accordingly, practitioners would benefit from monitoring corporate online rumors and developing strategies to address them effectively to preserve the good name of the corporation in the community. The companies have been advised to automatically assess the credibility of online rumors by classifying their features (Castillo et al., 2011). Our results provide practitioners with meaningful guidance on how to assess the potential credibility of online rumors.

More specifically, the confirmation of prior beliefs, argument strength, and source credibility are found to positively influence the perceived credibility of online rumors. These factors should be carefully con-

sidered when assessing the expected credibility of an online rumor. Accordingly, corporations could establish a guideline and criteria for an early warning system to proactively filter online rumors, which may have a high potential of being massively distributed in a brief space of time. Based on the expected credibility of the rumor, contemporary companies can judge whether the rumor should be addressed proactively at a very early stage, or whether they should wait and observe the rumor in case it disappears or has no significant harmful impact on the corporate reputation.

Acknowledgement

<References>

[1] Abbott, K., and Makowsky, W. (2010). Korean pop star battles attacks on stanford record. accessed *Stanford Daily* on Sept 28, 2010, Retrieved from http://www.stanforddaily.com/2010/09/27/korean-pop-star-battles-attacks-on-stanford-record/.

[2] Agarwal, R., Gupta, A., and Kraut, R. (2008). The interplay between digital and social networks. *Information Systems Research, 19*(3), 243-252.

[3] Alba, J., and Hutchinson, J. (1987). Dimensions of consumer expertise. *Journal of Consumer Research, 13*, 411-454.

[4] Ambrosini, P. J. (1983). Clinical assessment of group and defensive aspects of rumor. *International Journal of Group Psychotherapy, 33*, 69-83.

[5] Anderson, J. R. (1995). *Cognitive psychology and its implications, Fourth edition*. NY: Freeman.

[6] Ashkanasy, N. M., Humphrey, R. H., and Quy, N. H. (2017). Integrating emotions and affect in theories of management. *Academy of Management Review, 42*(2), 175-189.

[7] Baddeley, A. D. (1982). *Your memory, a user's guide*. NY: Macmillan.

[8] Bird, D. A. (1979). *Rumor as folklore: An interpretation and inventory*. Doctoral Dissertation, Indiana University, Bloomington.

[9] Blake, R. H., McFaul, T. R., and Porter, W. H. (1974). Authority and mass media as variables in rumor transmission. Paper presented at *the annual meeting of the Western Speech Communication Association*, Newport Beach, CA.

[10] Brandtzaeg, P. B., and Følstad, A. (2017). Trust and distrust in online fact-checking services. *Communications of the ACM, 60*(9), 65-71.

[11] Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*(3), 185-216.

[12] Brucks, M. (1985). The effect of product class knowledge on information search behavior. *Journal of Consumer Research, 12*(1), 1-16.

[13] Burbules, N. C. (1998). Rhetorics of the web: Hyper-reading and critical literacy. In I. Snyder (Ed.), *Page to screen: Taking literacy into the electronic era* (pp. 102-122). London: Routledge.

[14] Cacioppo, J. T., Petty, R. E., and Morris, K. J. (1983). Effects of need for cognition on message evaluation, recall, and persuasion. *Journal of Personality and Social Psychology, 45*(4), 805-818.

[15] Castillo, C., Mendoza, M., and Poblete, B. (2011). Information credibility on Twitter. *Proceedings of World Wide Web Conference*, Hyderabad, India.

[16] Chaiken, S. (1987). The Heuristic Model of Persuasion. In M.P. Zanna, J.M. Olson and C.P. Herman (Eds.), *Social influence: The Ontario Symposium* (pp. 3-39). Hillsdale, NJ: Erlbaum.

[17] Chin, W. W. (1998). Issues and opinion on structural equation modeling. *MIS Quarterly, 22*(1), 7-16.

[18] Cho, D., and Kim, S. (2012). Empirical analysis of online anonymity and user behaviors: The impact of real name policy. *Proceedings of the 45th Hawaii International Conference on System Sciences* (pp. 3041-3050). Maui, HI, USA.

[19] Chua, A. Y., and Banerjee, S. (2018). Intentions to trust and share online health rumors: An experiment with medical professionals. *Computers in Human Behavior, 87*, 1-9.

[20] Cindy Man-Yee, C., Sia, C. L., and Kuan, K.Y. (2012). Is this review believable? A study of factors affecting the credibility of online consumer reviews from an ELM perspective. *Journal of the Association for Information Systems, 13*(8), 618-635.

