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Correcting Fear-arousing Disinformation on Social Media in the Spread of a Health Virus: A Focus on Situational Fear, Situational Threat Appraisal, Belief in Disinformation, and Intention to Spread Disinformation on Social Media

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Abstract

Disinformation is prevalent in the current social media environment and circulated just as quickly as truthful information. Research has investigated what motivates the spread of disinformation and how to combat it. However, limited research focuses on how fear-arousing disinformation during crises affects individuals' belief in disinformation and to what extent corrective information can subdue the persuasive effects of fear-arousing disinformation. To address this gap, this research tests the effects of fear-arousing disinformation and different types of corrective information (i.e., no corrective information, simple corrective information, or narrative corrective information) on belief in disinformation and intentions to spread disinformation on social media, during a crisis—the spread of an unknown health virus. Furthermore, adapting the important roles of situational fear and threat appraisal in predicting people's health behavioral changes, this research examines the underlying psychological mechanisms of fear and threat appraisal of a crisis in the effects of fear-arousing disinformation and different types of corrective information on belief in disinformation and intentions to spread disinformation on social media.

Study 1 tests the interaction between fear-arousing disinformation and the presence of corrective information. Therefore, a 2 by 2 experiment was conducted in Study 1: disinformation (fear-neutral disinformation vs. fear-arousing disinformation) $\times$ corrective information (no corrective information vs. simple corrective information). Study 2 advances Study 1 by testing whether narrative corrective information decreases belief in disinformation. Study 2 conducted a 2 by 2 experiment (disinformation: fear-neutral disinformation vs. fear-arousing disinformation $\times$ corrective information: simple corrective information vs. narrative corrective information). A total of 419 data collected between January and February 2019 from Amazon MTurk were analyzed (205 for Study 1 and 214 for Study 2).

The current research notes several key findings: 1) Fear-arousing disinformation does not make people believe the disinformation under risky situations and it can even make people avoid the disinformation content as a coping strategy when there is no corrective information presented. 2) Simple corrective information serves as an effective corrective information strategy when fear-neutral disinformation is shown but can backfire when fear-arousing disinformation is presented. 3) Corrective information that features individual narratives does not differ from simple alerts on their abilities to reduce misperceptions, situational fear, situational threat appraisal, and intentions to spread disinformation on social media. 4) Across individual differences, social media usage (i.e., social media use for news, social media use for fact-finding, and social media use for social interaction, health blog usage) emerges as significant factors that decide disinformation and corrective information processing.

By testing effects of disinformation in terms of fear-arousal, which reflects a crisis of the spread of a health virus, this research addressed how fear-arousing disinformation and different forms of corrective information affect beliefs in disinformation and willingness to spread disinformation on social media, and how situational fear and situational threat appraisal may play their roles in the belief in disinformation mechanism.

Correcting Fear-arousing Disinformation on Social Media in the Spread of a Health Virus: A

Focus on Situational Fear, Situational Threat Appraisal, Belief in Disinformation, and

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To my loved ones, families, and my supporters in academia.

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Chapter 1: Introduction

In 2016, the Oxford Dictionary announced that "post-truth" is the word of the year, defining it as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief" (Oxford Dictionary, 2016). The term represents a phenomenon that people are more likely to rely on emotional appeals or their own beliefs than on fact-based information when they form opinions. In the post-truth era, when the border between truthful information and disinformation (i.e., information that promotes false information) or misinformation (i.e., unverified information) becomes blurred, we often face the dangers of spreading rumors. In the present social media era, rumor spread widely and quickly (Guille, Hacid, Favre, & Zighed, 2013) and people rarely verify truth of information circulated on social media (Del Vicario et al., 2016). Rumor is circulated in the "3 Cs"—conflict, crisis, and catastrophe— and the main reason for the spread of rumor is anxiety toward uncertain situations (Berger, 2011). For example, a false story circulated just before the 2016 election alleged that 2016 U.S. presidential election candidate Hillary Clinton was involved in sexual abuse ring of children whom were hidden at the basement of a pizzeria in Washington D.C. The story sounded so realistic to some people that a man armed with a rifle, went to the restaurant to probe for abused children.

Health-related disinformation on social media is deeply problematic because people rely on online media to search health resources and it can directly affect people's behaviors. The internet has enabled people to search health-related information such as diseases or medical issues (Fernández-Luque & Bau, 2015) and people can search information easily via social media during a health virus outbreak (Chandrasekaran et al., 2017). However, such online media platforms are conduits for disseminating disinformation that quickly goes viral,

sparking public apprehension (Ives, 2016). Health-related rumor tends to go viral as a sense-making process especially when in the midst of panic by helping people make sense of unfamiliar and unexpected situations (Wood, 2018) and anxiety is a key facilitator of the spread of rumor during crises because people spread it to mitigate their uncertainty levels (Difonzo & Bordia, 2007). Furthermore, rumor is particularly dangerous when it makes individuals change their attitudes and behaviors, as Thorson noted in a *Vox* article, (Illing, 2017). For example, a misperception that the measles, mumps, and rubella (MMR) vaccine causes autism was a factor that lessened people's willingness to get vaccinated for Zika (Ophir & Jamieson, 2018). Studying how people react to disinformation and corrective information during an emergent spread of a health virus is important because they are asked to take preventative actions such as getting vaccinated and avoiding contact with other people (Bode & Vraga, 2018; Jolley & Douglas, 2014).

Scholars in communication, psychology, and political science have investigated what reinforces belief in disinformation to combat the spread of disinformation. Corrective information strategies such as social media curation that Facebook provides related stories about misinformation mitigate the public's misperceptions (Bode & Vraga, 2015). Simple and brief retractions that use few arguments in refuting false information are effective in decreasing belief in false content (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012). In addition, corrective information provided by a peer (i.e., social correction) and corrective information provided by a social media platform (i.e., algorithmic correction) have similar effects on belief in false information (Bode & Vraga, 2018).

Although scholars have created effective strategies for corrective information, correcting disinformation is still a complicated process. Motivated reasoning, a biased decision-making process driven by emotion to decrease discomforts stemming from cognitive dissonance (Kunda, 1990), is a possible driving force in the failure of corrective information.

The argument of motivated reasoning that individuals' biased information processing to reduce their discomforts provides a reason that fear-arousing disinformation (e.g., "This virus is deadly!") is likely to increase beliefs in the content by generating fearful emotions. Such fearful emotions invite heuristic processing of corrective information. Given this possibility, this research questions whether the failure of corrective information could be attributed to fear-arousing disinformation. To date, health communication has studied fear-arousal mainly in the context of its persuasiveness. Applying fear-arousal to disinformation about crises will open new discussions on persuasive effects of disinformation and beliefs in it.

Of particular interest to this research is the role of corrective information in decreasing persuasive effects of fear-arousing disinformation. Although providing corrective information is more effective in decreasing the public's belief in disinformation than not, not all corrective information eliminates the public's belief that the disinformation they have encountered is accurate. Studies suggest that simple retraction of disinformation is not effective to reduce associated beliefs (Ecker, Lewandowsky, & Apai, 2011; Ecker, Lewandowsky, Swire, & Chang, 2011), and can even cause individuals to further entrench their beliefs (Nyhan, Reifler, & Ubel, 2013; Seifert, 2002). Repeated mention of disinformation, even when noting a retraction or correction, can increase the retrievability of the false statement allowing people to connect the disinformation content with other contexts and source, thereby backfiring which reinforces belief in the disinformation (Ecker et al., 2011; Henkel & Mattson, 2011; Verkoeijen, Rikers, & Schmidt, 2004). In this case, presenting simple corrective information may fail to reduce belief in disinformation.

To address this possible backfire effect of corrective information, this research investigates narrative corrective information as an "enhanced corrective" strategy. Narratives are an effective persuasive communication strategy through transportation into stories, identification with characters (Cappella, Maloney, Ophir & Brennan, 2015; Green & Brock,

2000; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013), and feelings such as sympathy or empathy toward characters in the stories (Escalas & Stern, 2003; Wirtz, Sar, & Duff, 2016). Using narrative messages as corrective information may reduce the beliefs in disinformation (Cappella et al., 2015; Lewandowsky, Ecker, Seifert, Schwarz & Cook, 2012).

Furthermore, the effects of disinformation and corrective information on belief in disinformation may depend on fear as an emotion and threat appraisal as cognition (i.e., severity and susceptibility) during crises; fear is a cognitive shortcut that engages individuals to automatically respond to in crises. When individuals face crises, their fear is activated without deliberative thoughts and heuristic information processing is associated with fear. In addition, threat appraisal is a cognitive response toward crises because it is an evaluation of the crisis situations, which activates systematic information processing and consists of perceived severity and susceptibility. When applying these different characteristics of fear and threat appraisal to the context of disinformation, fear and threat appraisal can result in different outcomes of the exposure of disinformation and corrective information through distinct information processing routes. Although little research includes the psychological fear and threat appraisal when testing the persuasiveness of disinformation and the act of providing corrective information, they are required to understand why corrective information fails to reduce belief in disinformation in the crisis context. The need to be addressed by undertaking research that examines fear and threat appraisal as motivators of belief in disinformation. This research addresses the limitations of prior work by examining fear in two dimensions: fear-arousal in the disinformation message, which can increase its persuasive effects, and fear of the associated crisis (i.e., situational fear), as well as addressing how fear and threat appraisal of a crisis affect beliefs in disinformation after the exposure of disinformation and its corrective information are presented.

Another goal of this research is to examine behavioral intentions to spread disinformation on social media. Disinformation is prevalent on social media and users can share it to their networks easily, cost-effectively (Gerodimos & Justinussen, 2015), and inattentively spread disinformation (Ratkiewicz et al., 2010), perpetuating the problem. People who believe and spread disinformation with others can become "unintended conspirators" for disinformation-mongering[1] (Kwon & Rao, 2017). This research, therefore, examines how individuals process disinformation type and composition of corrective information and associate with their intentions to spread disinformation to others on social media.

In sum, the purpose of this research is three-fold. First, it compares the effects of fear-arousing disinformation to fear-neutral disinformation on beliefs in disinformation. Second, it considers how different types of corrective information (i.e., no corrective information, simple corrective information, and narrative corrective information) impact the effects of belief in fear-arousing disinformation. Third, it broadens the research on disinformation research by considering individuals' responses to disinformation and corrective information (e.g., belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media). This research uses the spread of an unknown health virus as a crisis case in two online experimental studies: Study 1 examines a two (fear-neutral disinformation vs. fear-arousing disinformation) by two (no corrective information vs. simple corrective information) design to predict effects of the presence of corrective information on belief in disinformation, fear of the situation, and threat appraisal. Study 2 investigates the effect of different types of corrective information through a two (fear-neutral disinformation vs. fear-arousing disinformation) by two (simple corrective information vs. narrative

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[1] This research uses "disinformation-mongering" interchangeably with sharing disinformation.

corrective information) design. In doing so, this research will spawn new insights into

understanding disinformation and corrective information from a psychological perspective.

Chapter 2: Literature Review

The first part of this chapter discusses disinformation and corrective information overall with subsections defining disinformation, disinformation on social media in crisis, belief in disinformation, effects of corrective information, and narrative corrective information. The second part provides an explanation of situational threat appraisal as cognition and situational fear as emotion at two levels: disinformation and situation, as well as an application of fear-arousal to disinformation. The final part explains the intention to spread disinformation on social media, and the moderating effect of social media use.

Disinformation and Corrective Information

Defining disinformation. Disinformation refers to deceptive information that has a deliberate intent (Karlova & Fisher, 2013; Wardle, 2017). Examples of disinformation include government propaganda, deceptive advertisement, and forged documents (Fallis, 2015). Unlike an unintentional deception, disinformation comes from people who attempt to mislead others on purpose (Fetzer, 2004). According to philosopher James Fetzer (2004), disinformation "should be viewed more or less on a par with acts of lying" (p.231). Thus, this research defines disinformation as information designed to promote false information. Disinformation is distinct from misinformation, which Lewandowsky et al. (2012) refers to as "any piece of information that is initially processed as valid but that is subsequently retracted or corrected" (p.124-125). Habermas (1984) also distinguishes disinformation from misinformation in that disinformation contains a speaker's intention to deceive. However, scholars have discussed misinformation in broad terms and their conceptual explanations of misinformation seem to include disinformation.

A functioning democracy is formed by well-informed citizens (Kuklinski, Quirk, Jerit, Schwieder, & Rich, 2000) and a society in which the majority of people are misinformed is

opposed to a democratic society's best interest (Lewandowsky et al., 2012). For example, if parents believe a false claim that a vaccination causes autism, they will not immunize their children, provoking negative social consequences including a drastic increase in diseases that could be prevented by vaccine or even death (Poland & Spier, 2010), which ultimately damages public health (Poland & Spier, 2010). Disinformation often aims to influence people's perception and behaviors and can cause serious harm to society. Recently, the use of automated social bots or paid trolls on social media has become a common strategy of disinformation, as recent findings show that bot accounts produced over 50 percent of the tweets about Russian politics (Stukal, Sanovich, Bonneau, & Tucker, 2017). Such fabricated social media information manipulates public opinion, confuses understanding of public, and endangers deliberative discussion (Bessi & Ferrara, 2016; Ferrara, 2016).

Zhou and Zhang (2007) included concealment, ambivalence, and falsification into the concept of misinformation. In a similar line, Nyhan and Reifler (2010) defined misperceptions as "both false *and* unsubstantiated beliefs about the world" (p.305). Some scholars have interchangeably used disinformation with misinformation in terms of "wrong or misleading information" (Stahl, 2006). Scholars have raised concerns over "misinformed" citizens who believe false information (Kuklinski et al., 2000). According to Kuklinski et al. (2000), "… if [people] firmly hold beliefs that happen to be wrong, they are *mis*informed – not just in the dark, but wrongheaded" (p.793). The current research discusses disinformation with previous literature on misinformation, rumor, or false information.

Disinformation on social media in crisis. The deluge of content on social media can surreptitiously expose individuals to disinformation. When faced with a lot of information on social media, people tend to rely on heuristics because they do not have enough resources to process much information thoroughly and objectively (Ecker, 2017). Such heuristic information processing—a mental shortcut that requires little cognitive effort in decision-

making processes (Gilovich et al., 2002)—can lead people to deploy confirmation biases, where people seek information to confirm what they already believe as true (Nickerson, 1998). Online media environments, in which internet users have more media options than ever before, makes it even easier to read information that supports existing viewpoints while ignoring uncongenial information by relying on heuristics. Selecting favorable information (i.e., selective exposure in other words) can aggravate problems of disinformation in online media platforms.

Such concerns surrounding disinformation on social media are evident during crises when uncertainty about the situation is pervasive, the event has severe consequences, and individuals are under time pressure for decision-making (Runyan, 2006). In times of crisis, individuals rely greatly on social media to obtain important information about the uncertain situation (Sorensen & Sorensen, 2007), fulfill their information needs (Shklovski, Palen, & Sutton, 2008), and stay connected with others (Shklovski, Burke, Kiesler, & Kraut, 2010). However, reliance on social media can lead users to spread disinformation because of limited knowledge on the initial phases of crises (Simon, Goldberg, Aharonson-Daniel, Leykin, & Adini, 2014). A wealth of inaccurate information was distributed among social media users during crises such as the outbreak of Ebola in 2014 (Sarmah, 2014) and the Boston Marathon Bombing in 2013 (Starbird, Maddock, Orand, Achterman, & Mason, 2014). In addition, vaccination rates have declined in the U.S. due to growing skepticism of vaccination (Mccoy, 2015) that comes from a possible connection between vaccine and autism (Burgess, Burgess, & Leask, 2006). In the case of the Boston attack, for example, around 90,700 tweets provided false information, including a story that an eight-year-old girl was killed while running a marathon. However, only around 2,000 provided corrective information (Starbird et al., 2014). Such the spread of rumor worsens the crisis. Health rumors affects people's decision-

making processes and behaviors making them more vulnerable to disease (Gyenes & Mina, 2018).

Scholars have attributed the spread of rumors to uncertainty and anxiety about crises (Oh, Agrawal, & Rao, 2013; Rosnow, 1980, 1991, 2001). In real-life incidents such as the spread of Ebola virus, anxiety was prevalent among the public because people were uncertain about virus characteristics such as etiology and spread and scope of the disease (Crook, Glowacki, Suran, Harris, & Bernhardt, 2016). People try to decrease their uncertainties and make sense of uncertain situations by believing and spreading rumors (Difonzo & Bordia, 2007); therefore, rumor-mongering functions "to make sense of an unclear situation or to deal with a possible threat" (Difonzo & Bordia, 2007, p.771). In a similar sense, Allport and Postman (1947) explained that spreading rumor is a justification process that relieves individuals' anxiety; people continue spreading rumors until uncertainty and anxiety disappear (Knapp, 1944; Rosnow & Fine, 1976). In sum, the spread of disinformation during crises is interlocked with anxiety stemming from the ambiguous situation.

