Spreading Online Rumors: The Effects of Negative and Positive Emotions

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ABSTRACT

Malicious rumors often emerge online. However, few studies have examined why people spread online rumors. Recognizing that spreading online rumors is not only rational, but also emotional, this paper provides insights into the behavior of online rumor spreading using the cognitive emotion theory. The results show that perceived credibility of online rumors enhances both positive and negative emotions. However, positive emotions affect neither attitude nor behavior, whereas negative emotions affect both aspects of the spreading of online rumors. The results also indicate that prior positive attitude toward object influences negative emotions. Issues involvement moderates the relationship between attitude and behavior.

Keywords: Online Rumors, Cognitive Emotion Theory, Emotions, Perceived Credibility, Issue Involvement, Prior Positive Attitude toward the Object

Ⅰ. Introduction

How often do you encounter rumors these days? Do these rumors matter? Because contemporary social media platforms allow rumors to travel rapidly to large audiences, negative rumors can cause serious damage to a target individual or company. The following news on Nestlé particularly illustrates the gravity of online rumors:

"On March 17, 2010, Greenpeace released a report on Nestlé's palm-oil use. It said that Nestlé, 2010, was endangering orangutans through purchasing palm oil from an Indonesian company clearing rain forest[s] to build palm plantations. In spite of the acknowledgement of the company that it had already decided to stop dealing with the firm, which supplied just 1.25% of the palm oil Nestlé used in 2009, thousands of protesters gathered on Facebook and Twitter and

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shared the video; the orangutan video showed an office worker opening the candy's wrapper and snacking on a bloody orangutan finger. Some SNS users changed their profile pictures with the Killer logo and posted negative comments about Nestlé. Despite the acknowledgement of the company, many of them encouraged a boycott of Nestlé products. Although Google's YouTube pulled the video with Nestlé's official request, citing copyright infringement, they didn't stop to spread it on the Web. During the short period of this happening, Nestlé's sales already have been affected by the protest movement" (Steel, 2010).

As evident from this example, the potential consequences of online rumors are sufficiently severe that they cannot be simply ignored. Although Google's YouTube pulled the video at Nestlé's official request, the video remains live online (Fearn-Banks, 2002). Text with multimedia evidence and interactions among people can escalate the credibility of online rumors and strengthen emotions in individuals, leading to a snowball effect. In addition, all online records of rumors remain available in perpetuity, even after they are revealed to be false, unless all involved entities delete them, which is nearly impossible due to the enormity of the Internet.

Why, then, do people spread rumors? DiFonzo and Bordia (2007) integrated several antecedents from prior studies in attempting to identify reasons for using a social-psychological motivational framework, which other researchers have used based on attitude formation and maintenance. Nevertheless, previous studies on the spread of rumors have not examined some of the relevant aspects, discussed below.

First, DiFonzo and Bordia (2007) classified psychological factors in rumor spreading into four categories of fact of finding, relationship enhancement, self-en-

hancement, and contextual. All of these categories are related to cognitive processing. However, spreading rumors online is uniquely spontaneous and emotional. Thus, in addition to the role of cognitive factors, it is necessary to pay greater attention to the role of emotions in spreading online rumors (Oh et al., 2013; Vosoughi et al., 2018). Moreover, prior literature on word of mouth (WOM) (Chevalier and Mayzlin, 2006) indicates that negative emotions may have a greater effect on rumor spreading than positive ones. In addition, online rumor research has reported that an individual's emotions about rumors can affect their spread online (Jong and Dückers, 2016). Research on online rumors in consideration of cognitive factors and emotions, however, is rare. Also, there is little rumor research on the relationship between cognitive factors and emotions. Therefore, the existing literature does not clearly provide perspectives on people's motivation for online rumor behavior.

Second, according to DiFonzo and Bordia (2007), fact-finding motivation is a critical psychological factor in spreading rumors. Most studies have focused on motivations for rumor spreading in people who are directly affected by or engaged in the rumors. For instance, employees have been shown to spread rumors to reduce uncertainty related to them or their organizations, such as when they do not know the precise nature and consequences of a potential organizational restructuring or a merger with another organization (DiFonzo and Bordia, 2007, p. 71). Curiously, however, the general public spreads rumors online that are not particularly relevant to them. A prior study reports that issue involvement is one important factor in spreading rumors about public matters (Oh et al., 2013). Hence, we need to better understand the motivation of the general public in spreading rumors online, a trend that is currently

increasing. This study selected Tablo rumor that was the most public rumor in South Korea.

Finally, most empirical evidence on rumor spreading relates to offline rather than online rumors. Accordingly, we need to understand whether the factors that have been found to motivate offline rumor spreading are also important online.

Thus, with this study, we specifically address the following research questions. (1) What are the roles of emotion and cognition in spreading online rumors? (2) Do positive and negative emotions differ in their impacts on spreading online rumors? (3) Which factors lead individuals to spread online rumors about issues that are not directly related to them? Are there differences in people's online rumor spreading behavior depending on issue involvement? To address these questions, we focus on an online rumor about a celebrity in South Korea, which was extensively transmitted online by the general public. We adopt the cognitive emotion theory (CET), which incorporates both cognitive factors and emotional factors.

Ⅱ. Literature Review

2.1. Definitions of Rumors and Online Rumors

Academic disciplines such as sociology and psychology define rumors in various ways (DiFonzo and Bordia, 2007). Knapp (1944) stated that a rumor is a proposition for belief in a topical reference disseminated without official verification. Allport and Postman (1947) defined a rumor as a specific proposition for belief passed along from person to person, usually by word of mouth and without evidence. Rosnow (1974) explained that rumor discussion is a process of group interpretation, and the rumor is a product of that process. More recently, DiFonzo

and Bordia (2007) defined rumors as unverified and instrumentally relevant information statements in circulation that arise in contexts of ambiguity, danger, or potential threat, in part helping people to make sense of and manage risk.

