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ANNIE (CHUAN) TIAN
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A TWO-STAGE EXPLORATION OF CYBER RUMORS

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BY THE COMMITTEE CONSISTING OF

Dr.Matthew Jensen, Chair

Dr. Radhika Santhanam

Dr. Shaila Miranda

Dr. Alexandra Durcikova

Dr. Mark Bolino

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Abstract

The rise of online social networks (OSNs) has dramatically accelerated the diffusion of large-scale information cascades, leading cyber rumors to coalesce into a global social phenomenon. In this dissertation study, I conducted two rumor-related inquiries. Grounded in the research on discourse hedging, meta-cognitive theory (MCT), and warranting theory (WT), the first inquiry sought to develop an effective mechanism for helping users better understand the reliability of rumors so that they can make a more informed evaluation of the rumors. I investigated several candidate rating mechanisms and examined their relative efficacy in influencing users' evaluation of rumors on social network platforms. The second inquiry focused on people's rumor transmission motivation. Past rumor research has emphasized the role of plausibility in rumor transmission, finding it to be a core determinant of rumor spread. Yet individuals frequently share implausible rumors, which leads to a plausibility paradox of rumor sharing. Drawing on dual motivation theory, I argue that rumor novelty and plausibility influence sharing intention through utilitarian and hedonic motivation. This dissertation reports the results of a controlled, randomized experiment (N = 356) investigating the two research inquiries. Although I found no statistically significant results in support of the hypotheses for the first inquiry, the dissertation yielded valuable insights for developing future studies and designing viable and effective technical solutions by shedding light and provides nuances on the designing of technical mechanisms by

illuminating the varying nature of the rating system contingent to specific circumstances and topics.

Results for the second inquiry demonstrated both utilitarian and hedonic motivation increase rumor sharing intention. Although rumor plausibility significantly increased utilitarian motivation, it had no effect on users' hedonic motivation. However, rumor novelty led to higher rumor sharing intentions by increasing both the hedonic and utilitarian motivations. Our findings on the effect of novelty extend and deepen our understanding of rumor sharing by revealing that infusion of novelty into rumors can give rise to higher utilitarian value, rendering the information processing not only more enjoyable but also potentially more illuminating.

Keywords: cyber rumor, plausibility, hedge, warranting theory, self-rating, community-rating, online social networks, novelty

Chapter I. Introduction

On April 23, 2013, an unverified rumor about explosions at the White House injuring President Obama, ("BREAKING: Two Explosions in the White House and Barack Obama is injured.") appeared and quickly gained momentum on Twitter, leading the Dow Jones Index to plummet more than 140 points and the bond yield to plunge. It is estimated that the temporary capital loss totaled $136 billion just in the S&P 500 (CNBC 2013).

On Apr 16, 2020, Nokia's stock price surged by 7% as investors reacted to speculation claiming that the telecommunication firm hired a prominent investment bank for advisory service to prepare for a potential acquisition, despite no confirmation from Nokia (Fool.com 2020).

After rumors spread that President Trump suggested injecting disinfectants into the body to treat coronavirus, Maryland Emergency Management Agency received more than 100 calls about ingesting disinfectants as a possible treatment for COVID-19. New York Poison Center received 30 exposure calls about disinfectants in the 18 hours after Trump's comments (Forbes 2020).

After unfounded rumors went viral that Bill Gates had orchestrated the whole COVID-19 pandemic to reap huge profits from a Covid-19 vaccine, Gates and his foundation were subjected to hundreds of thousands of vicious attacks calling him a partisan and linking him to a wide range of bizarre conspiracy theories (BBC 2020).

Rumors are pervasive social and organizational phenomena. They attract attention, evoke emotion, stimulate engagement, affect attitude, and direct action (DiFonzo and Bordia 2007a). According to Lardner (1943), rumors are "bristling with circumstantial detail that spread like prairie fires" (p27). Rumors represent public discourses that reflect one's propositions about the world, serving to help citizens to collectively make sense of and cope with uncertainties and anxiety (Rosnow 1988; Rosnow 2001).

The function of rumors can be described as a double-edged sword. On one hand, rumors can help individuals keep abreast of current news, politics, and trends, and stay informed about the current occurrences in the environment (Rosnow and Foster 2005). It can offer a certain degree of emotional reassurance to community members especially during times of uncertainties such as social crises and natural disasters (Oh et al. 2011). Rumors have particular salience when the official, legitimate information supply is unavailable, scarce, or distrusted due to systematic censorship (Ding 2009; Oh et al. 2013). For instance, during the Mumbai terrorist attack in 2008, despite referring to official media that were thought to only zoom in on the sensational aspect of the disaster, citizens resorted to social media (e.g., Facebook, Twitter) where they could get information needed immediately for them to grasp the situation (Oh et al. 2013). On the other hand, rumors can be undeniably noxious and harmful, inducing substantial negative consequences. In organizational contexts, negative cyber rumors (e.g., concerning layoffs) lower employee morale, increase absenteeism and turnover, induce employee panic, undermine organizational reputation, and inflate stock price volatility (Ahern and Sosyura 2015; Coombs 2007). Although cyber rumors are unverified, they clearly hold sway over the emotions, attitudes, and actions of individuals.

In the past, rumors were primarily spread directly through close and weak social ties (Allport and Postman 1947). But, the rise of online social networks (OSNs), exemplified by Facebook and Twitter, has accelerated rumor dissemination and cascading on a scale once thought unimaginable. Rumors that proliferate on OSNs are termed cyber rumors (Antoniadis et al. 2015) and with simple button clicks, they can easily reach thousands (or millions) of people. In fact, cyber rumors are so prevalent, OSNs are frequently viewed as collective rumor mills (Oh et al. 2013). For example, during the outbreak of Ebola in 2014, numerous cyber rumors were found on multiple OSNs spreading false information, disrupting public opinion, and invoking fear and anxiety (Jin et al. 2014). Cyber rumors are often stripped of identity, nonverbal, and social cues that aid interpretation, but past multi-disciplinary research has shown that they achieve much more success than traditional rumors (Bakshy et al. 2012; Kwon et al. 2013; Yang and Counts 2010). People are more willing to accept and spread unverified information across the internet, but in the offline environment, they tend to be more skeptical (Garrett 2011; Kwon et al. 2013). For example, cyber rumors promoting conspiracy theories or that stir animosity enjoy wide circulation on OSNs, and these rumors are mostly false, ill-founded, or exaggerated (Campion-Vincent and Fine 2017). Widely circulated false rumors diminish the value of OSNs as effective platforms to disseminate valid information (Oh et al. 2013). In fact, cyber rumors were identified by the World Economic Forum (WEF) as one of the key threats to society (Del Vicario et al. 2016).

The extant research on cyber rumor mainly focuses on mitigation strategies using algorithm-driven rumor identification (Hamidian and Diab 2016; Qazvinian et al. 2011).

The behavior stream of research on cyber rumors has grown over the years but is not commensurate with the scale and volume of the rumors thriving in online social networks (see Appendix B and C for a review). With the proliferation and elevated negative impact of false rumors, the first key question of this dissertation is*: Whether a mechanism can be developed to effectively inform users about the extent to which rumors represent facts so that users can make a more informed rumor evaluation.* In an attempt to address this issue, I proposed several alternative hedge mechanisms (e.g., discourse hedge, self-rating, and community-rating) that are likely to help users to discern deception from the truth by providing additional information on rumor reliability. Further, drawing on warranting theory, metacognition theory, and the related research on discourse hedges, I argue that the presence of discourse hedge, self-rating and community-rating will exhibit different levels of efficacy in impacting how readers assess the reliability of the rumors.

Aside from rumor information processing, extant cyber rumor research on diffusion is sparse. One research theme mainly focuses on sharing and dissemination mechanisms in contexts such as social crises or natural disasters (e.g., Oh et al. 2013). Another theme of cyber rumor research (Bordia and DiFonzo 2004; DiFonzo and Bordia 2007a; Pezzo and Beckstead 2006) supplies confirmatory analysis of classic rumor-mongering theories (Bordia and Rosnow 1998; Rosnow 1991; Shibutani 1966b). Both themes have the evaluation of rumor plausibility at their core and suggest plausibility to be among or the most influential of all determinants of dissemination behavior (see Appendix F for a review). However, emerging research within OSNs has produced contrasting results. For example, a large-scale field study demonstrated that falsity spreads considerably

farther and faster on OSNs than truth in almost all classes of information (Vosoughi et al. 2018; Zubiaga et al. 2016). These contrasting observations raise the possibility of a *plausibility paradox*. On one hand, plausibility is a primary contributor to rumor diffusion and rumor dispersion is positively associated with plausibility (DiFonzo and Bordia 2007a; Kwon and Rao 2017; Rosnow et al. 1988). But on the other hand, low plausibility rumors are found to be more virally successful in OSNs (Vosoughi et al. 2018).

To unravel this paradox, I argue that there is a need to examine additional characteristics of cyber rumors that have been neglected but are likely to induce a high level of rumor transmission. In this dissertation, I focus specifically on novelty. Novelty reflects the perceived newness of information (Berlyne 1970) and has been found to be a primary affective factor that motivates information processing (Weierich et al. 2010). Novelty is also associated with significant hedonic value driving interest and curiosity (Koslow et al. 2003). Previous research has begun to examine the impact of novelty on rumor dissemination (e.g., Brooks et al. 2013). I build on this inquiry by answering the following question: *How do rumor plausibility and novelty differentially affect online users' rumor sharing motivations, and consequently, affect online users' rumor sharing intentions?* I designed an overall research model to guide the dissertation. The model is presented in Figure 1.
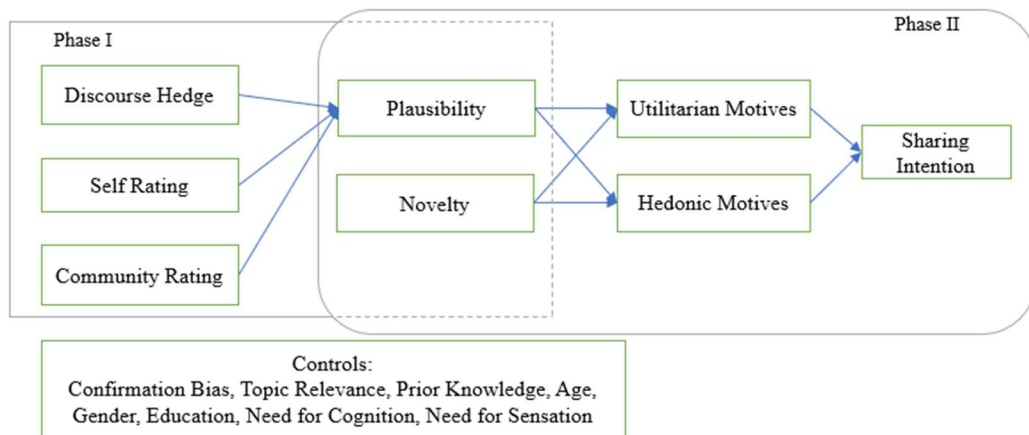
Figure 1. Overall Research Model

Chapter II. Literature Review

Overview of Rumor Definition

Rumor research can be traced back to World War II when rumors spread rampantly and were mainly consumed by citizens to assess the progress of the warfare and express emotional feelings such as fears, wishes, and anxieties (Knapp 1944). Robert Knapp described rumor as a "proposition for belief of topical reference disseminated without official verification" (Knapp 1944, p2). Shibutani (1966a) described rumor as a recurrent form of communication through which people draw their intellectual resources together and develop an interpretation of an ambiguous situation. As a collective consumption of unverified yet plausible information and collaborative improvisation and interpretations, rumors were primarily disseminated in informal communication channels (Bordia et al. 1999; Crampton et al. 1998).

DiFonzo and Bordia (2007a) defined rumor as an "unverified and instrumentally relevant information statement in circulation that arises in contexts of ambiguity, danger, or potential threat and that functions to help people make sense and manage risk" (DiFonzo and Bordia 2007c, p. 13). Rumors generally have four major characteristics. First, rumors are unverified information statements, i.e., rumor can be the accurate representation of fact or not, and it is independent of the fact (Buchegger and Le Boudec 2003). Second, rumors are instrumentally relevant to the individuals or groups that are involved, affected, benefited, or threatened. For instance, a layoff rumor can be consequential to some organizational employees. Third, rumors emerge in an ambiguous situation that is often accompanied by the absence of formal information

(Shibutani 1966a). As ambiguity causes uncertainty and a sense of lacking control, individuals frequently resort to informal communication channels to collectively make sense of the situation, attempting to achieve convergence on the interpretation of the context, to restore their sense of control, and take actions (Antaki 1988; Turner and Killian 1972). Hence, rumors are never only individual thoughts. Instead, they are collective discursive threads among the convoluted fabrics of social exchanges (Rosnow 1991). These characteristics distinguish rumor from other forms of online information such as fake news, gossip, and propaganda.

The Distinction of Rumors from other Forms of Misinformation

There are nuanced distinctions between rumor, gossip, fake news, and propaganda. *Gossip* refers to "evaluative social talk about individuals that arises in the context of social network formation, change, and maintenance" (DiFonzo and Bordia 2007a, p25). Gossip fulfills a number of essential social functions such as entertainment, group solidarity maintenance, networking, and group power structuration. For example, gossip is an effective way of social bonding (Dunbar 2004). Even though rumor and gossip are both "unofficial communication" (Kapferer 1990), they are not equivalent. First, rumors are not grounded on evidence, whereas gossip may or may not be verified (Rosnow and Kimmel 2000). Second, gossip is always about the private lives of certain individuals but rumor may focus on a large range of events (Ambrosini 1983). Third, rumor functions to make sense of an uncertain environment, while gossip is intended for network association and social bonding (DiFonzo and Bordia 2007a).

Different from rumor and gossip, *fake news* refers to articles "that are intentionally and verifiably false and could mislead readers" (Allcott and Gentzkow 2017, p. 213). It is

defined as "fabricated information that mimics news media content in form but not in organizational process or intent" (Lazer et al. 2018, p. 1094). An example of fake news could be a false news article from a website with a headline of "Pope Francis had endorsed Donald Trump's presidential candidacy" (Allcott and Gentzkow 2017, p. 214). Further, fake news can also be articles originating from some satirical sites, but being misconstrued as factual, in particular those viewed on Twitter or Facebook where contexts are frequently ignored (Allcott and Gentzkow 2017). Hence, the marked contrast between rumor and fake news is that a rumor is a message yet to be substantiated, while fake news is verifiably "false". Furthermore, whereas rumor and rumor mongering are primarily used by community members to collectively make sense of the situation and solve the problems concerning issues of their common interest, fake news functions to mislead readers.

Last, *propaganda* is defined as the communications of opinions or actions carried out by groups or individuals, aiming to manipulate the opinions or actions of other groups or individuals for predetermined purposes (Lasswell 1948). Propagandists frequently use manipulative instruments (e.g., symbols) to modify public attitudes and induce collective actions (Brown 1963). For example, during the Rwandan genocide in the 1990s, the elite Hutu members of the government led propaganda campaigns disseminating messages provoking violence against the Tutsi minority population by accusing them of a political threat (Yanagizawa-Drott 2014). The propaganda not only contained anti-Tutsi rhetoric that invoked hatred among citizens, but also information encouraging and even mandating behaviors such as killings of Tutsi and appropriation of their possessions (Yanagizawa-Drott 2014).

With the help of social media, algorithms, automation, and curation were oftentimes employed to disseminate misinformation to manipulate public opinion (Woolley and Howard 2017). For instance, according to an indictment filed by the special counsel investigating Russian interference into the 2016 presidential election, thirteen Russian nationals were indicted with illegal attempts to disrupt American politics and interfere with the 2016 presidential election. Allegedly, they were found using fraudulent social media accounts and employing special algorithms and tactics to impersonate American citizens and spread propaganda (NewYorkTimes 2018). Hence, the division between rumor and propaganda is that rumors focus on sensemaking and risk management, while propaganda intends to manipulate public opinion, attitudes, and behaviors for a special political agenda. In addition, propaganda is typically an organized effort oftentimes sponsored by groups, states, or governments to disseminate a political view, while rumors are improvised and dispersed by community members to achieve a cognitive convergence on the issues that are of their common interests (DiFonzo and Bordia 2007c).

The comparison of definitions, functions, and examples of rumors, gossip, fake news, and propaganda is presented in Table 1.

Table 1. The Comparison of Rumors, Gossip, Fake News, and Propaganda in Extant Literature

	Definition	Function	Examples
Rumor	Rumors refer to unverified information statements that are instrumentally relevant. Rumors arise in contexts of ambiguity, threat and anxiety (DiFonzo and Bordia 2007a).	Rumors function as community intelligence for members to collectively make sense of an ambiguous situation and fill knowledge gaps or discrepancies in time of information dearth; rumors offer psychological reassurance. False rumors can undermine organizational reputation and distort capital market prices.	Rumors of organizational lay-off (e.g., "I heard that operational officers will be downsized from 300 to 100") (Bordia et al. 2006)
Fake News	Fake news refers to "news articles that are intentionally and verifiably false and could mislead readers" (Kim and Dennis 2019).	Fake news is created aiming to mislead in order to spread disinformation, damage an agency, entity, or person, or achieve financial or political gains (Kim and Dennis 2019)	An article from a website with the headline, "FBI agent suspected in Hillary email leaks found dead in an apparent murder-suicide." (Allcott and Gentzkow 2017).
Gossip	Gossip is the evaluative social talk about an individual who is not present; gossip arises in the context of social network formation, change, and maintenance (Brady et al. 2017; DiFonzo and Bordia 2007b).	Gossip fulfills a myriad of essential social and organizational functions such as entertainment, group bonding, networking, and group power structuration (Michelson et al. 2010).	A story shared with other office staff regarding something that a supervisor has done behind his/her back (Brady et al. 2017)
Propaganda	Propaganda is the "management of collective attitudes by the manipulation of significant symbols." (Lasswell 1927, p. 627).	By leveraging psychological manipulations, propagandists manipulate public opinions and actions for predetermined purposes or furthering a political agenda. Propaganda is mainly carried out by governments, corporations, religious groups, etc.	During the 1994 Rwandan genocide, the ethnic Hutu members of the government intentionally spread inflammatory messages about the Tutsi minority group and called for their extermination (Yanagizawa-Drott 2014).

Chapter III. Online Hedge Mechanisms and Rumor Plausibility

This chapter explores the effect of disparate hedging mechanisms on users' plausibility evaluation of cyber rumors on social media platforms. Grounded in the research on discourse hedge, meta-cognitive theory (MCT) and warranting theory (WT), I seek to develop an effective mechanism for helping users better understand the reliability of rumors so that they can make a more informed evaluation of the rumors. I investigated several candiate rating mechanisms and examined their relative efficacy in influencing users' evaluation of rumors on social network platforms.