Belief in disinformation and effects of corrective information. In a recent meta-analysis, Walter and Murphy (2018) found that corrective information has a moderate effect on reducing beliefs in false information and is more successful when it comes to health issues compared to political issues because people are more resistant to change their beliefs related to political identity (Walter & Murphy, 2018). Moreover, corrective information regarding real-world issues (e.g., climate change or terrorism) may not reduce belief in rumors (Berinsky, 2017; Lewandowsky et al., 2012) and can even increase belief in disinformation. For example, conservatives who read corrective information that there were no weapons of mass destruction in Iraq more believed that Iraq possessed those weapons than those who did not read any corrective information (Prasad et al., 2009). This backfire effect of corrective information occurs because people tend to rely more on rumors that reinforces their attitudes

while being resistant to accepting corrective information in real-world scenarios (Nyhan & Reifler, 2010).

Some studies have attributed the failure of corrective information to message characteristics. Simple corrective information, which merely replicates false content and says it is false, is insufficient in reducing misperceptions and even strengthens false beliefs (Schwarz, Sanna, Skurnik, & Yoon, 2007) because individuals might have a sense of familiarity with the disinformation content in that they have "heard something like this before" (Schwarz et al., 2007, p.152). The role of the increased familiarity with the disinformation content in discrediting corrective information can be explained by the *illusory truth effect*, a tendency that repeated exposure of information increases its believability (Begg, Anas, & Farinacci, 1992); for example, the corrective information statement, "there were *no* oil paints and gas cylinders," simply repeats disinformation—"paints and gas were present" (Lewandowsky et al., 2012, p. 115). This type of corrective information enhances familiarity of the disinformation content, thus increasing beliefs in it (Lewandowsky et al., 2012).

Such failure of corrective information is dubbed as the continued influence effect: people hold their beliefs in disinformation despite the exposure of corrective information (Johnson & Seifert, 1994). Dyer and Kuehl's (1978) research demonstrated this effect by examining whether a single corrective advertisement has an effect over time on decreasing beliefs in a deceptive advertisement which states Listerine is helpful for preventing colds. Study findings revealed that beliefs in the disinformation were somewhat reduced after the exposure of the corrective advertising, but this effect did not last. Familiarity with the disinformation content strengthened the memory, which can then be used as a retrieval cue later by being connected with other contexts (Allport & Lepkin, 1945; Ecker et al., 2011; Henkel & Mattson, 2011).

A theory of mental event models (Johnson & Seifert, 1994; Wilkes & Leatherbarrow, 1988) provides a way to design effective corrective information in order to decrease a continued influence effect. According to mental event models, people tend to retain information already built in their schemas when no alternative is given because they do not want their mental models to be incomplete. Hence, alternative information helps people build up their complete mental models and mitigates the continued influence effect (Johnson & Seifert, 1994). When no plausible alternative is presented, the continued influence effect may arise because people prefer relying on disinformation (Ecker et al., 2011). Therefore, it is imperative to present alternative explanations that refutes disinformation to dismiss misperceptions already embedded in the mental models. In line with this, empirical research has shown that alternative explanations about why the disinformation is false could successfully replace misperceptions rather than providing a simple statement that explains falsehood of the content (Lewandowsky et al., 2012; Tenney, Cleary, & Spellman, 2009).

Narrative corrective information. Narrative is one compelling way in which corrective information can be effectively designed to dismantle misperceptions in mental models. A narrative is a "cohesive and coherent story with an identifiable beginning, middle, and end that provides information about scene, characters, and conflict" (Hinyard & Kreuter, 2007, p. 778). Using a narrative format as a corrective information strategy enhances engagement with fact-based information and many researchers have used a narrative to increase persuasiveness and demonstrated that a narrative format is more effective than other types of messages such as providing statistics to emphasize risks (Van Laer, De Ruyter, Visconti, & Wetzels, 2013). Cappella et al. (2015) referred to this corrective information strategy as "enhanced correctives" and suggested three specific directions for designing enhanced correctives: engaging emotional response, narrative forms, and causal reasoning in narrative accounts.

In Murphy et al.'s (2013) research, a narrative film about cervical cancer increased participants' knowledge about the cancer, attitudes, and behavioral intentions to check for their health status, compared to non-narrative information. Such power of the narrative was explained by transportation, identification with characters in the story, and emotional engagement (Murphy et al., 2013). Transporting into stories, a psychological state in which individuals leave one's reality behind and become highly involved in a story, is an important strategy to reduce resistance to new knowledge and facilitate understanding processes (Green, 2006; Green & Brock, 2000). Transportation, a dimension of presence, explains "the feeling a person has that they are inside a virtual environment, a sense of being there" (Nowak, 2001, p.11).

In addition, individuals empathize with the character both cognitively and emotionally when they identify with a character of a narrative. Individuals imagine themselves to be characters in narratives (i.e., identification), feel empathy towards that characters, and adopt the viewpoint of the characters (Green & Brock, 2000; Tal-Or & Cohen, 2010). Emotional engagement in narratives and identification with narrators make individuals be immersed in the story and understand situations of narrators. In Oliver, Dillard, Bae and Tamul's (2012) research, the authors found that a narrative-formatted news story about health care dilemmas elicited feelings of empathy and more favorable attitudes toward the subjects of a story than a non-narrative.

Focusing on persuasive effects of narratives, this research investigates the effects of narrative-formatted corrective information. A narrative suppresses counter-arguing based on the argument of the extended elaboration likelihood model (E-ELM) that individuals are unlikely to counter argue with the message once being absorbed into it (Moyer-Gusé & Nabi, 2010). More recently, Sangalang, Ophir, and Cappella (2018) found that narrative corrective information lowered false beliefs. In addition to increasing emotional involvement by using

narratives, a causal reasoning in narrative corrective information adds an influence on decreasing false beliefs (Cappella et al., 2015). Narrative corrective information describing a causal reasoning for the falsehood of misinformation generates new causal chains for individuals who read the corrective information. Individuals then replace their preexisting mental models with new mental models built by corrective information (Cappella et al., 2015). Therefore, narrative corrective information will arguably have more persuasive effects than simple corrective information or not showing any corrective information on reducing belief in disinformation.

Moderating and Mediating Role of Fear at Disinformation and Situation

Situational threat appraisal and situational fear. The effects of disinformation and corrective information on belief in disinformation have been extensively examined, but few studies have discussed these issues in terms of fear and situational threat appraisal. Two components of risk perception of crises operate with disinformation and corrective information because they can provide a solution to the failure of corrective information during crises. Recent work has suggested that two aspects—cognition and emotion—should be considered in examining "belief echoes," or the remained attitudinal effects of disinformation even after corrective information is provided (Cappella et al., 2015; Thorson, 2013, 2016). According to Thorson (2013), a conscious cognitive process generates cognitive belief echoes, whereas an unconscious process creates affective belief echoes, suggesting that the continued influence effect of disinformation should be considered from cognitive and emotional approaches.

In psychology, cognition is "the symbolic [or conceptual] processing of information that is required for the central representation and organized expression of a response" (Lang, 1984, p.192). The concept of cognition has been noted in the topic of Reason-Based Choice,

which argues, "Decisions … are often reached by focusing on reasons that justify the selection of one option over another" (Shafir, Simonson, & Tversky, 1993, p.34). On the other hand, emotion (interchangeably used with affect) is "a broad response disposition that may include measurable language behavior, organized overt acts, and a physiological support system for these events [somatic and visceral]" (Lang, 1984, p.192). Cognition and emotion are discussed as distinct concepts in attitudes assessment (Crites, Fabrigar, & Petty, 1994). Knowledge-based cognition is stored independently of emotions in processing information, according to Cappella and Jamieson (1997).

The dual process model of persuasion also supports the idea that persuasion operates via two separate paths—emotion and cognition. Heuristic or emotional information processing tends to occur automatically; as Shafir et al. (1993) note: "People's choices may occasionally stem from affective judgments that preclude a thorough evaluation of the options" (p.32), suggesting the negative roles of emotions in information processing. Information processing via cognitive routes requires deliberative efforts. In contrast, heuristic or peripheral processing, which is less analytical compared to deliberation, is likely to occur when information is being processed by affective cues (Mayer & Tormala, 2010; Schwarz & Clore, 1988).

The linkage between emotions and heuristic information processing is discussed in fear appeal theories. Traditional fear appeal theories such as the Extended Parallel Process Model (EPPM, Witte, 1992) argue that two types of coping strategies—fear control and danger control—occur via different cognitive and emotional processes. Drawing from Leventhal's work (Leventhal, 1970; Leventhal & Cameron, 1987), Witte (1995) notes that fear control is based on emotional arousal and results in a maladaptive response to crises (i.e., rejecting message recommendations), whereas danger control is based on cognitive threat appraisal and leads to an adaptive response to crises (i.e., accepting message recommendations) (Witte,

1995). Therefore, emotion and cognition may result in different responses to crises and should be considered independently.

Threat appraisal, which is classified as cognitive, includes perceived severity, or individuals' perception of a given problem as serious (Janz & Becker, 1984), and perceived susceptibility, or "one's subjective perception of the risk of contracting a health condition" (Rosenstock, Strecher, & Becker, 1994, p.8). Questions such as: "How much of an effect do you think heart disease would make on a person's life?" could be an example of perceived susceptibility (Janz & Becker, 1984) and "How likely are you to become infected with the AIDS virus?" is an example of perceived susceptibility (Rosenstock et al., 1994). These items are distinguished from questions asking levels of feelings in that threat appraisal is a personal cognitive evaluation of the chances that threats may occur. Emotions such as fear— "an internal emotional reaction comprising psychological and physiological dimensions that may be aroused when a serious and personally relevant threat is perceived" (Witte, 1996, p.320) —are immediate and automated processes (Chaiken & Trope, 1999). In line with these discussions, this research defines situational threat appraisal as perceived severity and susceptibility of crises. The traditional health-related models such as the health belief model (HBM; Janz & Becker, 1984), protection motivation theory (PMT; Rogers, 1983), and the EPPM (Witte, 1992, 1994) put a high value on threat appraisal in predicting health behaviors and argue that threat appraisal is a key influencer of understanding why individuals adopt health recommendations. The EPPM specifically delineates that fear-arousing messages increase threat appraisal (Witte, 1992), which ultimately affect information processing and acceptance of the message (Das, De Wit, & Stroebe, 2003; De Hoog, Stroebe, & De Wit, 2005).

Despite plentiful literature on threat appraisal in health communication, limited research examines threat appraisal in disinformation. Previous research addressing disinformation

effects on emotions (Sherman & Kim, 2002; Thorson, 2016) has not focused on threat appraisal. This research addresses this gap. When applying the links between fear-arousing information and threat appraisal to the disinformation context, it is likely that people who are exposed to fear-arousing disinformation will show higher levels of threat appraisal toward the crisis than those who see fear-neutral disinformation. Additionally, this situational threat appraisal will be highest for those who see simple corrective information due to its backfire effect. However, this situational threat appraisal may also decrease belief in disinformation by activating deliberative thoughts, thereby mediating the relationship between the group (the exposure of disinformation and corrective information) and belief in disinformation.

On the other hand, fear is categorized under emotion. One limitation of previous studies on disinformation is that few have documented effects of disinformation and its corrective information on emotions, while heavily weighing on cognitive effects such as beliefs. However, as Sherman and Kim (2002) proposed affective perseverance, in which emotions toward an object remain even after the object is invalidated, effects of disinformation and corrective information are associated with emotions. In Sherman and Kim's (2002) research, participants were provided with Chinese ideographs and their respective English translations. The given ideographs had both positive and negative valences. After the participants learned the meanings of Chinese ideographs, they were informed that translation was incorrect, but they maintained their positive and negative attitudes toward the characters.

In another example in Thorson's (2016) research, participants were provided negative information about a political candidate and were informed later that the initial information was false. Participants, however, did not change their negative attitudes toward the candidate whose information was falsely identified (Thorson, 2016). Building upon these discussions, this research acknowledges that inclusion of emotions into effects of disinformation and corrective information is necessary. This study focuses on fear because disinformation about

crisis can be more related to fear than other types of emotions such as anger, enthusiasm, or hope. This research examines fear at two levels: situation and disinformation. In this research, situational fear refers to an unpleasant emotion toward crises that is automatically aroused when facing dangerous situations.

Summing up past research that differentiates emotions from cognition, this study examines how individuals form their attitudes once they receive disinformation in terms of both emotion and cognition**.** The current research investigates situational fear as an emotional component and situational threat appraisal as a cognitive component of risk perception, and how these two components are shown independently after disinformation (fear-arousing disinformation vs. fear-neutral disinformation) and corrective information (no corrective information vs. simple corrective information vs. narrative corrective information) about a crisis are presented.

Fear-arousal in disinformation. Fear appeals have been widely used as a persuasive communication strategy. The fundamental idea of fear appeals scholars is that fearful emotions can serve as a driver for individuals to take health recommendations and self-protective action (e.g., Rogers, 1983). In one of the early studies, fear appeals were referred to as the messages describing the undesirable consequences caused by failure to accept the recommendations (Hovland, Janis, & Kelley, 1953). A long history of research has reached a general finding that fear appeals are more persuasive than other communication types that have no fear-arousal (de Hoog, Stroebe, & de Wit, 2007; Leventhal & Niles, 1964; Leventhal, Singer, & Jones, 1965; Witte & Allen, 2000). It is also important to note, however, that fear appeals are not always effective. In one instance, Muthusamy, Levine and Weber (2009) tested the effects of fear appeals among people from Namibia who had already had high levels of fear about HIV/AIDS. The findings indicated that exposure to fear appeals did not change people's fear, attitudes and behaviors related to condom use. This

ineffectiveness of fear appeals was attributed to high preexisting fear of the audience. In a similar line, scholars have predicted a curvilinear effect of fear arousal on persuasion, such that moderate levels of fear arousal are the most persuasive (McGuire, 1968; Janis, 1967). That is, if fear arousal goes beyond optimal levels, the effects of fear arousal may motivate defensive avoidance (i.e., unfollowing the health recommendations and denying the threat). In this case, boomerang effects of fear arousal could be observed (Rogers, 1983) because of feelings of hopelessness.

Despite abundant literature on fear appeals, it has not been discussed in which crisis situations that fear appeals may work or do not work. Previous research on fear appeals mainly tested the effects of fear appeals in the context of individual health. However, health crisis such as the spread of a health virus which was used as a case in the current research has a uniqueness because two billion people around the world are facing risks of health crisis or at least potentially exposed to crisis (World Health Organization[2]). According to WHO, health crisis is classified as a global health emergency when it meets criteria such as posing a serious danger to global societies or unexpected occurrence (Mwanamilongo, 2018). A possible impact of health crisis is invisible, which does not disrupt a physical environment. This causes the prevalence of fear of being infected by diseases among public. Compared to health crisis, man-made disasters such as terrorism has a certain subject that caused the disastrous event. Man-made disasters are defined as "conditions that result from a range of policies and deliberate state actions" (Harding, 2007, p.296). Anger is associated with these types of disaster (Pantti & Wahl-Jorgensen, 2011). Fear could be also prevalent when man-made disasters occur, but the fearful emotions tend to last for a short period of time. Fear diminishes when the terrorism or any other man-made disasters end and move to a recovery

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[2] See for more information: https://www.who.int/hac/about/threeyearplan_focus/en/

stage. Although research on fear appeals has not specifically distinguished between health crisis and other types of disastrous events, the current research considers the uniqueness of health crisis and focuses on an association between fear and health crisis events.

A motivated reasoning theory (Kunda, 1990), which suggests that individuals are always goal-oriented, provides a theoretical reason for the power of fear-arousal in disinformation. According to this theory, individuals have two different motives: accuracy-oriented motivated reasoning and goal-oriented motivated reasoning (Kunda, 1990). Accuracy-oriented motivated reasoning motivates people to carefully consider in their information processing in order to reach an accurate conclusion. On the other hand, goal-oriented motivated reasoning promotes individuals to process information in a biased way to support their desired conclusions (Kunda, 1990). Research focused on this goal-orientated motivated reasoning demonstrates that individuals arrive at a biased conclusion due to increased levels of emotion (Taber & Lodge, 2006). Using Abelson's (1963) *hot cognition* hypothesis, which posits that emotion undermines individuals' abilities to process new information in an objective, balanced way. Taber and Lodge (2006) explain that motivated reasoning occurs based on emotional responses. People engage in emotion-driven motivated reasoning to avoid mental discomfort when faced with contradictory information.

Building on the argument of motivated reasoning, Lodge and Taber (2005) argued that people tend to establish their attitudes automatically with aroused emotions—either positive or negative, and automatic emotional processes result in selective information processing. This "feelings become information" hypothesis (Lodge & Taber, 2005, p.456) is based upon a premise that people are biased reasoners who have difficulties in evaluating new information in a balanced way (Redlawsk, 2002). Therefore, heuristic processing results in disconfirming new information. While Lodge & Taber (2005) did not examine specific emotions, it is plausible that individuals will be likely to insulate themselves from corrective

information after receiving fear-arousing disinformation. Because heightened fear induced by fear-arousing disinformation can color perceptions and be used as a defensive mechanism, people are unable to process corrective information rationally when confronted by fear-arousing disinformation.