The above definitions of a rumor share two common elements－namely, (1) rumors are unverified upon origination, and (2) rumors reflect a community's information statements in circulation in contexts of ambiguity. We propose a definition of online rumors that integrates these elements with one unique aspect: online rumors are circulated on the Internet. Thus, we define online rumors as beliefs about topical issues that serve communities and that are disseminated through the Internet without official verification.

2.2. Factors Affecting the Spread of Rumors

The existing literature has addressed a number of conditions under which rumors are raised and spread. These conditions can be classified into five variables: 1) importance, 2) ambiguity, 3) anxiety, 4) uncertainty, and 5) belief in the rumor (Bordia and DiFonzo, 2002; Oh et al., 2013; Rosnow, 1991; Walker and Blaine, 1991); the more important a rumor, the more ambiguous a situation, the more anxious and uncertain people feel about the situation, or the stronger the belief in the rumor, the more likely are people to listen to and spread rumors. Moreover, studies have highlighted additional factors pertaining to rumor transmission such as rumor-specific attitude, source credibility, and rumor rebuttal (Eagly and Chaiken, 1993; Hovland and Weiss, 1951; Koller, 1992; London and London, 1975).

Several studies suggest that the decision to transmit a rumor is mainly influenced by an individual's confidence in the truth of the rumor (Esposito, 1988;

Jaeger et al., 1980; Kimmel and Keefer, 1991). Jaeger et al. (1980), for instance, was conducted in an academic setting with introductory psychology students as subjects. The research draws the following conclusion:

> "…[R]umors can and do vary in the extent to which they are believable. While there is evidence that rather incredible rumors can be spread with alacrity, our results suggest that a rumor perceived to be false is less likely to be transmitted than one perceived to be true."

We label this confidence in rumors as perceived credibility, which may be defined as the extent to which a rumor is considered true (DiFonzo and Bordia, 2007). Because people are more inclined to spread rumors that they consider true than to spread rumors that they consider false, we argue that perceived credibility plays a key role in rumor-spreading attitudes and behaviors. Thus, we include perceived credibility of rumors as a representative cognitive factor.

Next, we consider the factors affecting a person's belief in rumors. People are more likely to believe rumors that match their attitudes (DiFonzo and Bordia, 2007). If a rumor coincides with prior attitude, then s/he is more likely to reinforce his or her positive or negative emotions toward an emergent rumor depending on the nature of the rumor.

Based on the above, we incorporate only a few major cognitive factors that are essential for comparing the different roles of emotion in rumor-spreading behavior. We include two main cognitive factors: perceived credibility of online rumors and prior positive attitude toward the objects of rumors. Both of these factors can meaningfully affect attitude, emotions, and behaviors in people regarding the spread of online rumors. Although other cognitive factors may affect rumor spreading, we focus on these two variables due to their prominence and because one of our main objectives is to investigate the role of emotion.

Ⅲ. Theoretical Development

The cognitive emotion theory (CET) suggests that emotions are caused by the cognitive activity of observing a stimulus and forming corresponding evaluative perceptions (Lazarus and Folkman, 1984). According to CET, cognition－such as beliefs－can be assumed to directly precede emotions. In other words, cognitive appraisal is a necessary precondition for emotional arousal. The notion that cognition and affect involve separate and independent systems has been supported by emotion study (Reisenzein, 2009). Further, CET postulates that emotions directly cause particular behaviors (Frijda, 2010).

Many scholars argue that non-cognitive factors－such as affect－have a significant influence on attitude, which is not mediated by cognitive structure (Breckler, 1984; Crites et al., 1994; Haugtvedt and Seminar, 1997; Herr, 1995; Miniard and Barone, 1997; Schwarz, 1997). Furthermore, several studies explore the influence of affect on attitude. Holbrook and Batra (1987) found that multiple affect categories are related to attitudes, and Trafimow and Sheeran (1998) found differences between affective-based and cognitive-based beliefs, with research observing associations of each type of belief with attitudes. In addition, Eagly et al. (1994) used an idiographic (rather than a nomothetic) approach to measure beliefs and affect, finding that both cognitive structure and affect predict attitude. These results suggest that cognition may not always be a central determinant of attitude.

Based on the CET, we propose the research model shown in <Figure 1>, comprising cognitive and emotional factors, attitudes, and behaviors. All the hypothesized paths in the model are positive except H5a and H5b, which consider the negative nature of the rumor in this study. This is explained in greater detail below.

As indicated by several prior studies and the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980; Davis et al., 1989), a person's likelihood for a particular behavior is determined by his or her attitude toward the behavior. Based on these insights from TRA, as well as on existing literature on factors that affect the spread of rumors and the earlier discussion of CET (Miniard and Barone, 1997; Schwarz, 1997), an individual's attitude toward spreading online rumors is expected to influence the individual's actual rumor-spreading behavior. Hence, we posit:

H1: Attitude toward spreading online rumors positively affects the behavior of spreading online rumors.