Grounded in hedging literature, warranty, I investigated the effect of 1) discourse hedging embedded in rumor texts; 2) self-rating that is disclosed by the posters themselves when posting the rumors, and 3) community-rating, the aggregated average score contributed by community members on the reliability of the rumors. Community-rating is similar to the product review ratings on online shopping portals such as Amazon and eBay.

Theoretical Background

Rumor Plausibility

At the core of past interdisciplinary literature on rumors and other forms of misinformation is plausibility. Plausibility refers to the subjective confidence judgment about the probability that a certain hypothesis is truthful and authentic (DiFonzo and Bordia 2007b). Following DiFonzo and Bordia (2007), I labeled the truthfulness

evaluation as rumor plausibility to distinguish it from the credibility that is related to the reliability of the message source.

Ample empirical research has corroborated the revelation of people's susceptibility to deception and incompetence in distinguishing truth from falsehood (Bond Jr and DePaulo 2008; Levine et al. 1999). Due to individuals' inherent inability to detect deception, plausibility has been viewed as a central construct in information processing research. However, despite the inability to detect truth from falsehood, individuals are motivated to process information accurately in search of facts (Rosnow et al. 1986). Past research found individuals are more likely to transmit rumors they deem to be true (DiFonzo and Bordia 2007a; Rosnow et al. 1986). Hence, plausibility is believed to be a pivotal construct for rumor evaluation and therefore exhibits profound repercussions in individuals' subsequent rumor sharing behavior.

Two points make plausibility more salient in online communication. First, unlike offline contexts where people tend to be skeptical when assessing information, in the virtual environment, online users are more inclined to blindly believe and spread rumors (Vosoughi et al. 2018). There is a prevalent tendency for users to support and trust unverified rumor in the online environment (Zubiaga et al. 2016). The prevalence of trust and mindlessness in online social networks make online users more vulnerable to deception, and consequently, cyber rumors garner much more viral success than traditional rumors, and false rumors enjoy greater diffusion than truth (Bakshy et al. 2012; Kwon et al. 2013; Vosoughi et al. 2018; Yang and Counts 2010). Second, rumors involve collective discourses, interactive information communication, and social support (Festinger 1962). In traditional exchanges, rumors are mainly received and

disseminated through close and weak social ties such as friends and family members where social cues are available (Oh et al. 2013). Individuals can infer the plausibility of rumors by contemplating certain social cues such as source credibility or trustworthiness. However, digital platforms are characterized by the absence of nonverbal social cues such as facial expressions, appearance, and social status that are critical in interpersonal communication. Besides, in digital platforms, social interactions can take place between users unknown to each other where offline identities are often unspecified (Rains 2007). Hence individuals have to resort to cues afforded by the information communication technology (ICT) to arrive at a judgment about the plausibility of rumors.

Past research has ascertained a host of antecedents that are likely to influence how individuals evaluate the plausibility of rumors. For instance, research on fake news found that the perceived plausibility succumbs to a myriad of biases that are typified by confirmation bias (Einwiller and Kamins 2008; Sunstein 2014). Confirmation bias is the tendency for individuals to seek, interpret, and recall information that confirms or strengthens their existing attitudes or beliefs, and disregard information that contradicts their attitudes and beliefs (Nickerson 1998). In fact, research on fake news found that the confirmation bias prevails even in the presence of flag alerts indicating the falsehood of the information (Moravec et al. 2018).

Another significant determinant of plausibility is perceived source credibility (DiFonzo and Bordia 2007a; Nickerson 1998). Source credibility refers to the extent to which a source of a rumor is perceived to be capable, competent or having the ability to access certain information instrumental to evaluate the truthfulness of a rumor (DiFonzo and

Bordia 2007a; DiFonzo and Bordia 2007c). Related research has corroborated that source credibility and reputation have potent positive influence on the perceived plausibility of rumors (Fine 2007; Hu 2015; Liu et al. 2015).

Prior Research and Technical Solutions

Recent research investigating technical solutions to mitigate the proliferation of misinformation on online social networks has yielded some important findings (Kim and Dennis 2019; Kim et al. 2019; Shu et al. 2017). For instance, a study that examined the effect of social plugins (e.g., Facebook's "like" button) and symbolic labeling (e.g., positive vs. negative) found that online mechanisms that allow for a higher level of information flow control over the sharing process and those employing two-click designs can mitigate online content sharing due to the elevated frictional cost brought by these affordances (Heimbach and Hinz 2018). The study reported that around 40% of the major media outlets in Germany decided to opt-in this two-click design (Heimbach and Hinz 2018). Furthermore, Kim and Dennis (2019) observed that fake news presented in a source-primacy format placing the source in a more prominent position is more effective in inducing readers' skepticism than those presented in a headline-primacy format that emphasizes the content headlines. Therefore, source-primacy design can effectively reduce the perceived credibility of fake news. In addition, in proposing different technical rating solutions, Kim et al. (2019) found that expert rating (purportedly rated by professionals) has a stronger effect than source article rating (rated by ordinary users) in affecting the perceived believability of news, and the presence of a low rating has more salient effect deflating believability. Both studies

found that a lower level of plausibility is associated with a lower level of sharing intention.

Contrary to fake news articles that are primarily published by a number of news media outlets and agencies, cyber rumors are primarily improvised and posted by community citizens and online users (Fine 2007; Kwon and Rao 2017). In times of crisis, the amount of cyber rumors can be massive (Kwon et al. 2016; Zhao et al. 2015). For instance, Oh et al. (2013) reported that they collected hundreds of thousands of rumors on the Seattle Café Shooting at the moment when the shooting occurred at 2:00 pm central time on May 31, 2012. The outbreak of coronavirus pandemic in the United States and around the world in 2020 has also spawned countless online rumors, promising bogus treatments and inducing massive panic and anxiety (FEMA 2020).

Due to the large volume of rumors on the internet, it is neither technically realistic nor financially feasible to manually fact-check every single rumor posted by online users. Although several studies have proposed automating fact-checking to accelerate the process (Ratkiewicz et al. 2011; Shao et al. 2016), automated fact-checking only happens after the rumor has been consumed and negative consequences and damage have occurred (Kim et al. 2019). Aside from technical viability, other challenges are yet to be resolved by companies and agencies that conduct fact-checking. Facebook has dropped its fake news red flag warning system which is the "fake news" alert feature after coming to the conclusion that it is ineffective at curbing misinformation (Time 2017). Moreover, the warning system was found to spur online users to transmit suspicious links more often (Time 2017). A study by Moravec et al. (2018) also found

that falsehood flag exhibit almost no effect on readers' perceived credibility on online content.

Recent studies also proposed promising mechanisms such as expert rating (Kim et al. 2019) and source rating (Kim and Dennis 2019; Kim et al. 2019) as alternative solutions to combat false online information. However, expert-rating can inevitably involve a large financial cost for hiring "professionals" to do the work. For source-rating, there is a need to display the historical credibility record and credibility ratings of every single online user, which might constitute an intrusion of citizen privacy when the information sources are private citizens.

A viable solution that can effectively inform users of the reliability of rumors should encompass the following features: 1) having the ability to influence readers' plausibility assessment; 2) being available at the moment when cyber rumor consumption occurs (e.g., reading, commenting, and sharing); 3) avoiding a high cost for implementation to the extent that is prohibitive; and 4) the design should be cognizant of privacy when information sources are private citizens.

This dissertation proposes two candidate rating systems that may satisfy the aforementioned criteria: self-rating and community-rating mechanisms. Self-rating requires the posters of a message to rate the perceived certainty when they post the message. It is designed based on discourse hedges, language devices (e.g., maybe) that are used to express the perceived uncertainty of the focal statement in communication (Crompton 1997). While I acknowledge that not all users may submit their self-rating, a portion of users may do so just as they would do in the context of online product reviews and knowledge sharing on electronic networks of practice (Feinberg et al. 2012;

Park et al. 2014; Sproull 2011). These studies found that user's voluntary information sharing can be induced by a variety of motivations such as prosocial motives or reputation enhancement.

Community-rating is the aggregated average rating provided by community members on the plausibility of the content. Community-rating is similar to online product review ratings done on Amazon and eBay. Hence, the subsequent research questions are 1) whether self-rating can influence the extent to which the rumor is perceived to be plausible, 2) whether community-rating can influence the extent to which the rumor is perceived to be plausible, 3) if these mechanisms do exhibit effects, which one is more effective. To address these questions, I refer to warranting theory and meta-cognitive theory for the theoretical underpinning.

Warranting Theory

Warranting theory (WT) contends information that is more immune to manipulation is perceived to be more accurate, and therefore more valuable (Stone 1996). According to this theory, there is a perceived warrant associating one's self with one's self-presentation. In the physical world, it is easy to identify the connection between one's self to one's physical entity. Hence, the warrant between the self and the exhibited identity seems to be strong and indisputable (Stone 1996). However, in mediated communication, the warranting relationship can exhibit a higher level of variability. Hence, Walther and Parks (2002) argued the association between the self and self-presentation is more erratic and thereby more likely to be susceptible to information manipulation. The unpredictability is found to be more salient in the presence of anonymity because the possibility of manipulation is perceived to be greater when the

source is anonymous. Since information asymmetry is a ubiquitous feature of online communication (Mavlanova et al. 2012), warrants are pertinent to the legitimacy and validity of information concerning online users and the information presented in computer-mediated communication (CMC) environment (Walther 2011). Therefore, warrants can be referred to as diagnostic cues that online users use to assess the veracity of information (e.g., self-profiling and self-presentation) provided by other users. Warrants that are harder to manipulate by users are thought to contain a higher warranting value, whereas those that are easily manipulatable have a low warranting value and hence are more questionable in terms of reliability (Walther and Parks 2002).

Meta-Cognition Theory

The term metacognition was initially coined by a developmental psychologist John Flavell. Metacognition refers to the knowledge about regulating individuals' cognitive activities in learning (Flavell 1979). Metacognition is also defined as the scientific study of individuals' cognition regarding their own cognition, hence it is called the "cognition about cognition", "thinking about thinking", or "knowing about knowing (Nelson 1999, p. 625).

Grounded on the concept of metacognition, Petty et al (2007) developed a metacognitive model (MCM), suggesting that an attitude object can involve positive and negative evaluations (e.g., like vs. dislike), and the evaluation can be further associated with validity cues which are related to the strength of the attitude evaluation. An example of validity cues is certainty, a measure of attitude strength, referring to the extent to which an individual holds subjective conviction or validity regarding one's attitude or opinion (Gross et al. 1995). Certainty reflects whether a judgment about a

mental representation or attitude is justifiable or reliable, hence it is secondary

information attached to the attitude. Therefore, certainty is viewed as a meta-cognitive

concept (DeMarree et al. 2007). Metacognition is found to be more important when the

individual is engaged in a deliberative model of information processing and there is a

specific need to examine the strength of an attitude (Petty et al. 2007).

Paralleling the notion of attitude certainty, Dubois et al (2011) developed a theory of

belief certainty, arguing that individuals can hold their beliefs with varying levels of

certainty. Unlike an attitude, a belief can be valenced (e.g., this virus is horrible) or

unvalenced (e.g., this virus can spread through eyes) judgment about an object. But

similar to the metacognitive notion of attitude, a belief represents the primary cognition,

and belief certainty is the metacognitive or secondary dimension attached to the belief,

representing the subjective judgment about how confident the individual is about his or

her belief (e.g., I am certain that this virus can spread through eyes). Interestingly, past

research found that albeit both beliefs and the certainty tags are stored in one's memory,

the information retrieval process involves a hierarchical relationship which prioritizes

beliefs over the certainty (Dubois et al. 2011; Petty et al. 2007). The beliefs are more

conveniently and immediately extracted from the memory with or without the certainty

tag. Instead, the certainty tag is generally deemed as insignificant or unimportant such

as an appendix, and it is largely neglected unless there is a systematic need to evaluate it

(Dubois et al. 2011). For instance, a customer may say "McDonald's meat is made from

a genetically modified animal raised in a laboratory" without an associated certainty tag

(e.g., I am not sure about my belief) unless he or she is specifically asked, "how certain

are you?". Hence, in communicating beliefs, people tend to focus on expressing their beliefs yet not necessarily revealing the corresponding certainty.

How can the research on metacognition inform our understanding of rumor processing and diffusion in CMC? In rumor contexts, rumor messages represent the primary cognition, while the certainty evaluation is the metacognitive information, reflecting how likely the rumor is perceived to be true or not. Just as the importance of attitude strength that predicts the persistence of attitude and subsequent behaviors, the certainty tag can be consequential in predicting rumor plausibility evaluation and the subsequent rumor sharing behavior. In fact, Allport and Postman (1947) argued people prefer transmitting primary information of the rumor, generally ignoring secondary information or the contextual information accompanying the focal rumor, resulting in the dissipation of critical secondary information. In addition, research found that in rumor communication, the certainty status of rumors is also less salient for information recipients and less likely to be noticed even if it is provided (Dubois et al. 2011). The obliviousness on both ends of the communication can lead to the partial or complete decay of secondary information during the course of communication (Dubois et al. 2011). Eventually, a rumor originally seeded with low certainty may wind up being processed as a fact. Conversely, a fact initially posted with a strong certainty can be misrepresented and misinterpreted as a rumor.

Taxonomy of Hedging

Hedging is defined as "an item of language which a speaker uses to explicitly qualify his/her lack of commitment to the truth of a proposition he/she utters" (Crompton 1997, p. 281). Crompton's definition explicitly indicates the effect of hedging on discounting

the conviction of a focal statement. Hedging is a well-documented characteristic of verbal and written communication. Examples of hedging can be: "*I am not sure if this is right*, but I heard it was a secret ceremony", or "*I may be mistaken*, but I thought I saw a wedding ring on her finger". As a grammatical phenomenon, hedging has received considerable attention in pragmatic linguistics where devices such as *maybe, possibly, likely* are frequently used to express uncertainty, geniality, and graciousness, and to lubricate social discussion (Hyland 1996b). As a metadiscourse, hedging is deemed as a vehicle to deliberately express a lack of certainty, vagueness, or to present unproven propositions with caution (Hyland 1996b; Skelton 1988).

Past rhetoric analyses have unveiled the pragmatic importance of hedging as a discourse resource to convey uncertainty, suspicion, and lack of faith in a variety of social and institutional contexts such as financial forecasting, medical discourses and scientific research (Hyland 1996b). Further, hedging, as a rhetoric strategy, affords the authors to anticipate potential objections to the proposed statement by articulating an unproven statement or non-factive statement with precision, mindfulness, and diplomatic reverence (Hyland 1996b). Hedges are categorized into a content-oriented hedge and writer-oriented hedge based on the purposes and the objects of the hedging (1996a). For instance, content-oriented hedges aim to weaken the relationship between a statement and the representation of reality by circumventing the linkage between the authors' assertion of the fact and what the fact is. Writer-oriented hedges reveal the authors' aspiration to limit the potential negative consequences of being proven wrong, allowing the authors to describe propositions while alluding to personal suspicions (Hyland 1996a). Despite the distinctions, the ultimate purpose of hedges in discourse is to

express unproven propositions with caution. As hedges represent the metacognitive dimension of information that is critical to differentiate rumors from facts, I believe the inclusion of hedging discourses in the rumor text can add additional secondary information that is helpful for readers to have more mindful information processing.

Regarding its form, a hedge can take the form of a lexical hedge or discourse hedge. A lexical hedge usually uses single words or phrases such as *maybe, perhaps, possibly*, while a discourse hedge can employ an entire sentence to describe the extent of the conviction about the message (Hyland 1996b). The content of discourse hedges can vary depending on the specific circumstances where hedges are needed. For the purpose of this chapter, I follow Hyland (1996b) and consider discourse hedging as the manipulation of the stimulus materials.

Hypothesis Development

Effect of Hedging

According to Crismore and Vande Popple (1990), hedges fall into three categories representing three different levels of probability: 1) high certainty, 2) median level certainty, and 3) low certainty. While a low-certainty hedge highlights the expression of a lack of confidence, a high-certainty hedge represents high confidence in the factual representation of the statement. Thereby it is also called booster or intensifier in pragmatic linguistics (Holmes 1990; Hyland 2000). An example of a high-certainty hedge is "This hotel *always* provides good service". Research on online product reviews found that although only a portion of reviews contain lexical or discourse hedges in review texts, once noticed, the hedge can provide additional information elucidating

readers on the metacognitive dimension of the information aside from the valenced information (e.g., it is a reliable product) (Mudambi and Schuff 2010). Hence, hedges can help to better address the information asymmetry issues between two parties by explicating the metacognitive information (Dubois et al. 2011)

As in communication, a hedge is utilized to function as a certainty tag that represents users' probability evaluation of the rumor that they attempt to share. I argue that if the rhetoric device is applied in the message, it can work as a cue facilitating readers' information processing by illuminating the probability of the focal rumor. Specifically, once a low-certainty hedge is noticed by online readers, it can mitigate the certainty of the statement. The presence of a hedge exposes and epitomizes the extent to which posters are confident in the likelihood the rumors represent facts. In particular, for the information seekers on social media platforms, the manifestation of a low-certainty hedge can serve as an informative warrant that offers additional information on rumors, and hence can influence how the rumor is interpreted and assessed. Conversely, a high-certainty hedge represents strong confidence in the extent to which a rumor represents a fact. Therefore, once noted, it can provide additional cue warranting and endorsement of a focal rumor. Thus, the first hypothesis of the dissertation is the following:

H1. A discourse hedge (high vs. low certainty) is positively associated with rumor plausibility.

Self-Rating

Despite the potential value of using discourse hedges to offer metacognitive information (certainty), only a portion of individuals would apply hedges in their communication.

For instance, the research on electronic word-of-mouth (eWOM) found that approximately 25 percent of online product reviews contain hedging information expressing uncertainty while around 34 percent contain words or sentences expressing certainty (Dubois et al. 2011; Mudambi and Schuff 2010). Given plausibility is a crucial cognitive representation of the truthfulness of the rumor, entirely relying on users' autonomous disclosure of metacognitive information is not adequate. Hence, I am introducing a hedging system that can be technically afforded by the social media platform: self-rating. I believe that self-rating opens up a new way to use hedges to facilitate online information evaluation.

Unlike discourse hedges that are embedded in the rumor text, self-rating is a technological feature that is designed for sources to self-disclose the certainty evaluation of a focal rumor, and it is submitted by a source when a message is posted. Self-rating can illuminate readers by offering additional layers of metacognitive information validating or invalidating a rumor. The working process is that after a rumor message is posted on social media, the users will be prompted to submit a certainty evaluation on the likelihood the message represents a fact. Functionally, self-rating is a hedge presented as a technological feature (e.g., an add-in). Relative to hedges, self-rating has certain advantages for both the information providers and information seekers.

First, from the perspective of information providers, while the application of discourse hedges is entirely dependent on users' autonomous behavior, self-rating works as a reminder to prompt posters to retrieve or think about the certainty dimension of the message which could otherwise be buried and neglected due to the metacognitive nature

of the information (Dubois et al. 2011). Given the prevalence of hedonic motivation and mindless mindset of most individuals on social media (Thatcher et al. 2018), the metacognitive dimension of the information (e.g. certainty) is more likely to be neglected. Hence, a technical solution such as self-rating can remind users to think about the reliability of the information when posting or sharing it, which will consequently make users more mindful in sharing and posting information.

