

A STUDY ON THE FACTORS AFFECTING THE BEHAVIOR OF SPREADING ONLINE RUMORS

Completed Research Paper

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Abstract

For decades, the Internet has changed the way of communication of modern society dramatically. Particularly, tons of online media altered the method of rumor transmission from 'to hear' by word of mouth between people to 'to see' by written online messages. As a result, many individuals and organizations have tremendously damaged from malicious online rumors. Though the environment of rumor circulation has evolved as mentioned, little studies on online rumor have been conducted. In addition, no consensus on key determinants of online rumor spreading has been formulated, because few researchers have empirically tested such factors in the online rumor context under the solid theoretical foundations. Therefore, we suggest a research model based on various social psychological theories such cognitive emotion theory and dual process theory to explain the behavior of online rumor spreading as well as factors identified from the literature of rumor and persuasion studies. In line with the above, the model suggests that informational and normative determinants of online rumor lead to credibility and emotions that lead to attitude and behavior of spreading online rumor.

Keywords: Online Rumor, Cognitive Emotion Theory, Dual Process Theory, Informational Factors, Normative Factors, Factors Regarding Online Rumor-Spreading

Introduction

Research Background

It may be one of basic natures of human beings to spread a gossip. This may be why the Bible says "A gossip betrays a confidence; so avoid a man who talks too much (Verse 19, Chapter 20, Proverbs)." When it comes to a rumor which has greater influence than the personal gossip, consequences get more serious. To make things worse, the emergence of the Internet has allowed the rumor to reach larger audience at the light speed. The following news on Nestlé illustrates the seriousness of online rumor (Wall Street Journal on March 29, 2010):

"On March 17, 2010, Greenpeace released a report on the Nestlé's palm-oil use. It said that Nestle was contributing to destruction of Indonesia's rain forest, and endangering orangutans through purchasing palm-oil from an Indonesian company clearing rain forest 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 the Facebook and Twitter and shared the video across the Web. The video was showing an office worker opening the candy's wrapper and snacking on a bloody orangutan finger. Some SNA users changed their profile pictures with the 'Killer' logo and posted negative comments about Nestlé on their websites. What was worse, 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 protests' movement."

Despite this potential risk of the online rumor on corporate reputation, research on online rumor has been very limited - in fact, many studies have mainly focused on face to face rumor so far - due to the following reasons: First, it is very hard to identify the origin of online rumor and so does the motivation of spreading. Secondly, it is extremely difficult to trace the route of spreading of online rumor because the online rumor spread like wild fire across the globe on a real-time basis once it is initiated. Accordingly, not only there is little room for companies to react but recommendations for companies are very limited. Despite all these limitations, however, the consequence of the online corporate rumor is so severe as we have seen in the Nestlé's case that we cannot give up studying this subject. It seems that people tend to rely more and more on the online rumor when they evaluate companies and are inclined to accept the rumor's genuineness without any verification because it is in print and people tend to trust printed materials more easily than just word-of-mouth rumor (Fearn-Banks, 1996). Furthermore, with the advent of Web 2.0, the text with multimedia evidence and interaction among people about the rumor can escalate people's emotion and credibility of online rumor, and boost people's confidence toward it, subsequently leading to so-called a snowball effect. To top it all, all the records on the rumor would remain on the net forever even after the rumor turn out to be false unless it is deleted by media or authors.

Research Question and Objectives

The research question to be addressed here is 'What kinds of factors affect the behavior of spreading online rumor?' It refers to determinants to affect the credibility on online rumor or the attitude spreading online rumor.

The objectives of this study are to develop an understanding of the factors that affect the individual's attitude of spreading online rumor and how they eventually influence the individual's online rumor spreading behavior. Based on face to face rumor related theories and social psychological theories, we developed a theoretical framework in order to draw research model.

To test research hypotheses, we used structural equation modeling with PLS (Partial Least Squares). In this way, we described the relationship between emotion and the attitude toward spreading online rumor with the cognitive emotion theory. In addition, we identified informational factors and normative factor affect both credibility on online rumor and emotions.

Further, we expected that this study would provide researchers and stakeholders regarding online rumor with a more realistic understanding on how to manage the diffusion of online rumor, and how to minimize the loss from malicious online rumors.

Literature Review

As online rumors are not unprecedented rumors but are just propagated rumors on the Internet, we had to review the vast literature on rumors to conduct this study. Above mentioned, to fulfill our research objectives, we made an elaborate study of the literature on a rumor definition and the factors regarding belief in rumor.

Rumor Definition

Rumor should be distinguished from gossip, first. They differ in function and content. Gossip is "a small talk among a community's or group's members for the formation and the maintenance of their social network while rumor has a more impersonal content to help recognize ambiguous situation" (Rosnow, 1988). Ambrosini (1983) stated that "Gossip focuses on the private affairs of individuals; rumor focuses on the larger sphere of human events." That is, rumor deals with broader issues in the broader context whereas gossip cares about personal or private affairs.

Given this distinction, many great authorities in various disciplines have defined rumor. Knapp (1944) stated that rumor is "a proposition for belief of topical reference disseminated without official verification." In addition, he identified three basic characteristics of rumor: 1) Rumor is transmitted by word of mouth; 2) It provides information about topical issues; and 3) It expresses the emotional needs of the community. Allport and Postman (1947) defined 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's (1980) study defined rumor as "a proposition for belief in general circulation without certainty as to its truth." DiFonzo and Bordia (2007) defined rumor as "an 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." As we notice from the above discussions, the definition of rumor should contain the following three elements at least: Rumor 1) is a proposition for belief, 2) is officially unverified when it is issued, 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, because online rumor is passed around by online means, mainly by the Internet, not by word of mouth as in the definitions in the prior literature, it is indispensable to state the means of transmission of rumor.

By combining all the discussions above, online rumor can be defined as 'a proposition for belief of topical issues to a society disseminated by online means without official verification (to express the emotional needs of community and/or to help people make sense in the context of ambiguity, danger or potential threat)' in this study.

Factors Regarding Rumor Spreading

The major psychological literature on rumor has identified several variables related to rumor transmission: belief, attitude, source credibility (Bordia & DiFonzo, 2002; Rosnow, 1991; Walker & Blaine, 1991). We reviewed the literature regarding each variable. Moreover, we added the additional factors pertaining to rumor transmission repeatedly stressed by prominent scholars (Kelly, 2004; Hovland & Weiss, 1951; Bordia & DiFonzo, 2000; Eagley & Chaiken, 1978; Koller, 1992; London & London, 1975).

Belief in Rumor

A series of studies suggest that decisions to transmit a rumor may be influenced by one's confidence in the truth of rumor (Jaeger, 1980; Rosnow, 1986; Esposito, 1986; Kimmel & Keefer, 1991). Jaeger et al. (1980) conducted their research in an academic setting with introductory psychology students serving as subjects. The conclusion is as follows:

"...rumors 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."