The heuristic-systematic Model (HSM; Chaiken, 1980) also provides an explanation for how people process fear-arousing disinformation and the possible backfire effects of simple corrective information by presuming that attention to the information is more important in persuasive communication than other factors such as message length (Chaiken, 1980, 1987). The model proposes two types of information processing: heuristic and systematic. Opposed to heuristic information processing, systematic information processing involves "considerable cognitive effort" (Chaiken, 1980, p.752). Information with fearful content activates heuristic information processing, especially when receivers do not have much prior knowledge (Averbeck, Jones, & Robertson, 2011). In Averbeck et al.'s (2011) research, participants with lower prior knowledge of spinal meningitis and sleep deprivation exhibited greater levels of fear when reading fear-arousing information related to the topics, compared to those with higher prior knowledge. This leads to a conclusion that emotion—particularly fear—activates heuristic processing (Hale, Lemieuz, & Mongeau, 1995; Schwarz & Clore, 1988).

However, research addressing disinformation effects in terms of fear-arousal is limited. To address this gap, this research tests the effects of fear-arousal disinformation on beliefs in the disinformation and intentions to spread it on social media. Disinformation on social media has used fear appeal as a persuasive technique, particularly during crises. For example, a picture went viral on social media that shows South Korean wedding guests wearing facemasks to avoid Middle East Respiratory Syndrome (MERS) (Kirkpatrick, 2015). This post later turned out to be false, but many continued to perceive it as real (Worland, 2015). Moreover, this false information amplified fear and confused people (Zastrow, 2015).

Another example of rumors arousing fear was that Ebola was found in Kansas City in 2014.

This false story received 16,161 shares and heightened anxiety in those exposed to the

messages (Woollacott, 2014). As these real-world examples show, much disinformation

contains fearful content, which causes irrational decision-making (Bakir & McStay, 2018).

Fear may play a key role in understanding belief in disinformation and intentions to spread

disinformation to others on social media in that individuals are likely to retain memory of

emotional content (Hamann, Ely, Grafton, & Kilts, 1999; Levine & Pizarro, 2004) and retell

stories that raise their emotions (Tversky & Marsh, 2000).

Although fear-arousing content appears to increase belief in disinformation (Mulvey,

2015) and go viral[3] (Joyce, 2016), little empirical research applies fear-arousal to predicting

belief in disinformation and intentions to share it on social media, and the few studies that

have revealed contradictory effects. Ecker et al. (2011) tested whether negative emotionality

of false information about a plane crash incident discounted the effects of corrective

information. The negative emotion-laden false information in their study was presented as a

report of a plane crash as a result of a terrorist attack while the emotionally neutral false

information was a plane crash incident caused by a bad weather condition. As for the

corrective information, participants were assigned to 1) no corrective information, 2)

corrective information only (i.e., "…it was concluded that bad weather [terrorists] was not to

blame"), or 3) causal-alternative conditions (i.e., "The actual cause was determined to be a

faulty fuel tank.") (p. 287). Contradictory to their expectations, the authors found no

difference in the continued influence of false information between individuals exposed to the

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[3] Defining the concept of virality, Nahon and Hemsley (2013) explain speed and reach are key aspects of it:

> Virality is a social information flow process where many people simultaneously forward a specific
> information item, over a short period of time, within their social networks, and where the message
> spreads beyond their own [social] networks to different, often distant networks, resulting in a sharp
> acceleration in the number of people who are exposed to the message (p.16).

negative emotion-laden false information and those exposed to the emotionally neutral false information. They attributed the null findings to the moderate levels of negative emotionality in the manipulation. Ecker et al.'s (2011) research calls for a further investigation of integrating fear arousal into the disinformation context, which is a new arena for research.

In summary, these arguments suggest that people will retain the falsehood of the fear-arousing disinformation even if corrective information is presented during crises. This research predicts that backfire effects will appear in individuals exposed to fear-arousing disinformation and simple corrective information because heuristic processing of fear-arousing disinformation will be activated when corrective information simply refutes the disinformation content without providing any alternative explanations that can complete mental models. Applying fear to disinformation is imperative in addressing the reasons for the continued influence effect. Hence, this research compares the effects of fear-arousing disinformation and no fear-arousing disinformation on belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media, as well as how corrective information influences the mechanism.

Intentions to Spread disinformation on Social Media

Sharing information with others is known to be an innate tendency (Fehr, Bernhard, & Rocken-bach, 2008; Warneken & Tomasello, 2006). Information sharing on social media is defined as "the spread of content from one person to others in their social network through the Internet and/or mobile technologies" (Cohen, 2014, p.321-322) and is considered to be an active communicative behavior (Gerodimos & Justinussen, 2015). This is also termed as viral behavioral intentions, which refer to individuals' intentions to engage in behaviors that would make a message viral including "liking, sharing, and commenting on messages" (Alhabash, McAlister, Lou, Hagerstrom, 2015, p.355). The growth of social networking sites has facilitated information sharing because these technologies have allowed users to easily spread

content to their networks (Cohen, 2014). Cohen (2014) argues that individuals who regularly visit social media websites are likely to have more willingness or to share content on online media. Sharing information via social media is a cost-efficient way to spread information and facilitate interactions between users (Gerodimos & Justinussen, 2015).

However, sharing disinformation is of growing concern in the era of social media. Prior research has suggested a possibility that disinformation with fear-arousing content motivates people's intentions to share it with others. Berger (2011) found that that individuals who experienced high emotional arousal (e.g., anxiety or amusement) were more likely to spread the content than those with low emotion arousal (e.g., sadness or contentment) using emotional and neutral film clips. In Heath and colleagues' research, participants showed willingness to spread stories that were disgusting (Heath, Bell, & Sternberg, 2001). Heath and Heath (2007) also showed that urban legends containing disgusting content were more widely distributed online. These lines of research argue that *emotional selection* (i.e., whether stories evoke emotions such as anger, fear, or disgust) is a criterion of the spread of memes like urban legends (Heath et al., 2001). This research postulates that fear-arousing disinformation will be more likely motivate individuals to spread it to others on social media than fear-neutral disinformation. Adding to this prediction, simple corrective information will also backfire on decreasing intentions to spread disinformation when disinformation has fearful content.

Moderating Role of Social Media Use

The current research also considers individual differences as a moderator of fear-arousing disinformation and corrective information, including amount of social media usage, the way people use social media, and other basic demographic information (e.g., age, gender). The focus on social media uses in this research is based on the uses and gratifications (U&G) theory, which is an audience-focused approach that analyzes

individuals' different uses of media and it argues that media has different effects depending on individuals' needs (Katz, Blumler, & Gurevitch, 1973). Yet, there is no research on the roles of social media usage as an individual difference in processing disinformation and corrective information.

Researchers have hypothesized that high users of social media will discern corrective information from disinformation by learning from social media (Whiting & Williams, 2013). Such self-education process can cultivate their media literacy; therefore, high social media users cannot be deceived by disinformation when the disinformation is corrected. Meanwhile, they also may be impacted by the third-person effect such that they may exhibit self-confidence that the messages will not affect themselves but rather will affect others (Davison, 1983). In this sense, although they face with disinformation and corrective information, they can disregard the messages and rely on their own understandings of the content. Such trend is supported by empirical findings that high social media usage is associated with higher narcissism (Andreassen, Pallesen, & Griffiths, 2017), which can inhibit social media users from understanding the purpose of messages. Furthermore, the current research assumes that high social media users may confuse disinformation with corrective information because of information bombardment, which can distract users and cause information overload. Social media characteristics may aggravate the spread of disinformation because of the lack of disinformation control. Much information flows on social media without being controlled and one can spread disinformation effortlessly (Chen, Sin, Theng, & Lee, 2015). As social media is a double-edged sword, it is questionable how social media usage can affect the dependent variables of interest (i.e., belief in disinformation, situational fear, situational threat appraisal, intention to spread disinformation on social media) in the current research.

In addition, how people use social media should be considered in the disinformation and corrective information context. In general, individuals use social media with a variety of

motivations such as social interaction, which refers to develop and maintain relationship with others, or information seeking, which indicates finding information to meet informational needs (Park, Kee, & Valenzuela, 2009; Whiting & Williams, 2013). Given different motivations of social media usage, the current research particularly considers the roles of social media motivations (i.e., social media news use, social media fact-finding use, and social media social interaction use) in examining effects of disinformation and corrective information.

Summary of Theories and Connection to Current Research

In summary, the main points of the theories explained above that drive the current research are: 1) motivated reasoning theory and heuristic-systematic information processing in explaining persuasive effects of fear-arousing disinformation versus fear-neutral disinformation, 2) illusory truth effect in explaining a potential backfire effect of simple corrective information that repeats the disinformation content and simply flags the content as false, 3) mental model in explaining effects of narrative corrective information, and 4) uses and gratification theory in explaining possible moderating effects of social media usage.

A common argument of motivated reasoning theory and heuristic-systematic information processing theory is that emotion leads individuals to process information in a biased way. According to these theories, emotion activates heuristic information processing, which is driven by mental shortcuts with a goal-orientated perspective. Therefore, heightened fear caused by fear-arousing disinformation may activate heuristic information processing and this fearful emotion may lead participants to believe the disinformation, even though corrective information is presented.

Secondly, illusory truth effect explains that multiple exposure to the content may increase believability toward the message. When borrowing illusory truth effect to the current research, it is predictable that simple corrective information that flags the falsehood of

disinformation by showing the disinformation repeatedly to participants may nullify the effects of corrective information. Simple corrective information may fail to change the perceptions of the participants, which were already established by the disinformation content or it may even increase the persuasive effects of the disinformation.

Mental model provides an insight into predicting the possible effect of narrative corrective information. According to the mental model theory, a detailed story like narrative corrective information can replace preexisting thoughts. In this sense, a narrative story as a corrective information strategy can be effective in decreasing beliefs in disinformation, fearful emotions and threat perception established in reading disinformation. Furthermore, narrative corrective information may even affect behavioral aspects by decreasing intentions to share disinformation on social media.

The last main theory in the current research was uses and gratification theory which provides a supportive argument of considering social media usage in examining disinformation and corrective information processing. According to the theory, social media users use social media platforms in various patterns depending on their needs. Some social media users may heavily rely on the platforms while others may not use often. High social media users may understand the purpose of corrective information because of their high levels of media literacy. On the other hand, they may simply rely on their existing thoughts on disinformation and reject the simple corrective information content. Therefore, social media usage may moderate how individuals process disinformation and corrective information.

Chapter 3: Current Research

This chapter offers research questions, hypotheses for Study 1 and 2, and overall strategies for the current research. Focusing on the presence of corrective information, Study 1 examines the effects of different types of disinformation based on fear-arousal (fear-neutral disinformation vs. fear-arousing disinformation) and the presence of corrective information (no corrective information vs. simple corrective information) on belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media. Study 2 advances Study 1 by comparing different types of narrative information. Given the limited prior research regarding the variables of interest, the first research question explores the correlations between the dependent variables.

RQ1. In Study and Study 2, respectively, what is the relationship between belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media?

The next research question asks about the relationship between possible control variables and dependent variables of interest. The following research question will guide this research to decide which variables should be included as controls in the main analyses.

RQ2. In Study 1 and Study 2, respectively, what is the relationship between individual differences and the variables of interest?

Research Question and Hypotheses for Study 1

Based on the above discussions of persuasive effects of fear-arousal, there will be main effects of fear-arousing disinformation on belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media. Motivated reasoning theory and heuristic-systematic information processing commonly argue that emotion activates superficial information processing and leads individuals to have a biased perspective toward the information. Fear-arousing information has also been widely known

as an effective strategy to persuade people and change their behaviors. When applying the

argument that fear has a power to persuade people to disinformation, participants who will

read fear-arousing disinformation will report greater belief in the disinformation, fearful

emotions, severity, susceptibility, and disinformation sharing behaviors, compared to

participants who will read fear-neutral disinformation. Related hypotheses are proposed as

follows:

H1. There will be a main effect of fear-arousing disinformation (vs. fear-neutral

disinformation) on dependent variables of interest.

H1-a. Individuals who are exposed to fear-arousing disinformation will report

significantly greater belief in said disinformation than those who are exposed to fear-

neutral disinformation.

H1-b. Individuals who are exposed to fear-arousing disinformation will report

significantly greater levels of situational fear than those who are exposed to fear-neutral

disinformation.

H1-c. Individuals who are exposed to fear-arousing disinformation will report

significantly greater levels of situational threat appraisal than those who are exposed to

fear-neutral disinformation.

H1-d. Individuals who are exposed to fear-arousing disinformation will report

significantly greater levels of intentions to share said disinformation on social media

than those who are exposed to fear-neutral disinformation.

Regarding corrective information, some research has found that corrective information,

which merely repeats disinformation content and refutes it (Lewandowsky et al., 2012;

Schwarz et al., 2007) has a backfire effect. Simple corrective information in the current

research that states the disinformation is false by showing the disinformation content again

may increase familiarity of the disinformation. In this case, participants may not understand

the purpose of corrective information and may rely on disinformation even after the corrective information is shown. Participants may be familiar with the disinformation through repeated exposure to the disinformation content. With this possible backfiring of simple corrective information in mind, this study hypothesizes a significant interaction between different types of disinformation based on fear-arousal (fear-neutral disinformation vs. fear-arousing disinformation) and the presence of corrective information (no corrective information vs. simple corrective information) on belief in disinformation. It is also possible to predict that a simple refutation of disinformation can decrease belief in disinformation, but simple corrective information will backfire particularly when the disinformation messages feature fearful cues (i.e., language, images) because simple corrective information will reinforce heuristic processing of fear-arousing disinformation. The following hypotheses are proposed:

H2. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (no corrective information vs. simple corrective information) on belief in said disinformation.

H2-a. In the fear-neutral disinformation condition, participants who see simple corrective information will show lower belief in said disinformation than those who do not see any corrective information. However, in the fear-arousing disinformation condition, participants who see simple corrective information will show higher belief in said disinformation than those who do not see any corrective information.

This study also investigates the interaction between different types of disinformation based on fear-arousal and the presence of corrective information on situational fear. Similar to the logic of H2, simple corrective information can increase levels of situational fear for individuals who read fear-arousing disinformation by exposing the said disinformation content to them again with the added phrase that the disinformation is false. Again, following

the illusory truth effect, simple corrective information can make participants be aware of the risky situation and further increase fearful emotions, particularly when participants read fear-arousing disinformation. Therefore, I propose the following hypotheses:

H3. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (no corrective information vs. simple corrective information) on situational fear.

H3-a. In the fear-neutral disinformation condition, participants who see simple corrective information will show lower levels of situational fear than those who do not see any corrective information. However, in the fear-arousing disinformation condition, participants who see simple corrective information will show higher levels of situational fear than those who do not see any corrective information.

In the similar line with the above hypotheses, the next hypotheses postulate the interactive effects of fear-arousing disinformation and the presence of corrective information on situational threat appraisal (H4) and intentions to spread disinformation on social media (H5). These hypotheses are also based on the argument of the illusory truth effect such that the repeated exposure to disinformation content may increase persuasive effects of the disinformation. A simple refutation to the disinformation content can make again participants be aware of the risky situation and increase their perceptions on severity and susceptibility toward the situation. In reading fear-arousing disinformation, participants can show high levels of threat appraisal and disinformation sharing intentions. Therefore, the hypotheses are:

H4. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (no corrective information vs. simple corrective information) on situational threat appraisal (situational severity: H4-1, situational susceptibility: H4-2).

H4-a. In the fear-neutral disinformation condition, participants who see simple corrective information will show lower levels of situational threat appraisal than those who do not see any corrective information. However, in the fear-arousing disinformation condition, participants who see simple corrective information will show higher levels of situational threat appraisal than those who do not see any corrective information.

H5. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (no corrective information vs. simple corrective information) on intentions to share said disinformation on social media.

H5-a. In the fear-neutral disinformation condition, participants who see simple corrective information will show lower intentions to share said disinformation on social media than those who do not see any corrective information. However, in the fear-arousing disinformation condition, participants who see simple corrective information will show higher intentions to share said disinformation on social media than those who do not see any corrective information.

Related to the proposed interaction hypotheses, the third research question asks how individual differences that significantly correlate to the dependent variables of interests moderate the findings. Among various individual differences, this study particularly focuses on social media usage based on the uses and gratification theory. Social media users may use social media platforms in a different pattern based on their needs. This suggests that there will be a difference in understanding the given information between high and low social media users. High social media users, for example, can have better understanding of corrective information than low social media users, but they can also rely on their existing thoughts on the information without considering the purpose of corrective information. High social media users can have optimistic bias toward themselves by thinking that they have

abilities in understanding information. In addition to the social media usage, individual

differences include basic demographic factors (e.g., age, income, and education), and self-

efficacy. The moderating effects of individual differences will be examined when those

factors show significant correlations with dependent variables of interest (related to RQ2

above). The RQ3-1 is raised as follows:

> RQ3-1. How do individual differences moderate an interaction between disinformation
>
> (fear-arousing vs. fear-neutral) and presence of corrective information (no corrective
>
> information vs. simple corrective information) on dependent variables of interest?