Emotion is defined as "a mental state of readiness that arises from cognitive appraisals of events or thoughts; has a phenomenal tone; is accompanied by physiological processes; is often expressed physically; and may result in specific actions to affirm or cope with the emotion, depending on its nature and meaning for the person having it" (Bagozzi et al., 1999, p. 184). Prior literature differentiates between positive or negative emotions (Laros and Steenkamp, 2005) and shows that positive emotions such as joy, pleasure, interest, and excitement (Machleit and Eroglu, 2000) may stimulate people to circulate rumors to cause diversion or gain attention (Rosnow and Fine, 1976). Negative emotions such as anger, surprise, disgust, sadness, fear, and contempt (Machleit and Eroglu, 2000) may also stimulate people to propagate rumors (Fiske, 2004; Oh et al., 2013; Vosoughi et al., 2018).

CET expects emotions to directly cause behavior (Frijda, 2010) because affective responses can be distinguished from cognitive attitudes insofar as they are more spontaneous and more easily accessible.
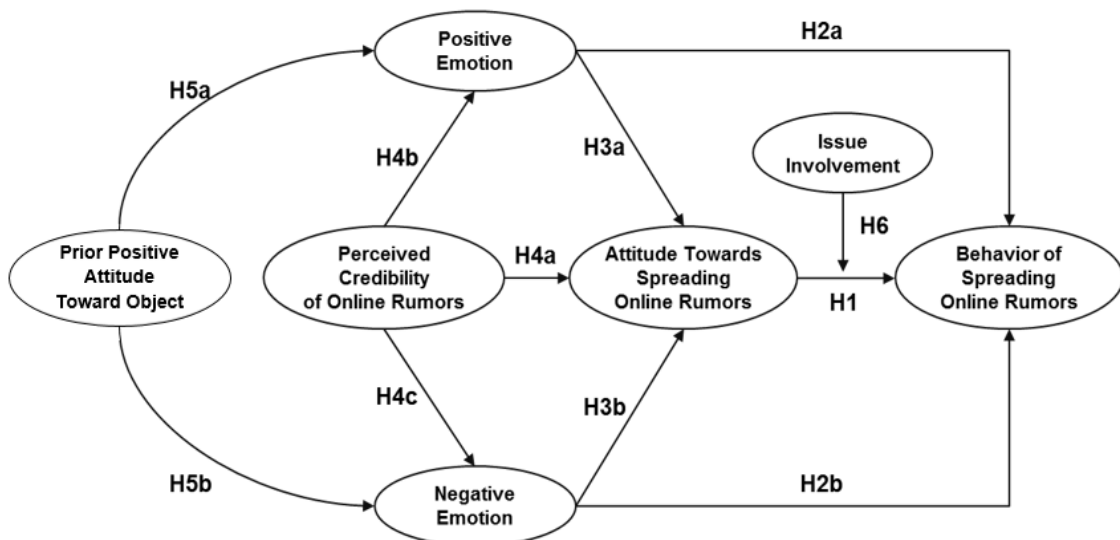
<Figure 1> The Research Model

That is, regardless of whether emotions are positive or negative, the stronger an individual's emotions, the greater the likelihood of the individual to act. For the purposes of this study, the action is the spreading of a rumor. Furthermore, several studies have found non-cognitive factors－such as affect－to have significant effects on attitude, which is not mediated by cognitive structure (Breckler, 1984; Crites et al., 1994; Haugtvedt and Seminar, 1997; Herr, 1995; Holbrook and Batra, 1987; Schwarz, 1997). Thus, we posit:

H2a: *Positive emotions regarding an online rumor positively affect the behavior of spreading that rumor.*

H2b: *Negative emotions regarding an online rumor positively affect the behavior of spreading that rumor.*

H3a: *Positive emotions regarding an online rumor positively affect the attitude toward spreading that rumor.*

H3b: *Negative emotions regarding an online rumor positively affect the attitude toward spreading that rumor.*

Past research has identified perceived credibility of a rumor as an important element in evaluating the truthfulness of the rumor and in spreading it (Rosnow, 1988). The perceived credibility of an online rumor can be defined as an individual's evaluation of whether or not a rumor is true (Frijda, 2010). Prior literature specifically suggests an association between credibility of a rumor and individual attitude (DeClerque et al., 1986), such that individuals are positively inclined to spread rumors they find credible (Hsu and Chang, 2014; Rosnow, 1991). Thus, we propose:

H4a: *The perceived credibility of online rumors positively affects the attitude toward spreading online rumors.*

Lazarus (1991) argued that cognitive appraisal of person-environment situations is both necessary and sufficient for forming emotions. Individuals' subjective appraisals of stimuli in the context of their needs determine their emotional responses. According to CET, cognitive appraisal of a situation mediated by emotion later leads to action tendencies (attitude and intention). Nyer (1997) showed that emotions mediate the relationship between cognitive appraisal and behavior. Thus, an increase in cognitive appraisal (i.e., for the purposes of this study, the perceived credibility of the rumor herein) may lead both to stronger positive emotions and to stronger negative emotions regarding the rumor. First, if a rumor seems credible, this seeming credibility increases positive emotions such as interest and excitement because the rumor is bound to attract attention. However, in the case of a negative rumor, as in this study, the rumor's seeming credibility is also likely to increase negative emotions toward the rumor, and vice versa. Because the rumor we study is a negative rumor about a celebrity in South Korea (as explained in the next section), we propose:

H4b: *The perceived credibility of a negative online rumor increases positive emotions regarding the rumor.*

H4c: *The perceived credibility of a negative online rumor increases negative emotions regarding the rumor.*