Rosnow (1986) conducted the study of the spread of rumor on a college campus that was the site of intense contract negotiations between the faculty union and the university administration. It revealed a significant positive relationship between belief and likelihood of rumor transmission of rumor. These findings suggest that rumors are more apt to be transmitted when they are perceived to be true.

Esposito (1986) also examined the relationship between belief and rumor transmission using questionnaire data collected from graduate and undergraduate students under unusually tragic circumstances. This result was consistent with Rosnow's study (1986). Kimmel and Keefer (1991) posited that importance to be a mediating variable between belief and transmission. That is, people are more inclined to pass along a rumor they believe is true than one they believe is false.

Rumor Specific Attitude

A quantity of descriptive research points toward belief in rumors that are consistent with rumormonger's attitudes (London & London, 1975; Pratkanis & Greenwald, 1989; Scheper-Hughes, 1990; Fischle, 2000; Kelly, 2004). London and London (1975) noted that widespread false variations of a rumor that President Nixon had stolen a teacup from Chairman Mao during his visit to China sprang from elements of Chinese national character. Pratkanis and Greenwald (1989) argued that attitudes affect judgments of information that is relevant to the attitudes.

In line with prior studies, Scheper-Hughes (1990) studied Brazilian rumor that Brazilian shantytown children are abducted and mutilated by American or Japanese agents to obtain body organs for transplants. It indicated that the poor class conflict attitudes were consistent with rumor's belief. Fischle (2000) asserted that judgment of the veracity of the Clinton-Lewinsky scandal allegations was strongly predicted by one's prior Clinton approval rating. Furthermore, Kelly (2004) concluded that Iraqi hostility rumors were strongly correlated with ethnic and political sentiment such as anti-Israel, anti-Sunni, anti-Saddam, and anti-U.S.

Rumor Source Credibility

A number of researches in persuasion have shown that source credibility is associated with attitude formation and change (Hovland & Weiss, 1951; Petty & Cacioppo, 1981). Some researchers have consistently observed that attribution to a credible source is part of the typical rumor formulation (Blake, 1974; Bird, 1979; Porter, 1984). Blake (1974) found evidence that rumors gained plausibility by the addition of an authoritative citation and a media source from which the rumor was supposedly heard. Bird (1979) concluded that rumors are frequently ascribed to a high-status community member. Porter (1984) revealed rumor communicator credibility was moderately too strongly related to belief in negative rumors about birth control in the Dominican Republic.

In corporative respect, when corporations attempt to communicate with their various publics to stem the flow of marketplace rumors, source credibility is critical in undermining falsehoods that travel through the grapevine. The rumormongers in workplace are largely dependent on their perception of the trustworthiness of the originators, along with their expertise regarding the subject matter (Tosi, Rizzo, & Carroll, 1994). Moreover, research has shown that when people argue for a position that is at odds with their own self-interest they tend to be perceived as more credible and thus more persuasive (Eagley, Wood, & Chaiken, 1978; Walster, Aronson, & Abraham, 1966). Taken as a whole, all these findings imply an association between credibility of source credibility and belief in rumor.

Factors Related to the Persuasion of Online Message

Online rumor basically changed the way of rumor transmission from 'to hear' by word of mouth between people to 'to see' by written online messages. Thus, factors regarding online rumor spreading, in a way, are analogous to the factors proposed by prior persuasion study. Therefore, the factors related to the persuasion of online message were carefully reviewed in this paragraph.

According to Yale model, source, message, and receiver are three major informational components in message evaluation (Hovland & Weiss, 1951). Source credibility and argument strength are vital factors that were found to play a significant role in communication judgment (Cacioppo et al., 1983; Wathen & Burkell, 2002). In addition, several receiver characteristics such as receiver's prior belief and attitude may affect evaluations of an incoming message (Zhang & Watts, 2003). After all, four informational based factors and one normative based factor that have been widely used in persuasion research. Thus, argument strength, source credibility, confirmation of prior belief, message involvement, and consensus were examined in this study (Grewal et al., 1994; Smith & Shelby, 1978; Zhang & Watts, 2003).

Argument Strength

The number of studies has demonstrated that argument strength will affect the attitude of the receiver, particularly in on-line environments (Sia & Tan, 1999). It is defined as the extent to which the message receiver views the argument as convincing or valid in supporting its position (Cacioppo et al., 1983). Argument strength is concerned with the quality of the received information. If the received information is perceived to be valid arguments, the receiver will develop a positive attitude toward the information and consider it as credible information.

On the contrary, if the received information appears to be invalid arguments, the receiver will adopt a negative attitude toward the information and be inclined to treat it as not credible. Argument strength has proved to be an important element that people use in evaluating incoming communications (Nabi & Hendriks, 2003).

Source Credibility

Numerous studies have shown that information source's credibility significantly influence the evaluation of incoming messages (Hovland & Weiss, 1951; Eagley & Chaiken; Wathen and Burkell, 2002). It is defined as the information source's trustworthiness and expertise (Hovland & Weiss, 1951).

Hovland and Weiss (1951) showed that the communicator's credibility can influence on the credibility of the message. Eagley and Chaiken found that communicators with more positive attributes were more persuasive than those with less positive attributes (Eagley & Chaiken, 1993). It indicated that source credibility determines the effectiveness of a communication (Eagley et al., 1978). People tend to believe information from a highly credible source and more readily accept the information; hence, if the source has low credibility, the receiver is less likely to accept that information (Grewal et al., 1994). In a virtual context, Wathen and Burkell's research found that Web information receivers also considered virtual source credibility as an important indicator of information credibility (Wathen & Burkell, 2002).

Confirmation of Prior Belief

Many studies have shown that confirmation of prior belief significantly influences the credibility of the received information (Fogg et al., 2001). It is defined as the level of confirmation between the received information and their prior beliefs (Man Yee Cheung et al., 2009).

In an eWOM context, when consumer perceives the information as consistent with their prior knowledge or expectations, they have more confidence in the received information (Alloy & Naomi, 1984; Peterson & William, 1987; Zhang & Watts, 2003). However, if the information disconfirms the prior belief, the consumer will probably refuse to accept the recommendation and discount its validity. Thus, if online rumor confirms the rumor receivers' existing beliefs, they will be more likely to believe the online rumor.

Message Involvement

Message involvement refers to the general level of interest in the object or the centrality of the object to the person's ego-structure (Sun et al., 2006). Many researchers have examined involvement as a key factor that has the potential to explain word of mouth. The relationship between message involvement and eWOM has also been positively validated (Sun et al., 2006). Flynn, Goldsmith, and Eastman (1994) showed that product involvement was positively correlated with opinion leadership.