This study also examines mediation effects of situational fear and threat appraisal.

Following the above proposed hypotheses that fear-arousing disinformation will increase

situational fear and situational fear will increase belief in disinformation through an

activation of heuristic information processing, situational fear will mediate between the group

(the exposure of fear-arousing disinformation and corrective information) and belief in

disinformation. In a similar sense, when fear-arousing disinformation increases situational

threat appraisal and situational threat appraisal serves to decrease belief in disinformation by

activating heuristic-systematic information processing, it is also possible to predict the

mediating role of situational threat appraisal. The argument of affect heuristic suggests that

fearful emotions result in heuristic information processing while cognitive threat appraisal

activates deliberative thoughts (Finucane, Alhakami, Slovic, & Johnson, 2000; Slovic,

Finucane, Peters, & MacGregor, 2007). Hence, the following hypotheses are proposed.

> H6. Situational fear will significantly mediate the effect of the interaction between
>
> disinformation (fear-arousing vs. fear-neutral) and the presence of corrective
>
> information (no corrective information vs. simple corrective information) on belief in
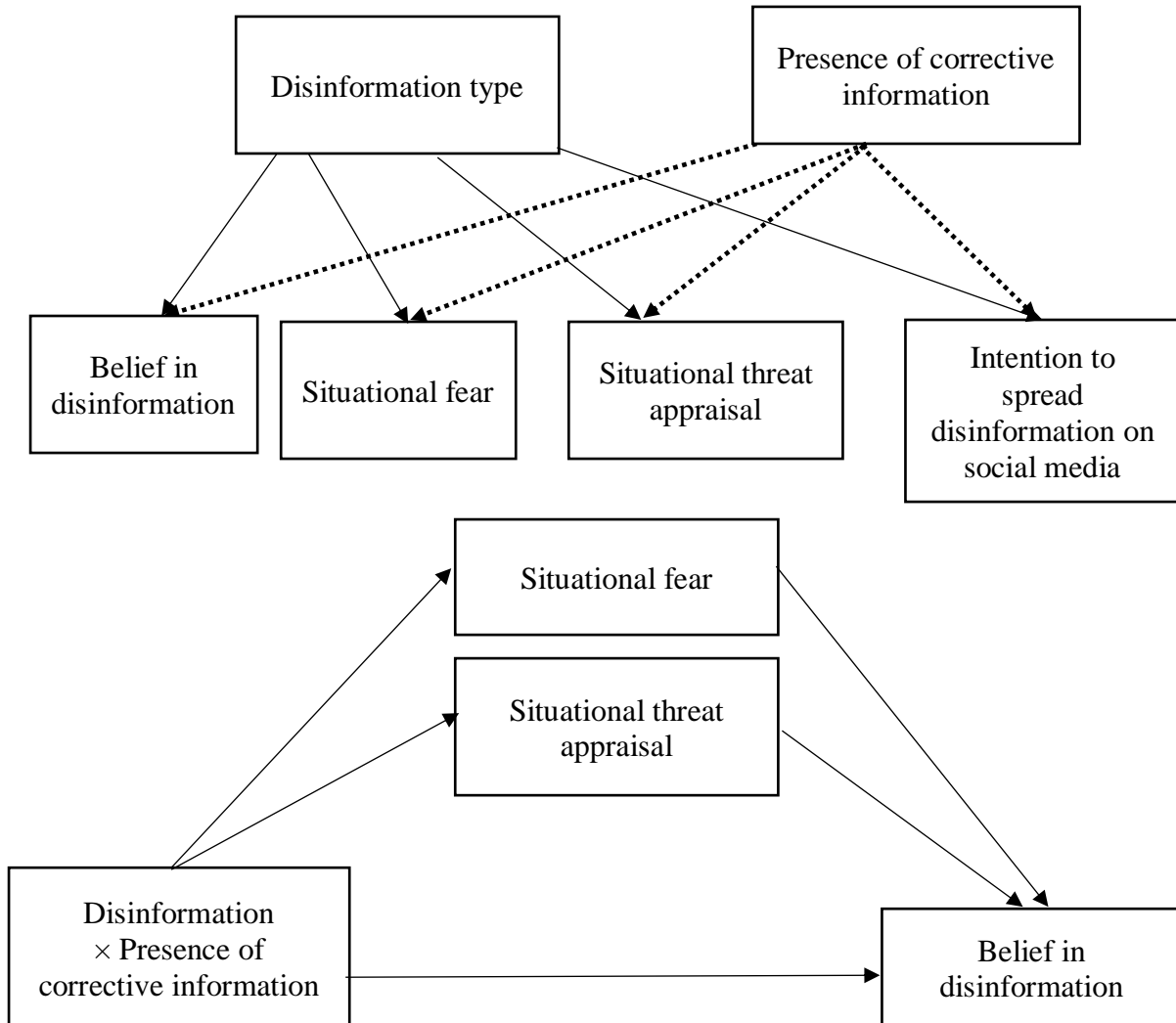>
> said disinformation.

H7. Situational threat appraisal will significantly mediate the effect of the interaction

between disinformation (fear-arousing vs. fear-neutral) and the presence of corrective

information (no corrective information vs. simple corrective information) on belief in
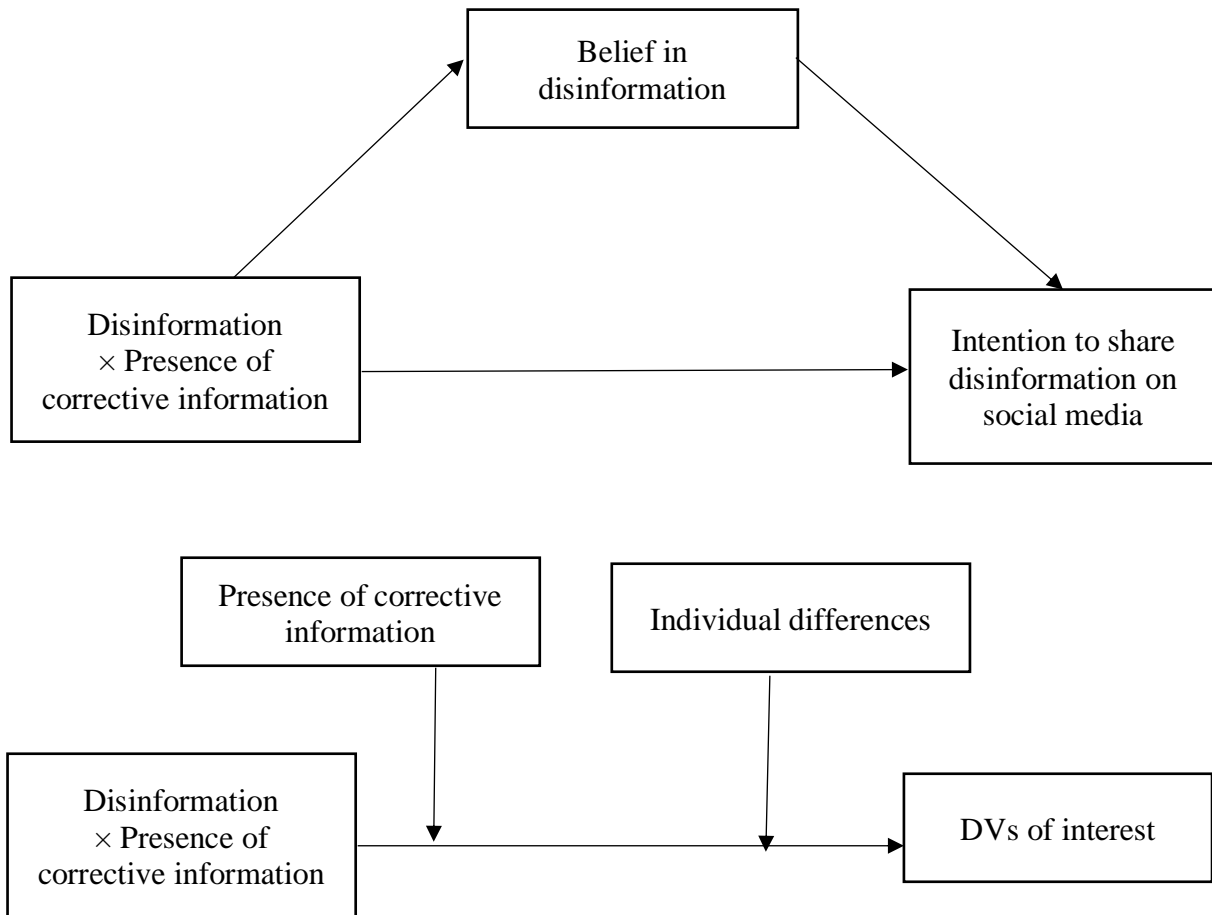
said disinformation.

Lastly, following the previous argument that belief in information is one of the

preconditions for information sharing behaviors and a potential significant interaction

between disinformation type and presence of corrective information on intentions to spread

disinformation on social media, this study sets up hypotheses as follows:

H8. Belief in disinformation will significantly mediate the effect of the interaction

between disinformation (fear-arousing vs. fear-neutral) and the presence of corrective

information (no corrective information vs. simple corrective information) on intentions

to spread said disinformation on social media.

Figure 1 displays a theoretical model for Study 1.

Figure 1. Theoretical model for moderation and mediation effects on Study 1

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                    ┌─────────────────┐
                    │    Belief in    │
                    │  disinformation │
                    └─────────────────┘
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```
┌──────────────────┐                          ┌──────────────────┐
│  Disinformation  │                          │ Intention to share│
│  × Presence of   │ ───────────────────────> │ disinformation on │
│corrective info...│                          │   social media    │
└──────────────────┘                          └──────────────────┘
```

```
┌──────────────────┐        ┌──────────────────┐
│ Presence of      │        │   Individual     │
│ corrective       │        │   differences    │
│ information      │        │                  │
└──────────────────┘        └──────────────────┘