The classic theories of attitudes suggest that initial attitudes can exert powerful influences when individuals evaluate new information (Sherif et al., 1965). Specifically, if people have established attitudes about an object, these attitudes provide subjectively valid bases for current evaluations of the object (Eagly

and Chaiken, 1993; Fazio, 2000). People with strong preconceived ideas may not easily change their existing attitudes and attributions of trust because they largely interpret events in accordance with their prior attitudinal positions (Adelaar et al., 2003; Poortinga and Pidgeon, 2004). In the case of a negative rumor about a particular object, as in this study, people with previously-held positive attitudes toward the object of the rumor tend to find the rumor to be inconsistent with their prior attitudes toward the object and thus tend not to be excited about, pleased with, amused by, or interested in the rumor. In other words, an individual with a positive attitude for the subject will be less likely to feel positive emotions about the subject's negative rumor. In addition, these positive attitudes toward the object mitigate the arousal of any negative feelings. In contrast, people with previously-held negative attitudes toward the object of the rumor tend to find the rumor to be consistent with their prior attitudes and thus tend to feel more interested in and excited about the rumor, triggering negative feelings about it. In this study, because we measure the positivity of prior attitudes toward the object of a negative rumor, we posit:

H5a: *The more positive is a person's prior positive attitude toward the object of a rumor, the weaker is the person's positive emotion toward a negative rumor about that object.*

H5b: *The less positive is a person's prior positive attitude toward the object of a rumor, the stronger is the person's negative emotion toward a negative rumor about that object.*

Allport and Postman (1947) identified two key prerequisites to rumor transmission. First, the theme of the rumor must have some importance to the speaker and the listener, where importance is defined

as the degree to which people care about or feel personally involved in the subject. Second, the rumor must have some ambiguity, defined as general uncertainty evoked by a situation that needs information or cognitive clarity (Rosnow, 1991).

Ambiguity is embedded in the context of a rumor. Ambiguity is not only a prerequisite for rumor spreading, however, insofar as it also play a role in rumor spreading. This is because people are more likely to spread rumors that matter to them (DiFonzo, 2008; Oh et al., 2013). Thus, we assume that the actual behavior of spreading an online rumor can be moderated by issue involvement－referring to the centrality of the rumor object to a given individual －which stands to increase the possibility that the individual's attitude will translate into the individual's actual rumor transmission behavior. Accordingly, we posit:

H6: *Issue involvement (with respect to online rumors) positively moderates the effect of attitude on the behavior of spreading online rumors.*

Ⅳ. Research Methods

4.1. The Sample Rumor

As mentioned above, issue involvement is an important factor in spreading online rumor (Oh et al., 2013). The purpose of this study is to understand the motivations of an individual in spreading publicly well-known rumor online. Hence, an online rumor about a celebrity in South Korea is used to address the research questions in this study. The detailed story about the rumor is as follows (Abbott, 2010):

Daniel Seon Woong Lee, better known in Korea as recording artist Tablo, graduated from Stanford with a seemingly uncontroversial record: two English degrees including a Bachelor's degree in 2001 and a Master's degree in 2002. Over the course of 10 months, an Internet campaign was launched, attacking Lee's credentials and, Lee 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, at which point he began receiving threats on his Twitter account. The sources of the attacks were netizens who launched a specific campaign to attack the validity of Lee's Stanford degrees. An intervention from Tom Black, then-University Registrar at Stanford, and a letter from English professor Tobias Wolff did little to help stop the movement. The campaign to discredit Lee's Twitter account exploded: "We Urge Tablo to Tell the Truth." Black stated that verifying a person's degree from the university is not an unusual practice, but that he had never seen a case as severe as the campaign against Lee. Black released a copy of Lee's transcript; when that did not prove satisfactory to quell the rumors, Black wrote a letter vouching for Lee's attendance and graduation. Subsequently, Black allowed camera crews to film him printing a degree to show that none of the process is fraudulent. Black has stated 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 [Lee's] life." Lee maintains that he is not angry and even waited several months before pursuing legal action. Lee is on record as expressing hope that a documentary, which aired on October 2, 2010, entitled "Tablo Goes to Stanford" on Korean network MBC, would vindicate his reputation.

After MBC aired the documentary on October 2, 2010, the Korean police reported the results of the investigation into the veracity of the rumors around Tablo's academic credentials on October 8, 2010. Although the rumors were eventually proved false by pertinent authorities, the falsities continued to circulate online. Indeed, some online communities were formed to either support or deny the Tablo rumors.

4.2. The Survey Instruments

For this study, we adapted survey items from previous research with modifications to fit the present research context (Smith and Vogt, 1995; Zhang and Watts, 2003). Following the approach proposed by Brislin (1970) for back translation, a bilingual person first translated the English version of survey items into Korean, and another bilingual translator (who was not aware of the original English version) subsequently translated the South Korean version back into English. The two English versions of the survey were then compared to ensure that there were no significant differences in meanings. The researchers and the two translators worked together to finalize the translated Korean version utilized herein.

We conducted preliminary testing by selecting two doctors and eight doctoral students at a prestigious South Korean university before we began actual data collection. We asked participants to complete paper questionnaires and then interviewed them to assess any difficulties in understanding the questions and to seek their suggestions for improvement. The results indicated that there were no major problems among participants in understanding the questionnaire instructions and items. Drawing on the suggestions of the preliminary test respondents, we incorporated minor changes into the new questionnaire, such as

addition of detailed explanations about constructs and items.

We also employed a pilot test in the form of an online questionnaire on university portal sites for one week. The online questionnaire consisted of two sections. The first section explained the general purpose of the research and a summary of the Tablo rumor, together with explanations of some specific terms used in the questionnaire. In the second section, respondents were asked to answer questions referring to the ways and channels via which they had encountered the Tablo rumors in various media. All the measurement items for the constructs are shown in <Table 1>.