In the eWOM context, Ha (2002) found that information from WOM is more likely to influence individuals when they are in a high involvement purchase situation. Xue and Phelps (2004) discovered that consumer-generated comments on a product posted on an independent online forum were more persuasive than those posted on a commercial websites, especially when individuals were less involved with the product.

Consensus

Normative influence occurs when information on the position favored by other members is available (Kaplan & Miller, 1987). Sundar (2008) asserted that individuals tend to assume that if many others think something is correct or good, they are likely to do as well.

Past research also found that consensus could have a higher effect for interpersonal communication than nonconsensus information (Burnkrant & Cousineau, 1975; Pincus & Waters, 1977). People tend to believe what most people believe, even if it is not true (Deutsch & Gerard, 1955). The strength of consensus will be reinforced when including more supportive viewpoints from different persons (Weiner, 2000). People tend automatically to trust sites and sources that were either recommended by known others or that come from aggregated testimonials, reviews, or ratings (Chaiken, 1987).

Having reviewed the literature relevant to this study, I turn now to a discussion of the theoretical framework for research model.

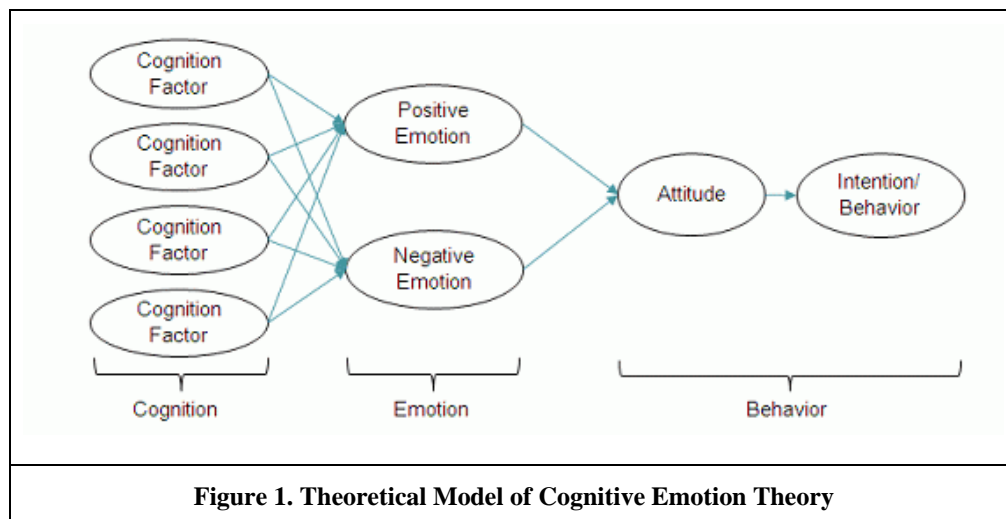
Theoretical Framework

As we reviewed earlier, the amount of rumor in circulation is resulted from subjective determinants of both emotional factors and cognitive factors (Rosnow, 1980). In addition, many studies suggest that decisions to transmit a rumor may be influenced by one's confidence in the truth of rumor (Jaeger, 1980; Rosnow, 1986; Esposito, 1986; Kimmel & Keefer, 1991). Eventually, cognitive factors pertaining belief in rumor and personal emotional factors may affect the judgment of credibility on a rumor and further rumor transmission behavior.

Therefore, we posit that evaluating and spreading online rumors are determined by the combinatorial effects of emotional process provoked by stimuli from outside and cognitive process for incoming information related with rumor. Based on this assumption, theoretical framework for this study is composed of cognitive emotion theory primarily adopted by attitude research and dual process theory mainly proposed by persuasion studies.

Cognitive Emotion Theory

Cognitive emotion theory (CET) assumes that emotions are caused by the cognitive activity of observing a stimulus and the formation of corresponding evaluative perceptions (Lazarus, 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. This argument suggesting that cognition and affect involve separate and independent systems has been supported by numerous emotion studies (Reisenzein, 2009). Further, CET postulated that emotions are expected to directly cause behavior in particular (Frijda, 2010). Figure 1 present the proposed theoretical model.



A multitude of scholars have argued that non-cognitive factors, such as affect, have a significant influence on attitude that is not mediated by the cognitive structure (Breckler, 1984; Crites, Fabrigar, & Petty, 1994; Haugtvedt, 1997; Herr, 1995; Miniard & Barone, 1997; Schwarz, 1997). Also, several researchers demonstrate the impact of affect on attitude. Holbrook and Batra (1987) found that multiple affect categories are related to attitudes. Trafimow and Sheeran (1998) found differences between affective-based and cognitive-based beliefs and observed

associations of each type of belief with attitudes. In addition, Eagley, Mladinic, and Otto (1994) used an idiographic rather than a nomothetic approach to measure beliefs and affect. They found that both cognitive structure and affect predict attitude. These results suggest that cognitions may not always be central determinants of attitude.

While many proposed conceptualizations distinguish emotions into positive and negative affect (Laros & Steenkamp, 2005). 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 in its nature and meaning for the person having it" (Bagozzi & Gopinath, 1999, p.184).

While many studies distinguish emotions into positive and negative affect (Laros & Steenkamp, 2005). Positive emotions such as joy, pleasure, interest and excitement (Yalch & Spangenberg, 2000) may stimulate people to circulate rumors as a source of diversion or as a means of getting attention (Rosnow & Fine, 1976). The passed on rumors must attract interest, and must be sensational and attention-getting (Koenig, 1985). Negative emotions such as anger, surprise, disgust, sadness, fear, and contempt (Yalch & Spangenberg, 2000) may also stimulate people to interact with others (Fiske, 2004).