[21] Cheung, M. Y., Luo, C., Sia, C. L., and Chen, H. (2009). Credibility of electronic word-of-mouth: Informational and normative determinants of on-line consumer recommendations. *International Journal of Electronic Commerce, 13*(4), 9-38.

[22] Connolly, T., Jessup, L. M., and Valacich, J. S. (1990). Effects of anonymity and evaluative tone on idea generation in computer-mediated groups. *Management Science, 36*(6), 689-703.

[23] Deutsch, M., and Gerrard, H. B. (1955). A study of normative and informational social influence upon individual judgment. *Journal of Abnormal and Social Psychology, 53*(3), 629-636.

[24] DiFonzo, N., and Bordia, P. (2007). *Rumor psychology: Social and organizational approaches.* American Psychological Association. NY: Hamilton Printing.

[25] Eagly, A., and Chaiken. H. (1993). *Psychology of attitudes.* NY: Harcourt Brace Jovanovich.

[26] Esposito, J. L. (1986). *Subjective factors and rumor transmission: A field investigation of the influence of anxiety, importance, and belief on rumormongering.* Doctoral Dissertation, Temple University, Dissertation Abstracts International, 48, 596B.

[27] Fishbein, M., and Ajzen, I. (1975). *Beliefs, attitude, intention and behavior: an introduction to theory and research.* MA: Addison-Wesley Publishing Company.

[28] Fogg, B. J., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., Paul, J., Rangnekar, A., Shon, J., Swani, P., and Treinen, M. (2001). What makes websites credible? A report on a large quantitative study. In J.A. Nicholas and M.L. Schneider (eds.), *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 61-68). NY: ACM Press.

[29] Fornell, C., and Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing Research, 19*(4), 440-452.

[30] Fornell, C., and Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement errors. *Journal of Marketing Research, 18*(1), 39-50.

[31] Habermas, J. (1984). *The Theory of Communicative Action*, McCarthy, T. (trans.). MA: Beacon Press.

[32] Hovland, C. I., and Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public opinion quarterly, 15*(4), 635-650.

[33] Hovland, C. I., Janis, I. L., and Kelley, J. J. (1953). *Communication and persuasion.* New Haven, CT:

Yale University Press.

[34] Jaeger, M. E., Anthony, S., and Rosnow, R. L. (1980). Who hears what from whom and with what effect: A study of rumor. *Personality and Social Psychology Bulletin, 6*, 473-478.

[35] Jessup, L. M., Connolly, T., and Galegher, J. (1990). The effects of anonymity on gdss group process in automated group problem solving. *MIS Quarterly, 14*(3), 312-321.

[36] Jingjun, X., Benbasat, I., and Cenfetelli, R. (2011). The effects of service and consumer product knowledge on online customer loyalty. *Journal of the Association for Information Systems, 12*(11), 741-766.

[37] Jong, W., and Dückers, M. L. (2016). Self-correcting mechanisms and echo-effects in social media: An analysis of the "gunman in the newsroom" crisis. *Computers in Human Behavior, 59*, 334-341.

[38] Johnson, E., and Russo, J. (1984). Product familiarity and learning new information. *Journal of Consumer Research, 11*(1), 542-550.

[39] Kaplan, M., and Miller, C. (1987). Group decision making and normative versus informational influence: Effects of type of issue and assigned decision role. *Journal of Personality and Social Psychology, 53*, 306-313.

[40] Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (pp. 192-238). Lincoln: University of Nebraska Press.

[41] Kelly, S. R. (2004). *Rumors in Iraq: A guide to winning hearts and minds.* Master's thesis, Naval Postgraduate School, Monterey, CA. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.165.3225&rep=rep1&type=pdf.

[42] Kiesler, S., Siegel, J., and McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist, 9*, 1123-1134.

[43] Kim, D., and Benbasat, I. (2009). Trust-assuring arguments in B2C e-commerce: Impact of content, source, and price on trust. *Journal of Management Information Systems, 26*(3), 175-206.

[44] Kim, J. H., and Bock, G. W. (2011, July). A study on the factors affecting the behavior of spreading online rumors: Focusing on the rumor recipient's emotions. In *PACIS* (p. 98).

[45] Kimmel, A. J., and Keefer, R. (1991). Psychological correlates of the transmission and acceptance of rumors about AIDS. *Journal of Applied Social Psychology, 21*, 1608-1628.