Of 63 total responses, 56 were found to be valid. Based on the survey responses, we restructured the

<Table 1> Measurement Items of Constructs

Construct	Measurement
Prior Positive Attitude Toward Object	1. I felt Tablo was good before the incident. 2. I felt Tablo was favorable before the incident. 3. I felt Tablo was honest before the incident. 4. I felt Tablo was friendly before the incident. 5. I felt Tablo was genuine before the incident.
Perceived Credibility of Online Rumors	1. I thought the Tablo rumor was realistic. 2. I thought the Tablo rumor was plausible. 3. I thought the Tablo rumor was believable.
Positive Emotion	1. I felt amused. 2. I felt interested. 3. I felt pleased. 4. I felt excited.
Negative Emotion	1. I felt angry. 2. I felt surprised. 3. I felt disappointed. 4. I felt displeased. 5. I felt depressed. 6. I felt contemptuous.
Attitude Toward Spreading Online Rumors	1. I thought spreading the Tablo rumor was desirable. 2. I thought spreading the Tablo rumor was valuable to me. 3. I thought spreading the Tablo rumor was important to me. 4. I thought spreading the Tablo rumor was meaningful to me.
Issue Involvement	1. I think the forgery of academic records of the celebrities is often what I am interested in. 2. I think the forgery of academic records of the celebrities is often what I am excited about. 3. I think the forgery of academic records of the celebrities is often what I have fun with. 4. I think the forgery of academic records of the celebrities is often what I bear in mind. 5. I think the forgery of academic records of the celebrities is often what I care about.
Behavior of Spreading Online Rumors	1. I transmitted the Tablo rumor by online means. 2. I posted the Tablo rumor on SNS or BBS or blog. 3. I transmitted the Tablo rumor by online means without editing the content. 4. I posted the Tablo rumor on SNS or BBS or blog without editing the content. 5. I transmitted the Tablo rumor by online means after editing the content. 6. I posted the Tablo rumor on SNS or BBS or blog after editing the content.

questionnaire items, focusing on the situation prior to the police report, and changed the survey method to a paper-based questionnaire to exclude from the main survey any respondents who did not know about the Tablo rumors.

The respondents were undergraduate students from three universities in South Korea, and respondents were encouraged to retrospectively recall the situation prior to the police report. Within three days, we received 211 valid responses out of a total of 231 responses; as incentive for participating in the survey, extra academic points were awarded to respondents. The questionnaire was carefully ordered to reduce respondent common method bias, a measurement error that threatens the validity of conclusions drawn from statistical results (Podsakoff et al., 2012). Among the various methods to test for common method bias, Harman's single factor test is the most widely used; if a single factor accounts for less than 50% of all the variables in a model, then the statistical results are not affected by common method bias (Podsakoff et al., 2003). In this study, 46.2% of the variance was explained by a single factor,

a result we obtained by running an unrotated single-factor analysis in SPSS statistical software. We also conducted an additional test for common method bias, examining a correlation matrix to determine whether any constructs correlated more highly than 0.90 (Pavlou et al., 2007, p. 122). In our findings (see <Table 5>), no constructs exceeded the correlation coefficient of 0.90; the highest correlation coefficient was 0.59. These results show that common method bias was not a major concern in this study.

We used a multiple-item survey for this study, and each item was measured using a seven-point Likert scale with responses ranging from "strongly agree" to "strongly disagree." <Table 2> summarizes the operational definitions of all the research constructs.

4.3. Sample Demographics

Among the 211 respondents, 141 (66.8%) were males and 70 (33.2%) were females. The respondents were generally young: 53 respondents (25.1%) were younger than 20 years of age, 130 respondents (61.6%) were 21 ~ 25 years of age, and 28 respondents (13.3%)

<Table 2> Operational Definitions of Constructs

Construct	Definition	Key References	Items
Prior Positive Attitude Toward Object	An individual's initial degree of like for an object before the rumor is heard	Sherif and Hovland (1961)	5
Perceived Credibility of Online Rumors	A cognitive evaluation of the entity that constitutes an individual's beliefs about the object	Esposito (1988), Jaeger et al. (1980), Rosnow (1988)	3
Positive Emotion	The emotional state of joy, pleasure, interest, and excitement	Machleit and Eroglu (2000)	4
Negative Emotion	The emotional state of anger, surprise, disgust, sadness, fear, and contempt	Machleit and Eroglu (2000)	6
Attitude Toward Spreading Online Rumors	An individual's degree of like or dislike for spreading rumor	Fishbein and Ajzen (1977)	4
Issue Involvement	The general level of interest in the object to the person's ego-structure	Sun et al. (2006)	5
Behavior of Spreading Online Rumors	An individual's observable response in a given situation with respect to a given target	Fishbein and Ajzen (1977)	6

were 26 ~ 30 years of age. The respondents were generally familiar with the Internet, with 178 respondents (84.4%) reporting Internet usage for more than one hour per day on average.

Ⅴ. Results

5.1. Measurement Model Analyses

According to Fornell and Larker (1981), composite reliability equal to or above 0.70 and a Cronbach's α value above 0.70 indicate acceptable reliability. As shown in <Table 3>, composite reliability and Cronbach's α values for each construct exceeded these threshold values. Moreover, as <Table 4> indicates, the primary factor loadings of all items on concerned constructs were above 0.50. Item 4 of positive emotion, item 2 of negative emotion, item 2 of attitude toward spreading online rumors, and items 1 and 2 of the behavior of spreading online rumors were excluded because of low factor loading values. All constructs consist of reflective measurement items.