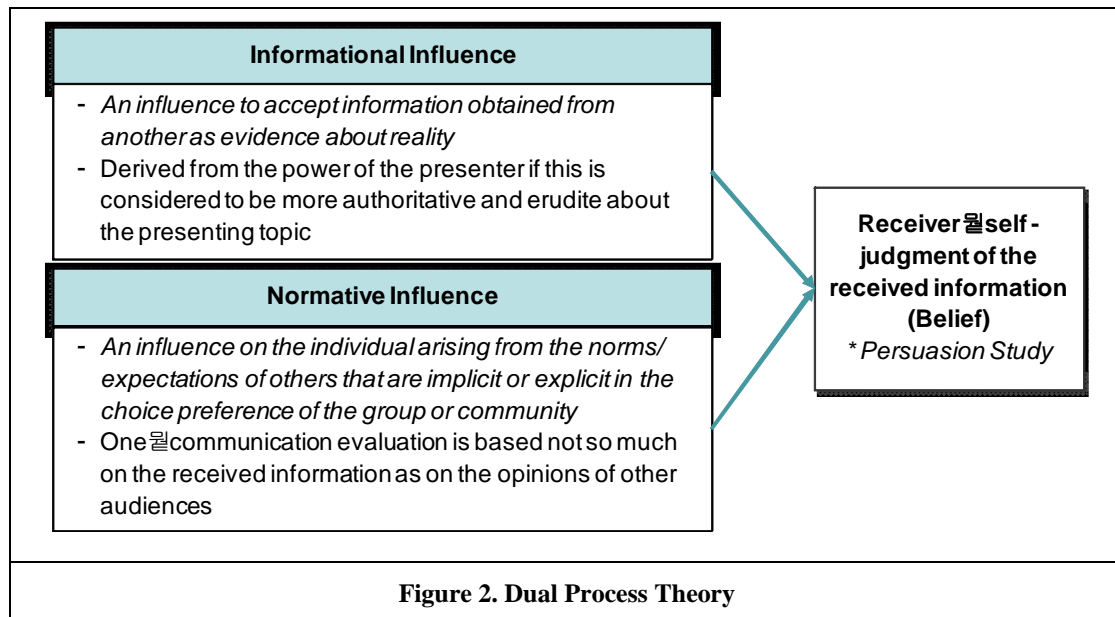
Affect is seen to guide other judgments and influences subsequent information processing (Petty, Gleicher, & Baker, 1991; Zajonc, 1980). Some arousal or excitement is necessary for rumor mongering to occur (Adams & Bristow, 1979). Although there are some conceptual and methodological difficulties associated with the measurement of affect (Crites, Fabrigar & Petty, 1994), it could be conceptualized as a fuzzy, overall valenced (positive or negative) evaluation of a particular situation or object. Moreover, affective responses can be distinguished from more cognitive attitudes in the sense that they are more spontaneous and more easily accessible.

Dual Process Theory

Dual process theory is a psychological theory that posits two distinct categories or types of influences on the persuasiveness of received messages: informational influence and normative influence (Deutsch & Gerrard, 1955). Informational influence arises from information obtained as evidence about reality. It is based on the receiver's self-judgment of the received information, and hence the relevant components of the information, such as the content, source, and receiver, are important sources of influence (Hovland & Kelley, 1953).

For instance, informational influence may be derived from the power of the presenter if this is considered to be more authoritative and erudite about the presenting topic. Normative influence, on the other hand, refers to the influence on the individual arising from the norms/expectations of others that are implicit or explicit in the choice preference of the group or community. In normative influence, one's communication evaluation is based not so much on the received information as on the opinions of other audiences.

Deutsch and Gerrard's dual process theory has been studied in various contexts, such as neighborhoods, university settings, and workplace communities, all of which have demonstrated the significant role of normative forces (Burnkrant & Cousineau, 1975; Kaplan & Miller, 1987). Figure 2 illustrate the both influences to the receiver's self judgment of the received information.



Dual process theory has been adopted to explain how different types of influences (normative factors vs. informational factors) affect the persuasiveness of online consumer reviews. Informational influence is based on the content of the reviews, whereas normative influence reflects the impact of social aggregation mechanisms available in today's online consumers (Man Yee Cheung et al., 2009).

According to the theory, informational and normative influence work together to shape the reader's information credibility judgment. This theory focuses on a communication influence model based on both the receiver's self-judgment of the information and the normative power of other audiences. It is useful in explaining communication effectiveness when group opinions/discussions are present (Briggs et al., 2002; Sia, Tan, & Wei, 2002). Thus, it has both informational elements from the shared discussion content and normative influences from the community of participant opinions.

Conceptual Framework

In order to identify salient beliefs for online rumor spreading, factors derived from informational factors and normative factors in dual process theory. As discussed earlier, belief in a rumor is considered as most important factors in rumor spreading. It can be conceptually linked to the receiver's self judgment of the received information. Thus, we assume that both sides of belief factors affect the credibility on online rumor.

In conclusion, order of constructs is placed on as follows; cognition-emotion- behavior according to CET. Simply credibility on online rumor precede emotions. The other part of conceptual model is consistent with the assumptions of CET. Attitude toward spreading online rumor is mediated by positive and negative emotions. After all, theoretical framework is integrated with two social psychological theories and academic foundations from prior rumor research. Figure 3 shows the conceptual framework.