[46] Kimmel, A. J. (2004). Ethical trends in psychology and marketing research: an update. Paper Presented at *the 112th Annual APA Convention*, Honolulu, HI.

[47] Kleinsmith, L. J., and Kaplan, S. (1963). Paired associate learning as a function of arousal and interpolated interval. *Journal of Experimental Psychology, 65*, 190-193.

[48] Kwan, S., Cha, M., Jung, K., Chen, W., and Wang, Y. (2013). Prominent features of rumor propagation in online social media. *Proceedings of the 18th International World Wide Web Conference*, Dallas, TX, USA.

[49] LeBar, K. S., and Phelps, E. A. (1998). Arousal-mediated memory consolidation: the role of the medial temporal lobe in humans. *Psychological Science, 9*(6), 490-493.

[50] Liu, L., Qi, J., and Yu, C. (2013). How does praise and rumor spread online? Analyzing user relationships on social networks: A case study of Haidliao. *Proceedings of 20th International Conference on Management Science and Engineering* (pp. 57-65). Harbin, China.

[51] Lohmoller, J. (1989). *Latent variable path modelling with partial least squares.* Heidelberg: Physica-Verlag.

[52] Lord, C. G., Ross, L., and Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*, 2098-2109.

[53] Lowry, P. B., Zhang, J., Wang, C., and Siponen, M. (2016). Why do adults engage in cyberbullying on social media? An integration of online disinhibition and deindividuation effects with the

social structure and social learning model. *Information Systems Research, 27*(4), 962-986.

[54] Luo, C., Cheung, M., Sia, C. L., and Chen, H. (2009). Credibility of electronic word-of-mouth: Informational and normative determinants of on-line consumer recommendations. *International Journal of Electronic Commerce, 13*(4), 9-38.

[55] Ma, M., and Agarwal, R. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities. *Information Systems Research, 18*, 42-67.

[56] Metzger, M. J., Flanagin, A. J., Eyal, K., Lemus, D., and McCann, R. (2003). Bringing the concept of credibility into the 21st century: Integrating perspectives on source, message, and media credibility in the contemporary media environment. *Communication Yearbook, 27*, 293-335.

[57] Moore, M. J., Nakano, T., Enomoto, A., and Suda, T. (2012). Anonymity and roles associated with aggressive posts in an online forum. *Computers in Human Behavior, 28*(3), 861-867.

[58] Nabi, R. L., and Hendriks, A. (2003). The Persuasive effect of host and audience reaction shots in television talk shows. *Journal of Communication, 53*(3), 527-543.

[59] Nisbett, R., and Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall, Inc.

[60] Oh, O., Agrawal, M., and Rao, H. R. (2013). Community intelligence and social media services: A rumor theoretic analysis of tweets during social crises. *Mis Quarterly, 37*(2), 407-426.

[61] O'Keefe, D. J. (2002). *Persuasion: Theory and research.* Thousand Oaks, CA: Sage.

[62] Pavlou, P. A., Liang, H., and Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS quarterly, 31*(1), 105-136.

[63] Petty, R. E., and Cacioppo, J.T. (1981). *Attitudes and persuasion: Classic and contemporary approaches.* Dubuque, IA: Brown.

[64] Pincus, S., and Waters, L. K. (1977). Informational social influence and product quality judgments. *Journal of Applied Psychology, 5*(62), 615-619.

[65] Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

[66] Podsakoff, P. M., MacKenzie, S. B., and Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539-569.

[67] Rosnow, R. L., Yost, J. H., and Esposito, J. L. (1986). Belief in Rumor and Likelihood of Rumor Transmission. *Language and Communication, 6*, 189-194.

[68] Rudell, F. (1979). *Consumer food selection and nutrition information.* NY: Praeger.

[69] Scheper-hughes, N. (1990). Three propositions for a critically applied medical anthropology. *Social Science and Medicine, 30*, 189-197.

[70] Schiffman, L. G., and Kanuk, L. L. (2004). *Consumer behavior.* Prentice Hall, 250-287.

[71] Scott, C. R. (1998). To reveal or not to reveal: A theoretical model of anonymous communication. *Communication Theory, 8*(4), 381-407.

[72] Sia, C. L., Tan, B. C. Y., and Wei, K. K. (2002). Group polarization and computer-mediated communication: Effects of communication cues, social presence, and anonymity. *Information Systems Research, 13*(1), 70-90.