Second, self-rating can bring more benefits for information seekers who are in search of facts. Given the ambiguous nature of rumors, the presence of the self-rating functions as a warrant authenticating or disapproving of the focal rumor on OSNs. In online communication, information asymmetry is ubiquitous and the connections between one and one's presentation can vary (Ellison et al. 2006; Walther and Parks 2002). Hence, the presence of meta-cognitive information from the source can provide an illuminating cue validating (or invalidating if the rating is low) the authenticity of rumors, facilitating a more informed sense-making process.

As to the warranting value of self-rating, I cannot entirely rule out the possibility of source deception or source manipulation of online information. But research has found that there was a significant cost (e.g., social cost or legal cost) associated with online deception (Ellison et al. 2006; Lai and Wong 2002), and the recordability of social media platforms (the ability to record and archive historical posts and sharing) may deter users from leaving evidence of their deception (Hancock et al. 2004; Hancock et al. 2007). Past research revealed the negligence of metacognition is a major contributing factor confusing rumors with facts (Dubois et al. 2011). By explicating the metacognitive information associated with the rumor, the self-rating mechanism may

function as an alternative, incremental solution to address the proliferation of rumors due to information asymmetries. Specifically, when self-rating is high, it represents a high certainty evaluation from the rumor source, which, once being incorporated into the plausibility assessment, can render the rumor more believable. Conversely, a low self-rating can undermine the plausibility of a focal rumor. Thus, the second hypothesis of the dissertation is as follows:

H2. Self-rating is positively associated with rumor plausibility.

The Prominence of Self-Rating

While discourse hedges and self-rating mechanisms may, assuming accurate hedging, partially remedy issues related to information asymmetry in online communication, the placement of the hedges can be another pending question necessitating further examination. For instance, a hedge can be a discourse hedge embedded in the rumor text or placed in a separate place proximate to the rumor message as a disembedded hedge. To compare the relative effect of different rating mechanisms, I consulted prior empirical studies on the prominences of cues (Fogg 2003). Specifically, prominence refers to how likely a cue is noticed by online users (Fogg 2003). Prominence concerns the salience of online cues and whether the cues can stand out and become conspicuous so that they can be used for credibility attribution (Jensen and Yetgin 2017). Prominence also impacts the interpretation of cues and thereby affects the credibility attribution process (Fogg 2003). For instance, a flashy banner ad can easily stand out and get noticed (prominence) by an individual browsing an online website. However,

the site may be interpreted as unreliably due to the presence of the obnoxious ad. Applying this line of prominence analysis, Jensen and Yetgin (2017)) found that hedges (e.g., disclosures of conflict of interest) placed in the proximity of online reviews are more prominent than those embedded in the review texts. Therefore, the disembedded disclosures are more likely to be noticed, and online users will be more likely to perceive the review as less credible. Hence, the effect of hedges regarding online information can have different effects depending on the prominence of the hedges: the more prominent a hedge is, the more likely it can create potent effect on the user's evaluation of plausibility.

I believe that the prominence and interpretation effect will also apply in the context of cyber rumor and that cyber rumor consumers will process the prominent cues that are available and around. While embedded discourse hedges are more likely to be neglected, self-rating, as a disembedded hedge, can exhibit a stronger impact on plausibility. Thus, the third hypothesis of the dissertation is as follows:

H3. Self-rating has a stronger influence on rumor plausibility than a discourse hedge.

Community Rating Mechanisms

Similar to the product review ratings on online shopping portals such as Amazon and eBay, community-rating is computed as the aggregated average score provided by community members on the certainty of the rumors. Hence, it functions as a crowd-sourced hedging mechanism, complementing the dominant role of authoritative institutions (Madden and Fox 2006). By offering additional metrics reflecting community members' collective appraisal of the cyber rumors, community-rating can

reduce the sole reliance on the gatekeepers of the media platforms for information surveillance. Community-based rating metrics are viewed as the functional building blocks and defining characteristics of social media platforms (Kietzmann et al. 2011). Research has emerged to highlight the significant positive impact of online metrics represented by community-rating on users' information processing (Bond et al. 2017; Messing and Westwood 2014). Past research has found a significant effect from collective opinions on individuals in uncertain situations. The effect of community-rating can be more pronounced online because opinions can be conveniently aggregated for easy consumption, and the numeric representation denotes the reliability in a more straightforward manner (Dellarocas et al. 2007; Metzger et al. 2010).

Although different users may derive a certainty rating differently, and the rating can be subject to individual bias such as confirmation bias, I argue that community-rating is a viable online hedging solution based on the following four points. First, the presence of community-rating inevitably provides an additional information cue that readers of a rumor can refer to and anchor on when it comes to assessing the general plausibility of the rumor. If the community-rating is low, then it means the majority of the online users disapprove of the message or believe the message lacks reliability. Conversely, a high community-rating reflects the public's endorsement of the rumor. Second, grounded on WT, I argue that community-rating, as a hedging mechanism, can serve as a viable warrant validating or disapproving cyber rumors on social media platforms because community-rating is collectively contributed by a large number of online users and automatically aggregated by a set of algorithms. Therefore it is more immune to manipulation and falsification. After all, fabricating online rating involving a host of

costs such as financial cost and technical cost, and significant legal risks. Third, individuals sharing cyber rumors seek to make sense of an ambiguous situation, and the information that has attracted and been validated by a crowd of users is more likely to be perceived as compelling, convincing, and impartial (Messing and Westwood 2014). Fourth, empirical studies on eWOM found that users' purchasing decisions are strongly influenced by community-based rating to the extent that it exceeded the effect of expert-based rating (Dellarocas et al. 2007; Zhang et al. 2010). The potency of community-rating is also corroborated by a recent study using fMRI imaging to examine user online information processing behavior, discovering that in online forums of an electronic network of practice, the community-based cues impact the information evaluation and filtering behavior of online information seekers more heavily than expert-based cues (Meservy et al. 2019a). Despite the difference of content on different online platforms, I argue that the effect of community-based rating can create an impact on users' evaluation of rumor plausibility.

In brief, I contend that community-rating is a viable online warranting solution: a high community-rating represents public endorsement and verification and can function as a high-certainty hedge. Consequently, it can bolster cyber rumor plausibility. Conversely, a low community-rating signifies public disapproval of the rumor and thereby can undermine cyber rumor plausibility. Thus, the fourth hypothesis of the dissertation is the following:

H4. Community-rating is positively associated with rumor plausibility.

Comparative Effects

My last hypothesis concerns the comparative effect of self-rating and community-rating in influencing rumor plausibility. Self-rating represents the metacognitive dimension of rumor information voluntarily provided by the posters, and the evaluation is provided on two conditions, 1) the posters have accessibility or proximity to critical factual information surrounding the uncertainty, or 2) the posters offer their individual self-reflection on the reliability of the information. While the rumor posters' self-rating is also subject to subjectivity and a variety of biases, however, two points make the self-rating more believable and trustworthy than community-rating. First, self-rating is provided by the posters themselves, therefore it is potentially associated with the credibility of the posters. However, community-rating is contributed by a crowd of online users and the rating is displayed as the arithmetic average of all scores of the participating users that are recorded anonymously. Online users don't consume crowd ratings by reading and processing ratings of individuals. Second, rumors arise in an ambiguous situation where information is scarce (Kapferer 1992). While rumors also concern information that holds high outcome relevance for community members, rumors are generally conceived as a valuable but scarce resource (Lai and Wong 2002). As a result, the sources may matter more than social proofs that are exemplified by the community-rating, because the sources of the rumors are perceived to have closer ties to the fact itself (Lai and Wong 2002).

Community-rating is calculated based on the aggregated assessment of rumor messages by a crowd of online users. A rating mechanism contributed by a large number of community members appears to be more immune to manipulation and therefore would render a higher warranting value. However, past research has found that ratings

provided by the community members are susceptible to a myriad of factors such as social norms, readers' emotional state, and confirmation biases (Jonas et al. 2001; Kim et al. 2019; Nickerson 1998). That is, there is a tendency for community members to rate the rumor certainty high if the rumor confirms their existing attitudes, or low if the rumor challenges their beliefs and attitudes. Further, past research has repeatedly suggested the difficulties of individuals to detect truth from deception. In addition, the average probability that an individual can successfully distinguish deception from truth is significantly less than chance (Bond Jr and DePaulo 2008; Levine et al. 1999). Last, research found that community members tend to follow others in making decisions, rather than act on proprietary information and conduct independent analysis (Cialdini and Cialdini 2007; Cialdini et al. 1999; Greenwood and Gopal 2016; Sunstein 2009). This social proof effect can also hinder them from evaluating information certainty accurately and objectively. So, I posit that whereas community rating has high warranting value due to the high cost of falsification, it is more susceptible to a variety of factors that make the rating less reliable. Thus, I argue that when online users seek to evaluate the plausibility of a cyber rumor, they will place more emphasis on the self-rating (Eisenegger and Imhof 2008; Habermas 1981) than community-rating. Therefore, I propose my last hypothesis in this chapter as the following:

H5. Self-rating exhibits a stronger effect than community-rating on rumor plausibility.

The research model in chapter III is presented in Figure 2.
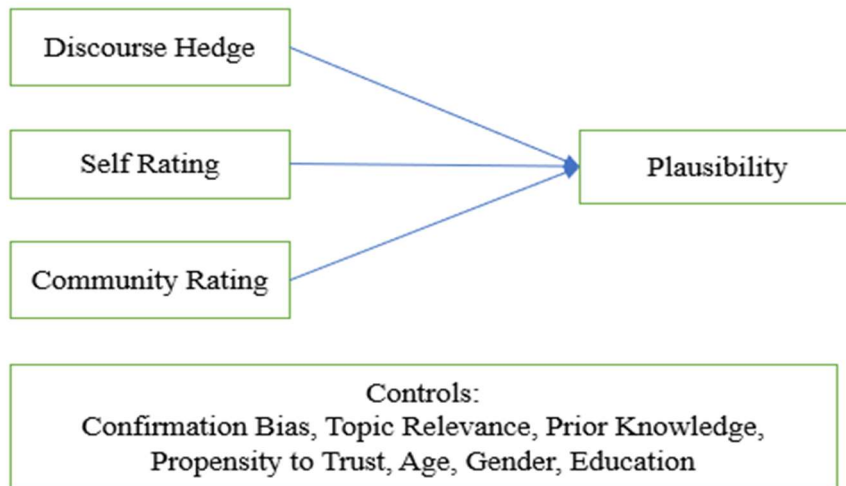
Figure 2. Research Model in Chapter III

Method

I conducted a lab experiment using a university student sample to examine the impact of disparate hedge mechanisms (discourse hedges, self-rating, community-rating) on online users' rumor evaluation and sharing intention. Specifically, I used an online survey to assess rumor evaluation under different hedge mechanisms and to collect the control information (e.g., outcome relevance, confirmation bias, knowledge on the topic, the propensity to trust, and demographics) related to plausibility evaluation.

It is worth noting that albeit online social media users constitute a much broader population beyond university students, I believe university sophomores are an appropriate group for the purpose of this dissertation (Gordon et al. 1986). As community members, university students are frequently exposed to and susceptible to cyber rumors. Past empirical studies found that although college students exhibited significant differences from non-college-student subjects when assessing the credibility of information on traditional media, there is no statistically significant difference

between college students and non-college-student subjects when it comes to evaluating information on the internet (Metzger et al. 2003). Moreover, social network application software constitutes an integral part of college students' lives, and more than 98 percent of university students use social media such as Facebook, Twitter, and/or Instagram to acquire information (BroadBandSearch 2020). While I would not claim that this sample is highly representative of the overall population, it is reasonable to generalize the findings of the dissertation to the university student population and to draw implications for information processing behaviors of constituents representing a broader population.

Experimental Design

For the effect of self-rating and community-rating on rumor plausibility, the experiment follows a 3 (self-rating: high vs. low vs. no) × 3 (community-rating: high vs. low vs. no) between-subjects full factorial design, resulting in 9 distinct conditions. The condition with the no for self-rating and the no for Community-rating is omitted because it is equivalent to the baseline setting (condition 1). To test the effect of discourse hedges, I designed two conditions: high-certainty discourse hedge and low-certainty discourse hedge. In total, there are eleven distinct conditions (refer to Table 2). Each participant clicked a web link to open the online survey where he or she was randomly assigned to one of the eleven conditions of rumor manipulation. Within each condition, the participants were presented four rumor messages with a specific treatment mimicking Twitter posts, and then they were requested to answer questions on their rumor evaluation (e.g., plausibility) and questions on the control variables (e.g., pre-existing attitude on the specific topic, perceived relevance of the topic, knowledge

on the topic, etc.). Last, participants were asked to answer questions on personal traits

(e.g., propensity to trust) and demographics such as gender, age, education, etc.

Table 2. Full Factorial Design and Eleven Treatment Conditions

Condition No.	Treatment	
1	Baseline	-
2	Embedded high	-
3	Embedded low	-
	Self-rating (Disembedded)	**Community-rating**
4	Low	Low
5	Low	No
6	Low	High
7	No	Low
8	No	High
9	High	Low
10	High	No
11	High	High

Participants

Participants were recruited from a Computer-Based Information System class at a

research university in the mid-south of the United States. The class was required for all

students in business majors. The students were compensated by extra credit (less than

1% of overall course credit) for participating in the survey. A total of 425 students

initiated the study, but 68 students either did not completed the survey, did not follow

instructions, or failed attention-check questions and were excluded from the

dissertation. This left a sample of 356 participants with an average age of 19.7 (SD =

2.12) with the oldest aged 36 and youngest 18. Further, there were 176 female students,

constituting 49% of all the participants. University students constitute an integral

constituency in OSN communities, and they are frequently exposed to and consume

rumors on social media (Carton et al. 2015; Chen et al. 2015).

Stimulus Materials

To determine proper stimulus materials for the experiment, I conducted a pilot test with 13 rumor candidates that were selected by reviewing popular social media pages of students in the region around the university. Subsequent investigation determined that each candidate rumor was actually false. After identifying candidate rumor topics, I constructed each rumor to appear linguistically and structurally similar. I then asked 31 students to rate the rumor candidates in terms of relevance, plausibility, and novelty (Scaled 1 to 7, Strongly Agree – Strongly Disagree). Since rumors are an "unverified and instrumentally relevant information statement in circulation" (DiFonzo and Bordia 2007a, p. 13), I first selected rumors with high relevance and dropped those with a low relevance level.

The anonymized text of each rumor is shown below. The complete layout of the rumors as participants saw them is presented in Appendix G.

Rumor 1: Open-carry Policy

[The university] Board of Regents is working on a policy allowing students and faculty to openly carry guns on campus, like in classrooms, the library, and the union. There are school shootings almost every single week in the US. I guess [the university] is hoping to make the campus safer by allowing even more guns. Shocking!

Rumor 2: Tap Water Contamination

[The university city] drinking water contains a dangerous chemical called

Chromium 6. It is a highly toxic metal that causes fever, diarrhea, and even

cancer. Chromium 6 comes from the decay of dead animals, like rats. But the EPA

in [the city] still claims the water is safe. Disgusting!

Rumor 3: Side-effects of Smartphones

Frequently using your smartphone causes weight gain. Exposure to the RF waves

phones emit slows the metabolism and makes it more difficult to burn calories off.

You can even be affected by other people's phones too. Time to turn the thing off a

little more often. Incredible!

Message 4: Mandatory Vaccine Filing

[University] students will soon be required to submit for review all their personal

vaccine records. After all the virus and measles outbreaks, the [State] Department

of Education is going to set new rules for [university] students. This is a pretty big

invasion of privacy and personal liberty. Unbelievable!

Specifically, I chose a gender-neutral name (Alex Johnson) as the account owner and
rumor poster on the social media platform to avoid the gender-induced bias. To avoid
potential biases induced by the sequence of topics, I randomized the order of displaying
four rumors for each treatment condition.

Treatment

I followed Hyland's treatment of discourse hedging as the manipulation of stimulus materials (Hyland 1996b). For the high-certainty hedge (condition 2), the following sentence was added at the beginning of the rumor message: "*I checked this one. I think it is very likely and want to share it with you.* ". For low-certainty hedge (condition 3), the following sentence was added at the beginning of the rumor message: "*I did not check this one. I think it is very unlikely but want to share it with you.* ". Rumors in the baseline condition were presented in a Twitter post format, and four example posts were presented in Figure 3a-3d.

For self-rating and community-rating mechanisms, I modeled after the design scheme by Kim and Dennis (2019) using the number of stars to represent the low and high certainty conditions. The rating is displayed at the bottom of the post. While the low-certainty rating is represented by one highlighted star plus four stars in gray with a numerical rating of 1.0, the high-certainty rating is represented by five highlighted stars with a numerical rating of 4.9. Figure 3c and 3d demonstrate the design scheme of low self-rating and low community-rating respectively.

Figure 3a. Baseline Condition

Figure 3b. Low-likelihood Discourse Hedge Condition

Figure 3c. Low Self-rating Condition

Figure 3d. Low Community-rating Condition

Figure 3. Four Treatment Samples

Dependent and Control Variables

Rumor plausibility instruments were adopted and modified from prior research on rumors (the message is believable, realistic, truthful) (DiFonzo and Bordia 2007a). I also measured how likely each participant would share, comment, or post an emotional response (emoji) and the type of emojis that he or she posted.

To minimize potential confounding effects, I identified four control variables that have been found to affect plausibility evaluation by previous studies: confirmation bias, topic relevance, prior knowledge on the topic, and the propensity to trust. Confirmation bias refers to the extent to which an individual seeks and interprets information that is in line with one's existing attitude or expectation and neglects or dismisses information that contradicts or challenges existing attitude or expectation (Bordia et al. 2005; Kim et al. 2019; Wason 1960). Numerous previous interdisciplinary studies have demonstrated that pre-existing attitudes and opinions have a substantial impact on information processing, plausibility assessment, and sharing behavior. Most individuals choose to believe and opt for information that resonates with their attitude and rejects or screens out information opposing their existing believes or attitudes. In this dissertation, I adapted the measure of confirmation bias from prior literature on rumors ("Do you agree with the message?"; "Do you have a favorable feeling about the message?") (DiFonzo and Bordia 2007a; Kim et al. 2019).