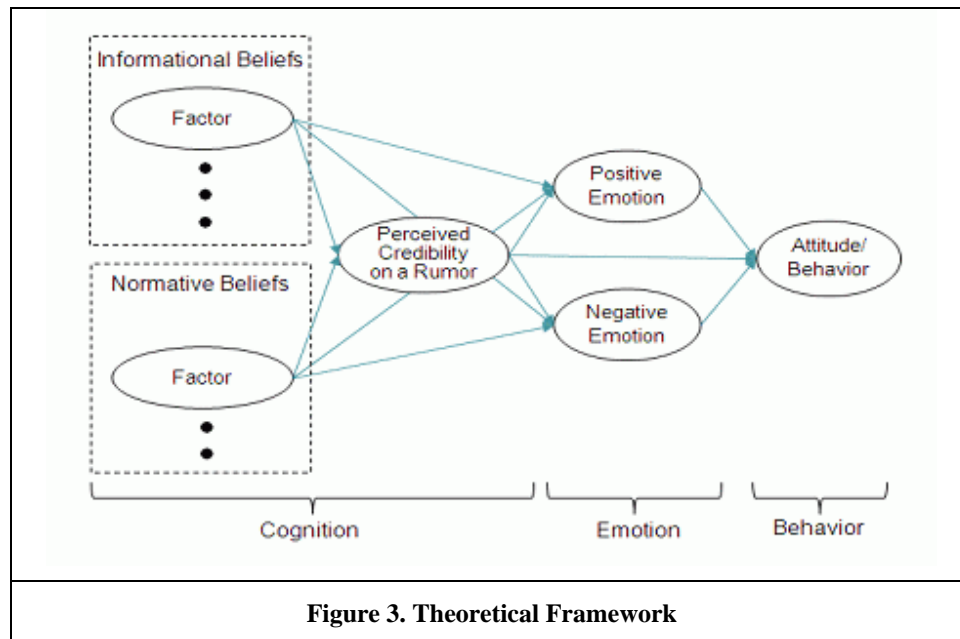


Figure 3. Theoretical Framework

Research Model

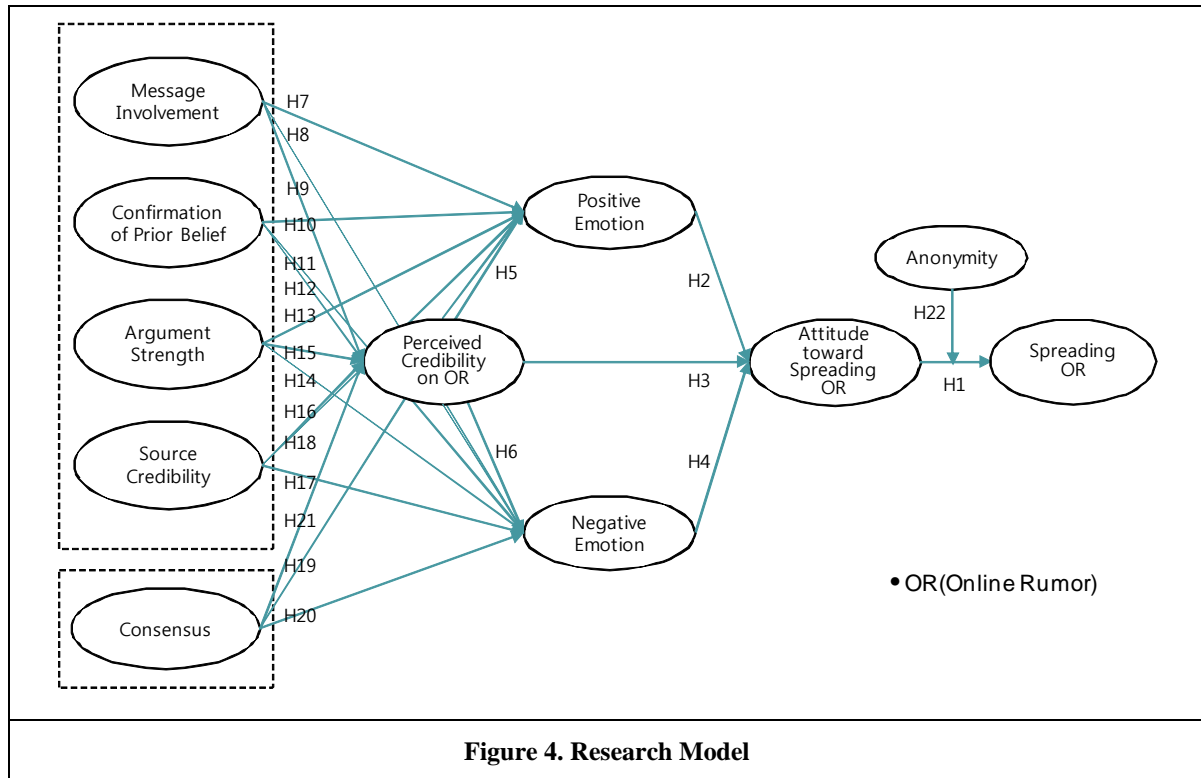
Hypotheses

With the introduction of prior literature, researchers and practitioners have identified many variables affecting the behavior of rumor spreading as we have seen in previous chapters. Even though many factors affecting behavior of rumor spreading have been identified, there has been no consensus on key determinants of online rumor spreading, because few researchers have empirically tested such factors in the online rumor context under the solid theoretical foundations. Therefore, we suggest a research model based on various social psychological theories to explain the behavior of online rumor spreading as well as factors identified from the literature review and preliminary study.

The proposed model is rooted into the theoretical framework from cognitive emotion theory and dual process theory. In line with the above, the model suggests that beliefs of online rumor lead to emotions that lead to attitude and behavior of spreading online rumor. Research model is based on literature review, theoretical framework along with social psychological theories.

Factors are derived from rumor and persuasion study from the standpoint of importance and relevance in rumor spreading. Thereafter, the selected factors are put in informational and normative variables based on dual process theory. Informational factors are argument strength, source credibility, confirmation of prior belief, and message involvement. Normative factor is consensus. Particularly, past research points that belief in rumor is important element in rumor spreading. As one of the belief constructs, perceived credibility on online rumor mediate between beliefs and attitude toward spreading online rumor. Comprehensively, five belief factors are applied to research model.

In the end, anonymity should increase the ordinarily forbidden behaviors by diminishing self-awareness (Kiesler, Siegel & McGuire, 1984; Siegel, 1986; Sproull & Kiesler, 1991). In that respect, it is assumed that anonymity moderated the behavior of spreading online rumor. Figure 4 depicts the research model of this study.



Based on research model, 22 hypotheses are formulated. The arguments for these hypotheses are aforementioned in literature review. All the hypotheses are summarized in table 1.

Table 1. Hypotheses		
Hypothesis	Path	Relationship
H1	Attitude → Behavior	Positive
H2	Positive emotion → Attitude	Positive
H3	Perceived credibility on online rumor → Attitude	Positive
H4	Negative emotion → Attitude	Positive
H5	Perceived credibility on online rumor → Positive emotion	Positive
H6	Perceived credibility on online rumor → Negative emotion	Positive
H7	Message Involvement → Positive emotion	Positive
H8	Message Involvement → Negative emotion	Positive
H9	Message Involvement → Perceived credibility on online rumor	Positive
H10	Confirmation of prior belief → Positive emotion	Positive
H11	Confirmation of prior belief → Negative emotion	Positive
H12	Confirmation of prior belief → Perceived credibility on OR	Positive
H13	Argument Strength → Positive emotion	Positive
H14	Argument Strength → Negative emotion	Positive
H15	Argument Strength → Perceived credibility on online rumor	Positive

H16	Source Credibility → Positive emotion	Positive
H17	Source Credibility → Negative emotion	Positive
H18	Source Credibility → Perceived credibility on online rumor	Positive
H19	Consensus → Positive emotion	Positive
H20	Consensus → Negative emotion	Positive
H21	Consensus → Perceived credibility on online rumor	Positive
H22	Anonymity → (Attitude → Behavior)	Positive

Methodology

Sample Rumor

Before we did survey about online rumor, we selected sample rumor (Tablo rumor) to help the respondents to recall the situation of online rumor spreading. The following news described a detailed story about the Tablo rumor (Stanforddaily on September 28, 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 MBC network airing the documentary on October 2, 2010, the Korean police reported the result of the investigation about the verity of the Tablo rumor on October 8, 2010. Although the rumor was proved to be false by the authorities concerned, the rumor is still survived and circulated on the Internet.

Questionnaire

All the instrument items were adapted from previous research, with some amendments made to fit the context of the present research (Smith & Vogt, 1995; Zhang & Watts, 2003). Since the original instruments were in English, the questions were first translated into simplified Korean and then a native Korean speaker (who was fluent in English) was engaged to check the translation. Disagreements in wording and meaning were resolved through further discussion.

A preliminary test was conducted prior to the actual data collection in which 2 Ph.D.s and 8 carefully selected Ph.D. candidates of the School of Business Administration in Sungkyunkwan University in Korea were invited. They were asked to fill in the paper questionnaire, were then interviewed to report any difficulties in understanding the

questions, and were invited to give suggestions. Results indicated that there were no major problems in understanding the questionnaire instructions and items. There were no missing important constructs, and the measurement statistics results were good enough to proceed to the actual data collection. Based on the suggestions of the preliminary test respondents, some minor changes, such as adding explanations about constructs and items that were unclear to respondents, were made to the questionnaire.