┌──────────────────┐                          ┌──────────────────┐
│  Disinformation  │                          │                  │
│  × Presence of   │ ───────────────────────> │  DVs of interest │
│corrective info...│                          │                  │
└──────────────────┘                          └──────────────────┘
```

Research Question and Hypotheses for Study 2

Study 2 aims to further investigate how fear-arousing disinformation and narrative corrective information affect belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media. Study 2 assesses the effects of disinformation based on fear-arousal (fear-arousing disinformation vs. fear-neutral disinformation) and different types of corrective information (simple corrective information vs. narrative corrective information).

Before testing the effects of narrative corrective information, Study 2 also examines the persuasive effects of fear-arousing disinformation. Fear-arousal has been used as a persuasive message strategy to make people believe the information and further change their behaviors. Based on motivated reasoning theory and heuristic-systematic information processing, which

argue the role of emotion in activating superficial information processing and eliciting biased perception toward the information, Study 2 also postulates that fear-arousing disinformation may have more persuasive effects than fear-neutral one. When applying the argument that fear has a power to persuade people to disinformation, participants who will read fear-arousing disinformation will report greater belief in the disinformation, fearful emotions, severity, susceptibility, and disinformation sharing behaviors, compared to participants who will read fear-neutral disinformation. Therefore, the following hypotheses for the main effects will be tested to replicate the findings from Study 1.

H9. There will be a main effect of fear-arousing disinformation (vs. fear-neutral disinformation) on dependent variables of interest.

H9-a. Individuals who are exposed to fear-arousing disinformation will report significantly greater belief in said disinformation than those who are exposed to fear-neutral disinformation.

H9-b. Individuals who are exposed to fear-arousing disinformation will report significantly greater levels of situational fear than those who are exposed to fear-neutral disinformation.

H9-c. Individuals who are exposed to fear-arousing disinformation will report significantly greater levels of situational threat appraisal than those who are exposed to fear-neutral disinformation.

H9-d. Individuals who are exposed to fear-arousing disinformation will report significantly greater levels of intentions to spread disinformation to others on social media than those who are exposed to fear-neutral disinformation.

The next hypotheses assess the persuasive effects of narrative corrective information. If narrative corrective information is an effective corrective information strategy that can replace preexisting thoughts on disinformation following the argument of mental model,

narrative corrective information will decrease the influence of disinformation. A narrative story is persuasive because it can help individuals enter the story through transportation and identification. Narrative corrective information will show a significant difference from simple corrective information. In addition, given that fear-arousing disinformation may have more persuasive effects than fear-arousing disinformation as H9 postulated, the persuasive effect of narrative corrective information will be more likely to be shown for participants who read fear-neutral disinformation. This suggests an interaction between disinformation type and corrective information type. Individuals who are exposed to fear-neutral disinformation and narrative corrective information will report the lowest levels of belief in disinformation (H10), situational fear (H11), situational threat appraisal (H12), and intentions to spread disinformation to others on social media (H13). Hence, the following hypotheses are proposed.

H10. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on belief in said disinformation.

H10-a. In the fear-neutral disinformation condition, there will be small difference in belief in said disinformation between participants who see narrative corrective information and those who see simple corrective information. However, in the fear-arousing disinformation condition, there will be large difference in belief in said disinformation between participants who see narrative corrective information and those who see simple corrective information.

H11. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on situational fear.

H11-a. In the fear-neutral disinformation condition, there will be small difference in situational fear between participants who see narrative corrective information and those who see simple corrective information. However, in the fear-arousing disinformation condition, there will be large difference in situational fear between participants who see narrative corrective information and those who see simple corrective information.

H12. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on situational threat appraisal (situational severity: H12-1, situational susceptibility: H12-2).

H12-a. In the fear-neutral disinformation condition, there will be small difference in situational threat appraisal between participants who see narrative corrective information and those who see simple corrective information. However, in the fear-arousing disinformation condition, there will be large difference in situational threat appraisal between participants who see narrative corrective information and those who see simple corrective information.

H13. There will be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on intentions to share said disinformation on social media.

H13-a. In the fear-neutral disinformation condition, there will be small difference in intentions to share said disinformation on social media between participants who see narrative corrective information and those who see simple corrective information, when controlling for variables that significantly correlated with the dependent variables. However, in the fear-arousing disinformation condition, there will be large difference in intentions to share said disinformation on social media between participants who see narrative corrective information and those who see simple corrective information.

Related to the proposed interaction hypotheses, the following research question asks how individual differences that significantly correlate to the dependent variables of interests moderate the findings. Of the individual differences, Study 2 also put a particular emphasis on social media usage based on the uses and gratification theory. Social media users may show different patterns of social media usage. This suggests that a difference will be shown between high and low social media users in disinformation and corrective information processing. For example, high social media users can better understand narrative corrective information than low social media users because of high media literacy, but they also cannot understand the narrative corrective information because of information overload. They may have already read much information on social media. In addition to the social media usage, individual differences include basic demographic factors (e.g., age, income, and education), and self-efficacy. The moderating effects of individual differences will be examined when those factors show significant correlations with dependent variables of interest (related to RQ2 above). The RQ3-2 is raised as follows:

RQ3-2. How do individual differences moderate an interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on dependent variables of interest?

The following hypotheses (H14–H16) are proposed with a similar reasoning of H6–8 in Study 1. If there is a significant interaction between disinformation type and corrective information type on situational fear, situational threat appraisal, belief in disinformation and intentions to spread disinformation on social media, mediation effects will be shown as follows:

H14. Situational fear will significantly mediate the effect of the interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple

corrective information vs. narrative corrective information) on belief in said disinformation.

H15. Situational threat appraisal will significantly mediate the effect of the relationship between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on belief in said disinformation.

H16. Belief in disinformation will significantly mediate the effect of the relationship between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on intentions to share said disinformation on social media.

Figure 2 displays a theoretical model for Study 2.

Figure 2. Theoretical model for moderation and mediation effects on Study 2
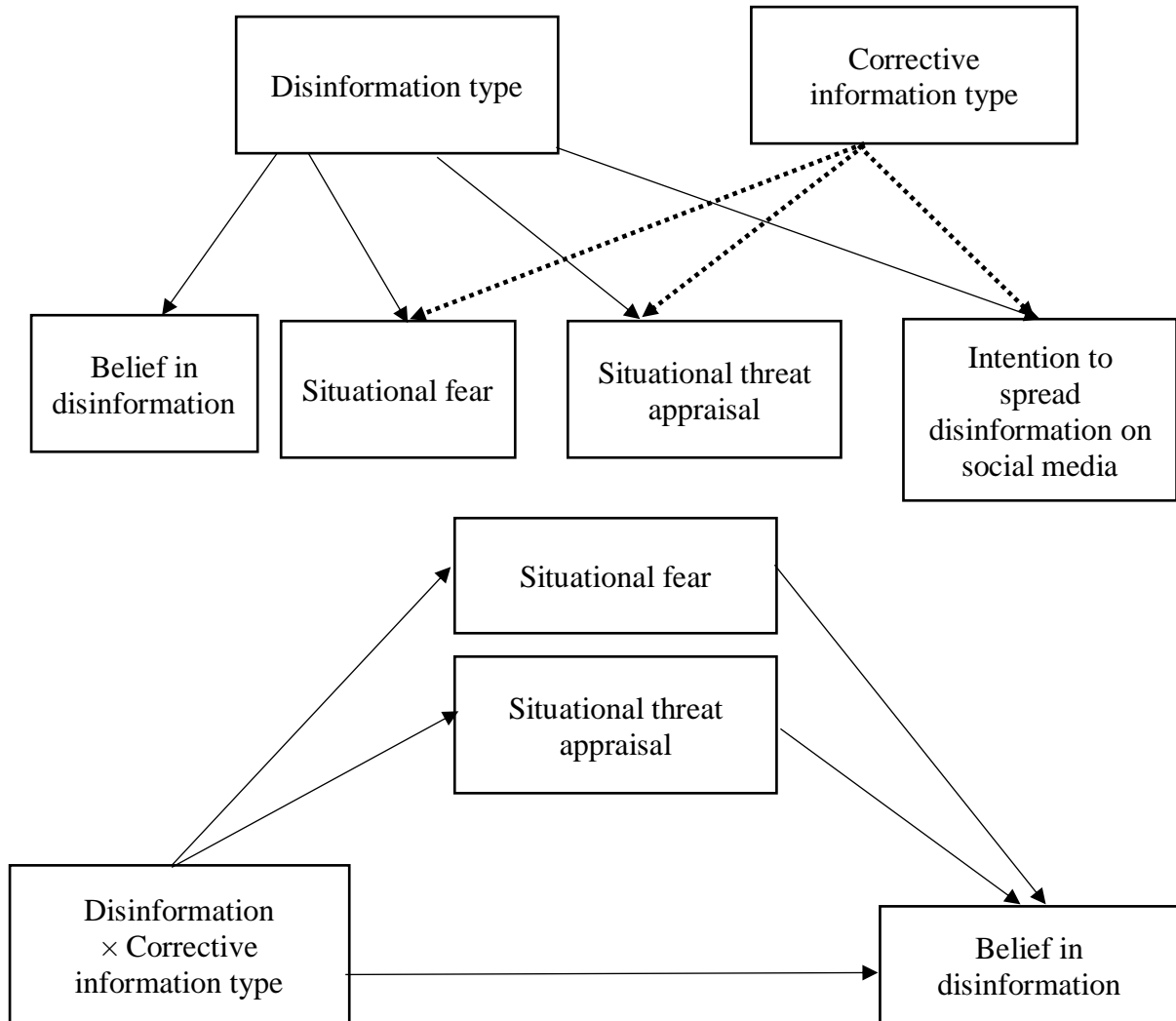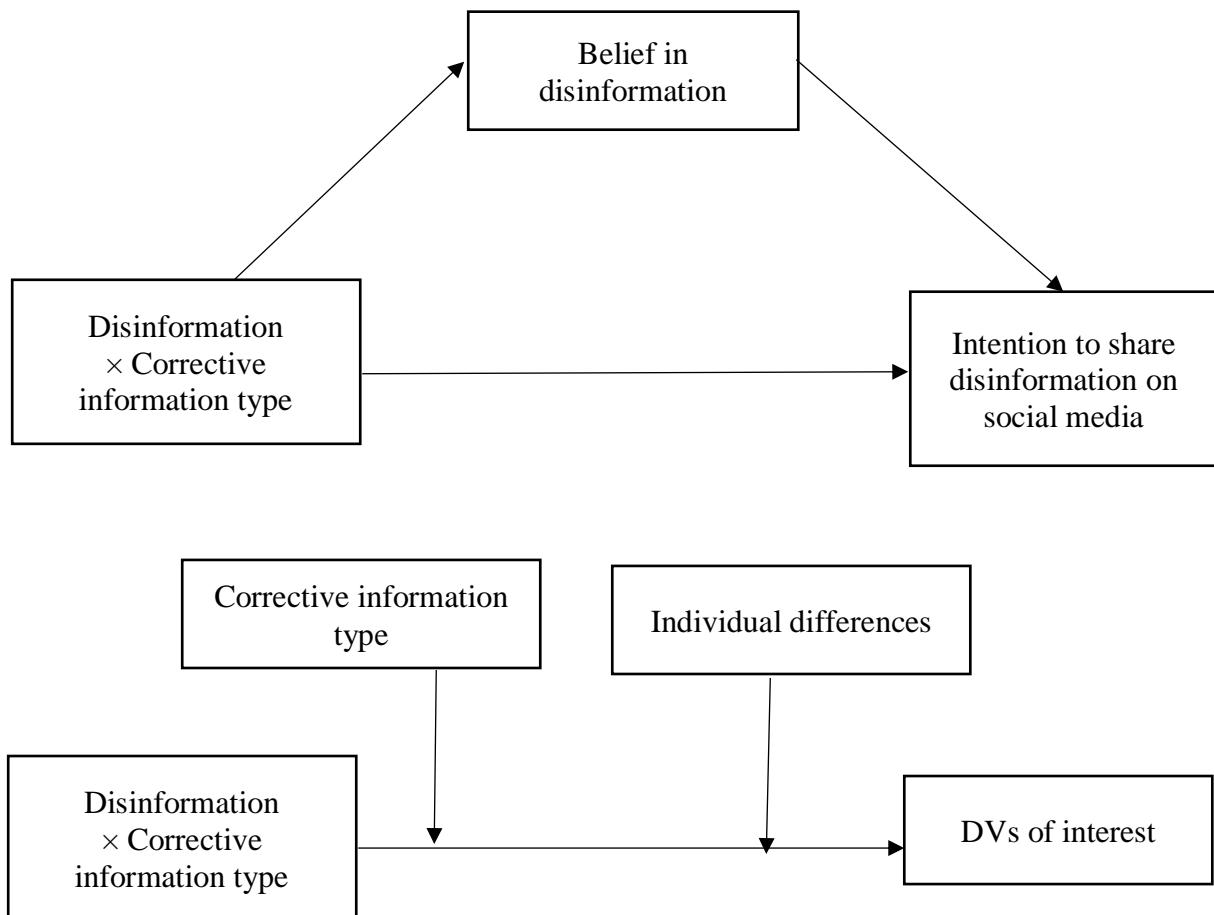
Overall Strategies

Study 1 and Study 2 were conducted at the same time in order to prevent duplicated participation. A total of 493 individuals visited the Qualtrics link between January 25 and February 4, 2019. For the two screening questions (i.e., year of birth and general activity on Facebook), 14 participants could not be forwarded to the main study (1 participant answered a year of birth as 2019 and 13 participants answered they do not have a Facebook account). Other 59 participants did not complete the survey (completion rate: 85.19%). Therefore, data from 420 participants who completed the survey and agreed their data to be included in the research were analyzed. Of the 420 data, those in the no corrective information condition belonged to Study 1 while the others in the narrative corrective information condition

belonged to Study 2. Participants in the simple corrective information condition were randomly assigned to Study 1 or Study 2 using a random number generator.

The reason for conducting two separate studies is because the length of narrative corrective information may inhibit maintaining ceteris paribus of manipulation of corrective information. The main purpose of Study 1 is to examine whether the presence of corrective information matters in processing disinformation content. In order to compare the no corrective information condition with the corrective information condition, corrective information should be brief, rather than providing detailed stories. In Study 2, the purpose is to examine whether different outcomes are shown depending on corrective information type. Hence, narrative corrective information was manipulated in order to be compared with simple corrective information. By conducting two separate studies, this research can explicitly show results of effects of corrective information.

Chapter 4: Study 1

Method

    Design. This study received Institutional Review Board (IRB) approval. This study used the spread of an unknown health virus as a case of crisis. The spread of health viruses such as MERS, Ebola, and Zika have raised serious concern in the public, and the spread of health disinformation on social media exacerbates these crises. The spread of health disinformation can affect one's decision-making processes, behaviors, and threaten public health (Vogel, 2017).

    Study 1 features an online experiment with a 2 (disinformation: fear-neutral vs. fear arousal) × 2 (corrective information: no corrective information vs. simple corrective information) between group factorial design resulting in four conditions designed for the exposure of disinformation and corrective information: 1) fear-arousing disinformation and no corrective information, 2) fear-arousing disinformation and simple corrective information, 3) fear-neutral disinformation and no corrective information, and 4) fear-neutral disinformation and simple corrective information.

    Participants. Participants were recruited from Amazon Mechanical Turk (MTurk). MTurk provides access to a distribution of participants in terms of demographics such as age, gender, and income (Ross, Irani, Silberman, Zaldivar, & Tomlinson, 2010). Research has shown that results of MTurk are similar to those of other online or traditional methods (e.g., Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012). Eligible participants included United States residents who were over 18 years old (no upper limit) who understand and use English for everyday conversation with internet access and are active on Facebook. Participants who were born after 2002 (i.e., under 18 years old) or those who do not have a Facebook account were excluded from the study. All ethnic and religious backgrounds were

considered eligible. Additional eligibility criteria included HIT approval rate (97 or greater) and the number of HITS approved (5,000 or greater).

Study 1 had 205 participants. Their mean age was 43.95 years old ($SD = 12.15$). Of the participants, 33.2% were male and 66.8% were female. Regarding their race, 81.5% were Caucasian, 3.4% were Latino/Hispanic, 5.9% were Black/African American, 0.5% were South Asian, 6.3% were East Asian, 1.5% were Mixed, 1.0% were Native American Indian, and 1.0% were Southeast Asian. As for the open-ended question asking about their ethnicity, participants who marked their race as Caucasian answered their self-identified ethnicity as follows: Irish/Italian American, German, Italian American, Eastern European, White/Hispanic, Polish/Mixed, White/Turkish, Norwegian American, American of Scots-Prussian, Irish/Scottish/Polish.

Regarding their annual income, 18.5% of the participants are earning 0 - $24,999 (18.5%), 33.7% were $25,000 - $49,999, 25.9% were $50,000 - $74,999, 12.7% were $75,000 - $99,999, 6.3% were $100,000 - $149,999, 2.0% were $150,000 - $199,999, 1.0% were $200,000 and above. Regarding participants' political orientation, the mean value of conservatism from 0 (extremely liberal) to 100 (extremely conservative) was 43 ($SD = 30.99$). One percentage of the participants indicated their education levels as less than high school, 9.3% were high school graduate, 22.4% were some college levels, 9.3% were 2-year degree, 42.4% were 4-year degree, 1% had professional degree (e.g., J.D., M.D., D.D.S.), 14.1% were master's degree, and 5% were doctorate.

Procedure. Participants were directed to a Qualtrics survey link. The experiment took about 15 minutes to complete ($M = 863.93$ seconds, $SD = 411.35$ seconds). Data were collected between January 25 and February 4, 2019. Participants received $1 as an incentive. Upon visiting the Qualtrics survey, participants read an informed consent form, which stated that all responses would be recorded anonymously, and participants' identifiable data would

be deleted to protect their privacy. Participants provided their year of birth and general

activity on Facebook. After these screening questions, participants answered a series of

questions including social media usage, self-efficacy, and involvement in the spread of an

unknown health virus.

Next, participants were randomly assigned to see either a fear-neutral disinformation or

fear-arousing disinformation message. In each condition, participants first read the statement:

Consider the following scenario: Someone whom you know reshared the following

Facebook post. Please read the message and answer the questions below.

Participants had three minutes to read disinformation and answer an open-ended

question "Briefly, please enter your immediate thoughts about the above post" in each

condition. A countdown clock was presented to make participants more concentrated on

reading disinformation, but participants could continue reading disinformation after three

minutes were ended. The average time spent reading the disinformation was 93.43 seconds

($SD = 60.72$). Around 11.2% of the participants took more than three minutes to read the

disinformation and answer the question. Participants could advance to the next page

whenever they want after they read disinformation and answered the open-ended question.

After the exposure of disinformation, participants answered Positive and Negative

Affect Schedule (PANAS) items and responded to questions assessing their present fear of

the disinformation, belief in disinformation, intentions to spread disinformation on social

media. They were also asked to indicate the image in the disinformation content they just saw

as a manipulation check.

Participants were then randomly assigned to either no corrective information or simple

corrective information condition. In the no corrective information condition, participants saw