Topic relevance refers to the extent to which the topic in the rumor message bears instrumental relevance to the individuals. Topic relevance is used interchangeably with personal relevance or outcome-related involvement (DiFonzo and Bordia 2007a). Following DiFonzo and Bordia (2007a), I assessed the topic relevance by giving two

choices: "The message is relevant to me" and "The message is important to me". Prior knowledge of the topic refers to the extent to which an individual knew the relevant knowledge related to the topic (Eastin 2001). I measured the construct using the item: "How much do you know about the topic?" adapted from Roehm et al. (2002). Propensity to trust is an individual difference trait, referring to an individual's tendency to trust (Hui et al. 2007; Pavlou and Gefen 2004). The propensity to trust was found to impact people's assessment of and attribution to online information (Pavlou and Gefen 2004). I adapted the instrument from Hui et al. (2007). All the control variables were measured using a 7-point Likert scale, ranging from strongly disagree to strongly agree.

Further, to measure the prominence of the hedges and rating mechanisms, I designed a question in each experimental condition asking participants to recall the specific hedges and ratings associated with each treatment. Table 3 reports the descriptive statistics and correlation of constructs. The construct instruments and corresponding reliability are provided in Appendix A.

Table 3. Descriptive Statistics and Correlation Metrics

Variable	Obs.	Mean	Std. Dev.	Min	Max	PL	R	PT	C	PK
Plausibility (PL)	1,409	3.52	1.69	1	7	1.00				
Relevance (R)	1,416	4.86	1.54	1	7	0.33	1.00			
Propensity to trust (PT)	1,399	2.81	1.25	1	6	0.12	0.05	1.00		
Confirmation Bias (C)	1,421	3.10	1.44	1	7	0.64	0.24	0.11	1.00	
Prior knowledge (PK)	1,421	2.33	1.05	1	5	0.12	0.12	0.02	0.22	1.00

Results

The average plausibility of each treatment condition is presented in Table 4. The results

indicate the discourse hedge with high-certainty treatment, and treatment with high self-

rating and high community-rating have the highest average plausibility ($M = 3.67$),

while the condition with low self-rating and low community-rating receives the lowest

plausibility ($M = 3.2$).

Table 4. Treatment Conditions and Average Plausibility

Condition No.	Treatment		Obs.	Average Plausibility	Std. Dev.
1	Baseline		133	3.471	1.925
2	Embedded High		147	3.667	1.581
3	Embedded Low		130	3.621	1.577
	Self-rating	Community-rating			
4	Low	Low	131	3.201	1.678
5	Low	No	130	3.421	1.618
6	Low	High	127	3.667	1.687
7	No	Low	130	3.236	1.717
8	No	High	122	3.650	1.719
9	High	Low	118	3.528	1.639
10	High	No	133	3.594	1.734
11	High	High	112	3.673	1.613

To test hypotheses 1 regarding the effect of discourse hedges on rumor plausibility

evaluation, I conducted a mixed-effects linear regression with a random intercept in

Stata using the observations in condition 1 (baseline), 2 (embedded high-certainty

hedge) and 3 (embedded low-certainty hedge). Because each participant evaluated all

four messages for each treatment condition, this is a between-subject analysis with

participant ID as the cluster variable. The outcomes of the regression are presented in

Table 5. As shown in Table 5, the discourse low-certainty hedge does not have a

significant negative effect on perceived plausibility (b=0.06, p=0.727). Also, the results

show that embedded high-certainty hedge has no significant effect on plausibility and

there is no statistical difference between the conditions with or without a high-certainty

hedge. Hence, hypothesis 1 is not supported.

Table 5. The Effect of Discourse Hedges on Plausibility (n=397)

Plausibility	Coef.	Std. Err.	z	P
Discourse Hedge High	0.072	0.164	0.440	0.662
Discourse Hedge Low	0.060	0.171	0.350	0.727
Confirmation Bias	0.668***	0.045	14.820	<0.01
Trust Propensity	-0.014	0.058	-0.240	0.810
Relevance	0.216***	0.042	5.180	<0.01
Prior Knowledge	0.1*	0.056	1.780	0.076
Education	0.194	0.364	0.530	0.594
Age	-0.003	0.025	-0.120	0.904
Gender (female=1)	0.053	0.141	0.370	0.708
Constant	-2.094	1.487	-1.410	0.159

Log likelihood = -630.71 Prob > chi^2 = 0.0000 ICC = 0.11

To test the effect of self-rating and community-rating on plausibility, I conducted a

mixed-effect linear regression with a random intercept using the observations in

conditions 4 through 11. Similar to the analysis I conducted when testing hypotheses 1

and 3, this is a between-subject analysis with participant ID as the cluster variable.

Because the experiment employs a full factorial design, I also reported the interaction

effect between self-rating and community-rating in the analysis. Table 6 provides the

regression results. The results show no significant effect of self-rating on plausibility,

despite a negative coefficient associated with low self-rating (b = -0.236, p = 0.203).

Further, the results show no significant effect of community-rating on plausibility.

Confirmation bias, the propensity to trust, and topic relevance exhibit strong positive

effects on plausibility. Hence, hypothesis 2, 4 and 5 are not supported.

Table 6.The Effect of Ratings on Plausibility (n=1,093)

Plausibility	Coef.	Std. Err.	z	P>z
Self-rating Low	-0.236	0.185	-1.270	0.203
Self-rating High	-0.107	0.184	-0.580	0.560
Self-rating No	0.000	(omitted)		
Community-rating Low	0.302	0.321	0.940	0.346
Community-rating High	0.202	0.163	1.230	0.217
Community-rating No	0.000	(omitted)		
Self-rating Low # Community-rating Low	-0.306	0.261	-1.170	0.241
Self-rating Low # Community-rating High	-0.217	0.252	-0.860	0.390
Self-rating High # Community-rating Low	-0.381	0.262	-1.450	0.146
Confirmation Bias	0.66***	0.03	22.96	<0.01
Trust Propensity	0.09**	0.04	2.55	0.011
Relevance	0.18***	0.03	6.66	<0.01
Prior Knowledge	-0.02	0.04	-0.5	0.615
Education	0.28	0.23	1.21	0.226
Age	-0.01	0.02	-0.34	0.736
Gender (female=1)	0.01	0.09	0.12	0.906
Constant	0.57	1.04	0.55	0.581

Log-likelihood = -1846.4582 Prob > chi^2 = 0.0000 ICC = 0.085

To test the comparative effect of discourse hedges and low self-rating on rumor

plausibility, I conducted a third mixed-effect linear regression with random intercept

(with the ID as the cluster) using observations in conditions 1, 3 and 5. Table 7 displays

the regression results. It shows a negative coefficient yet not significantly associated

with low self-rating, while the embedded low-certainty hedge is associated with a

positive yet not significant coefficient. Although self-rating is associated with a

negative coefficient while the discourse hedge has a positive coefficient, the effect of

self-rating and discourse hedges are not significant. Hence, hypothesis 3 is not

supported. Table 8 presents the hypothesis testing results.

Table 7. Relative Effect of Self-rating and Embedded Hedge on Plausibility (n=379)

Plausibility	Coef.	Std. Err.	Z	P>z
Self-rating Low	-0.177	0.177	-1	0.318
Discourse Low	0.046	0.177	0.26	0.795
Confirmation Bias	0.639***	0.048	13.41	<0.001
Trust Propensity	0.085	0.061	1.39	0.166
Relevance	0.250***	0.044	5.66	<0.001
Prior Knowledge	0.163***	0.059	2.75	0.006
Education	-0.612	0.429	-1.43	0.153
Age	0.002	0.026	0.09	0.929
Gender (female=1)	-0.014	0.147	-0.1	0.924
Constant	-3.144	1.565	-2.01	0.045

Log likelihood = -607.01045 Prob > chi2 = 0.0000 ICC = 0.10

Table 8. Hypothesis Testing Results for Chapter III

Hypothesis	Result
H1. A discourse hedge (high vs. low certainty) is positively associated with rumor plausibility.	Not Supported
H2. Self-rating is positively associated with rumor plausibility.	Not Supported
H3. Self-rating has a stronger influence on rumor plausibility than a discourse hedge.	Not supported
H4. Community-rating is positively associated with rumor plausibility.	Not Supported
H5. Self-rating exhibits a stronger effect than community-rating on rumor plausibility.	Not supported

Chapter IV. The Antecedents and Motivations for Cyber Rumor Transmission

While chapter III investigates the effect of disparate rating mechanisms on rumor information processing, chapter IV mainly focuses on rumor transmission, and the central research inquiry is: *How do rumor plausibility and novelty differentially affect online users' rumor sharing motivation, and consequently affect online users' rumor sharing intentions?* To answer this research question, I apply the lens of rumor processing as an act of information consumption (Holbrook and Hirschman 1982) and examine how plausibility and novelty feed utilitarian and hedonic motivations for actions (e.g., cyber rumor sharing). I test these ideas in a randomized, controlled experiment including 356 participants to show that novelty has prominent effects on sharing intentions, not only through hedonic motivations for sharing but also through utilitarian motivation.

Theoretical Background

Cyber Rumor Transmission

Classic rumor research has identified a number of factors indispensable for predicting rumor occurrence and mongering: uncertainty, anxiety, topic relevance, and perceived rumor plausibility where uncertainty can be categorized as a contextual factor, anxiety is related to the propositional and situational characteristics of individuals, relevance and plausibility are characteristics of rumors (Oh et al. 2013; Rosnow et al. 1988; Shibutani 1966b). For example, rumors are likely to erupt in circumstances of emergency, social crises, or natural disasters – especially when official information is

scarce, and the situation is full of uncertainty (DiFonzo and Bordia 2007a; Oh et al. 2013).

Rumor Transmission

To investigate the relationship between rumor characteristics (plausibility and novelty) and rumor transmission intention, one needs to first understand the psychological motivations for rumor transmission. Cialdini and Trost (1998) suggested three fundamental motives for social interactions: 1) acquiring information for responding to and coping with the environment, 2) initiating and developing social relationships, 3) seeking pleasure and building self-esteem through engaging in self-enhancement activities such as entertainment. DiFonzo and Bordia (2007a) assimilated the three motives for social interactions into the context of rumor diffusion and proposed three primary motivations for rumor sharing behavior: fact-seeking, image enhancement, and self-enhancement. *Fact-seeking* reflects individuals' effort to search for accurate information from relevant others by sharing rumors and engaging in a collective sense-making process. In conditions of situational ambiguity, sharing rumors and collective sense-making can help individuals manage their emotional anxiety and restore a sense of control (Ashford and Black 1996; Bordia et al. 2004; DiFonzo and Bordia 2007a). *Image enhancement* involves impression management through spreading rumors. Image enhancement reflects individuals' desire to maintain a positive reputation and thereby build and maintain good social relationships (Allport and Postman 1947; Guerin and Miyazaki 2006). S*elf-enhancement* reflects individuals' need to feel good about themselves through their sharing behavior. Individuals desire to engage in communications expressing and sharing their emotions (e.g., like, dislike, sadness,

sympathy), and provoking emotional responses from others. Such expression reinforces self-esteem and projects self-identity (Tajfel et al. 1979). Self-enhancement is also characterized by the pursuit and promotion of fun, pleasure, or interest (Taylor et al. 2012). Extrinsic rewards from rumor sharing are mainly fulfilled by reputation and status-building (Marett and Joshi 2009).

Utilitarian and Hedonic Motivation

Although the kinds and manifestations of rumor sharing motives are many, they can be circumscribed by two broad dimensions: utilitarian motivation and hedonic motivation (Holbrook and Hirschman 1982). The utilitarian and hedonic perspective of motivation was originally developed in consumer research, arguing that individuals consume products , services, or information to obtain instrumental value and emotional satisfaction (Holbrook and Hirschman 1982). This perspective referred to motivations for obtaining instrumental value as a utilitarian motivation and the attainment of emotional satisfaction as a hedonic motivation (Holbrook and Hirschman 1982; Liao et al. 2013). This perspective of motivation has drawn considerable attention and has been applied widely to explain technology adoption (Lowry et al. 2012), health behavior (Williams 2018), and, importantly, social media usage (Pöyry et al. 2013).

When applied to the context of rumor dissemination through OSNs, utilitarian motivation refers to individuals' pursuit of functional value derived from accomplishing specific tasks such as gathering or sharing unverified information from reading and sharing online articles (Overby and Lee 2006; To et al. 2007). The utilitarian benefit depends on whether the goal is achieved or whether the goal is achieved efficiently (Overby and Lee 2006; Ozturk et al. 2016; To et al. 2007). Hence, the utilitarian

motivation of behaviors involves more cognitive aspects of information processing, such as contemplating the economic value and accuracy of information contained in online rumors.

In contrast, hedonic motivation reflects individuals' pursuit of enjoyment, fantasy, and sensory gratification, and it is primarily emotional and experience-oriented (Holbrook and Hirschman 1982). For example, users often browse social media platforms seeking pleasure and entertainment (Zhou et al. 2011). Unlike utilitarian motives, hedonic motives are not about achieving a specific goal (e.g., information search and transmission for effective decision making). Social media users can gain gratification and pleasure simply by browsing and sharing information that is entertaining or emotionally resonant for readers (Zhou et al. 2011).

Previous research has recognized the dual motives for those using online platforms: achieving specific tasks and pursuing hedonic pleasure (Kim et al. 2019; Zhou et al. 2011). Hence, the dual characterization of motivation is an appropriate conceptual framework for us to examine the underlying motivations for online users' rumor transmission, and to uncover the causal relationship between rumor characteristics and user's rumor sharing intention. However, the prior research has noted that the prominence of each type has been uneven. Social media users tend to be more focused on hedonic pursuits as manifested by their search for recreation and connecting with friends (Johnson and Kaye 2015).

Rumor Characteristics

Plausibility

Plausibility (sometimes also referred to as credibility) is at the center of the extant

literature on rumors and it refers to the confidence judgment about the probability that a

certain rumor is truthful and authentic (DiFonzo and Bordia 2007b). Plausibility reflects

the cognitive appraisal of the likelihood that a rumor represents a fact, it exemplifies the

cognitive dimension of information evaluation (DiFonzo and Bordia 2007b). Since

rumors are unverified information statements and rumors are improvised and

transmitted to help individuals make sense of uncertain situations, plausibility is of

particular importance in the rumor context (DiFonzo and Bordia 2007b; Kwon and Rao

2017; Pezzo and Beckstead 2006; Rosnow et al. 1988). A rumor perceived to be more

reliable provides higher informational value and thus can be more helpful for resolving

uncertainties (Bordia and DiFonzo 2017). Research exploring rumor plausibility has

concluded that it is perhaps the most influential of the factors considered during rumor

evaluation (see Appendix F for a review). However, despite the hegemony of

plausibility in rumor and online information processing research, a growing number of

studies have emerged, demonstrating some conflicting findings. Perhaps the most

prominent study is Vosoughi et al. (2018), which tracked more than 126,000 fake and

unsubstantiated news stories over two years and included 4.5 million online users. The

study found that false information spread substantially faster, deeper, and broader than

the true information, and these effects were more pronounced for categories involving

political information, natural disasters, and social crises (Vosoughi et al. 2018). More

surprisingly, the study found that false information travels six times faster than true

information to reach to an equivalent number of users, and falsity can reach to a certain

depth of information cascading ten times faster than the truth (Vosoughi et al. 2018).

Additional research found that false rumors tend to outlast true rumors when

considering the average time of remaining active on social networks (Zubiaga et al.

2016).

These findings lead to a plausibility paradox: on one hand, ample extant research

suggested the close association between rumor plausibility and transmission intention.

On the other hand, implausible, false rumors seem to be substantively more viral than

the truth. In an attempt to explain the potency of falsehood relative to the truth in

inducing online virality, Vosoughi et al (2018) concluded that false information may

offer more novelty than true information. However, despite their proposition and

analysis using text-mining, the study did not provide a compelling conceptualization of

novelty nor employ a rigorous methodology to determine the causal effect of novelty on

rumor sharing.

Novelty

Novelty is primarily examined by psychological and neurophysiological research, and it

is defined as the extent to which a stimulus is perceived to be new, unexpected, unique,

and discrepant from routine (Berlyne 1970; Berlyne and Parham 1968; Lee and

Crompton 1992). Novelty is the opposite of familiarity (Skavronskaya et al. 2019) and

ample research has evidenced its integral role in stimulating information acquisition and

processing (Biederman and Vessel 2006). Human neurological systems are inherently

wired for seeking new information and escaping boredom (Biederman and Vessel

2006). Specifically, the effects of novelty on individuals' information processing can be

generalized into three categories.

First, while initially treating novelty as a cognitively driven feature of stimuli, empirical research found that novelty was associated with significant hedonic pursuits during information processing (Berlyne 1970). For example, participants in controlled experiments who were exposed to novel stimuli reported a higher level of "pleasantness and interestingness" (Berlyne 1970, p. 1). Studies on marketing and advertising corroborate the hedonic value of novelty by revealing that novelty in advertisement functions as a key affective factor increasing consumers' interest and positive attitude toward brands (Koslow et al. 2003).

Second, aside from hedonic value, novelty was found to exhibit salient effects enhancing learning and individual cognitive information processing. Berlyne suggested that novelty holds the key to "our understanding of the more complex levels of motivation in the human being" because "the human impulse is more inexorable than the urge to escape from monotony and boredom to some new forms of stimulation " (Berlyne 1970, p. 68). Thus, novelty is a key determinant of individuals' exploratory behaviors (Berlyne 1970).

Third, research found that novelty can improve decision-making because it attracts attention, updates our understanding of the world, infuses energy, invigorates learning, and contributes to more productive decision-making (Baranes et al. 2014; Betsch et al. 2001; Wu and Huberman 2007).

Despite the essential role of novelty in stimulating hedonic pursuits and facilitating information processing, novelty has yet to be systematically examined in the context of online rumors. Therefore, I focus on how novelty motivates rumor processing and ultimately induces sharing. I integrate and apply the dual motivation perspective to offer

hypotheses concerning utilitarian and hedonic motivations and argue that novelty is the key to address the plausibility paradox in sharing behavior.

Hypothesis Development

Utilitarian Motivation for Rumor Sharing

Utilitarian motivations relate to the usefulness of rumors and the extent to which rumors are effective in helping individuals to fulfill their purpose of searching for accurate information in ambiguous situations. As rumor is unverified information that is improvised and transmitted for community-members to make sense of the situation, the central utilitarian motivation underlying rumor sharing is fact seeking and sharing. While fact seeking reflects individuals' effort to search out and verify information by sharing rumors with relevant others to reduce the ambiguity, fact sharing is a prosocial behavior, representing individuals' desire to help and benefit others by sharing the rumors (Bordia and DiFonzo 2004; DiFonzo and Bordia 2007a). In this vein, Shibutani (1966b) described rumor sharing as an emergency communication process in search of the truth.

Rumors' utilitarian value is likely to be highly salient during the early stages of dissemination that are oftentimes characterized by the co-existence of information overload and dearth (Oh et al. 2013; Shklovski et al. 2008). Information dearth reflects the shortage of accurate information, desperately wanted by those who are affected by the object of the rumor. But at the same time, as individuals collectively make sense of an uncertain situation, they are likely to flood communication channels with rumors, many of which will ultimately be disproven. Thus, consuming and sharing rumors

function as a collective social reporting tool for individuals to gather information, separate accurate from inaccurate rumors, and address problems (Oh et al. 2013). Through this process, a converged understanding about the circumstance may take shape, and this understanding serves a utilitarian function by offering individuals a way to achieve clarity and coherence (Rosnow 1988).