[73] Smith, R. E., and Vogt, C. A. (1995). The effects of integrating advertising and negative word of mouth communications on message processing and response. *Journal of Consumer Psychology, 4*(2), 133-152.

[74] Spears, R., Postmes, T., Lea, M., and Wolbert, A. (2002). When are net effects gross products? The power of influence and the influence of power in computer-mediated communication. *Journal of Sociology, 58*(1), 91-107.

[75] Sproull, L., and Kiesler, S. (1991). *Connections: New*

ways of working in the networked organization. Cambridge, MA: MIT Press.

[76] Steuer, J. (1992). Defining virtual reality: Dimensions determining tele-presence. *Journal of Communication, 42*(4), 73-93.

[77] Sundar, S. S. (2008). The main model: A heuristic approach to understanding technology effects on credibility. In M. J. Metzger and A. J. Flanagin (Eds.), *Digital Media, Youth and Credibility* (pp. 73-100). Cambridge, MA: The MIT Press.

[78] Thomas, S. A. (2007). Lies, damn lies, and rumors: an analysis of collective efficacy, rumors, and fears in the wake of Katrina. *Sociology Spectrum, 27,* 679-703.

[79] Tian, R. Y. and Chen, Z. L. (2013). *Advances in intervention of online public opinion.* Social Physics Series, Beijing, Science Press.

[80] Walthen, C. N., and Burkell, J. (2002). Believe it or not: Factors influencing credibility on the web. *Journal of the American Society for Information Science and Technology, 53*(2), 134-144.

[81] Wasko M., and Faraj, S. (2005). Why should i share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly, 29*(1), 35-58.

[82] Weiner, B. (2000). Intrapersonal and interpersonal theories of motivation from an attributional perspective. *Educational Psychology Review, 12,* 1-14.

[83] Zeff, R. L., and Aronson, B. (1997). *Advertising on the internet.* NY: Wiley Inc.

[84] Zhang, W., and Watts, S. (2003). Knowledge adoption in online communities of practice. In S. T. March, A. Massey, and J. I. DeGross (eds.), *24th International Conference on Information Systems* (pp. 96-109). Atlanta: AIS.

[85] Zhao, L., Wang, Q., Cheng, J., Chen, Y., Wang, J., and Huang, W. (2011). Rumor spreading model with consideration of forgetting mechanism: A case of online blogging live journal. *Physica A, 390*(13), 2619-2625.

\<Appendix\> Factor Loadings for all Constructs

	Component									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
BHVR3	**.91**	.17	.23	.31	.20	.13	.11	.11	.13	.07
BHVR4	**.90**	.09	.26	.25	.19	.18	.12	.08	.06	-.04
BHVR5	**.89**	.11	.25	.20	.23	.18	.12	.08	.11	-.07
BHVR6	**.90**	.09	.26	.24	.21	.20	.16	.08	.11	-.12
ATTD1	.35	.00	.19	**.79**	.18	.16	.09	.09	.06	.02
ATTD3	.34	.09	.22	**.83**	.13	.21	.08	.07	.05	.01
ATTD4	.32	.04	.24	**.86**	.12	.13	.10	.09	.04	.01
VDNS1	.03	**.87**	.09	.09	.12	.10	.03	.10	.04	.04
VDNS2	-.02	**.90**	.08	.02	.15	.05	-.01	.07	-.02	.03
VDNS3	.09	**.90**	.13	.04	.15	.15	-.02	.02	.02	.08
VDNS4	.18	**.87**	.23	.11	.15	.16	.04	.07	-.06	.05
VDNS5	.15	**.88**	.07	-.01	.20	.10	-.02	.12	.03	.02
VDNS6	.12	**.83**	.15	.04	.19	.21	.06	.06	.02	.02
SRCR1	.20	.28	**.85**	.21	.32	.24	.17	.17	.11	.36
SRCR2	.24	.24	**.85**	.27	.33	.24	.22	.17	.07	.38
SRCR3	-.11	.14	**.81**	-.01	.17	.01	-.16	.01	-.06	.81
AGST1	.22	.28	.22	.21	.15	.15	.20	.02	.02	**.87**
AGST2	.26	.28	.17	.21	.10	.15	.17	.07	.00	**.79**
AGST3	.19	.33	.12	.05	.02	.12	.09	.11	.09	**.83**
COPB1	.22	.20	.27	.43	**.91**	.26	.18	.08	-.01	-.21
COPB2	.14	.12	.34	.38	**.92**	.24	.23	.12	-.06	-.28
COPB3	.14	.17	.47	.41	**.90**	.16	.21	.03	-.06	-.22
PCOR1	.27	.31	.38	.39	.28	.12	**.82**	.05	-.03	.14
PCOR2	.26	.40	.32	.36	.26	.13	**.76**	.04	.01	.16
PCOR3	.27	.30	.37	.37	.26	.19	**.82**	.04	-.03	.16
PKLG1	.06	-.00	.01	-.05	.08	.06	.01	.08	**.88**	-.06
PKLG2	.12	-.01	.13	.06	.09	-.04	.07	.10	**.83**	-.07
PKLG3	.15	.04	.09	.10	-.02	.19	.02	-.06	**.84**	.08
CSSS1	.25	.20	.19	.13	.06	**.82**	.11	.02	.02	.07
CSSS2	.18	.17	.09	.21	.14	**.85**	.06	.07	.01	.09
CSSS3	.17	.21	.12	.13	.16	**.84**	-.05	.02	.08	-.04
CSSS4	.04	.18	.20	.14	.22	**.78**	-.01	.10	.15	.00
ANMT1	.10	.11	.04	.18	-.00	.10	.27	**.75**	.22	.09
ANMT2	.14	-.01	.08	.16	.04	.05	.14	**.84**	.02	.11
ANMT3	.00	.12	.09	-.10	.13	-.02	-.06	**.85**	-.00	-.05
ANMT4	.13	.19	.03	.05	.08	.07	-.01	**.86**	-.02	-.10