a screen that simply asked them to click next to advance. Participants in the simple corrective

information condition were informed that the original post was "fake" and had three minutes

to read simple corrective information, which was borrowed from web add-on. They had to answer an open-ended question "Briefly, please enter your immediate thoughts about the above post." They were given three minutes to read simple corrective information and answer the question, but they could advance to the next page whenever they finished. The average time spent reading the simple corrective information and answering the question was 36.43 seconds ($SD = 54.83$). Around 4% of the participants read the corrective information more than three minutes.

Participants then answered again about the PANAS items and whether they read the information that refuted the spread of an unknown health virus. Participants who saw simple corrective information answered items measuring belief in corrective information and intentions to spread corrective information on social media. Next, participants in all conditions responded again to their belief in the original disinformation and intentions to spread the original disinformation on social media, items about heuristic-systematic information processing, information seeking, sharing and avoidance intentions, situational threat appraisal, negative emotions of the spread of health viruses including situational fear. Lastly, they provided demographic information including age, gender, race, education, income, and political ideology. Participants were then thanked, debriefed, and asked to confirm their continued participation in the study after the deception was revealed. Table 1 presents the number of participants for each condition.

Table 1. Number of participants for each condition (Study 1)

	Disinformation		
Corrective Information	Fear-neutral	Fear-arousal	Total
No Corrective Information	44	58	102
Simple Corrective Information	46	57	103
Total	90	115	205

Stimuli. Disinformation content was adapted from an actual Facebook post that fact-checking website *Snopes* refuted (MacGuill, 2018). Fear-neutral and fear-arousing disinformation had exact same number of words (52).

In the fear-neutral disinformation condition, the following Facebook post was presented to participants and included an image of a head of lettuce (see Appendix B):

"An unnamed virus is spreading across the U.S. Avoid eating lettuce because it could carry the virus. People have a mild stomachache due to this virus. But one bite of lettuce will not cause pain. The U.S. government is working on a cure at this time. Make your family and friends aware."

In order to develop the fear-arousing condition, prior research regarding mortality salience or vividness of videos (Meijnders, Midden, & Wilke, 2001) was consulted. These strategies include a car crash or holocaust video, a story of a character's death, a narrative about a war, or an essay about cancer or the 9/11 terrorist attacks (see meta-analysis of Burke, Martens, & Faucher, 2009). Given that death reminders increase anxiety (Routledge & Juhl, 2010), this study used mortality salience to activate fear. The Facebook post contained fearful words written in capital letters to heighten fear and featured a picture of workers who wore

masks and protective clothing to move dead bodies, which was circulated during the spread of Ebola virus in 2014 (see Appendix B)[4]. The fear-arousing disinformation reads:

> *"An unnamed, FATAL virus is rapidly spreading across the U.S. Do NOT eat lettuce because it could carry the virus. Many people have DIED due to this deadly virus. One bite of lettuce is DEADLY. The U.S. government is working on a cure at this time. Make your family and friends aware."*

In both conditions, the uploader's name and picture on the Facebook post were blurred to prevent participants from being influenced by the source and to gain external validity (Bode & Vraga, 2018).

Participants in the simple corrective information condition saw the initial disinformation content with a label marking the information as false, which was adapted from a web extension (see Appendix C) along with the statement:

> *Now consider the following scenario: However, a web add-on marked the post you just read as a "fake story." Please read the following corrective information and answer the questions below.*

Measures.

Individual differences.

Amount of social media usage. Participants were asked to answer a single item for social media usage: "How often do you use ANY social media (e.g., Facebook, Twitter, Instagram, etc.) in your daily life?" This item was measured on a 5-point scale: 1 = Not at all,

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[4] The pictures used for fear-neutral and fear-arousing disinformation were chosen based on results of a pilot study that asked participants to select one picture that matches with the message content among five different images for each disinformation type. As for fear-neutral disinformation, 12 out of 25 participants (48%) selected an image of a lettuce head as the most relevant one that matches with the disinformation content. In addition, the image used for fear-arousing information was chosen by 12 out of 26 participants (46.2%). See Appendix A for images presented to participants.

2 = A few times a month, 3 = A few times a week, 4 = A few times a day, and 5 = Regularly

throughout the day (M = 4.31, SD = .73).

Social media usage. Adapted from Ellison, Steinfield and Lampe (2007), social media

usage was measured with the following items: (a) Social media is part of my everyday

activity, (b) I am proud to tell people I'm on social media, (c) Social media has become part

of my daily routine, (d) I feel out of touch when I haven't logged onto social media for a

while, (e) I feel I am part of the social media community, (f) I would be sorry if social media

shut down, (g) I like using social media, (h) I often think about deactivating my social media

accounts (reverse-coded), (i) I am tired of using social media (reverse-coded).

A principal component analysis (PCA) was performed on the items measuring social

media usage in order to test whether the items comprise of an identical component. PCA has

been used as a dimension-reduction tool to find principal components (i.e., common items) of

a concept. The result of the Kaiser-Meyer-Olkin measure indicated the sampling adequacy

was acceptable (.838) because it was above the value of .50. Bartlett's test of sphericity was

χ^2 (36) = 885.670, p < .001. See Table 2 for the factor loadings after varimax rotation; Items

(1)-(7) were factored together (Cronbach's α = .87, M = 5.10, SD = 1.04) and items (8)-(9)

were factored (Cronbach's α = .82, M = 5.10, SD = 1.52). The second component of social

media usage which comprised items (8) and (9) was dropped from further analysis.

Table 2. Rotated component matrix of social media usage items in Study 1

	Component	
	1	2
(1) Social media is part of my everyday activity	**.779**	-.240
(2) I am proud to tell people I'm on social media	**.644**	.061
(3) Social media has become part of my daily routine	**.763**	-.328
(4) I feel out of touch when I haven't logged onto social media for a while	**.648**	-.393
(5) I feel I am part of the social media community	**.772**	-.207
(6) I would be sorry if social media shut down	**.760**	-.057
(7) I like using social media	**.809**	.102
(8) I often think about deactivating my social media accounts (reverse-coded)	.569	**.675**
(9) I am tired of using social media (reverse-coded)	.510	**.763**

Social media usage for news. Borrowed from Gil de Zúñiga, Jung and Valenzuela (2012), four items were used for social media usage for news: (a) Social media help me to stay informed about current events and public affairs, (b) Social media help me to stay informed about the local community, (c) Social media help me to get news about current events from mainstream news media, and (d) Social media help me to get news about current events through friends (Cronbach's α = .84, M = 5.03, SD = 1.25). The items were rated on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree.*

Social media usage for fact-finding. This variable was measured with four items following (Lee & Choi, 2018): (a) Social media help me to find fact-based information, (b) Social media help me to check accuracy of information, (c) Social media help me to find a counter-argument, and (d) Social media help me to find additional resources. The items were rated on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree* (Cronbach's α = .85, M = 4.33, SD = 1.29).

Social media usage for social interaction. This research used the following items asking how participants use social media for social interaction: (a) Social media help me to get ideas

about how to approach others in important or difficult situations, (b) Social media help me to

have fun with family or friends, (c) Social media help me to have something to do with my

friends, and (d) Social media help me to be a part of social events you enjoy without having

to be there. Adapted from Kim, Shin, Cho, Jung, Shon and Shim (2015), the items were rated

on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*

(Cronbach's α = .76, *M* = 4.90, *SD* = 1.12).

Self-efficacy. Participants asked the following items for self-efficacy, adapted from So,

Kuang, and Cho (2016). Items were ranged from 1 (strongly disagree) to 7 (strongly agree):

(a) It is easy for me to get help against the spread of a health virus, (b) Getting help against

the spread of a health virus is no problem for me, (c) I am able to go to get help against the

spread of a health virus easily, and (d) I have the capability to utilize health resources against

the spread of a health virus (Cronbach's α = .95, *M* = 5.29, *SD* = 1.32).

Issue involvement. Issue involvement in this study is defined as the "extent to which the

attitudinal issue under consideration is of personal importance" (Petty & Cacioppo, 1979,

p.1915). Adapted from previous studies (Flora & Maibach, 1990, Ryu & Kim, 2015), five

items consisted of the issue involvement variable: (a) I think about health viruses with a great

deal, (b) I consider myself at risk of influences of health viruses, (c) The spread of health

viruses is personally relevant topic for me, (d) The issue of the spread of health viruses is

meaningful for me, (e) I personally feel very interested in judging the issue of the spread of

health viruses. All items ranged from 1 = *strongly disagree* to 7 = *strongly agree* (Cronbach's

α = .82, *M* = 4.16, *SD* = 1.22).

Health consciousness. Borrowed from Dutta-Bergman (2004), items consisting of health

consciousness include the following: (a) Living life in the best possible health is very

important to me, (b) Eating right, exercising, and taking preventive measures will keep my

healthy for life, (c) My health depends on how well I take care of myself, (d) I actively try to

prevent disease and illness, and (e) I do everything I can to stay healthy. These items were measured from 1 (*strongly disagree*) to 7 (*strongly agree*) (Cronbach's α = .82, *M* = 5.62, *SD* = .93).

Health blog usage. Participants answered a single question, "How often do you visit medical-related websites (e.g., WebMD)?" which had 5-point scale (1 = *Not at all*, 5 = *Regularly throughout the day*). 17.1% reported "not at all," 71.7% reported "a few times a month," 9.3% said "a few times a week," 1.0% said "a few times a day," and 1.0% said "regularly throughout the day" (*M* = 1.97, *SD* = .63).

Dependent Variables

Positive and Negative Affect Schedule (PANAS). Borrowed from Watson, Clark, and Tellegen (1998), PANAS was used as a delay strategy after the exposure of the message and presented twice: between disinformation and corrective information and after the exposure of corrective information. PANAS comprised of the following 20 items: interested, distressed, excited, upset, strong, guilty, scared, hostile, enthusiastic, proud, irritable, alert, ashamed, inspired, nervous, determined, attentive, jittery, active, and afraid. The items were measured on a 5-point scale (1 = *None at all*, 5 = *A great deal*).

A principal component analysis (PCA) was conducted for PANAS items measured between the disinformation and corrective information conditions. The result of the Kaiser-Meyer-Olkin measure indicated the sampling adequacy was acceptable (.892) because it was above the value of .50. Bartlett's test of sphericity was χ^2 (190) = 3248.080, *p* < .001. See Table 3 for the factor loadings after varimax rotation; Items (1), (3), (5), (9), (10), (14), (16), and (19) were factored together and termed as "positive PANAS" (Cronbach's α = .92, *M* = 2.74, *SD* = 1.00) and items (2), (4), (6), (7), (8), (11), (13), (15), (18), and (20) were factored and termed as "negative PANAS" (Cronbach's α = .94, *M* = 1.43, *SD* = .73). Remaining items (12) and (17) were factored and termed as "attentive PANAS" (Cronbach's α = .80, *M*

= 3.81, *SD* = .95). Of the three PANAS factors, negative PANAS was used to see whether

participants in the fear-arousing disinformation condition reported greater negative affect

than those in the fear-neutral disinformation condition.

Table 3. Rotated component matrix of PANAS items measured between disinformation and corrective information in Study 1

	Component		
	1	2	3
(1) Interested	-.132	**.586**	.524
(2) Distressed	**.904**	-.103	.026
(3) Excited	.055	**.844**	.010
(4) Upset	**.844**	-.072	.024
(5) Strong	-.074	**.784**	.225
(6) Guilty	**.722**	.163	-.435
(7) Scared	**.865**	-.060	.038
(8) Hostile	**.694**	.157	-.463
(9) Enthusiastic	-.172	**.834**	.125
(10) Proud	-.123	**.867**	.127
(11) Irritable	**.683**	-.061	-.230
(12) Alert	-.013	.394	**.691**
(13) Ashamed	**.767**	.161	-.393
(14) Inspired	.023	**.896**	.041
(15) Nervous	**.851**	-.177	.110
(16) Determined	.039	**.518**	.451
(17) Attentive	-.162	.315	**.772**
(18) Jittery	**.822**	-.066	.036
(19) Active	.076	**.648**	.448
(20) Afraid	**.858**	-.071	-.023

Fear of disinformation. After viewing the disinformation, participants indicated their

levels of fear using a set of items. Adapted from Dillard and Peck (2000) including: "The

post I just read made me feel nervous," "The post I just read made me feel fear," "The post I

just read made me feel scared," "The post I just read made me anxious," "The post I just read

made me frustrated," and "The post I just read made me afraid." These items were presented

between the disinformation and the corrective information and were measured using a 7-point

scale (1 = *strongly disagree* to 7 = *strongly agree*). These items were used for a confirmation

of effectiveness of fear-arousing disinformation (Cronbach's α = .95, *M* = 2.90, *SD* = 1.70).

Belief in disinformation. Adapted from Appelman and Sundar (2016), the measure of

belief in disinformation contained four items on a 7-point scale ranging from *1 = strongly*

disagree to *7 = strongly agree*. Participants were asked to indicate their agreement levels on

the following items after reading the given disinformation: (a) I think the post is accurate, (b)

I think the post is authentic, (c) I think the post is believable, (d) I think the post is

trustworthy, and (e) I think the post is reasonable. These items were measured twice: between

the disinformation and corrective information and after the corrective information condition.

This research used the items measured after the corrective information condition (Cronbach's

α = .98, *M* = 2.98, *SD* = 1.72).

Intentions to spread disinformation on social media. The measure of intentions to spread

disinformation online was created for this study based on prior research (Alhabash et al.,

2015). Items were assessed on a 7-point scale ranging from *1 = strongly disagree* to *7 =*

strongly agree. These items are: (a) I would "LIKE" the post that argued the spread of an

unknown virus if I receive on Facebook, (b) I would "COMMENT" on or "REPLY" to the

post that argued the spread of an unknown virus if I receive on Facebook, (c) I would

"SHARE" the post that argued the spread of an unknown virus if I receive on Facebook, (d)

The post that argued the spread of an unknown virus is worth sharing with others, and (e) I

would recommend the post that argued the spread of an unknown virus to others. These items

were also measured twice: between the disinformation and corrective information and after

the corrective information condition. This research used the items measured after the

corrective information condition (Cronbach's α = .94, *M* = 2.54, *SD* = 1.59).