Convergent validity is the extent to which each measurement item is related to its corresponding theoretical construct. When this relationship is high, the convergent validity is high. An average variance

extracted (AVE) of 0.50 or above indicates satisfactory convergent validity, as was the case with all our measures, as shown in <Table 3>.

Discriminant validity indicates the extent to which the items of a construct are distinct from those of other constructs. The discriminant validity is acceptable when the square root of the AVE of each construct is larger than any correlation among any pairs of constructs (Fornell and Bookstein, 1982; Fornell and Larcker, 1981). This was true for all the constructs in this study, as shown in <Table 5>.

5.2. Structural Model Analyses

We used partial least squares (PLS) to test the research model. PLS is a latent structural equation modeling component-based approach for estimation (Lohmöller, 1989). It provides the ability to model latent constructs under conditions of non-normality and makes less restrictive demands on sample size and residual distribution. In PLS, bootstrapping is used to generate t-test statistics and standard errors, which are interpreted as multiple regressions (Chin, 1998), and the R^2 value indicates the amount of variance explained by the model (Barclay et al., 1995). To evaluate the full model, we calculated R^2 for attitude toward spreading an online rumor and the be-

<Table 3> Descriptive Results and Internal Consistency of Model Constructs

Construct	Mean	Standard Deviation	Number of Items	AVE	Composite Reliability	Cronbach's *a*
Prior Positive Attitude Toward Object	4.52	1.63	5	0.87	0.97	0.96
Perceived Credibility of Online Rumors	2.88	1.81	3	0.94	0.98	0.97
Positive Emotion	3.78	1.66	4	0.86	0.95	0.92
Negative Emotion	3.38	1.65	6	0.66	0.89	0.83
Attitude Toward Spreading Online Rumors	2.18	1.74	4	0.90	0.96	0.94
Issue Involvement	3.15	1.71	5	0.78	0.95	0.93
Behavior of Spreading Online Rumors	1.82	1.55	6	0.96	0.98	0.98

<Table 4> Factor Loadings for All Constructs

	Component						
PATO1	-.22	.87	-.12	-.16	-.07	-.14	-.02
PATO2	-.12	.91	-.09	-.14	-.04	-.10	-.01
PATO3	-.16	.87	-.12	-.10	-.16	-.14	-.12
PATO4	-.07	.93	-.04	-.08	-.01	-.10	-.08
PATO5	-.12	.87	-.11	-.12	.00	-.10	-.14
PCOR1	.27	-.31	.25	.28	.13	.84	.09
PCOR2	.20	-.19	.22	.21	.04	.80	.15
PCOR3	.29	-.22	.24	.26	.10	.81	.07
PSTE1	.17	-.16	.15	.18	.08	.07	.80
PSTE2	.12	-.03	.25	.04	.04	.07	.91
PSTE3	.29	-.28	.20	.14	.29	.22	.92
NGTE1	.20	-.02	.16	.18	.78	.02	.00
NGTE3	.07	-.17	.26	.08	.68	.22	.26
NGTE4	.17	.04	.10	.09	.84	-.03	.05
NGTE5	.37	-.16	.11	.22	.67	.13	.03
ATTD1	.25	-.15	.19	.77	.15	.22	.17
ATTD3	.33	-.20	.20	.80	.21	.17	.05
ATTD4	.28	-.20	.20	.82	.20	.16	.09
ISIV1	.23	-.04	.82	.18	.20	.16	.20
ISIV2	.18	-.07	.84	.14	.14	.17	.23
ISIV3	.22	-.08	.77	.15	.15	.19	.29
ISIV4	.32	-.26	.70	.24	.12	.13	.02
ISIV5	.38	-.23	.68	.21	.20	.12	.02
BHVR3	.88	-.13	.23	.22	.19	.19	.12
BHVR4	.80	-.18	.20	.21	.17	.13	.11
BHVR5	.82	-.15	.21	.16	.17	.12	.12
BHVR6	.88	-.17	.21	.20	.16	.12	.10

Note: PATO (prior positive attitude toward object), PCOR (perceived credibility of online rumors), PSTE/NGTE (positive/negative emotions), ATTD (attitude), ISIV (issue involvement), BHVR (behavior).
Principal component analysis: varimax with Kaiser normalization.

havior of spreading the online rumor. <Figure 2> presents the results of the structural model.
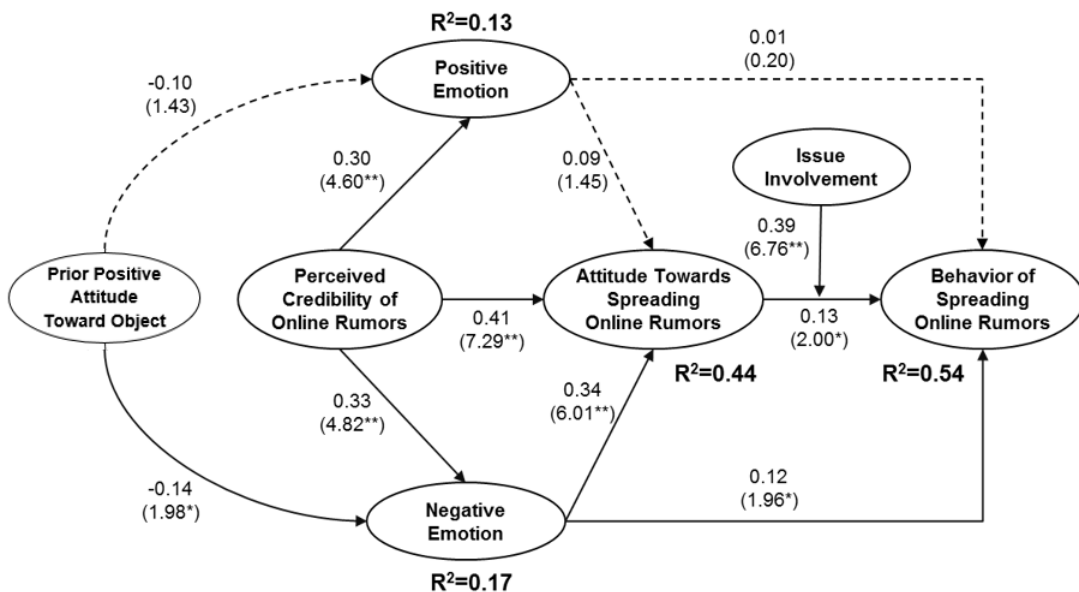
The attitude toward spreading an online rumor had a statistically significant, positive relationship with behavior of spreading the online rumor (H1 supported, $p < 0.05$). Issue involvement had a sig- nificant positive relationship with the effect of attitude on behavior of spreading the online rumor (H6 supported, $p < 0.01$). Perceived credibility of the online rumor had a significant relationship with attitude toward spreading online rumors (H4a supported), positive emotions toward the online rumor (H4b