Besides social crises and natural disasters, another example where utilitarian motivation is particularly salient is organizational layoffs. For instance, uninformed employees of a company facing an upcoming organizational layoff may turn to rumors on Twitter or other online platforms (e.g, layoff.com) to seek information on the nature and potential impact of the layoff, to decide on the subsequent coping strategy (Bordia et al. 2006). Those rumors considered as more helpful in addressing problems for online users will be perceived to contain a higher utilitarian value, hence they are more likely to be transmitted. Conversely, online users will be less likely to transmit rumors that are deemed to offer little help and benefit for themselves and others.

H6: Utilitarian motivation is positively associated with cyber rumor transmission.

Hedonic Motivation for Rumor Transmission

Although most traditional media are perceived to be more reliable than OSNs (Johnson and Kaye 2015), a growing number of individuals are abandoning traditional media and turning to social networks as primary information sources (Johnson and Kaye 2015). A recent report showed that over three-quarters of Americans rely on social media to seek information (Global Web Index, 2019). Studies have evidenced that the gratification acquired on OSNs can overshadow an individual's need for credibility to the extent that users are willing to trade credibility for gratification (Johnson and Kaye 2015).

In the context of rumor sharing, the pursuit of gratification reflects hedonic motivation. Two dimensions are at the core of the hedonic motivation for rumor transmission: image management and self-enhancement (Bordia and DiFonzo 2017). Image management includes individuals building positive impressions or images about themselves in social connectivity through rumor sharing (Bordia and DiFonzo 2017) and can be conscious or subconscious (Krämer and Winter 2008). Self-enhancement reflects individuals' desire to feel good, be entertained, and experience fun through rumor sharing. This experiential view deems information consumption and transmission as a "primarily subjective state of consciousness with a variety of symbolic meanings, hedonic responses, and aesthetic criteria" (Holbrook and Hirschman 1982, p. 132). Aside from the utilitarian value that users derive from improvising and transmitting rumor, users share resonating rumors in pursuit of experiential satisfaction and gratification. Hedonic motivation captures ones' need to feel good about themselves through sharing behavior because as social actors, people desire to engage in social interaction for enjoyment, excitement, and self-expression, and inviting (or provoking) responses from others. Intriguingly, research has found that the entertainment value of rumor sharing is more evident when rumors hold little plausibility and are only deemed an amusing subject (e.g., for boasting; Kimmel 2004). Rumor is also considered as an entertainment resource vital for the development and success of an online community (Marett and Joshi 2009). For instance, sharing a recreational rumor about a football team can be exhilarating and amusing because it offers fans an opportunity to enjoy and fantasize about an enjoyable event together (Marett and Joshi 2009). Thus, when users

perceive high hedonic value derived from sharing rumors, they will be more likely to transmit them.

H7: Hedonic motivation is positively associated with cyber rumor transmission.

Rumor Characteristics and Motivation

Plausibility

As utilitarian motivation is associated with the perceived helpfulness and usefulness of rumors, transmitting false rumors can render both the rumor senders and recipients' negative consequences. For the rumor sender, transmitting false information will confuse collective sense-making. For rumor recipients, false information can lead to inaccurate interpretation of the situation and undermine decision making. Furthermore, past research unveiled the fundamental psychological drivers instigating fact-seeking and sharing motivation are the need to restore the psychological control over an uncertain situation (DiFonzo and Bordia 2007a) For individuals seeking information and clarity, plausibility can determine the utilitarian value of a given rumor (DiFonzo and Bordia 2007b). For example, an employee may actively engage in a dialogue to seek information about the details of an upcoming company layoff in order to decide on a coping strategy. In this case, plausibility will likely determine the informational value of the rumor.

If the rumor appears very unlikely, its information value would be substantively decreased because the rumor incapacitates others seeking a sensible explanation and therefore won't be considered as helpful in addressing uncertainty and making rational decisions. Conversely, a plausible rumor will be thought of as having more

informational value and sharing it would contribute to a more coherent explanation of the situation, thereby addressing people's anxiety and restoring a sense of psychological control. Therefore, a plausible rumor is more likely to be conceived of satisfying people's fact seeking and sharing needs, thus feeding utilitarian motivation.

H8. Rumor plausibility is positively associated with the utilitarian motivation of rumor sharing.

In order to seek and maintain a viable online relationship, individuals employ a variety of image management tactics such as seeking the company of others, compliance with social norms, reacting to persuasive appeals, or using ingratiation and self-promotion to elevate their likeability (Krämer and Winter 2008; Rui and Stefanone 2013). People have been shown to be strategic in sending (or not sending) controversial rumors that are likely to provoke disputes or to try to use humor to attract attention and maintain a good image (Leary and Kowalski 1990). But, rumors are unverified and transmitting false rumors may threaten the senders' image (Bordia et al. 2005). For example, if an employee is caught sharing false rumors about an upcoming corporate layoff, the employee is likely to suffer negative consequences to her reputation and relationships (DiFonzo and Bordia 2007a; Rosnow et al. 1986). On the contrary, if the rumor is proven to be accurate, the rumor senders may accrue reputational and relational benefits. As hedonic motivation involves the pursuit of pleasure and avoidance of pain, transmitting plausible rumors is more likely to bring about positive and pleasant feelings.

H9. Rumor plausibility is positively associated with the hedonic motivation of rumor sharing.

Novelty

Past research has discovered that exposure to a novel stimulus can bring an elevated sense of pleasantness, and hence suggested that novelty is an important antecedent of hedonic value in individuals' information processing (Berlyne 1970). People have a general propensity to seek new and potentially discrepant information because exposure to new or unfamiliar stimuli provides them with more pleasantness and emotional gratification (Biederman and Vessel 2006). Research in marketing came to a similar conclusion: marketing campaigns crafted with novel content are more likely to achieve viral success in online platforms (Berger and Milkman 2012). I argue that rumor novelty will feed hedonic motivation to share the rumor with others for three reasons.

First, novel rumors are more likely to attract attention, alleviate the feeling of boredom, and lift the entertainment value of the message. Aside from the fun-seeking perspective, sharing a rumor that is perceived to be unique and exclusive can function as an effective self-presentation strategy to elevate one's online image and reputation (Bordia and DiFonzo 2017; DiFonzo and Bordia 2007a). Hence, I argue that novelty heightens the hedonic value of online social exchange and will consequently instigate hedonic motivation for rumor sharing.

Second, novel rumors tend to be more attractive and appealing to people's sensation-seeking, serving as a social lubricant that can fulfill people's image management motivation (Lee 2014). Further, sharing intriguing cyber rumors is a way of expressing one's emotion and self-identity, and can bolster self-esteem, making people feel good about themselves (Bordia and DiFonzo 2017).

Third, contrary to plausibility, novelty reflects the experiential dimension of information processing, primarily as a result of online users' affective reactions to interesting and stimulating features of messages (Baranes et al. 2014; Pearson 1970; Pearson 1971). Novel information is found to be appealing and sharing novel information is more likely to instigate momentary pleasure and hedonistic satisfaction from both the sender and the recipient (Kim and Yang 2017). Hence, online users are more likely to be motivated to share rumors.

H10. Novelty is positively associated with an individual's hedonic motivation for rumor sharing.

Past research has shown that the infusion of novel ideas incentivizes people's exploratory behavior, assisting learning and inducing comprehension (Berlyne 1970; Biederman and Vessel 2006; Rose et al. 1982; Skavronskaya et al. 2019). In the rumor context, the provision of new, unique, or unexpected information is going to be particularly important because it rejuvenates the conversation, contributes to more effective sense-making of the ambiguous situation, and facilitates enhanced decision-making and problem-solving concerning how to adapt to the situation. Thus, the presence of novelty in rumor can infuse energy into and facilitate an individual's fact searching. Reciprocally, online users will be more likely to share a novel message with other users because novelty can exhibit a similar effect on the recipient, and novel messages will be conceived to be more helpful for the recipients, facilitating the recipients' sense-making and problem-solving. Aside from gratifying hedonic needs, novel stimuli can enhance people's sense-making and provide utilitarian value for both

posters and recipients. Therefore, rumor novelty should exhibit a positive effect on online users' utilitarian motivation.

H11. Novelty is positively associated with an individual's utilitarian motivation for rumor sharing.

The research model is provided in Figure 4.
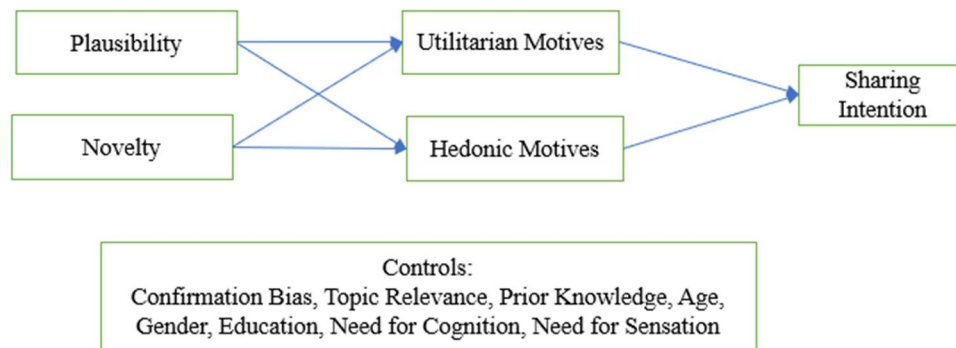
Figure 4. Research Model in Chapter IV

Method

To test the hypotheses, I conducted a controlled, randomized experiment to test the mediation effect of psychological motivations on the relationship between rumor characteristics (plausibility and novelty) and individuals' rumor sharing intention. To investigate the effect of plausibility and novelty on rumor sharing motives, I selected four different rumors representing combinations of rumor plausibility and rumor novelty. After participants read the rumors, I collected participants' ratings for psychological motivations for rumor sharing, sharing intention, and the control variables that were included in the analysis.

Procedure

The experiment followed a 2 (plausibility: high plausibility vs. low plausibility) × 2 (novelty: high novelty vs. low novelty) factorial, within-subjects design. To start the experiment, participants provided their consent. Then, each participant read the four randomly ordered rumors and following each rumor, responded to items regarding perceived plausibility, novelty, utilitarian motivation, hedonic motivation, and intention to share. Finally, participants completed items capturing the control variables used in the analysis including confirmation bias, the propensity to trust, prior knowledge on the topic, the need for cognition, the need for sensation, as well as demographic information. The experiment participants were described in chapter III.

Stimulus Materials

As I used one experiment to collect data for chapter III and IV, the stimulus materals of chapter IV is the same as chapter III [1]. After I first selected rumors with high relevance and dropped those with a low relevance level. I then picked four messages that satisfied high and low conditions of plausibility and novelty. The rumors in the low plausibility rumors were significantly lower in reported plausibility than the high plausibility rumors ($t(74) = 2.53$, $p < .001$). Similarly, the rumors in the low novelty condition were lower in reported novelty than high novelty rumors ($t(74) = 0.8$, $p = .009$). The anonymized text of each rumor has been shown in Chapter III and the conditions of each rumor along with pilot study means are shown in Table 9. The complete layout of the rumors as participants saw them is presented in Appendix G.

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[1] Since the manipulations in chapter III were not successful, participants were combined into the cells described in chapter IV.

Table 9. Experiment Conditions and Pilot Study Means

Topics	Experiment Conditions		Pilot Study Means		
	Plausibility	Novelty	Relevance (SD)	Plausibility (SD)	Novelty (SD)
Open-carry Policy	Low (0)	High (1)	5.84 (1.61)	2.474 (1.50)	4.53 (1.12)
Tap Water Contamination	High (1)	High (1)	5.84 (1.83)	4.474 (1.84)	4.32 (1.38)
Side-effects of Smartphones	Low (0)	Low (0)	5.11 (1.97)	2.368 (1.49)	3.63 (1.74)
Mandatory Vaccine Filing	High (1)	Low (0)	5.63 (1.53)	5.421 (1.02)	3.68 (1.34)

Mediating and Dependent Variables

I identified items for utilitarian and hedonic motivations based on a comprehensive review of the relevant literature. As utilitarian motivation mainly concerns fact seeking and fact sharing, I adapted the instruments for fact-seeking from DiFonzo and Bordia (2017) and added fact-sharing by adapting the prosocial motivation items from Grant and Berry (2011). For hedonic motivation, I followed Lee (2014) and included items capturing image management and entertainment motivation. Items for image enhancement motivation were also included and were adapted from Compeau et al (1999). I followed prior literature to measure sharing intention as a single item, a 7-point scale from "extremely unlikely" to "extremely likely" (DiFonzo and Bordia 2007a; Kim and Dennis 2019; Kim et al. 2019). Finally, I identified and included several control variables that were found in previous research to have an influence on online sharing intention (Kim and Dennis 2019; Kim et al. 2019; Lee 2014). These variables include confirmation bias (Bordia et al. 2005; Kim and Dennis 2019; Wason 1960), perceived topic relevance (importance) (DiFonzo and Bordia 2007a), prior knowledge on the topic (Eastin 2001), propensity to trust (Hui et al. 2007; Pavlou and

Gefen 2004), need for cognition (Cacioppo et al. 1996), need for sensation (Hoyle et al. 2002; Zuckerman 2010), and demographics including age, education, gender. All items (except demographics) were taken from existing scales and are shown in Appendix D.

Measurement Model and Psychometrics

I followed previous literature to examine and validate construct validity with two procedures: 1) Exploratory factor analysis to identify common factors among instruments using principal component analysis (PCA), and 2) Validation of the factor structure using confirmatory factor analysis (CFA) (Rutner et al. 2008). First, I conducted a PCA with oblimin rotation and eliminated items which either loaded more on other constructs than their own construct or had loadings less than 0.5 on their own construct (Sun 2013). As a result, one motivation item was dropped. I present the result of the PCA and the rotated component matrix in Appendix E and descriptive statistics of all the constructs are shared in Table 10.

Second, I conducted a CFA to test the fitness of the proposed measurement model, and the fit indices are as follows: $\chi^2 (303) = 2349$, p<0.001, root mean squared error of approximation (RMSEA)=0.06, Standardized Root Mean Square Residual (SRMR) = 0.055, Comparative Fit Index (CFI) =0.92, Tucker-Lewis Index (TLI) =0.91. The indices suggested the proposed measurement model has an acceptable level of fitness with the dataset (Bentler 1990).

I then investigated the reliability, convergent validity, and discriminant validity of the proposed measurement model and constructs. I assessed the construct reliability by measuring the composite reliability of constructs which is a more accurate reliability measure than Cronbach's alpha coefficient as composite reliability does not assume

equity of the item loadings and error terms (Chin et al. 2003). Past research has suggested a threshold value of 0.7 for adequate reliability (Bearden et al. 1993; Fornell and Larcker 1981; Sun 2013). All composite reliability values satisfied this criterion (see Table 11).

Convergent validity was examined by measuring the factor loadings and the average variance explained (AVE) metrics. Past research suggested a threshold value of 0.7 for each factor loading associated with the construct and an AVE value above 0.5 (Campbell and Fiske 1959). The factor loadings of each construct and AVE values indicate the convergent validities of all constructs are acceptable. The discriminant validities of constructs were tested by measuring 1) the square root of AVE values, and 2) the factor loading on the focal construct relative to other constructs (Campbell and Fiske 1959). Prior research suggested the square root of the AVE should be greater than the variance between constructs (e.g., correlation) and the factor loadings on the construct should be greater than those on other constructs (Chin 1998; Compeau et al. 1999; Fornell and Larcker 1981). Table 12 presents the values of the square root of AVEs and the correlation matrix, exhibiting an acceptable level of discriminant validity for each construct.

Table 10. Descriptive Statistics of Variables

Variable	No. of Obs.	Mean	Std. Dev.	Min	Max
Share	1,425	2.809	1.856	1	7
Relevance	1,419	4.863	1.543	1	7
Utilitarian Motives	1,413	4.374	1.514	1	7
Hedonic Motives	1,398	2.838	1.228	1	7
Need for Cognition	1,394	3.624	0.653	1	6
Need for Sensation	1,385	3.934	1.115	1	6
Trust Propensity	1,399	2.814	1.255	1	6

Prior Knowledge	1,421	2.328	1.053	1	5
Confirmation bias	1,423	3.168	1.662	1	7

Table 11. Composite Reliability, Average Variance Extracted (AVE)

Constructs	Composite Reliability	AVE
Hedonic Motive (HM)	0.95	0.62
Utilitarian Motive (UM)	0.91	0.61
Need for Cognition (NC)	0.73	0.51
Need for Sensation (NS)	0.88	0.65
Relevance (R)	0.86	0.76
Confirmation Bias (CB)	0.72	0.58
Trust Propensity (TP)	0.85	0.74

Table 12. Square Roots of AVEs and Correlations

	HM	UM	NS	NC	R	TP	CB
Hedonic Motive (HM)	0.79						
Utilitarian Motive (UM)	0.48	0.69					
Need for Sensation (NS)	-0.02	-0.09	0.71				
Need for Cognition (NC)	<0.01	-0.05	0.13	0.81			
Relevance (R)	0.05	0.33	-0.38	-0.06	0.86		
Trust Propensity (TP)	0.60	0.23	0.02	0.03	0.02	0.87	
Confirmation Bias (CB)	0.39	0.42	-0.04	-0.06	0.16	0.39	0.78

Note: the diagonal values are the square roots of the AVE, and the off-diagonal values are the bivariant correlation coefficients between constructs. The diagonal values should be greater than the bivariant correlations to meet the criterion of discriminant validity.

Results

I employed a multiple-level structured equation model (SEM) with "message" as the cluster variable to analyze the causal relationship between the independent variables (rumor plausibility and novelty), the mediators (utilitarian motivation and hedonic motivation) and the outcome variable (rumor sharing intention).

Following previous research (e.g., Baron and Kenny 1986; Bulgurcu et al. 2010), I performed an analysis to test the mediating effects between plausibility and novelty and rumor sharing intention. I argued that psychological motivations mediated the effect of rumor characteristics on individuals' intention to share a rumor. Therefore, I conducted a mediation analysis to examine whether no, partial, or full mediation exists (see Table 13). The first column for plausibility and novelty contains the path coefficients for mediated paths (a and b) and direct paths (c) determined independently. The second column provides the path coefficients determined simultaneously. As indicated by Baron and Kenny (1986) mediation exists when the direct paths (c) are reduced by controlling for mediated paths (a and b). This condition is met, as shown in Table 13, since the coefficients of the direct paths determined independently are less than coefficients of direct paths determined simultaneously. Moreover, results show that the coefficients for direct paths are not statistically significant. In other words, the direct path coefficients between plausibility and sharing intention (b=0.115, p=0.291) and the between novelty and sharing intention (b=0.001, p=0.939) are not significant. The results of the analysis suggest a full mediation model. Further, the Sobel test was conducted to examine the significance of the mediation effect (Sobel 1982). The test reported significant p-value for the mediation paths, suggesting the significance of the mediation effect between rumor characteristics and rumor sharing outcomes. Hence, the findings suggest that rumor characteristics affect rumor sharing intention entirely through their effect on psychological motivations.