Thereafter, a pilot test was conducted in the on-line questionnaire in the portal of Sungkyunkwan University for one week. There were two main sections in the on-line questionnaire. The first section included an explanation of the general research purpose and a brief story about the Tablo rumor. It also included explanations of some special terms used in the questionnaire. In the second section, the question items, the respondents were asked to answer the questions referring to the Tablo rumor heard or read from various media. Out of 63 total responses, 56 responses were proved to be valid. After analyzing the 56 samples using paired t-test for the belief on a rumor before the police's report and the one after the police's report, we found out that there was a significant difference ($p < 0.007$) between both beliefs. In addition, there were sampling biases from respondents who didn't know the Tablo rumor at all. Therefore, we restructured questionnaire items focusing on situation before the police's report and changed the survey method into paper-based questionnaire to control the sampling biases from respondents who didn't know the Tablo rumor in main survey.

In main survey, we prevented respondents who didn't know the Tablo rumor from answering a paper-based questionnaire. Additionally, the respondents who didn't have experiences in accessing rumor sources, they were led to answer 'don't know' item in the part of source credibility for an exact measure. Respondents were made up of undergraduate students from 3 universities in Korea. Within three days, 211 valid responses were received out of 231 responses in total.

Respondents were encouraged to recall the situation prior to the police's report retrospectively. Then, we gave extra points to the respondents who participated in the survey as an incentive. Questions about their perceptions of message involvement, confirmation of prior belief, argument strength, source credibility, consensus, anonymity, and positive/negative emotion were asked. Items on their perceived credibility on a rumor, attitude toward spreading online rumor, spreading online rumor were also included in this section. Finally, they were asked to fill in some personal demographic information for statistical purposes. All the measurement items for the constructs in this study are shown in Table 2.

Table 2. Measurement Items of the Constructs		
Construct	Item	Measurement
Message Involvement	Item1	1. I think the forgery of academic records of the celebrities is often what I am interested in
	Item2	2. I think the forgery of academic records of the celebrities is often what I am excited about
	Item3	3. I think the forgery of academic records of the celebrities is often what I have fun with
	Item4	4. I think the forgery of academic records of the celebrities is often what I bear in mind
	Item5	5. I think the forgery of academic records of the celebrities is often what I care about
Consensus	Item1	1. I agree on the argument regarding the Tablo rumor that has a lot of hits
	Item2	2. I agree on the argument regarding the Tablo rumor that has a lot of comments
	Item3	3. I agree on the argument regarding the Tablo rumor that has a lot of recommendations
	Item4	4. I agree on the argument regarding the Tablo rumor that most people state identical opinions
Confirmation of Prior Belief	Item1	1. Information about the rumor corresponded to what I had known before reading it
	Item2	2. Information about the rumor supported my impression of Tablo
	Item3	3. Information about the rumor confirmed information I had previously known about Tablo
Argument Strength	Item1	1. The argument about the Tablo rumor was convincing
	Item2	2. The argument about the Tablo rumor was valid
	Item3	3. The argument about the Tablo rumor was persuasive
	Item4	4. The argument about the Tablo rumor was logical

Source Credibility	Item1	1. I trusted the information that the Tajinyo provided
	Item2	2. I trusted the information that the Sangjinse provided
	Item3	3. I trusted the information that the Tajinal provided
	Item4	4. I trusted the information that Tablo provided
	Item5	5. I trusted the information that Whatbecomes provided
	Item6	6. I trusted the information that the Internet portal provided
	Item7	7. I trusted the information that the MBC broadcast provided
Positive Emotion	Item1	1. I felt amused
	Item2	2. I felt interested
	Item3	3. I felt pleased
	Item4	4. I felt excited
Negative Emotion	Item1	1. I felt angry
	Item2	2. I felt surprised
	Item3	3. I felt disappointed
	Item4	4. I felt displeased
	Item5	5. I felt depressed
	Item6	6. I felt contemptuous
Perceived Credibility on Online Rumor	Item1	1. I thought the Tablo rumor was realistic
	Item2	2. I thought the Tablo rumor was probable
	Item3	3. I thought the Tablo rumor was believable
Attitude toward Spreading Online Rumor	Item1	1. I thought spreading the Tablo rumor was desirable
	Item2	2. I thought spreading the Tablo rumor was valuable to me
	Item3	3. I thought spreading the Tablo rumor was important to me
	Item4	4. I thought spreading the Tablo rumor was meaningful to me
Spreading Online Rumor	Item1	1. I transmitted the Tablo rumor by online means
	Item2	2. I posted the Tablo rumor on SNS, BBS, and blog
	Item3	3. I transmitted the Tablo rumor by online means without change
	Item4	4. I posted the Tablo rumor on SNS, BBS, and blog without change
	Item5	5. I transmitted the Tablo rumor by online means by changing
	Item6	6. I posted the Tablo rumor on SNS, BBS, and blog by changing
Anonymity	Item1	1. I don't reveal my real name when I do online communication
	Item2	2. I don't reveal my email address when I do online communication
	Item3	3. I don't reveal my telephone number when I do online communication
	Item4	4. I don't reveal my personal information when I do online communication

The questionnaire is carefully ordered to prevent respondents' common method bias. For the questionnaire, the multiple-item method will be used and each item will be measured based on 7 point Likert scale from 'Strongly agree' to 'Strongly disagree'. All operational definitions of variables are summarized in table 3.

Table 3. Operational Definitions of Constructs

Construct	Definition	Key References	Items
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Consensus	The degree to which individuals agree on the other people's opinion with respect to the same object	Kelly (1967)	4
Confirmation of Prior Belief	The level of confirmation between the received information and their prior beliefs	Man Yee Cheung (2009)	3
Argument Strength	The extent to which the message receiver views the argument as convincing or valid in supporting its position	Cacioppo & Morris (1983)	4
Source Credibility	The information source's trustworthiness and expertise	Hovland & Weiss (1951)	7
Positive Emotion	The emotional state of joy, pleasure, interest and excitement	Yalch & Spangenberg (2000)	4
Negative Emotion	The emotional state of anger, surprise, disgust, sadness, fear, and contempt	Yalch & Spangenberg (2000)	6
Message Involvement	The general level of interest in the object to the person's ego-structure	Sun et al., (2006)	5
Perceived Credibility on Online Rumor	A cognitive evaluation of the entity that constitutes an individual's beliefs about the object	Jaeger (1980), Rosnow (1986), Esposito (1986)	3
Attitude toward Spreading Online Rumor	An individual's degree of like or dislike for an object	Fishbein and Ajzen (1975)	4
Behavior (Spreading Online Rumor)	An individual's observable response in a given situation with respect to a given target	Fishbein and Ajzen (1975)	6
Anonymity	The degree to which a communicator perceives the message source as unknown or unspecified	Scott (1998)	4

Sample Demographics

Among the 211 respondents, 141(66.8%) were male and 70(33.2%) were female. They were generally young (53(25.1%) were below 20, 130(61.6%) were 21 to 25 years old, 28(13.3%) were 26 to 30). All the respondents were well educated as an undergraduate student. They were generally familiar with the Internet, with 178(84.4%) of them having used the Internet for over one hour per day on the average.