Heuristic-systematic information processing. The variable heuristic-systematic

information processing was not used in this research but included seven items including the

following: I approached the spread of the health virus with a cautious stance, I thought about how the spread of the health virus relates to other things I know, and I found myself making connections between the spread of the health virus and information I get elsewhere. Items were measured on a 7-point scale from 1 = *strongly disagree* to 7 = *strongly agree*. The reliability, mean, and standard deviation were not reported because this variable was not used in the current research.

Information seeking, sharing, and avoidance intentions. The variables of information seeking, sharing, and avoidance intentions were not used in this research. Sample of items include the following: I plan to seek information about the virus using online media in the near future (information seeking), I am willing to initiate conversation in online media about the spread of the virus (information sharing), and I will refuse to listen to information about the virus (information avoidance). Items were measured on a 7-point scale from 1 = *strongly disagree* to 7 = *strongly agree*. The reliability, mean, and standard deviation for each variable were not reported because the variables were not used in the current research.

Situational threat appraisal. Threat appraisal in this study includes perceived severity and susceptibility. Severity of the unknown virus in this study was measured with four items, borrowed from past research (Averbeck et al., 2011; Iriyama, Nakahara, Jimba, Ichikawa, & Wakai, 2007; Witte, 1996): (a) The spread of the unnamed virus would be a very serious threat to my quality of life, (b) The spread of the unnamed virus would be a very severe threat to my health, (c) The spread of the unnamed virus would be harmful to my well-being, and (d) I believe the unnamed virus is probably the worst illness that a person suffers. Using a 7-point scale (*1 = strongly disagree* to *7 = strongly agree*), respondents were asked the extent to which they agree with the statements about the spread of the virus (Cronbach's α = .87, *M* = 3.50, *SD* = 1.54).

Susceptibility of the unknown virus was measured with four items borrowed from past research (Averbeck et al., 2011 & Witte, 1996), including: (a) I believe that I am at risk of getting the unnamed virus, (b) I believe that I might contract the unnamed virus, (c) I believe that the chances are high that I can get the unnamed virus, and (d) It is likely that I will develop the unnamed virus. Participants were asked to indicate their levels of agreement ranging from *1 = strongly disagree* to *7 = strongly agree*. These items were summed and calculated as a mean value (Cronbach's $\alpha = .90$, $M = 2.65$, $SD = 1.41$).

Situational fear. Of the items measuring negative emotions of the situation, fear of the unknown virus in this study was gauged by asking respondents how much they fear the spread of the virus. Items derived from prior research (Dillard & Peck, 2000) are: (a) I am afraid of the spread of the unnamed virus, (b) I am frightened by the spread of the unnamed virus, (c) I am scared of the spread of the unnamed virus, (d) I am anxious about the spread of the unnamed virus, (e) I am fearful of the spread of the unnamed virus, (f) I feel tense when I think about the spread of the unknown virus, and (g) I am worried about the spread of the unknown virus. Respondents had options to choose their agreement levels ranging from *1 = strongly disagree* to *7 = strongly agree* (Cronbach's $\alpha = .97$, $M = 3.02$, $SD = 1.65$). Items for other emotions were not used in the current research.

Variable transformations

Before analyzing data for testing hypotheses and research questions, the dependent variables of interest were explored. The histogram show that distributions of the dependent variables were right-skewed (i.e., positive skewness distributions) and this was confirmed through skewness and kurtosis scores. To reduce the skewness and kurtosis, a normalizing transformation technique was applied. According to Tabachnick and Fidell (2007), substantial positive skewness could be solved by computing the original variable to LG10(DV).

In Study 1, belief in disinformation, situational susceptibility, and intentions to spread disinformation on social media were log-transformed because the variables were substantially skewed; see Table 4.

Table 4. Skewness and Kurtosis results for measured variables in Study 1

Variable (Study 1)	Mean (SD)	Skewness	Kurtosis
Belief in disinformation	2.98 (1.72)	.583	-.779
Log Transformed	.38 (.28)	-.098	-1.343
Situational fear	3.02 (1.65)	.403	-1.005
Situational severity	3.50 (1.54)	.025	-.838
Situational susceptibility	2.65 (1.41)	.754	-.072
Log Transformed	.36 (.24)	-.111	-1.054
Intentions to spread disinformation on social media	2.54 (1.59)	.901	-.225
Log Transformed	.32 (.27)	.186	-1.260

Statistical methodologies

Statistical methodologies the current research used were bivariate correlations, independent t-Test, analysis of variance (ANOVA), analysis of covariance (ANCOVA) for control variables, and regression analyses. Bivariate correlations were used to measure the relationships between variables. Independent t-Tests were used to compare the mean value of two independent groups and whether the difference is significant. ANOVA was used to check significant interactions between disinformation type and the presence of corrective information on dependent variables of interest. Related, ANCOVA was used to check further significant interactions between disinformation type and the presence of corrective information on dependent variables of interest when considering control variables (i.e., covariates). Regression analyses were used to find significant effects of an independent variable on dependent variables of interest when either control variables were considered or not. Each methodology that this study used is specifically mentioned for each analysis.

Results

      Manipulation check for disinformation. When asked to indicate which photo they had just seen, all of the participants in the fear-neutral disinformation condition chose the correct image of a lettuce head. Of the participants in the fear-arousing disinformation condition, 93% of participants ($N = 107$) indicated the correct the image (i.e., a picture of workers who wore masks and protective clothing to move dead bodies). All data was used for analysis.

      There was a significant difference between the fear-arousing disinformation condition and the fear-neutral disinformation condition on fear of the disinformation such that participants who saw the fear-neutral message reported significantly lower fear ($M = 2.61$, $SD = 1.53$) than participants who saw the fear-arousing message ($M = 3.14$, $SD = 1.79$), $t(201.37) = -2.288$, $p = .023$), according to a t-Test analysis. However, there was no effect of disinformation condition on negative affect in general. There was a marginally significant effect of disinformation condition on positive affect such that participants who saw the fear-arousing message reported greater positive affect ($M = 2.86$, $SD = .98$) than participants who saw the fear-neutral message ($M = 2.59$, $SD = 1.01$) ($t(203) = -1.925$, $p = .056$), according to a t-Test analysis.

      Manipulation check for corrective information. When asked to indicate whether participants read the information that refutes the spread of an unknown health virus, 20.6% of participants ($N = 21$) in the no corrective information condition said they saw the corrective information while 76.5% of participants ($N = 78$) said they did not. Within the no corrective information condition, 2.9% of data ($N = 3$) were missing. In the simple corrective information condition, 87.4% of participants ($N = 90$) stated they saw the corrective information but 12.6% of participants ($N = 13$) said they did not see the correction.

Correlations. RQ1 addressed the relationship between dependent variables of interest (i.e., belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media). Bivariate correlations revealed that all of the main variables in this study were positively related to each other (see Table 5).

Table 5. Bivariate correlations of the main variables in Study 1

Study 1	Belief in disinformation	Situational fear	Situational severity	Situational susceptibility	Intentions to spread disinformation online
Belief in disinformation	-				
Situational fear	.327	-			
(*p*-value)	(.000)				
Situational severity	.186	.586	-		
(*p*-value)	(.008)	(.000)			
Situational susceptibility	.360	.613	.481	-	
(*p*-value)	(.000)	(.000)	(.000)		
Intentions to spread disinformation on social media	.684	.436	.263	.389	-
(*p*-value)	(.000)	(.000)	(.000)	(.000)	

RQ2 addressed the relationship between individual differences and the dependent variables of interest. To answer this question, bivariate correlation analyses were conducted between individual differences and the variables of interest. Individual differences were: gender, age, education, race (white vs. non-white), income, issue involvement, health consciousness, health blog usage, self-efficacy, conservatism, amount of social media usage, social media usage, social media usage for news, social media usage for fact-finding, and social media usage for social interaction; see Table 6.

Gender, age, education, income, self-efficacy, conservatism, and amount of social media usage were not related to any dependent variables of interest.

Whiteness was negatively related to belief in disinformation ($r = -.234$, $p = .001$), situational fear ($r = -.145$, $p = .037$), situational severity ($r = -.208$, $p = .003$), and intentions to spread disinformation on social media ($r = -.167$, $p = .017$). White participants reported lower belief in disinformation, lower situational fear, lower situational severity, and lower intentions to spread disinformation on social media, compared to non-white participants.

Participants who thought the issue of health viruses is important to themselves reported greater situational fear ($r = .345$, $p < .001$), greater situational severity ($r = .322$, $p < .001$), and greater situational susceptibility ($r = .347$, $p < .001$).

Health consciousness was positively correlated with situational fear ($r = .170$, $p = .015$) and situational severity ($r = .185$, $p = .008$), which means participants with higher health consciousness reported higher situational fear and severity.

Health blog usage was positively correlated with situational severity ($r = .139$, $p = .047$), and intentions to spread disinformation on social media ($r = .140$, $p = .045$) such that participants with greater health blog usage reported greater situational severity, and intentions to spread said disinformation on social media.

Social media usage was correlated to situational fear ($r = .179$, $p = .010$), situational severity ($r = .193$, $p = .005$), and situational susceptibility ($r = .142$, $p = .043$), such that high social media users reported greater fear, severity, and susceptibility toward the situation.

Social media use for news was related to belief in disinformation ($r = .151$, $p = .030$), situational fear ($r = .231$, $p = .001$), situational severity ($r = .213$, $p = .002$), and situational susceptibility ($r = .201$, $p = .004$), such that high social media users for news reported greater belief in said disinformation, situational fear, situational severity, and situational susceptibility.

Social media use for fact-finding was significantly related to belief in disinformation ($r = .273$, $p < .001$), situational fear ($r = .241$, $p < .001$), situational severity ($r = .313$, p $< .001$), situational susceptibility ($r = .301$, $p < .001$), and intentions to spread disinformation on social media ($r = .268$, $p < .001$) such that high social media users for fact-finding reported greater belief in disinformation, situational fear, situational severity, situational susceptibility, and intentions to spread said disinformation on social media.

Social motivation to use social media also affected all the main variables. High social media users for social interaction reported greater belief in disinformation ($r = .202$, $p = .004$), greater situational fear ($r = .217$, $p = .002$), greater situational severity ($r = .253$, $p < .001$), greater situational susceptibility ($r = .225$, $p = .001$), and greater intentions to spread disinformation on social media ($r = .241$, $p = .001$).

Table 6. Bivariate correlations of the individual differences and main variables in Study 1

Study 1	Gender	Age	Education	Whiteness	Income	Issue Involvement	Health Consciousness	Health Blog Usage	Self-efficacy	Conservatism	Amount of SM usage	SM usage	SM news	SM fact-finding	SM social interaction
Belief in Disinformation	.018	-.027	-.001	-.234**	.023	.093	.046	.023	.032	.082	-.023	.063	.151*	.273***	.202**
Situational fear	.070	-.067	.046	-.145*	-.058	.345***	.170*	.107	-.096	.045	.084	.179**	.231**	.241***	.217**
Situational severity	-.066	-.033	.090	-.208**	.114	.322***	.185**	.139*	.092	.003	.071	.193**	.213**	.313***	.253***
Situational susceptibility	-.062	-.093	.063	-.125+	-.005	.347***	.011	.121+	-.035	-.014	.083	.142*	.201**	.301***	.225**
Intentions to spread disinformation on social media	.049	-.034	-.131+	-.167*	-.010	.098	-.062	.140*	-.091	.130+	.040	.121+	.114	.268***	.241**

Notes. Significant correlations were highlighted. ***p < .001, **p < .01, *p < .05, +*p* < .10

Main effects.

H1: Hypothesis 1 postulated that disinformation type (fear-neutral vs. fear-arousal) would significantly affect dependent variables (i.e., belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media). According to an independent *t*-Test analysis, participants who saw fear-arousing disinformation reported greater situational fear ($M = 3.26$, $SD = 1.74$) than those who saw fear-neutral disinformation ($M = 2.72$, $SD = 1.47$) ($t(201.656) = -2.401$, $p = .017$). Participants who saw fear-arousing disinformation also reported greater perceived severity about the situation ($M = 3.99$, $SD = 1.50$) than those who saw fear-neutral disinformation ($M = 2.87$, $SD = 1.36$) ($t(203) = -5.518$, $p < .001$). In addition, results revealed that participants who saw fear-arousing disinformation ($M = .34$, $SD = .27$) reported lower beliefs in said disinformation compared to those who saw fear-neutral disinformation ($M = .43$, $SD = .27$) ($t(203) = 2.271$, $p = .024$).

No effects of disinformation type were observed on situational susceptibility or intentions to share said disinformation online (see Table 7).

Table 7. *t*-Test results on main effects of disinformation type on DVs of interest in Study 1

	Fear-neutral disinformation		Fear-arousing disinformation		
	M	*SD*	*M*	*SD*	*t*-test
Belief in disinformation	.43	.27	.34	.27	2.271*
Situational fear	2.72	1.47	3.26	1.74	-2.401*
Situational severity	2.87	1.36	3.99	1.50	-5.518***
Situational susceptibility	.36	.24	.36	.24	ns
Intentions to spread disinformation on social media	.33	.27	.32	.27	ns

To further assess the effects of disinformation type, a stepwise linear regression was also conducted to control for individual differences that were correlated with each dependent variable of interests. Individual differences that were significant correlated with each

dependent variable were entered in step 1; disinformation type (fear-neutral disinformation vs. fear-arousing disinformation) was entered in step 2. All the regression analysis findings confirmed the independent t-Test results and did not show any differences (see Table 8).

Table 8. Regression results of the main effects in Study 1

Predictor	Belief in disinformation		Situational fear		Situational severity		Situational susceptibility		Intentions to spread disinformation online	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	β	β	β	β	β	β	β	β	β	β
Education	--	--	--	--	--	--	--	--	-.153*	-.152*
Whiteness	-.192**	-.203**	-.101	-.092	-.151*	-.131*	-.061	-.063	-.157*	-.158*
Conservatism	--	--	--	--	--	--	--	--	.143*	.144*
Issue involvement	--	--	.282***	.276***	.211**	.196**	.268***	.270***	--	--
Health consciousness	--	--	-.002	-.010	.033	.018	--	--	--	--
Health blog usage	--	--	--	--	.052	.067	.036	.035	.065	.064
Social media usage	--	--	.033	.030	.046	.037	-.030	-.030	-.090	-.090
Social media use for news	-.148	-.66	.049	.067	-.126	-.084	-.099	-.102	--	--
Social media use for fact-finding	.286**	.312**	.056	.034	.231*	.180+	.235*	.239*	.189*	.191*
Social media use for social interaction	.106	.090	.019	.038	.051	.093	.059	.057	.175+	.173