Table 13. Results of Mediation Analysis

	IV=Plausibility		IV=Novelty	
	Independent	**Simultaneous**	**Independent**	**Simultaneous**
Path a1: IV → Utilitarian Mot.	0.26***	0.26***	0.53***	0.54***
Path a2: IV→ Hedonic Mot.	0.05	-0.001	0.12*	0.12*
Path b1: Utilitarian Mot. → Sharing Int.	0.52***	0.51***	0.52***	0.51***
Path b2: Hedonic Mot. → Sharing Intent	0.32***	0.33***	0.32***	0.33***
Path c: IV → Sharing Intent	.30	0.115	0.56***	0.001

Next, I created the structural model using the "lavaan" library in R Studio (Rosseel 2012). Table 14 presents the full mediation model (i.e., only indirect paths between plausibility, novelty, and sharing intentions through psychological motivations) and includes the effect of all control variables.

Table 14. Results of Structural Equation Model Analysis

DVs	**IVs**	**Full Mediation Model**			
Share Intent ←		**Est.**	**Std.Err**	**Z**	**P(>|z|)**
	Utilitarian Mot.	0.52***	0.07	7.97	<0.01
	Hedonic Mot.	0.32***	0.05	5.99	<0.01
	Education	0.27***	0.07	3.77	<0.01
	Age	-0.005	0.01	-0.45	0.65
	Gender	-0.07	0.05	-1.40	0.16
	Relevance	0.19***	0.06	3.42	<0.01
	Confirmation Bias	0.08***	0.03	3.32	<0.01
	Trust Propensity	0.16***	0.02	8.51	<0.01
	Prior Knowledge	0.14***	0.04	3.40	0.00
Utilitarian Mot. ←					
	Plausibility	0.26***	0.06	4.47	<0.01

Novelty	0.53***	0.05	10.64	<0.01
Need for Cognition	-0.05***	0.02	-2.85	0.004
Need for Sensation	0.005	0.02	0.19	0.85

Hedonic Mot. ←

Novelty	0.12*	0.072	1.73	0.08
Plausibility	0.05	0.071	0.001	0.99
Need for Cognition	-0.16***	0.018	-9.15	<0.01
Need for Sensation	-0.01	0.012	-0.81	0.42

The results of the fully mediated model are also depicted graphically in Figure 5.

Results indicated that control variables relevance, confirmation bias, trust propensity, and prior knowledge all exhibited significant positive effects on individuals' rumor sharing intention. The need for cognition exhibited a negative effect on both utilitarian and hedonic motivations, but the need for sensation was not found to be related to the utilitarian or hedonic motivation. Further, education was found to be significantly and positively related to online users' rumor sharing intention.
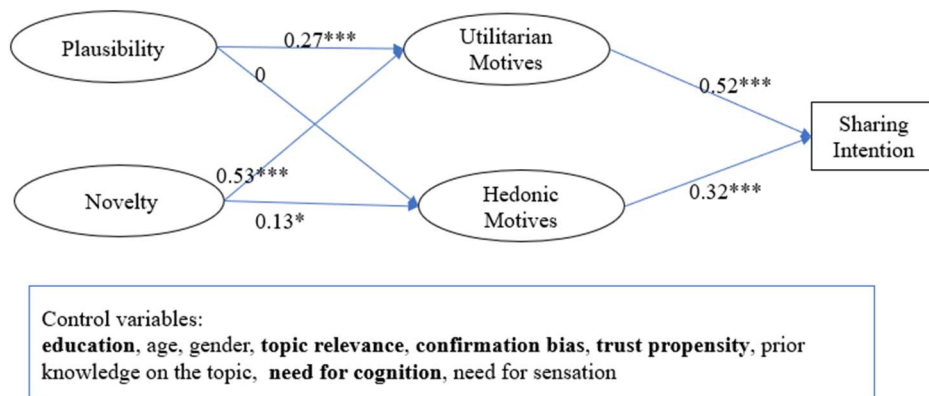

Figure 5. The Structural Model in Chapter IV

Results of the SEM provide evidence for most of the hypotheses. Hypothesis 6 proposed a positive relationship between utilitarian motivation and individuals' rumor sharing intention. The results demonstrate that utilitarian motives do in fact have

positive and significant effects on sharing intention (b=0.517, p<0.001). Hypothesis 7 claimed a positive relationship between hedonic motivation and individuals' rumor sharing intention. In support, the results show that the hedonic motive is positively and significantly related to sharing intention (b=0.324, p<0.001). Hypothesis 8 concerned the relationship between plausibility and utilitarian motivation. As shown in Table 14, the path coefficients between plausibility and utilitarian motivation are positive and significant (b=0.266, p<0.001) indicating that Hypothesis 8 was supported. Hypothesis 9 argued for a positive relationship between plausibility and hedonic motivation. However, the SEM did not produce a significant effect of plausibility on hedonic motivation (b=0.05, p=0.99). Therefore, Hypothesis 9 was not supported. Hypothesis 10 argued for a positive relationship between rumor novelty and hedonic motivation. The path analysis produced a positive and marginally significant effect (b=0.124, p=0.08). Hence, Hypothesis 5 was supported. Hypothesis 11 further argued for a positive relationship between rumor novelty and utilitarian motivation. The result showed a positive and significant effect (b=0.533, and p<0.001). Therefore, Hypothesis 11 was supported.

Supplementary Analysis

Aside from using the experimental design to manipulate rumor plausibility and rumor novelty, I also requested participants to provide the ratings for their perceived plausibility and novelty for each specific rumor. To test the robustness of the findings, I performed an additional SEM and replaced experimental conditions of plausibility and novelty with participants' self-reports.

The construct of rumor plausibility was adapted from DiFonzo and Bordia (2007a) using a 7-point Likert scale from Strongly Disagree to Strongly Agree. The items for plausibility were "the message is believable," "the message is realistic," and "the message is truthful." Novelty refered to the extent to which a rumor was perceived to be new, unexpected and unfamiliar. I adapted the construct items from Koslow et al. (2003) using the following four items: "the message is new," "the message is unfamiliar to me," "the message is unexpected," and "the message is different from my expectations on the topic." The alpha coefficient for plausibility and novelty are 0.93 and 0.86 respectively, exceeding the threshold required for construct reliability.

I then performed Principal Component Analysis (PCA) and CFA to test the measurement model. The results of the factor loading, descriptive statistics, composite reliability, and the square roots of AVEs and correlations are provided in Table 15 through Table 18 respectively.

Table 15. Factor Loadings of Principal Component Analysis (PCA)

Variable	HM	P	UM	N	NF	NC	TP	R
Plausibility_1	0.0873	**0.8634**	0.1783	0.13	0.0241	0.0026	0.0509	0.0903
Plausibility_2	0.0865	**0.8692**	0.1683	0.1373	0.0125	0.0189	0.0265	0.0882
Plausibility_3	0.1789	**0.8585**	0.0918	0.1222	0.0304	0.0108	0.0832	0.0552
Novelty_1	0.0451	0.0964	0.0615	**0.8711**	0.0016	0.0768	0.0096	0.055
Novelty_2	0.0227	0.0135	0.1094	**0.8522**	0.0075	0.0614	0.0022	0.0159
Novelty_3	0.072	0.3061	0.0423	**0.8027**	0.0219	0.0737	0.0338	0.0288
Novelty_4	0.0548	0.365	0.0104	**0.7134**	0.054	0.0316	0.048	0.0723
Utilitarian Motive_1	0.219	0.035	**0.8184**	0.0588	0.0013	0.0001	0.0061	0.0592
Utilitarian Motive_2	0.1954	0.0734	**0.8122**	0.0672	0.0679	0.0248	0.0304	0.0991
Utilitarian Motive_3	0.2007	0.1342	**0.7877**	0.0518	0.0191	0.0238	0.0198	0.1686

Utilitarian Motive_4	0.3947	0.2451	**0.6179**	0.0302	0.0456	0.0253	0.0032	0.1895
Utilitarian Motive_5	0.6459	0.0957	0.3531	0.0225	0.0183	0.0218	0.0241	0.1003
Utilitarian Motive_6	0.3187	0.2914	**0.6806**	0.0648	0.0464	0.0081	0.0176	0.15
Hedonic Motive_1	**0.8408**	0.1066	0.0394	0.0348	0.0109	0.0177	0.0584	0.0363
Hedonic Motive_2	**0.8387**	0.1565	0.0155	0.0405	0.0731	0.0269	0.0223	0.0248
Hedonic Motive_3	**0.8198**	0.1621	0.0205	0.038	0.0522	0.016	0.0306	0.0335
Hedonic Motive_4	**0.8395**	0.1691	0.0274	0.0162	0.0551	0.0248	0.084	0.0189
Hedonic Motive_5	**0.581**	0.0365	0.4476	0.018	0.0989	0.0282	0.0533	0.1115
Hedonic Motive_6	**0.6183**	0.1186	0.3247	0.0133	0.0967	0.0873	0.0524	0.0907
Hedonic Motive_7	**0.7564**	0.0225	0.1825	0.0133	0.063	0.021	0.0418	0.0215
Hedonic Motive_8	**0.8297**	0.1781	0.071	0.0028	0.0131	0.0216	0.0491	0.029
Hedonic Motive_9	**0.8276**	0.0404	0.1532	0.032	0.0085	0.0223	0.071	0.066
Hedonic Motive_10	**0.7689**	0.0269	0.204	0.0413	0.0185	0.0132	0.0549	0.029
Hedonic Motive_11	**0.7571**	0.0438	0.2911	0.0311	0.0581	0.0309	0.0573	0.1015
Need for Cognition_1	0.1361	0.0476	0.0244	0.0376	0.0872	**0.7164**	0.035	0.0906
Need for Cognition_2	0.0391	0.063	0.0314	0.0249	0.1183	**0.7355**	0.1036	0.0827
Need for Cognition_3	0.0421	0.0379	0.0177	0.0592	0.0026	**0.7792**	0.0381	0.0695
Need for Cognition_4	0.0527	0.0607	0.0231	0.0871	0.0328	**0.7554**	0.1331	0.0869
Need for Sensation_1	0.1092	0.0317	0.1355	0.0462	**0.7247**	0.1423	0.045	0.0301
Need for Sensation_2	0.0722	0.0116	0.1167	0.0552	**0.8249**	0.0576	0.0098	0.0652
Need for Sensation_3	0.0831	0.0329	0.0057	0.0011	**0.7944**	0.0529	0.0551	0.0657
Need for Sensation_4	0.1249	0.0451	0.1278	0.0352	**0.7369**	0.0423	0.0023	0.0413
Trust Propensity_1	0.1426	0.07	0.0043	0.0438	0.0207	0.1955	**0.9034**	0.0317
Trust Propensity_2	0.2213	0.0644	0.0218	0.0363	0.0198	0.1572	**0.8933**	0.0449
Relevance_1	0.0649	0.1768	0.2979	0.0588	0.0556	0.0183	0.0022	**0.8511**
Relevance_2	0.1685	0.2308	0.3126	0.0129	0.0229	0.0093	0.0165	**0.8221**
Eigen Value	7.71	3.85	3.75	2.76	2.46	2.35	1.70	1.63
Variance Explained	20.3%	10.1%	9.9%	7.3%	6.5%	6.2%	4.5%	4.3%

Table 16. Descriptive Statistics of Variables for Additional Analysis

Variable	No. of Obs.	Mean	Std. Dev.	Min	Max
Share	1,425	2.809	1.856	1	7
Plausibility	1,413	3.519	1.686	1	7

Novelty	1,412	4.427	1.473	1	7
Relevance	1,419	4.863	1.543	1	7
Utilitarian Motives	1,413	4.374	1.514	1	7
Hedonic Motives	1,398	2.838	1.228	1	7
Need for Cognition	1,394	3.624	0.653	1	6
Need for Sensation	1,385	3.934	1.115	1	6
Trust Propensity	1,399	2.814	1.255	1	6
Prior Knowledge	1,421	2.328	1.053	1	5
Confirmation bias	1,423	3.168	1.662	1	7

Table 17. Composite Reliability, Average Variance Extracted (AVE) for Additional Analysis

Constructs	Composite Reliability	AVE
Plausibility	0.933	0.832
Novelty	0.862	0.614
Hedonic Motive (HM)	0.947	0.621
Utilitarian Motive (UM)	0.907	0.609
Need for Cognition (NC)	0.731	0.509
Need for Sensation (NS)	0.880	0.650
Relevance (R)	0.856	0.755
Confirmation Bias (CB)	0.723	0.580
Trust Propensity (TP)	0.850	0.739

Table 18. Square Roots of AVEs and Correlations for Additional Analysis

Variables	P	N	HM	UM	NC	NS	R	CB	TP
Plausibility (P)	0.912								
Novelty (N)	-0.311	0.784							
Hedonic Motive (HM)	0.373	0.114	0.788						
Utilitarian Motive (UM)	0.303	0.034	0.518	0.780					
Need for Cognition (NC)	-0.022	-0.154	-0.018	-0.099	0.713				
Need for Sensation (NS)	-0.035	0.026	0.009	-0.037	-0.117	0.806			
Relevance (R)	0.372	0.015	0.599	0.256	0.011	0.023	0.869		

| Trust Propensity (TP) | 0.13 | 0.063 | 0.053 | 0.322 | 0.379 | - 0.059 | - 0.028 | 0.15 | 0.86 |

Note: the diagonal values are the square roots of the AVE, and the off-diagonal values are the bivariant correlation coefficients between constructs. The diagonal values should be greater than the bivariant correlations to meet the criterion of the discriminant validity.

Further, Harman's single-factor test was employed to evaluate common method bias (Podsakoff et al. 2003). I loaded all the variables into an exploratory factor analysis (EFA) and examined the unrotated factor solution. Podsakoff et al (2003) suggested that the primary assumption of the method is that a substantial portion of the common method variance may exist if 1) one single factor emerges from the unrotated factor solution, or 2) one general factor explains the majority of the covariance among measure. Our analysis unveiled multiple factors and the largest factor accounts for 26 percent of covariance in the measure. Hence, neither of the scenarios occurred in the analysis. The result of the Harman's single-factor test suggests that common method bias is not a large concern for the analysis.

The results of the structural model are presented in Table 19, indicating that all six hypotheses are supported. This additional analysis corroborates the findings of the main analysis. Table 20 summarized the results of the hypothesis testing.

Table 19. The Results of the Structural Models for Additional Analysis

DVs	IVs	Full Mediation Model			
Sharing Intention ←		Est.	Std.Err	z	P(>|z|)
	Utilitarian Motive	0.504***	0.054	9.402	<0.001
	Hedonic Motive	0.288***	0.053	5.461	<0.001
	Education	0.155	0.1	1.559	0.119
	Age	-0.004	0.01	-0.376	0.707
	Gender	-0.058	0.046	-1.244	0.213

	Relevance	0.12***	0.032	3.777	<0.001
	Confirmation Bias	0.257***	0.063	4.104	<0.001
	Trust Propensity	0.133***	0.027	4.856	<0.001
	Prior Knowledge	0.127***	0.041	3.121	0.002
Utilitarian Mot. ←					
	Plausibility	0.301***	0.089	3.367	0.001
	Novelty	0.296***	0.034	8.786	<0.001
	Need for Cognition	0.13***	0.01	13.175	<0.001
	Need for Sensation	-0.011	0.011	-1.021	0.307
Hedonic Mot. ←					
	Novelty	0.222***	0.035	6.311	<0.001
	Plausibility	0.288***	0.042	6.896	<0.001
	Need for Cognition	0.301***	0.089	3.367	0.001
	Need for Sensation	-0.042***	0.007	-6.233	<0.001

Table 20. Results of Hypothesis Test in Chapter IV

Hypothesis	Results
H6: Utilitarian motivation is positively associated with cyber rumor transmission.	Supported
H7: Hedonic motivation is positively associated with cyber rumor transmission.	Supported
H8. Rumor plausibility is positively associated with the utilitarian motivation of rumor sharing.	Supported
H9. Rumor plausibility is negatively associated with the hedonic motivation of rumor sharing.	Not Supported
H10. Novelty is positively associated with an individual's hedonic motivation for rumor sharing.	Supported
H11. Novelty is positively associated with an individual's utilitarian motivation for rumor sharing.	Supported

Chapter V. Discussion

While cyber rumors are exhibiting increasing influence, research on rumor information processing and transmission has been sporadic. Grounded on related theoretical paradigms, this dissertation proposes and compares the efficacy of several rating mechanisms to help users to perform more sensible processing of rumors on social media platforms. Further, drawing on the dual motives perspective, the dissertation investigates the psychological motivations of cyber rumor transmission, which mediates rumor characteristics and online users' rumor sharing intention outcomes. Based on the empirical outcomes of this dissertation, I highlight several major findings, each of which holds implications on theory and practice.

First, the dissertation examines the impact of several rating mechanisms on rumor plausibility on four disparate rumors, and the mixed-level regression show mixed results. I found that neither high certainty nor low certainty discourse hedge exhibits statistically significant impacts on rumor plausibility evaluations when controlling for confirmation bias, trust propensity topic relevance, prior knowledge, age, gender, education, etc. For self-rating, I found that although the coefficients related to low self-rating are in the expected direction, they are not statistically significant. Also the coefficient related to high self-rating is negative, which is opposite of the hypothesis. For community-rating, neither low certainty nor high certainty community-ratings exhibit statistically significant results. In comparing the relative salience of self-rating and discourse hedges, I found that low self-rating was associated with a negative

coefficient (-0.177) and low certainty discourse hedges were associated with a small and positive coefficient (0.046), both of which were not statistically significant. When comparing the relative efficacy of self- rating and community-rating, I found that for low certainty rating, self-rating was related to a negative coefficient (-0.236), community-rating was related to a positive coefficient (0.302), neither of which were statistically significant. For high certainty rating, the coefficients of high self-rating and high community-rating were -0.107 and 0.202 respectively, neither of which was statistically significant.

Second, the dissertation found that utilitarian motivation and hedonic motivation are the salient, direct antecedents of individuals' rumor transmission intention. Controlling for other factors, the impact of rumor characteristics exemplified by plausibility and novelty on rumor transmission intentions is fully mediated by the utilitarian and hedonic motivations of online users. While utilitarian motivation mainly concerns the informational and functional value of rumors that is instrumental for the community, my dissertation found that hedonic motives, which highlight people's pursuits of experiential gratification, also constitute an integral determinant of rumor sharing intention.