Results and Discussions

Measurement Model Analyses

Table 4 shows the descriptive and internal consistency statistics for all the constructs in the research model. The factors loadings for all constructs are shown in Table 5. The item 4 of positive emotion construct and item 3, 4, 6, 7 of source credibility construct were excluded in the analysis for low loading values. The answers included 'don't know' item were also excluded in the analysis confined to test source credibility construct. As a result, the number of samples for source credibility test was 137. The valid 211 samples were applied for the test of all the rest constructs.

Table 4. Descriptive Results and Internal Consistency of Model Constructs

Construct	Number of Items	Mean	S.D.	AVE	Composite Reliability	Cronbach's Alpha
AGST	4	3.61	1.68	0.83	0.95	0.93
ANMT	4	4.70	1.83	0.71	0.91	0.87
ATTD	4	2.18	1.74	0.90	0.97	0.96
BHVR	6	1.82	1.55	0.90	0.98	0.98
PCOR	3	2.88	1.81	0.91	0.97	0.95
CSSS	4	3.69	1.54	0.80	0.94	0.92
COPB	3	2.77	1.70	0.87	0.95	0.92
MIVM	5	3.15	1.71	0.78	0.95	0.93
NGTE	6	3.38	1.65	0.60	0.90	0.87
PSTE	3	3.78	1.66	0.74	0.90	0.83
SRCR	3	2.78	1.49	0.95	0.98	0.97

* AGST(Argument Strength), COPB(Confirmation of Prior Belief), PCOR(Perceived Credibility on Online Rumor), ATTD(Attitude), SRCR(Source Credibility), PSTE/NGTE(Positive/Negative Emotion), BHVR(Behavior), MIVM(Message Involvement), CSSS(Consensus), ANMT(Anonymity)

Convergent validity was used to judge the extent to which each measurement item was related with its corresponding theoretical construct. When this relationship is at a high level, the convergent validity is high. Cornell and Larker (1981) recommended a value of composite reliability equal to or above 0.70, and a Cronbach's alpha above 0.70 as acceptable reliability of the instruments. As can be seen from Table 4, the composite reliability and Cronbach's alpha of most of the constructs exceeded the corresponding threshold criterion values.

Table 5. Factor Loadings for all Constructs

	1	2	3	4	5	6	7	8	9	10	11
BHVR1	.575										
BHVR2	.636										
BHVR3	.603										
BHVR4	.676										
BHVR5	.640										
BHVR6	.660										
MIVM1		.778									
MIVM2		.812									
MIVM3		.739									
MIVM4		.656									
MIVM5		.645									
NGTE1			.763								
NGTE2			.620								
NGTE3			.681								
NGTE4			.783								
NGTE5			.680								
NGTE6			.594								

CSSS1				.831							
CSSS2				.854							
CSSS3				.842							
CSSS4				.780							
ANMT1					.762						
ANMT2					.834						
ANMT3					.843						
ANMT4					.854						
COPB1						.739					
COPB2						.767					
COPB3						.723					
PSTE1							.511				
PSTE2							.760				
PSTE3							.824				
ATTD1								.790			
ATTD2								.771			
ATTD3								.767			
ATTD4								.792			
AGST1									.656		
AGST2									.762		
AGST3									.793		
AGST4									.743		
PCOR1										.658	
PCOR2										.710	
PCOR3										.696	
SRCR1											.850
SRCR2											.855
SRCR5											.817

Discriminant validity indicates the extent to which the items of a construct are distinct from those of other constructs. According to Fornell and Larcker (1981) the discriminant validity is acceptable when the square root of every AVE of each construct is larger than any correlation among any pair of the constructs. Table 6 shows that all values of the square root of AVE were above 0.70 and were larger than all other cross-correlations. This indicates that the variance explained by the respective construct was larger than the measurement error variance (Fornell & Bookstein, 1982).

Table 6. Square Root of AVE and Cross-Correlations												
	AVE	AGST	ANMT	ATTD	BHVR	PCOR	CSSS	COPB	MIVM	NGTE	PSTE	SRCR
AGST	0.83	0.91										
ANMT	0.71	0.30	0.84									
ATTD	0.90	0.49	0.30	0.95								
BHVR	0.90	0.57	0.33	0.69	0.95							
PCOR	0.91	0.67	0.31	0.64	0.64	0.95						

CSSS	0.80	0.47	0.24	0.48	0.47	0.47	0.89					
COPB	0.87	0.65	0.29	0.65	0.61	0.61	0.50	0.93				
MIVM	0.78	0.56	0.28	0.62	0.67	0.67	0.48	0.61	0.88			
NGTE	0.60	0.52	0.14	0.61	0.64	0.54	0.37	0.54	0.63	0.77		
PSTE	0.74	0.62	0.24	0.50	0.53	0.49	0.32	0.54	0.61	0.56	0.86	
SRCR	0.95	0.64	0.35	0.59	0.61	0.62	0.56	0.66	0.63	0.58	0.62	0.97

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

Structural Model Analyses

Partial least squares (PLS) was used to test the research model. PLS is a latent structural equation modeling technique that is used as a component-based approach for estimation (Lohmoller, 1989). It has strong ability to model latent constructs under conditions of non-normality and with less restrictive demands on sample size and residual distribution (Chin, 1998). Table 7 represents the results of the structural model. The model explains 56.7 percent of the variance of perceived credibility on online rumor, 47.8 percent of the variance of positive emotion, and 38.6 percent of the variance of negative emotion, showing a rather high explanatory power. Furthermore, perceived credibility on online rumor and positive/negative emotion constructs explain 49.4 percent of the variance of the attitude toward spreading online rumor. Finally, the attitude toward spreading online rumor construct alone explains 42.7 percent of the variance of behavior of spreading online rumor. This provides substantial evidence of the strong relationship between the constructs in the model.