<Table 5> Square Roots of Average Variances Extracted (AVE) and Cross-correlations

	AVE	PATO	PCORI	PSTE	NGTE	ATTD	ISIV	BHVR
Prior Positive Attitude Toward Object (PATO)	0.87	**0.93**						
Perceived Credibility of Online Rumors (PCOR)	0.94	-0.47	**0.97**					
Positive Emotion (PSTE)	0.86	-0.24	0.34	**0.93**				
Negative Emotion (NGTE)	0.66	-0.29	0.39	0.30	**0.81**			
Attitude Toward Spreading Online Rumors (ATTD)	0.89	-0.43	0.57	0.33	0.52	**0.94**		
Issue Involvement (ISIV)	0.78	-0.39	0.58	0.46	0.52	0.58	**0.88**	
Behavior of Spreading Online Rumors (BHVR)	0.96	-0.38	0.50	0.32	0.51	0.57	0.59	**0.98**

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

<Figure 2> Results of PLS Analysis

supported), and negative emotions toward the online rumor (H4c supported).

Positive emotions regarding online rumors, however, did not have significant positive effects on either attitude toward spreading the online rumor (H3a not supported) or behavior of spreading the online rumor (H2a not supported). In contrast, negative emotions regarding the online rumor had significant positive effects ($p < 0.01$) on both attitude toward

and behavior of spreading the online rumor (H2b and H3b supported).

Prior positive attitude toward the object of a rumor did not have a statistically significant relationship with positive emotion toward the online rumor (H5a not supported). In contrast, prior positive attitude toward the object of a rumor had a negative effect ($p < 0.01$) on negative emotions toward the rumor, as expected (H5b supported).

The model explained 53.6% of the variance in behavior of spreading online rumors and 43.76% of the variance in attitude toward spreading online rumors. The model also explained 12.56% of the variance in positive emotions and 17.16% of the variance in negative emotion. Overall, these results provide evidence of strong relationships among the constructs in the model.

Ⅵ. Discussion

For this study, we applied CET to examine how the spread of online rumors on the part of the general public is affected by emotions and rumor credibility. The major findings of the study are as follows. First, perceived credibility plays an important role in the spread of online rumors, as expected. Second, negative emotion is critical in online rumor spreading. Next, individuals with positive attitude toward the object of the rumor were shown to have less negative emotion toward the negative rumor. Finally, issue involvement facilitates turning people's attitudes into behavior.

6.1. Implications for Research

Drawing on the CET, we found that emotions and cognitive factors have significant effects on the spread of online rumors. In a previous study of online rumors, anxiety was examined as an emotional factor, but it was shown to be partially significant on online rumors, while the theoretical relationship of anxiety with cognitive factors was not considered (Oh et al., 2013). In other words, previous research has not been clear on how negative emotions and positive emotions along with cognition affect online rumors. To the best of our knowledge, this study is the first

to explore the roles of positive and negative emotions in the spread of online rumors based on a concrete theoretical foundation–namely, CET. The structural model we used in this study explained more than 50% of the variance in people's attitudes toward spread of online rumors. This provides empirical evidence of the validity and explanatory ability of the theoretical model based on CET. Negative emotions played an especially important role in attitude toward spreading online rumors, as well as in the behavior of spreading online rumors. In a context where an individual's emotions are as important as cognitive factors (Jong and Dückers, 2016; Oh et al., 2013; Vosoughi et al., 2018), this study simultaneously demonstrates the influence of emotions and cognitions on online rumors. We also explain the theoretical relationship between emotions and cognitive factors affecting online rumors based on the CET.