Third, I analyzed the structural model utilizing two measurement methods for rumor plausibly and novelty (design measures and self-reported scales) to enhance the reliability of the analysis. The outcomes of the two analyses are largely consistent with the only exception of hypothesis 9. The study confirms that rumor plausibility serves as a potent determinant of utilitarian motivation due to its informational value. But, for the effect of plausibility on hedonic motivation, the two analyses exhibited discrepancy.

The SEM results utilizing the design method (coding plausibility and novelty as binary variables) showed no effect, however, the analysis using participants' self-reported plausibility and novelty ratings showed a positive and significant coefficient (b=0.29, p<0.001).

Fourth, the dissertation found novelty as a salient predictor of hedonic motivation as well as utilitarian motivation underlying rumor transmission, thereby influencing individuals' rumor transmission intention. The finding attests to my propositions that aside from plausibility, there are other rumor characteristics that have been neglected by previous studies that can exhibit a potent effect on people's rumor transmission intention.

Implications for Research

In drawing on the rumor literature and associating this line of work with studies of social media and the dual motive perspective, I contribute to three streams of literature: 1) Exploring how the technical affordances on social media platforms affect online users' information processing, with recent examples studying the online rating mechanisms on fake news (Kim and Dennis 2019; Kim et al. 2019), 2) Understanding the mechanisms underlying unverified and false information diffusion through social media (Lazer et al. 2018; Vosoughi et al. 2018), and 3) Examining the determinants and consequences of rumor and rumor-mongering (DiFonzo and Bordia 2007c; Oh et al. 2013). Recent research on misinformation (e.g., Kim and Dennis 2019; Kim et al. 2019) has acknowledged the importance of designing mechanisms that can assist online users to effectively identify misinformation, thereby mitigating the spread of false claims in

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social media platforms. Further, emerging research has started to acknowledge the distinctive diffusion patterns of online information and the rapid proliferation of misinformation that are enabled by OSNs (Kim et al. 2019; Vosoughi et al. 2018). In connection with these research streams, this dissertation offers several theoretical implications.

First, grounded in the taxonomy of hedges, meta-cognition theory, and warranting theory, this dissertation investigates the relative efficacy of discourse hedges, self-rating, and community hedges in influencing plausibility evaluation. I found that discourse hedges are not particularly effective in affecting how rumors are evaluated by readers. Further, the dissertation proposed a new rating mechanism – self-rating – that is disembedded from the rumor text. Self-rating was thought to be more prominent than a discourse hedge. However, the dissertation does not find the effect of self-rating to be statistically significant. Several reasons might explain why self-rating is not exhibiting an effect on people's evaluation of rumor plausibility. First, self-rating is a hedge method voluntarily provided by the source of the rumors, and it is introduced as a technical manifestation of discourse hedges. Before this dissertation, this rating system, to my knowledge, has not been proposed, adopted and implemented by either researchers or practioners. Hence, I cannot rule out the possibility that online users (i.e., the experiment participants) were not fully aware of the connotations of self-rating and thus failed to interpret the ratings appropriately. Another possibility is whereas online users fully notice the existence of self-rating and hold an accurate understanding of how the rating is derived, they did not perceive it as an effective and important cue pertinent to rumor evaluation. The third possibility that hinders self-rating from showing an

impact on rumor plausibility is that the effect of self-rating could be contextually sensitive, that is, the effect of a self-hedge is different depending on specific topics. The varying impacts of self-rating on different topics manifest in my dissertation as the extent to which the four rumor stimuli in the experiment were impacted by self-rating. Further, although past research reported a significant impact of community-based rating mechanisms (source, or article rating) on information evaluation assessment (Kim et al. 2019; Meservy et al. 2019b; Winter et al. 2010), this dissertation does not observe a salient effect of community-rating on rumor plausibility. Regardless of the potential causes that keep the rating mechanisms from exhibiting effectiveness, the dissertation sheds light and provides nuances on the designing of technical mechanisms by illuminating the varying nature of the rating system contingent to specific circumstances and topics.

Second, previous research on online information sharing has primarily focused on the sharing outcomes as a direct consequence of information characteristics (e.g., plausibility), and largely neglected the psychological motivations inducing individuals' sharing intentions. This dissertation extends and deepens this line of research by investigating the mediating effect of psychological motivations between rumor characteristics and sharing intention outcomes. Incorporating the dual motives perspective, this dissertation shows that online users' psychological motivations, consisting of utilitarian motives and hedonic motives, fully mediate the effect of rumor characteristics (e.g., plausibility and novelty) and sharing intentions. That is, controlling for the impact of confirmation bias, topic relevance, trust propensity and several other demographics, the underlying utilitarian and hedonic motivations are direct

determinants of online users' rumor sharing intention, and they also serve as the direct consequences of rumor characteristics.

Third, my dissertation confirms rumor plausibility as a primary driver for rumor sharing, through its effect on unitarian motivation. This finding corroborates recent observations in other forms of online information sharing such as the spread of fake news where perceived credibility is recognized as a major determent of users' evaluation and sharing behaviors (Kim and Dennis 2019; Kim et al. 2019). Therefore, I echo the findings of past researchers (see Appendix F) - it is critical to account for the impact of plausibility when understanding individuals' rumor transmission behavior. But individuals are still likely to share implausible rumors and my dissertation reveals the reason why.

Finally, in unraveling the plausibility paradox, this dissertation identifies and attests rumor novelty as an important determinant of rumor sharing intentions. There is ample interdisciplinary research on online information sharing, however, plausibility has remained the dominant characteristic explaining online users' behavioral intentions and behaviors (e.g., sharing, commenting, reading, etc.). This dissertation identified novelty as a unique rumor characteristic that holds strong ramifications on hedonic motivation as novelty pertains to the affective and sensory gratifications when it comes to users' experience. Our analysis reveals novelty also exhibits a strong, positive impact on the utilitarian motivations of rumor transmission. Surprisingly, the relative magnitudes of the coefficients of the SEM model indicate that novelty contributes significantly more to utilitarian motives than rumor plausibility. That is, online users, appear to derive a higher portion of utilitarian value from rumor novelty than plausibility. This finding

indicates that novelty is a vital feature in rumor contexts, in part because novel rumors can bring about significant hedonic value, but possibly more importantly, novelty is likely to infuse new ideas that invigorate communication and collective sense-making. In this way, the infusion of novelty into rumors can give rise to higher *utilitarian value*, rendering the information processing not only more enjoyable but also potentially more illuminating. Extant studies on rumors have ascertained four major antecedents of rumor transmission: emotional anxiety, general situational uncertainty, rumor credulity (plausibility) and outcome-relevance (Rosnow 1991; Rosnow et al. 1988; Shibutani 1966b). Our findings on the effect of novelty extend and deepen our understanding of rumor sharing by revealing that rumor sharing is not simply a result of informational value mainly derived from the perceived plausibility of rumors. The perceived novelty of rumors also contributes to the informational values which are critical for community members to collectively make sense of ambiguous situations – perhaps more so than other traditional antecedents of rumor transmission.

Implications for Practice

Past research has cautioned about the negative consequences associated with rumors, in particular with rumors of low plausibility (Ahern and Sosyura 2015; Coombs 2007; Oh et al. 2013). In response, researchers have investigated strategies to mitigate the diffusion of rumors in OSNs. Our study shows that aside from plausibility, there are other determinants of rumor sharing (novelty) that are at play contributing to the rapid spread of rumors. Novelty can bring along entertainment value, but also facilitate and rejuvenate users' functional information processing such as fact seeking and sharing. Although rumors are unverified information, they are somewhat different from other

forms of online misinformation (e.g., fake news and propaganda) that are meant for manipulating and misleading. Rumors are improvised and transmitted by community members to make sense of situations and restore psychological control. Therefore, this dissertation can inform policymakers, social media practitioners, as well as social media users about the importance of information novelty in enhancing the collective sense-making process. Specifically, this dissertation provides empirical support for developing capabilities on OSNs and relevant regulation to encourage the spread of rhetoric and discourse with high plausibility and high novelty and to deter those that are novel, but deceptive. One implication of this dissertation is that deceptive rumors that are novel are likely to gain wide proliferation on OSNs because the novelty of such rumors wields such motivational power over sharing.

To quickly identify and examine novel rumors, social media practitioners may begin investigating rating mechanisms that approximate novelty (e.g., originality scores) so they can quickly identify which rumors are most likely to achieve a wide spread. In some cases (especially those with marketing, technology innovation diffusion or other benign purposes), companies may even wish to reward novel content producers in the hope that content producers' messages will reach a wide audience.

This dissertation also shows that aside from the utilitarian value of cyber rumors, hedonic value also constitutes an integral motivation for those participating in the collective conversation and sense-making on OSNs. Focusing only on the informational value and the pursuit of information accuracy paints a partial picture of why individuals share unverified information with others. During collective sense-making, a tight focus on functional objectives could dim OSN members' interest, passion, and willingness to

express their opinion by contributing to collective discourses. However, social media users, social media practitioners, and policymakers should also be aware that, without safeguards, the power of hedonic motivation in cyber rumor sharing can easily turn OSNs into rumor mills. Therefore, those who manage OSNs are tasked with overseeing a delicate balance between utilitarian and hedonic value when unverified information is shared on their platforms.

Limitations and Future Research Directions

There are several limitations to this dissertation that should be kept in mind when considering its implications. One key limitation of the dissertation is the student sample. The use of college students can be generalizable to a broader population when the phenomenon of the inquiry is familiar to students (Niederman and DeSanctis 1995; Peterson 2001). College students constitute an integral part of the social media community, and they are constantly exposed to and used to consume rumors on social media (Carton et al. 2015; Chen et al. 2015). Using student research subjects has been prevalent in research on online consumer behavior and information processing on OSNs (e.g., Johnston and Warkentin 2010; Moravec et al. 2018; Pavlou and Fygenson 2006). But past empirical research has also found that student samples are more homogenous than nonstudent samples, so caution should be exercised in generalization (Boulianne 2015; Peterson 2001). Future research should corroborate my findings and examine the external validity of my dissertation by replicating the dissertation using non-student samples.

Another limitation is that I selected four rumor messages as stimuli on different topics that are deemed to be of relevance within the context of the university. These rumors

may not be generalizable to the populations outside the university campus. However, when I shortlisted the four rumors, I did investigate the nomological representativeness of the stimulus materials following the definition of rumors which stipulated the situational ambiguity and outcome relevance as the important components for rumors (Rosnow 1991; Rosnow et al. 1988). Future rumor research may test the findings of this dissertation by expanding the topics to broader topic areas such as financial rumors, rumors about products and services, or other socially-oriented rumors.

Next, the dependent variable of this dissertation is sharing intentions, not actual sharing behavior. Intentions are viewed as "an indicator of a motivational state that exists just prior to the commission of an act." (Paternoster and Simpson 1996, p. 561). The intention of sharing represents a predisposition to the sharing behavior. However, an important next step will be examining sharing behavior in response to utilitarian and hedonic motivations.

Finally, this dissertation lays the foundation for future inquiries. I found besides utilitarian motivation for rumor sharing, the hedonic motivation constitutes an integral contributor to rumor transmission. There are likely other neglected rumor characteristics that may hold promise to elevate users' rumor sharing intention. For instance, some affective features of rumors such as arousal may wield considerable influence over rumor sharing.

Conclusion
With the proliferation of false online rumors on social media platforms, the first objective of the dissertation was to design a mechanism that functions to facilitate more sensible information processing. This dissertation proposed and compared the efficacy

of self-rating and community-rating mechanisms in affecting users' rumor plausibility evaluation. Although the effects of the rating mechanisms were not found statistically significant, the dissertation provided nuances on the design of rating mechanisms in online social networks. Further, drawing on dual motivation theory, this dissertation found that utilitarian and hedonic motivation constitute important antecedents of users' rumor sharing intention. Aside from the utilitarian motivation derived from rumor plausibility, rumor novelty also exhibited a stronger impact on both the utilitarian and hedonic motivation of online users. The study extends and deepens the research on cyber rumor and informs future researchers and practitioners as they consider effective designs and management policies on OSNs where cyber rumors proliferate.

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Appendix

Appendix A. Construct Instruments and Reliability for Chapter III

Construct (Alpha Coefficient)	Instruments	Reference
Rumor Plausibility (0.93)	The message is believable. The message is realistic. The message is truthful.	DiFonzo and Bordia 2007
Relevance (0.85)	The message is relevant to me. The message is relevant to me.	Kim and Dennis 2019
Confirmation Bias (0.83)	Do you agree with the message? Do you have a favorable feeling about the message?	Kim et al. 2019
Trust Propensity (0.84)	I feel that information on social media is generally trustworthy. I feel that information on social media is generally reliable.	Hui et al 2007
Knowledge of Topics	How much do you know about his topic?	-

Appendix B. Selected Literature Review on Rumors

Source	Title	Theory	DV/IV	Method	Findings	Stage
(Oh et al. 2013) MISQ	Community Intelligence and Social Media Services: A Rumor Theoretic Analysis of Tweets During Social Crises	Rumor theory/ Rumor as collective social reporting to gather community intelligence	DV: rumor mongering IVs: anxiety, ambiguity, involvement and social ties (not significant).	Coding, Logistic regression	Source ambiguity, personal involvement and anxiety are rumor causing factors under social crisis.	Diffusion
(Marett and Joshi 2009) JAIS	The Decision to Share Information and Rumors: Examining the Role of Motivation in an Online Discussion Forum	Motivation Theory Rumor Theory	DV: rumor (information) sharing IVs: intrinsic motivation/extrinsic motivation/normative influence	Survey, SEM	Posters and lurkers are differently motivated by intrinsic factors and extrinsic motives are motivating factors for rumor-mongering.	Diffusion
(Stieglitz and Dang-Xuan 2013) JMIS	Emotions and Information Diffusion in Social Media—Sentiment of Microblogs and Sharing Behavior	Information diffusion, Emotion theory	DV: retweet frequency, retweet time lag IVs: sentiment Positive sentiment Negative sentiment	Sentiment Analysis	The sentiment is positively related to retweet frequency, and is negatively related to retweet time lag.	Diffusion
(Rosnow 1991)	Inside Rumor: A personal journey	Basic Law of Rumor	DV: rumor transmission IVs: anxiety, uncertainty, credulity, relevance	Meta-analysis	Rumor generation and transmission result from an optimal combination of personal anxiety, general uncertainty, credulity, and outcome-relevant involvement.	Diffusion
(Allport and Postman 1947) A book	The psychology of rumor	NA	NA	NA	Theoretical paper postulated the occurrence of rumors will vary according to an incident's thematic importance and the amount of ambiguity inherent in a given situation.	Reception and diffusion

Source	Title	Theory	DV/IV	Method	Findings	Stage
(Zhao et al. 2016) Computer in Human Behavior	An exploration of rumor combating behavior on social media in the context of social crises	Planned behavior theory Norm activation model	DV: intention to combat rumors IVs: attitude, perceived behavioral control, norms, responsibility, etc.	Survey, SEM	Subjective norms, perceived behavioral control and awareness of adverse consequences were the three most important predictors of actual rumor combating behavior.	Reception
(Sutton et al. 2016)	What it Takes to Get Passed On: Message Content, Style, and Structure as Predictors of Retransmission in the Boston Marathon Bombing Response	Terse Communication	DV: retransmission of tweets IVs: message (content, style) and sender characteristics	Case study	Retransmission of official Tweets during the Boston bombing response was jointly influenced by various message content, style, and sender characteristics.	Diffusion
(Qazvinian et al. 2011)	Rumor has it: Identifying Misinformation in Microblogs	NA	DV: rumor identification IVs: three categories of patterns	Modeling and machine learning	Content-based, network-based, and microblog-specific memes are examined for correctly identifying rumors in microblogs	Reception
(Zubiaga et al. 2016) PLOS	Analyzing How People Orient to and Spread Rumors in Social Media by Looking at Conversational Threads	N/A	DV: rumor diffusion IVs: true vs. false rumors in social media	Text mining	There is a prevalent tendency for users to support every unverified rumor. True rumors tend to be resolved faster than false ones.	Reception and diffusion
(Zubiaga et al. 2018) ACM	Detection and Resolution of Rumors in Social Media: A Survey	N/A	N/A	Text mining	Propose a rumor classification system consisting of four components: rumor detection, rumor tracking, rumor stance classification and rumor veracity classification.	Reception

Appendix C. Selected Literature Review on Fake News

Source	Title	Theory	DV/IVs	Methods	Findings	Stages
(Vosoughi et al. 2018) Science	The spread of true and false news online	N/A	DV: news diffusion IV: true and fake news in Twitter	Text Mining	Falsehood diffused significantly farther, faster, deeper, and more broadly than the truth. The effects were more pronounced for false political news than for false news about terrorism, natural disasters, science, urban legends, or financial information.	Diffusion
(Del Vicario et al. 2016) PNAS	The spreading of misinformation online	N/A	DV: content diffusion IVs: structure of social networks, content exposure.	A data-driven percolation model	Selective exposure to content and homogeneity are the primary driver of content diffusion and generates the formation of homogeneous clusters, i.e., "echo chambers." Homogeneity and polarization are the main determinants for predicting cascades' size.	Diffusion
(Kim and Dennis 2019) MISQ	Says who? The effects of presentation format and source rating on fake news on social media.	Confirmation Bias Primacy effect	DV: fake news believability, sharing IVs: presentation format (headline primary vs. source primary)	Experiment	Source primary induces more critical view of the source, a low source rating is negatively related to believability. Confirmation bias is a strong predictor of sharing. Believability is positively related to sharing.	Reception and diffusion
(Kim et al. 2019) JMIS	Combating Fake News on Social Media with Source Ratings: The Effects of User and Expert Reputation Ratings	Reputation theory	DV: believability, sharing IVs: expert, user article rating, and user source rating	Experiment	Expert ratings and user article ratings had stronger effects than user source ratings on believability. Lower ratings had stronger effects than higher ratings. The belief in an article influenced the extent to which users would engage with the article (e.g., read, like, comment and share).	Reception and diffusion
(Moravec et al. 2018) Upcoming MISQ	Fake News on Social Media: People Believe What They Want to Believe When it Makes No Sense at All	Confirmation bias Theory of cognitive dissonance Dual-process theory	DV: belief, processing time IV: fake news flag	EEG experiment	The presence of a fake news flag triggered increased cognitive activity and users spent more time considering the headline. However, the flag did not affect judgments about truth and did not influence users' beliefs	Reception