Table 7. PLS Results			
Hypothesis	Path Coefficient	t-value	Result
Perceived credibility on online rumor	R ² =0.567		
Message Involvement (H9)**	0.232	3.898	Supported
Confirmation of prior belief (H12)**	0.232	3.083	Supported
Argument strength (H15)**	0.257	3.317	Supported
Source Credibility (H18)**	0.526	8.823	Supported
Consensus (H21)	0.004	0.066	Not Supported
Positive emotion	R ² =0.478		
Message Involvement (H7)**	0.310	4.599	Supported
Confirmation of prior belief (H10)*	0.152	2.049	Supported
Argument strength (H13)**	0.337	4.478	Supported
Source Credibility (H16)**	0.619	13.144	Supported
Consensus (H19)**	0.157	2.563	Supported
Perceived credibility on online rumor (H5)	0.033	0.478	Not Supported
Negative emotion	R ² =0.386		
Message Involvement (H8)**	0.315	4.139	Supported
Confirmation of prior belief (H11)*	0.158	2.085	Supported
Argument strength (H14)*	0.136	1.981	Supported
Source Credibility (H17)**	0.579	10.799	Supported
Consensus (H20)	0.023	0.323	Not Supported
Perceived credibility on online rumor (H6)	0.046	0.588	Not Supported

Attitude	R2=0.494		
Positive emotion (H2)	0.110	1.658	Not Supported
Perceived credibility on online rumor (H3)**	0.432	6.956	Supported
Negative emotion (H4)**	0.307	4.906	Supported
Behavior	R2=0.427		
Attitude (H1)**	0.596	11.083	Supported
Anonymity (H22)**	0.173	3.668	Supported

*p<0.05, **p<0.01

Four determinants of informational influence to perceived credibility on online rumor were supported. Message Involvement (H9), Confirmation of prior belief (H12), Argument strength (H15), and Source Credibility (H18) were found to be statistically significant at the p<0.01 level. On the other hand, Consensus was not significant in the model. Thus, H21 was not supported.

Four determinants of informational influence and a normative determinant to positive emotion were supported. Message Involvement (H7), Argument strength (H13), Source Credibility (H16), and Consensus (H19) were found to be statistically significant at the p<0.01 level, while Confirmation of prior belief (H10) was significant at the p<0.05 level. On the other hand, Perceived credibility on online rumor was not significant in the model. Therefore, H5 was not supported.

Four determinants of informational influence to negative emotion were supported. Message Involvement (H8), Argument strength (H14), and Source Credibility (H17) were found to be statistically significant at the p<0.01 level, while Confirmation of prior belief (H11) was significant at the p<0.05 level. On the other hand, Consensus and Perceived credibility on online rumor were not significant in the model. Thus, H20 and H6 were not supported. Lastly, Anonymity was found to significantly moderate the relationship between attitude toward spreading online rumor and behavior of spreading online rumor.

Discussion

This study applied the cognitive emotion theory and the dual-process theory of information processing to examine how online users express their emotions and evaluate the credibility of online rumor. It also examined the extent to which perceived credibility of online rumor leads to attitude and behavior of spreading online rumor.

The structural model explained more than 50 percent of the variance of perceived credibility of online rumor. Perceived credibility, in turn, explained more than 40 percent of the variance of attitude and behavior of spreading online rumor.

This provides empirical evidence of the validity and explanatory ability of the theoretical model. Based on the data analysis results, it was found that informationally based determinants significantly influenced perceived credibility on online rumor. These findings are consistent with the findings of prior rumor research (Kimmel & Keefer, 1991; Bird, 1979; Blake, McFaul, & Porter, 1974). The results indicate that all the informationally based determinants are the crucially influential ingredients in online rumor spreading. On the contrary, consensus didn't affect the perceived credibility of online rumor. The result indicates that the respondents are not easily influenced by just number of hits and comments as long as they stand in as a passive reviewer of online rumor. This is also applied to H20. Additionally, it was found that informationally based determinants significantly influenced positive emotion.

Perceived credibility on online rumor significantly influenced the attitude toward spreading online rumor. These results are consistent with the findings of prior rumor research (Ambrosini, 1983; Hicks, 1990; Kelley, 2004). The results suggest that the more people have belief in online rumor, the more people have attitude toward spreading online rumor. Positive emotion did little affect attitude toward spreading online rumor while negative emotion was associated with perceived credibility on online rumor. It can be explained that memories for neutral stimuli decrease but memories for arousing stimuli remain the same or improve (LeBar & Phelps, 1998; Baddeley, 1982; Kleinsmith & Kaplan, 1963). Namely, if people received the stronger impulse, the longer the stimulus will live in their memory.

In the end, attitude significantly influenced the behavior of spreading online rumor as prior behavioral research suggested (Fishbein & Ajzen, 1975). Anonymity exerted a strong influence on behavior of spreading online rumor. This result strongly supports that anonymity could increase the ordinarily forbidden behaviors by diminishing self-awareness (Kiesler, Siegel & McGuire, 1984; Siegel, 1986; Sproull & Kiesler, 1991).

Conclusion

Contributions of the Research

The first contribution is that we conducted a pioneering exploratory empirical study in the online rumor research field. While previous research has focused on face to face rumor, if any, online rumor research was seldom carried out, this study defined the definition of online rumor and revealed the status quo of online rumor diffusion. Thus, we can understand the phenomena of online rumor from a realistic point of view.

The second contribution is that we elaborated the research model providing a more comprehensive understanding of online rumor spreading. We found the major factors affecting the online rumor spreading behavior based on social psychological theories. To the large extent, this study supports the cognitive emotion theory empirically. The theory argues that cognitive structure is mediated by emotion (Lazarus, 1982). Our findings demonstrate that the belief constructs affect positive or negative emotion, and then, emotion finally affects the attitude and behavior of online rumor spreading. These results provide significant implications both in theory and practice.

The third contribution is to provide foundations for field users of a corporation or the Internet users to understand the process of online rumor diffusion. Although a celebrity rumor was selected in this study, psychological factor such as confirmation of prior belief was selected as substitutes for brand awareness. Therefore, results from this study can be carefully interpreted for practitioners.

Limitations and Future Research Directions

Even though this research has drawn theoretically and practically meaningful implications, there are a few limitations. First of all, as survey of the study was conducted after the police's report on the verity of sample rumor, we had no choice but to ask perceptions of the respondents about the rumor retrospectively. Though we carefully designed questionnaire focusing on the situation before the police report, the answers of the respondents might be influenced by the event. For more effective online rumor research, controlling the change of cognition and emotion as time goes by should be considered in future study.

Secondly, data of the study was collected from Korean students for the specific sample rumor. The results might not be generalizable due to the national characteristics unique in Korea and the small sample size. In order to generalize the results from this study, we need to collect data from various countries. Then, we can generalize this research model, and further can compare the cultural differences between countries. Specifically, if sample rumors are increased to corporate online rumors, the more practical implications for the reputation management of corporation can be deduced.

For future research, extended research method such as laboratory experiment should be considered to enhance explanatory power of this research model. Because behavior of online rumor spreading is involved with many factors and it is realistically difficult to control environment in real setting, more simplified and sophisticated experiment methods are needed. Further, to provide a more accurate explanation on behavior of online rumor spreading based on the adopted theories, a longitudinal approach also needs to be taken.

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