Note: BHVR (Behavior), ATTD (Attitude), VDNS (Vividness), AGST (Argument Strength), SRCR (Source Credibility), CSSS (Consensus), COPB (Confirmation of Prior Belief), PCOR (Perceived Credibility of Online Rumors), PKLG (Prior Knowledge), ANMT (Anonymity)

◆ About the Authors ◆

Jong-Hyun Kim

Jong-Hyun Kim received his Ph.D. degree in Management Information Systems from Sungkyunkwan University, Seoul, Korea, in 2011. He is currently working for Korea Investment Partners Co. as a fintech investment team leader. His current research interests include online rumors, knowledge sharing, and social network. His papers have been published in Decision Support Systems, Asia Pacific Journal of Information Systems, and top-tier information systems conferences such as International Conference on Information Systems, and Pacific Asia Conference on Information Systems.

Gee-Woo Bock

Gee-Woo Bock joined the Business School in Sungkyunkwan University (SKKU) in Seoul, Korea, in September 2006 where he is currently a professor. Gee-Woo has served 'Information and Management' as an AE since 2012. Since 2001, he has translated 3 books and published 7 book chapters, 34 journal articles and 41 conference papers, and edited 2 special issues of journals. His articles have been cited about 8000 times in total, and his MIS Quarterly paper alone has been cited about 4,000 times since 2005 according to Google Scholar in April, 2018. His h-index is 21. His current research focuses on Knowledge Management, Cross-Border E-Commerce, and Big Data Analytics. Gee-Woo won SKKU Young Fellowship, a university wide research award, in 2012, and the Mirae Asset Best Researcher Award by Korean Business Society which is the most renowned nation-wide association for business administration scholars and practitioners, in 2018.

Rajiv Sabherwal

Rajiv Sabherwal is Distinguished Professor, Edwin & Karlee Bradberry Chair, and the Department Chair of Information Systems in the Walton College of Business at the University of Arkansas. He has authored numerous journal articles, including in prestigious journals such as MIS Quarterly, Information Systems Research, Management Science, Journal of MIS, and Organization Science. His research interests include information technology management and success, social aspects of systems development, knowledge management, and business analytics. He is a Senior Editor for Journal of AIS, and a member of the editorial boards for Journal of MIS and Information and Organization. He has served as the Editor-in-Chief of IEEE Transactions on Engineering Management, and performed editorial roles for MIS Quarterly, Information Systems Research, and Management Science. He is a Fellow of IEEE and a Fellow of Association of Information Systems.

Han-Min Kim

Han-Min Kim is a doctoral student with emphasis on MIS at the Business School in Sungkyunkwan University (SKKU). His research interests include malicious comments, Blockchain, information quality, and big data analytics. His paper has been published in Information Technology & People (IT&P), Asia Pacific Journal of Information Systems (APJIS), Journal of Information Technology Applications & Management (JITAM), Information Systems Review, Journal of Distribution Science, and Americas Conference on Information Systems (AMCIS).