Appendix D. Construct Items and Alpha Coefficients

Construct (Alpha Coefficients)	Sub-construct	Instruments	References
Plausibility (0.93)	-	The message is believable. The message is realistic. The message is truthful.	Adapted from (DiFonzo and Bordia 2007a)
Novelty (0.86)	-	The message is new. The message is unfamiliar to me. The message is unexpected. The message is different from my expectations on the topic.	Adapted from (Sheinin et al. 2011)
Utilitarian Motivation (0.86)	Fact Seeking	I would like to see if other people know if the message is true or false. I would like to figure out whether or not the message is true or false. I would like to get more information on the message.	Adapted from (DiFonzo and Bordia 2007)
	Fact Sharing	I want to help others by sharing this information. I get energized by sharing the information that can benefit others. I think it can provide important information to other people.	Adapted from (Grant and Berry 2011)
Hedonic Motivation (0.94)	Image Enhancement	Sharing it helps me make friends with others. Sharing it can improve my image. Sharing it can improve other people's recognition of me. Sharing it can build up my reputation with others.	Adapted from (Compeau et al. 1999)
	Self Enhancement	Sharing it can stimulate others. Sharing it can make other people appealed. Sharing it can alleviate my boredom. Sharing it can create a pleasant mood in me. Sharing it is thrilling. Sharing it is entertaining. Sharing is stimulating.	Adapted from (Lee 2014)
	-	I don't like to have to do a lot of thinking (reverse).	Adapted from

Need for Cognition (0.75)		I prefer complex problems to simple problems. I find satisfaction in deliberating hard and for long hours. Thinking is not my idea of fun	(Cacioppo et al. 1996)
Need for Sensation (0.77)	-	I would like to explore strange places. I crave excitement and new sensations. I like new experiences even if I have to break the rules. I like to do frightening things.	Adapted from Hoyle et al. (2002) and Zuckerman (2010)

Appendix E. Factor Loadings of Principal Factor Analysis (PCA)

Variable	Hedonic Motive	Utilitarian Motive	NS	NC	R	TP
Rrelevance_1(R)	-0.001	**0.676**	0.042	0.050	0.047	0.309
Relevance_2 (R)	0.133	**0.664**	0.026	0.040	0.077	0.377
ConfirmationBias_1(CB)	0.264	0.190	-0.023	0.020	0.032	**0.793**
ConfirmationBias_2(CB)	0.292	0.081	-0.049	-0.054	0.001	**0.774**
Utilitarian_1	0.294	**0.748**	-0.016	-0.033	-0.053	-0.135
Utilitarian_2	0.251	**0.780**	0.025	-0.007	-0.086	-0.081
Utilitarian_3	0.285	**0.772**	-0.010	0.014	-0.052	-0.002
Utilitarian_4	0.466	**0.636**	-0.027	-0.027	-0.004	0.141
Utilitarian_5	0.689	0.336	0.057	-0.027	0.018	0.025
Utilitarian_6	0.399	**0.692**	-0.021	0.001	0.011	0.118
Hedonic_1	**0.851**	-0.017	0.000	-0.008	0.065	0.056
Hedonic_2	**0.849**	-0.018	-0.059	0.034	0.052	0.105
Hedonic_3	**0.830**	0.000	-0.021	0.035	0.049	0.113
Hedonic_4	**0.850**	-0.003	-0.065	-0.010	0.082	0.086
Hedonic_5	**0.617**	0.433	0.032	-0.022	0.015	-0.059
Hedonic_6	**0.665**	0.307	0.013	-0.062	0.043	0.042
Hedonic_7	**0.780**	0.121	0.040	-0.020	0.033	-0.096
Hedonic_8	**0.853**	0.019	-0.028	-0.016	0.050	0.119
Hedonic_9	**0.838**	0.118	0.007	-0.015	0.070	-0.006
Hedonic_10	**0.785**	0.156	0.035	-0.017	0.032	-0.032
Hedonic_11	**0.773**	0.275	0.025	-0.015	0.039	-0.014
NeedForCognition_1(NC)	-0.178	0.093	0.177	**0.679**	-0.115	-0.043
NeedForCognition_2(NC)	0.046	-0.008	0.056	**0.726**	-0.153	0.028
NeedForCognition_3(NC)	0.054	-0.052	-0.013	**0.765**	-0.078	0.042
NeedForCognition_4(NC)	-0.097	0.005	-0.016	**0.753**	-0.126	-0.064
NeedForSensation_1(NS)	-0.078	0.064	**0.827**	0.027	-0.023	-0.072
NeedForSensation_2(NS)	-0.085	0.050	**0.882**	0.052	-0.028	-0.026
NeedForSensation_3(NS)	0.035	-0.021	**0.877**	-0.028	0.024	-0.021
NeedForSensation_4(NS)	0.077	-0.071	**0.853**	0.047	-0.033	0.067
TrustPropensity_1(TP)	0.184	-0.025	-0.006	-0.166	**0.892**	0.009
TrustPropensity_2(TP)	0.253	-0.036	-0.046	-0.091	**0.892**	0.022
Eigen Value	8.349	4.138	3.019	2.200	1.705	1.609
Proportion of variance	26.93%	13.35%	9.74%	7.10%	5.50%	5.19%

Appendix F. Review of Key Research on Rumor Plausibility

| Source	Title	Method	Findings
(Rosnow 1991)	Inside Rumor: A personal journey	Meta-analysis	Rumor generation and transmission result from an optimal combination of personal anxiety, general uncertainty, *credulity*, and outcome-relevant involvement.
(Pezzo and Beckstead 2006)	A Multilevel Analysis of Rumor Transmission: Effects of Anxiety and Belief in Two Field Experiments	Experiment	There are strong overall effects of belief (*plausibility*) and typically no overall effect of rumor anxiety on rumor transmission.
(Rosnow et al. 1986)	Belief in rumor and likelihood of rumor transmission	Experiment/Survey	People are more likely to transmit a rumor they *believe is true* than a rumor they believe is not true. Believability mediates the relationship between anxiety and uncertainty.
(Brooks et al. 2013)	The GBN-dialogue model of outgroup-negative rumor transmission: group membership, belief, and novelty	Monte Carlo simulations	Transmission Probability Function is determined by three variables: group membership, *plausibility,* and novelty.
(DiFonzo and Bordia 2007a)	Rumor psychology: Social and organizational approaches.	Empirical paper	Individuals are more likely to transmit rumors *that they believe to be true*.
(Bordia and DiFonzo 2002)	When social psychology became less social: Prasad and the history of rumor research		The positive association between *belief* and transmission is strongest in situations of moderate anxiety.
(Kim and Bock 2011)	A Study on The Factors Affecting The Behavior Of Spreading Online Rumors: Focusing On The Rumor Recipient's Emotions.	Experiment	Rumor belief as an informational factor together with a normative belief is positively related to rumor transmission behavior through the mediating effect of emotions.
(Kim and Dennis 2019)	Says who? The effects of presentation format and source rating on fake news on social media.	Experiment	Source prominence induces more critical views of the source, a low source rating is negatively related to believability.

(Kim et al. 2019)	Combating Fake News on Social Media with Source Ratings: The Effects of User and Expert Reputation Ratings	Experiment	Confirmation bias is a strong predictor of sharing. Believability is positively related to sharing. Expert ratings and user article ratings had stronger effects than user source ratings on believability. Lower ratings had stronger effects than higher ratings. The belief in an article influenced the extent to which users would engage with the article (e.g., read, like, comment and share).

Appendix G. Stimulus Materials

a. Open-carry Policy
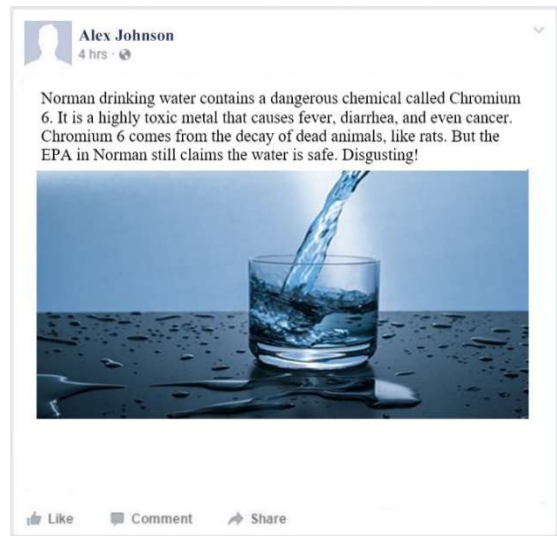
b. Tap Water Contamination

c. Side-effect of Smartphone
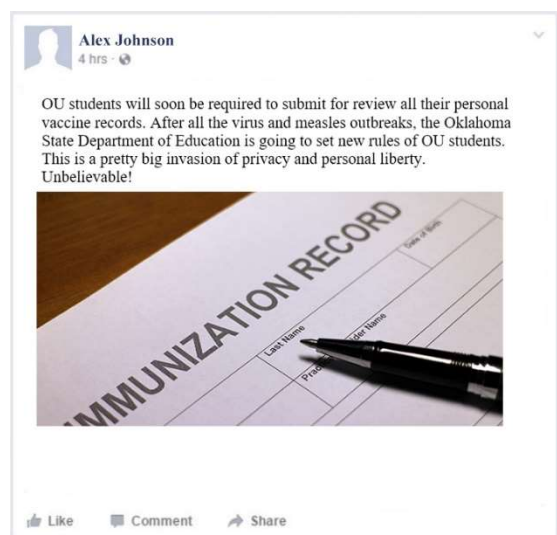
d. Mandatory Vaccine Filing

Figure 6. Baseline Treatment (Treatment 1)

a. Open-carry Policy

b. Tap Water Contamination
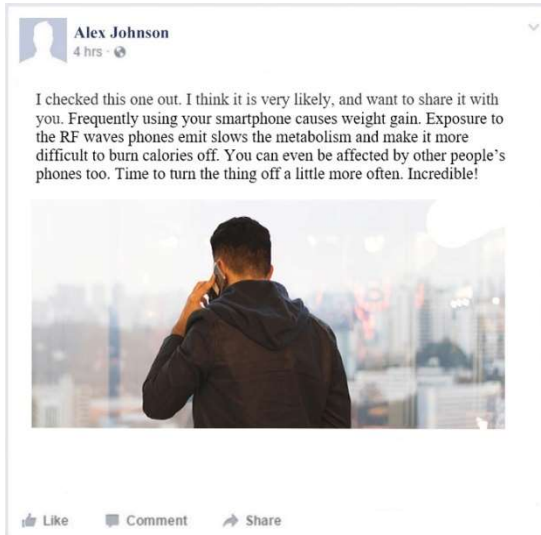
c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

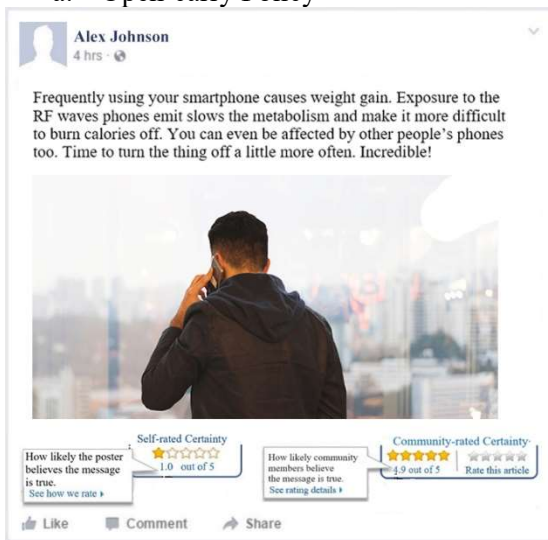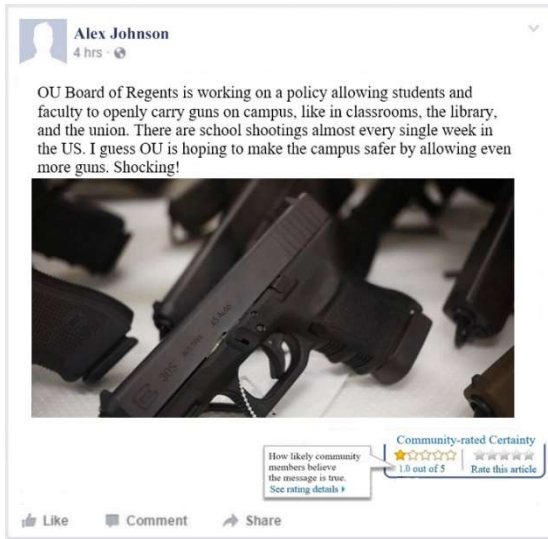Figure 7. High Certainty Hedges (Treatment 2)

a. Open-carry Policy

b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 8. Low Certainty Hedges (Treatment 3)
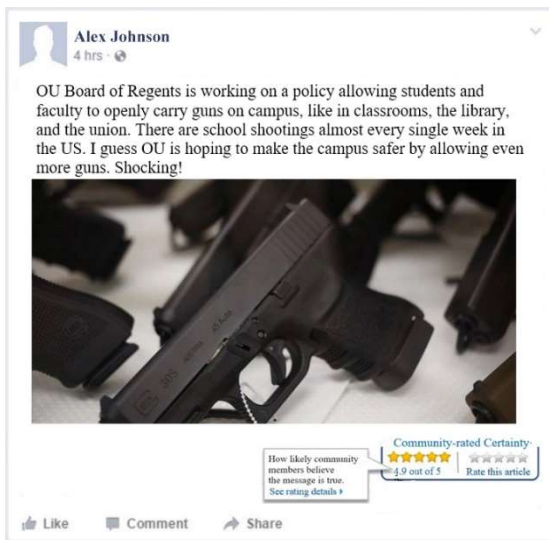
a. Open-carry Policy b. Tap Water Contamination

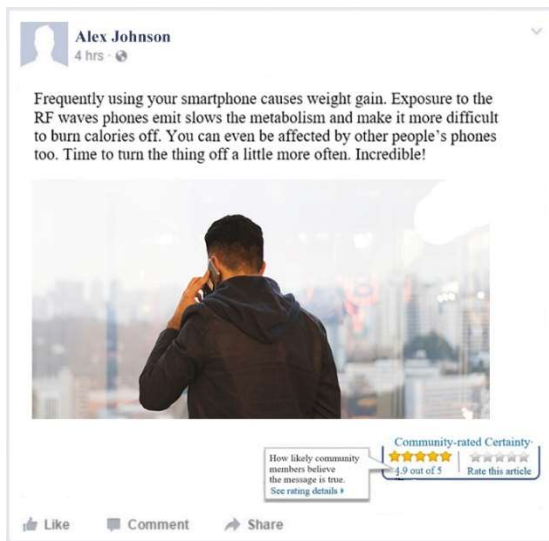c. Side-effect of Smartphone d. Mandatory Vaccine Filing

Figure 9. Low Self-Rating and Low Community-Rating (Treatment 4)

a. Open-carry Policy
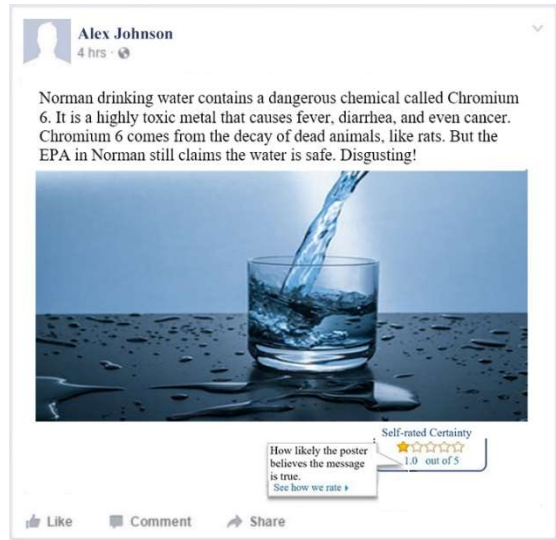
b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 10. Low Self-Rating and No Community-Rating (Treatment 5)

a. Open-carry Policy

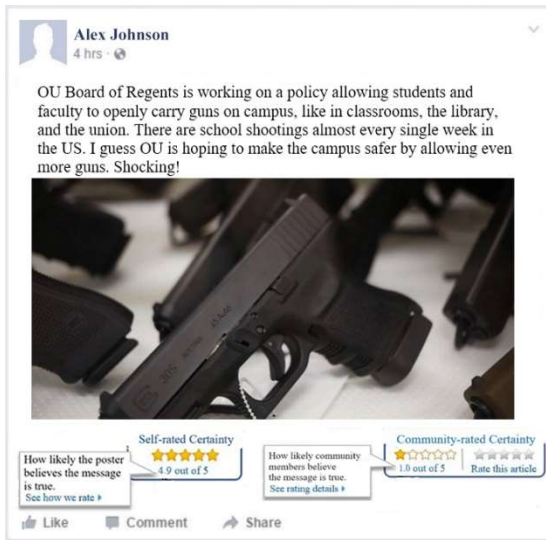b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 11. Low Self-Rating and High Community-Rating (Treatment 6)

a. Open-carry Policy

b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 12. No Self-Rating and Low Community-Rating (Treatment 7)

a. Open-carry Policy

b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 13. No Self-Rating and High Community-Rating (Treatment 8)

a. Open-carry Policy

b. Tap Water Contamination

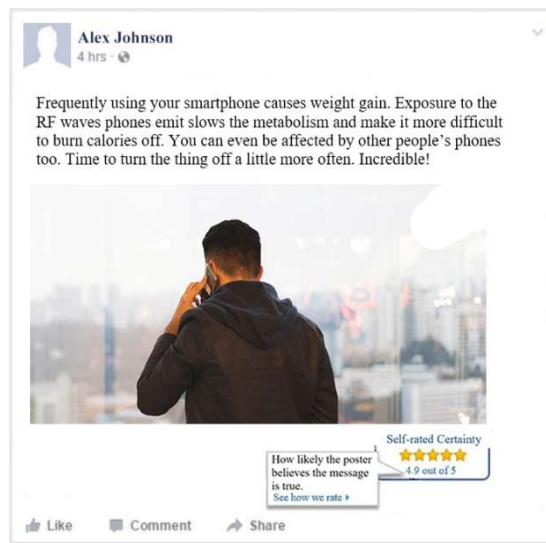c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 14. High Self-Rating and Low Community-Rating (Treatment 9)

a. Open-carry Policy

b. Tap Water Contamination

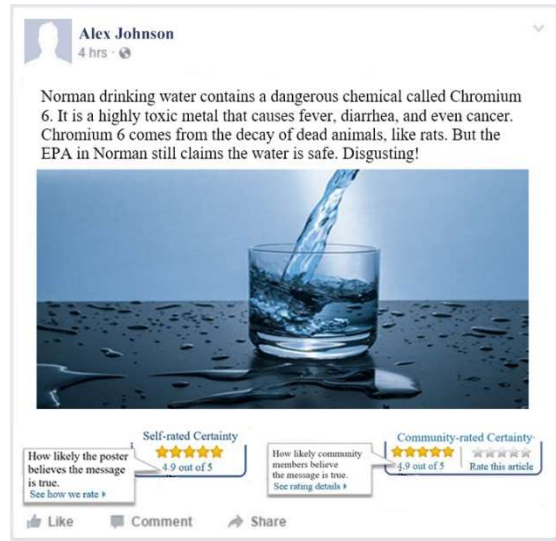c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 15. High Self-Rating and No Community-Rating (Treatment 10)

a. Open-carry Policy

b. Tap Water Contamination

c. Side-effect of Smartphone

d. Mandatory Vaccine Filing

Figure 16. High Self-Rating and High Community-Rating (Treatment 11)