The significant effects of negative emotions and the nonsignificant effects of positive emotions found in this study are consistent with prior research on WOM communications (DiFonzo and Bordia, 2007; Hanna and Wozniak, 2001; Scott and Tybout, 1981) and online rumors (Oh et al., 2013). Prior research has found that dissatisfied consumers place more weight on negative information (Scott and Tybout, 1981), and Hanna and Wozniak (2001) found that the probability of WOM behaviors increases when consumers have unfavorable emotional reactions to experiences. Furthermore, spreading rumors is an interpretive activity, which allows people to manage uncertainty and threat (DiFonzo and Bordia, 2007; Rosnow, 1980; Shibutani, 1966). Rumors can carry negative connotations, and they can be used to serve the self-interests of the people that choose to spread them (Van Bommel, 2003). Accordingly, individuals are more likely to be interested in negative news
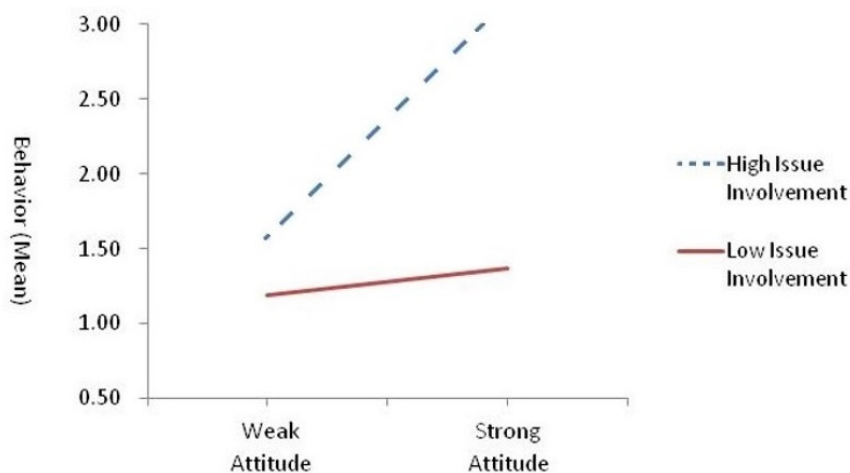
than positive, which is consistent with the notion that rumor transmission may be less about motivations such as self-presentation and more about an individual's internal state. Thus, positive emotions may not play a part in rumor transmission, whereas negative emotions may be crucial.

Moreover, in this study, a person's positive attitude toward the rumor object was shown to weaken the negative emotion regarding the negative rumor rather than to promote it. In addition, a positive attitude may have mitigated any positive emotions about the rumor. Further research is needed on these significant effects of negative emotions and the passive role of prior positive attitudes before we can generalize our findings to other rumors, especially to positive rumors about target objects (in contrast to this study, focusing on a negative set of rumors).

Next, the perceived credibility of online rumors was shown to significantly affect people's attitudes toward spreading the rumors. This result is consistent with the findings of prior face-to-face rumor research (Ambrosini, 1983; Hicks, 1990), suggesting that the perceived credibility of a rumor significantly affects the attitude toward spreading the rumor. Again, other antecedents could be explored along with perceived credibility to broaden our understanding of the interplay among various cognitive factors and emotions in future research.

Issue involvement moderated the effects of attitude on the behavior of spread of online rumors, as expected. The interaction plot for this moderating effect, shown in <Figure 3>, supports the PLS results herein. This is a potentially important finding in that, if online rumor behaviors are applied to firms, then a multitude of consumers who are highly involved in products or services may become active in spreading rumors. Thus, firms should monitor the communities or individuals directly or indirectly involved in their companies' activities, and they should be ready to take appropriate measures to minimize losses from malicious online rumors as soon as they begin. Further research is needed to examine whether the moderating effects of issue involvement apply in other contexts. For instance, longitudinal studies with differing levels of issue involvement would provide insights into whether the effects hold when focal individuals' involvement with an issue changes over time.

<Figure 3> Interaction Plot

6.2. Implications for Practice

We conducted this study in the context of a real set of online rumors circulated about a celebrity. Thus, the results provide an authentic understanding of how to manage the diffusion of online rumors and how to minimize the adverse effects of malicious rumors. Moreover, the study provides insights that managers may find useful in managing rumors. First, the results suggest that managers should focus on mitigation strategies for individuals with negative emotions toward the rumor and its object, insofar as this group of people appears to be most likely to spread the rumor. Second, the results suggest that managers seeking to reduce the spread of rumors should attempt to limit the perceived credibility of the rumor. Finally, managers seeking to reduce the spread of rumors should focus their efforts on the individuals most involved with the issue at the core of the rumor because this group of people is most likely to spread the rumor.

6.3. Limitations

Although this study has some theoretically and practically intriguing implications as discussed, the results should be considered with caution considering its limitations. First, we conducted the study survey after the police report on the veracity of the sample rumor; thus, we collected respondents' retrospective perceptions about the rumor. Although we carefully designed the questionnaire to focus on the circumstances before the police report, the responses may have been influenced by the subsequent findings. Second, because we collected study data on a specific set of rumors about one celebrity spread by the general public, it is necessary to be cautious in applying the findings of this study to any other context, such as employees' transmission of corporate rumors. In addition, because the target rumor was negative in nature, the findings may be different for positive rumors. Third, there is a limitation in generalizing the results of this study because student samples were used. the Accordingly, future research needs to collect samples from various ages regarding the spread of online rumors to generalize the results. Finally, we conducted the study in South Korea; thus, the findings should be interpreted in the South Korean cultural context.

Ⅶ. Conclusion

This paper extends the results of prior face-to-face rumor transmission research to online rumors based on CET, utilizing an empirical investigation with a questionnaire survey about a specific online rumor. The credibility of the online rumor and people's attitudes toward the rumor influenced the behavior of spreading the rumor, as supported by findings in previous literature. Furthermore, the level of issue involvement moderated the effects of attitude on the behavior of rumor spreading. The results also show differences between positive and negative emotions in affecting attitudes toward spreading rumors and in rumor-spreading behavior. This study provides fresh insights into the role of prior positive attitude on positive and negative emotions in the context of spreading online rumors. Overall, this paper contributes meaningfully to research and practice regarding the spread of online rumors and, ideally, stands to motivate future research in this important area.

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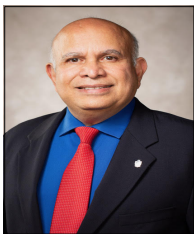
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