Disinformation (Fear-neutral vs. Fear-arousal)		-.180**		.153*		.347***		-.023		-.021
R^2	.122	.154	.146	.169	.180	.297	.165	.166	.156	.157
R^2 change	.122***	.133**	.146***	.023*	.180***	.117***	.165***	.001	.156***	.000
F	6.957***	7.252***	4.830***	4.995***	5.369***	9.163***	5.568***	4.866***	5.208***	4.548***

Notes. Dummy-coded variables: Whiteness (0 = Others, 1 = White), Disinformation (0 = Fear-neutral, 1 = Fear-arousal).
+$p < .10$, *$p < .05$. **$p < .01$, ***$p < .001$.
Diagnostic plots are included in the Appendix F; the residuals for all of the regression models were roughly normal.

Interaction effects.

A series of ANOVAs was conducted to assess the interaction of different types of disinformation (fear-neutral vs. fear-arousal) and presence of corrective information (no corrective information vs. simple corrective information) on dependent variables of interest (H2-H5). Table 12 presents overall interaction results.

H2: H2 postulated that there would be a significant interaction between disinformation (fear-arousing vs. fear-neutral) and corrective information (no corrective information vs. simple corrective information) on belief in said disinformation. According to a two-way ANOVA, the interaction between disinformation type and the presence of corrective information was not a significant predictor of belief in said disinformation. Furthermore, a two-way analysis of covariance (ANCOVA) controlling for whiteness, issue involvement, health consciousness, social media usage, social media use for news, social media use for fact-finding, and social media use for social interaction also revealed that the interaction was not significant.

A post-hoc independent *t*-Test was conducted to examine the effect of disinformation type on belief in said disinformation by the presence of corrective information. Data were split up into no corrective information and corrective information. According to Table 9, there was a significant difference of disinformation type within participants who did not see corrective information: within the no-corrective information condition, participants who saw fear-arousing disinformation reported lower beliefs in said disinformation ($M = .36$, $SD = .29$) than those who saw fear-neutral disinformation ($M = .47$, $SD = .26$) ($t(100) = 1.973$, $p = .051$). However, within the simple corrective condition, there was no significant difference of disinformation type on beliefs in said disinformation.
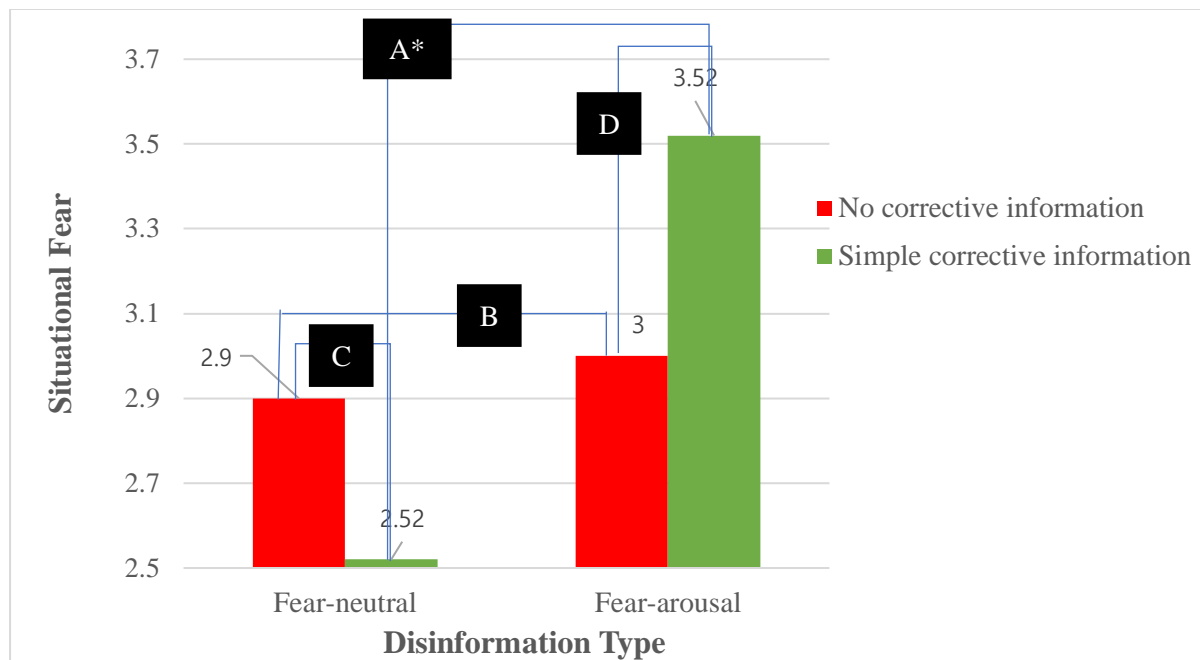
Table 9. *t*-Test results on the effect of disinformation type on belief in disinformation by presence of corrective information in Study 1

Belief in disinformation	Fear-neutral disinformation		Fear-arousing disinformation		t-test
	M	*SD*	*M*	*SD*	
No corrective information	.47	.26	.36	.29	1.973 ($p = .051$)
Simple corrective information	.38	.29	.32	.25	ns

H3: H3 postulated a significant interaction between disinformation and corrective information on situational fear. A two-way ANOVA analysis showed that the interaction between disinformation type and the presence of corrective information did not significantly predict situational fear.

When whiteness, issue involvement, health consciousness, social media usage, social media use for news, social media use for fact-finding, and social media use for social interaction were controlled, the interaction between disinformation type and presence of corrective information on situational fear was marginally significant ($F(1, 194) = 3.593$, $p = .060$), according to the ANCOVA result. T-test analyses were conducted for a post-hoc analysis. Among participants in the simple corrective information condition, there was a significant effect of disinformation type such that those who saw fear-arousing disinformation reported greater situational fear ($M = 3.47$, $SD = 1.72$) compared to those who saw the fear-neutral disinformation ($M = 2.79$, $SD = 1.56$) (see Figure 3, A): $t(101) = -2.073$, $p = .041$), demonstrating a backfire effect of simple corrective information on situational fear when fear-arousing disinformation is presented (see Table 10 for details). However, there was no difference of disinformation type on those who saw no corrective information (B) and no significant effect of corrective information within disinformation conditions (C and D).

Figure 3. Interaction between disinformation types and presence of corrective information on situational fear

* *p* < .05

Table 10. *t*-Test results on the effect of disinformation type on situational fear by presence of corrective information in Study 1

Situational fear	Fear-neutral disinformation		Fear-arousing disinformation		
	M	*SD*	*M*	*SD*	*t*-test
No corrective information	2.64	1.39	3.05	1.74	ns
Simple corrective information	2.79	1.56	3.47	1.72	-2.073 (*p* = .041)

H4: H4 postulated a significant interaction between disinformation and corrective information on situational threat appraisal, measured by situational severity (H4-1) and situational susceptibility (H4-2). Two-way ANOVA multiple analyses showed that there was no significant interaction of disinformation type and the presence of corrective information on their subscales.

Then, individual differences that showed significant correlations with situational severity and situational susceptibility, respectively, were considered. According to a two-way ANCOVA controlling for whiteness, issue involvement, health consciousness, health blog usage, social media usage, social media use for news, social media use for fact-finding, and social media for social interaction, there was a marginally significant interaction of disinformation type and presence of corrective information on situational severity ($F(1, 193) = 3.571$, $p = .060$; see Figure 4). However, the interaction on situational susceptibility was not significant, after controlling for whiteness, issue involvement, health blog usage, social media usage, social media use for news, social media use for fact-finding, and social media use for social interaction.

A series of independent t-Tests for post-hoc analysis showed that there was a significant effect of disinformation type on situational severity among participants who did not see corrective information ($M = 2.81$, $SD = 1.29$ for those saw fear-neutral disinformation and did not see corrective information, $M = 3.85$, $SD = 1.63$ for those who saw fear-arousing disinformation and did not see corrective information, $t(100) = -3.50$, $p = .001$, Figure 4, A). Among those who saw simple corrective information, there was a significant effect on situational severity between those who saw fear-neutral disinformation ($M = 2.93$, $SD = 1.43$) and those who saw fear-arousing disinformation ($M = 4.12$, $SD = 1.35$) ($t(101) = -4.342$, $p < .001$, Figure 4, B). However, there was no significant effect of presence of corrective information among those who saw fear-neutral disinformation (C). No significant effect on situational severity was found between those who saw fear-arousing disinformation and no corrective information and those who saw fear-arousing disinformation and simple corrective information (D). See Table 11 for details.

Figure 4. Interaction between disinformation types and presence of corrective information on situational severity

** *p* < .001.

Table 11. *t*-Test results on the effect of disinformation type on situational severity by presence of corrective information in Study 1
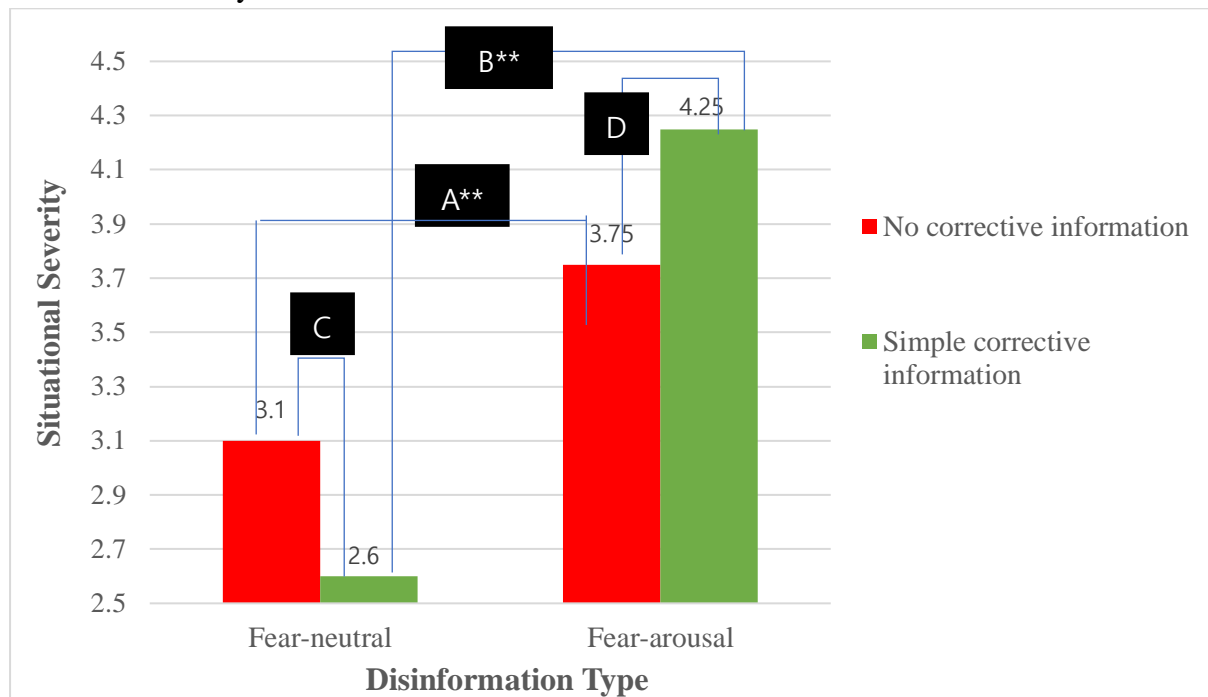
Situational severity	Fear-neutral disinformation		Fear-arousing disinformation		
	M	*SD*	*M*	*SD*	*t*-test
No corrective information	2.81	1.29	3.85	1.63	-3.500 (*p* = .001)
Simple corrective information	2.93	1.43	4.12	1.35	-4.342 (*p* = .000)

H5: Lastly, H5 postulated a significant interaction between disinformation and corrective information on intentions to share said disinformation on social media. A two-way ANOVA showed that the interaction between disinformation type and presence of corrective information on intentions to spread disinformation on social media was not significant. A two-way ANCOVA also showed no significant interaction on intentions to spread

disinformation on social media when education, whiteness, health blog usage, conservatism,

social media usage, social media use for fact-finding, and social media use for social

interaction were included; therefore, H5 was not supported. An additional analysis using an

independent t-Test did not show any significant results.

Table 12. Interaction ANCOVA results in Study 1

Predictor	Belief in disinformation			Situational fear			Situational severity			Situational susceptibility			Intentions to spread disinformation online		
	df	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value
Education	--	--	--	--	--	--	--	--	--	--	--	--	1	5.653	.018
Whiteness	1	9.634	.003	1	2.611	.108	1	5.449	.021	1	1.175	.280	1	4.591	.033
Conservatism	--	--	--	--	--	--	--	--	--	--	--	--	1	5.770	.017
Issue involvement	--	--	--	1	14.221	.000	1	8.679	.004	1	14.924	.000	--	--	--
Health consciousness	--	--	--	1	.020	.887	1	.063	.803	--	--	--	--	--	--
Health blog usage	--	--	--	--	--	--	1	1.588	.209	1	.454	.501	1	.986	.322
Social media usage	--	--	--	1	.115	.735	1	.178	.674	1	.092	.762	1	.926	.337
Social media use for news	1	2.036	.155	1	.353	.553	1	.568	.452	1	.713	.399	--	--	--
Social media use for fact-finding	1	7.945	.005	1	.018	.894	1	2.608	.108	1	4.241	.041	1	4.817	.029
Social media use for social interaction	1	1.830	.178	1	.340	.560	1	1.346	.247	1	.556	.457	1	2.821	.095
Disinformation (Fear-neutral vs. Fear-arousal)	1	7.529	.007	1	5.447	.021	1	32.946	.000	1	.122	.727	1	.101	.751
Corrective Information (No correction vs. Simple correction)	1	3.584	.060	1	.012	.912	1	.033	.856	1	.095	.758	1	2.767	.098
Disinformation × Corrective Information	1	1.661	.199	**1**	**3.593**	**.060**	**1**	**3.571**	**.060**	1	2.296	.131	1	.717	.398
Error	197			194			193			194			194		

Notes. Dummy-coded variables: Whiteness (0 = Others, 1 = White), Disinformation (0 = Fear-neutral, 1 = Fear-arousal), Corrective information (0 = No correction, 1 = Simple correction)

RQ3-1: RQ3-1 addressed the moderating roles of individual differences (i.e., education, whiteness, conservatism, issue involvement, health consciousness, health blog usage, social media usage, social media use for news, social media use for fact-finding, social media use for social interaction) in interactions between disinformation (fear-arousing vs. fear-neutral) and presence of corrective information (no corrective information vs. simple corrective information) on dependent variables of interest. A series of linear regressions were conducted to see three-way interactions. In step 1, disinformation condition, corrective information condition, and a variable of individual difference were entered. In step 2, the subsequent two-way interactions (i.e., disinformation condition $\times$ corrective information condition, disinformation condition $\times$ a variable of individual difference, and corrective information condition $\times$ a variable of individual difference) were entered. In step 3, the three-way interaction (i.e., disinformation condition $\times$ corrective information condition $\times$ a variable of individual difference) was entered. See Appendix G for diagnostic plots of significant results. The residuals for all of the regression models were roughly normal.

Three-way interactions between disinformation type, corrective information, and individual differences that correlated with each dependent variable of interest were not significant predictors of belief in said disinformation or situational fear.

A three-way interaction between disinformation condition, presence of corrective information, and social media usage on situational severity was significant ($\Delta R^2 = .017$, $p = .040$, $\beta = -.306$). To plot this interaction, social media usage was divided into three groups: low social media usage (below 4.57), medium social media usage (from 4.57 to 5.57), and high social media usage (above 5.57); see Figure 5.

Figure 5. Three-way interaction between disinformation type, presence of corrective information, and social media use on situational severity (Study 1)
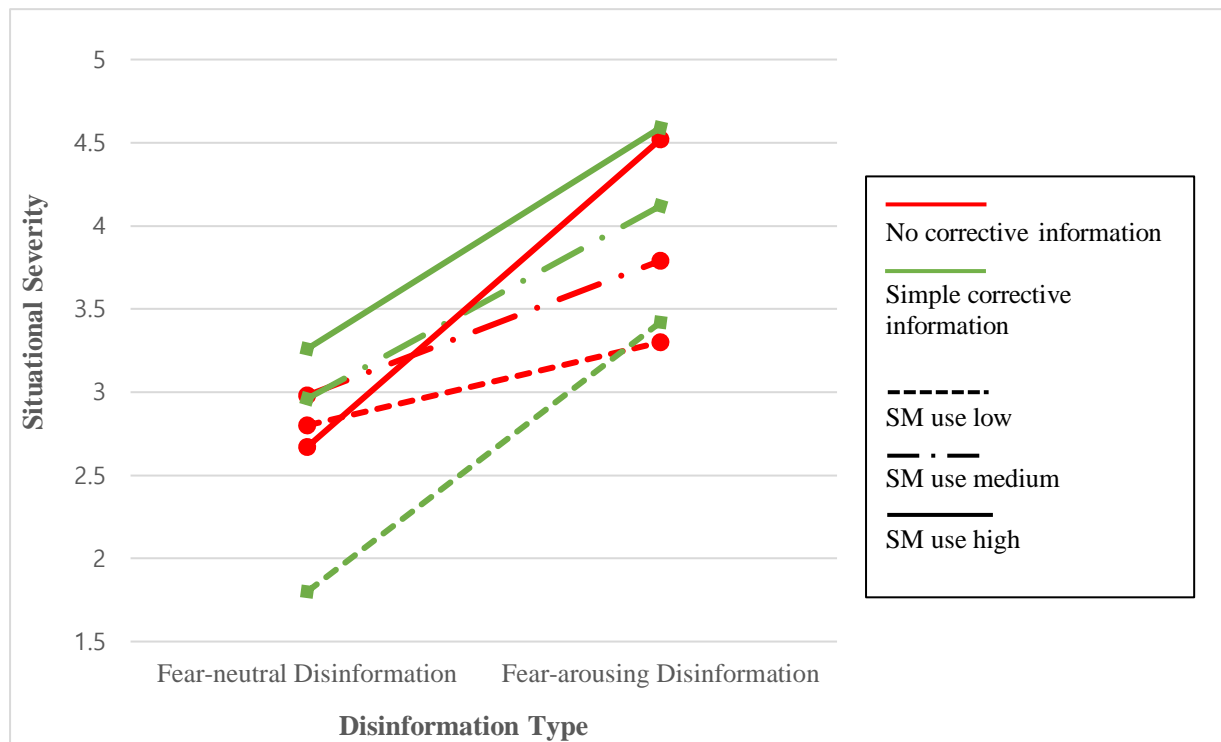
Although the interaction between disinformation type and corrective information was not significant within each level of general social media usage when investigated separately, the overall graph reveals that for low social media users within the fear-neutral disinformation condition, participants who saw simple corrective information reported less situational severity than those who did not see any corrective information (see Figure 5-a). For high social media users, participants who saw simple corrective information reported greater situational severity compared to participants who did not see any corrective information (see Figure 5-c). When facing fear-arousing disinformation, high social media users reported greater situational severity than middle or low social media users, regardless of the presence of corrective information (see Figure 5-a, 5-b, and 5-c for comparison). In the fear-arousing disinformation condition, high social media users reported greater situational severity when seeing simple corrective information than middle and low social media users.

High social media users who did not see any corrective information after seeing fear-arousing disinformation also reported greater situational severity than middle and low social media users.

The proposed hypothesis that simple corrective information may increase situational severity when fear-arousing disinformation is presented was only shown among low social media users. That said, for low social media users in the fear-neutral information condition, participants who faced with simple corrective information reported less situational severity compared to participants that did not see corrective information. However, when faced with fear-arousing disinformation, low social media users reported slightly greater situational severity when facing with simple corrective information compared to those who did not see corrective information.

Additionally, the interaction between disinformation type and social media usage was not significant within each condition of presence of corrective information when investigated separately. The interaction between corrective information type and social media usage was also not significant within each condition of disinformation when investigated separately.

Figure 5-a. Interaction between disinformation type and presence of corrective information on situational severity among low social media users (Study 1)

Notes. The green line was significant ($p < .01$).
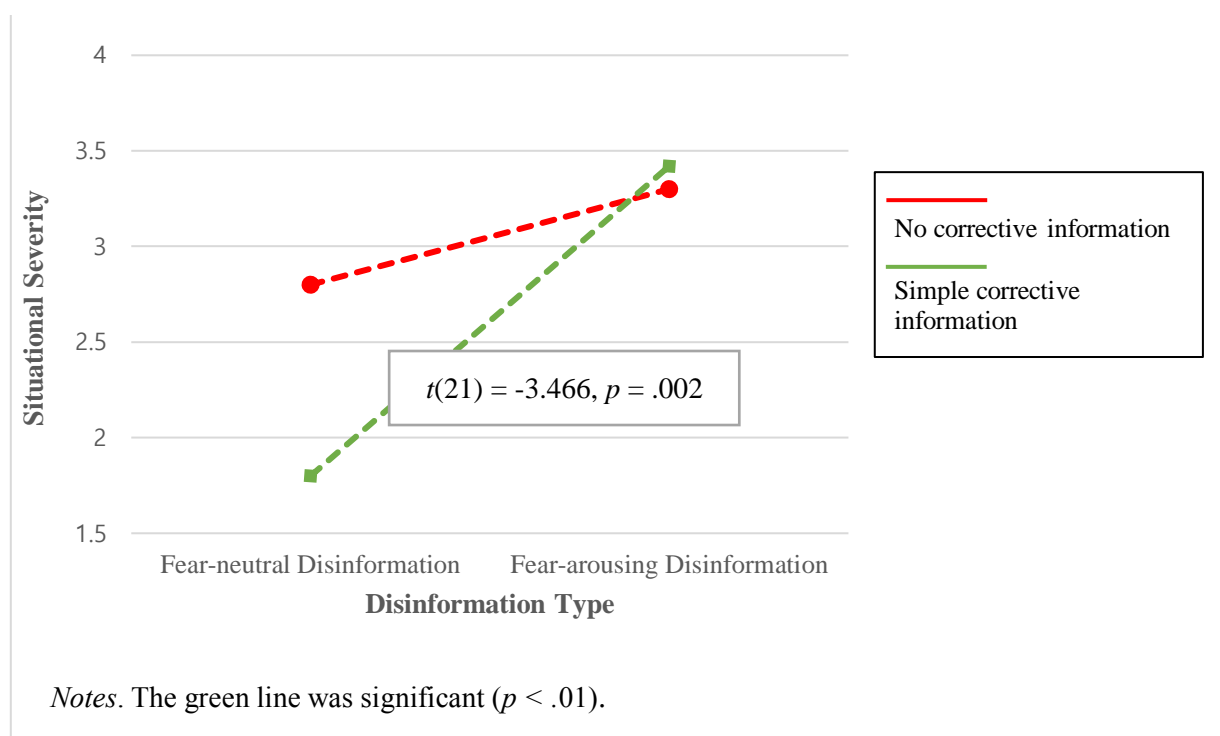
Figure 5-b. Interaction between disinformation type and presence of corrective information on situational severity among medium social media users (Study 1)

Notes. The green line ($p < .05$) and red line ($p < .10$) were significant.
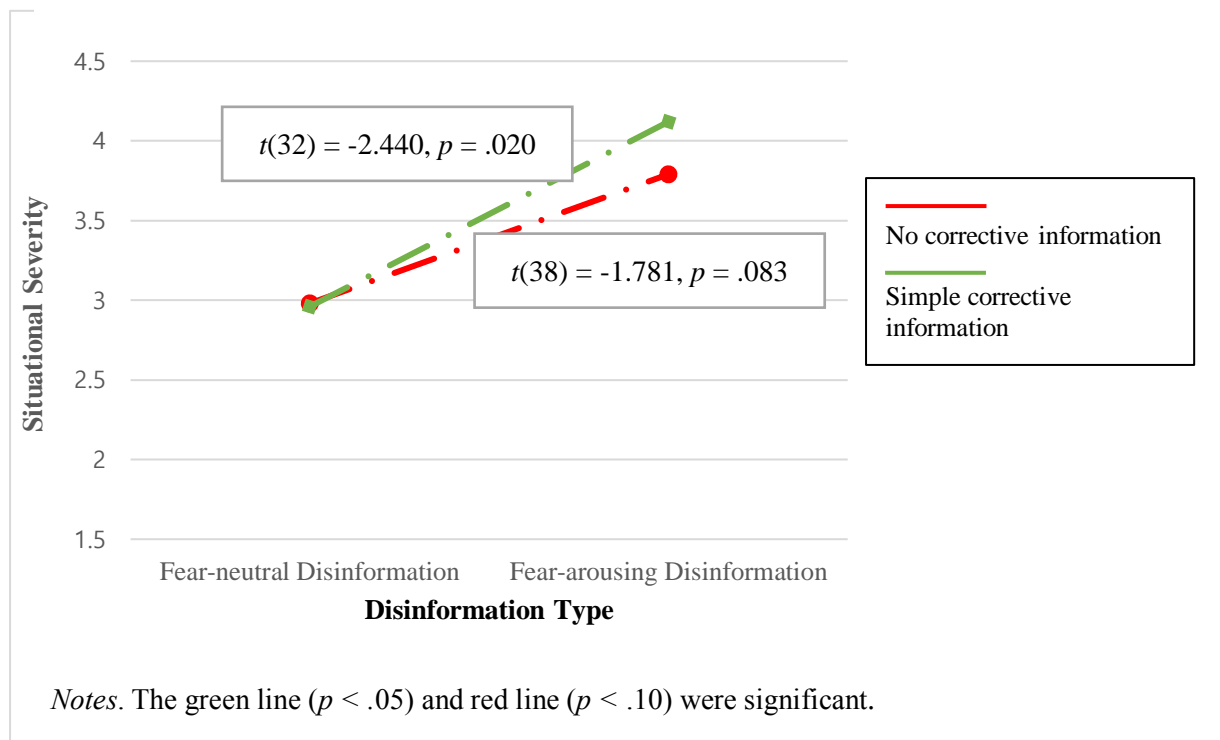
Figure 5-c. Interaction between disinformation type and presence of corrective information on situational severity among high social media users (Study 1)

A three-way interaction between disinformation condition, presence of corrective information, and social media use for news on situational severity was also significant at a marginal level ($\Delta R^2 = .013$, $p = .080$, $\beta = -.236$), according to the regression analysis. To plot this interaction, social media use for news was divided into three groups: low social media use for news (below 4.50), medium social media use for news (from 4.50 to 5.75), and high social media use for news (above 5.75). Figure 6 displays the interaction.

Figure 6. Three-way interaction between disinformation type, presence of corrective information, and social media use for news on situational severity (Study 1)

Although the interaction between disinformation type and presence of corrective information was not significant for each level of social media use for news when investigated separately, the overall graph reveals that for low social media users for news within the fear-neutral disinformation condition, participants who saw simple corrective information reported less situational severity than those who did not see any corrective information (see Figure 6-a). A significant result was found in the green line in Figure 6-a when an independent *t*-Test was conducted ($t(29) = -3.599$, $p = .001$). For high social media users, participants who saw simple corrective information reported greater situational severity than those who did not see any corrective information (see Figure 6-c). When facing fear-arousing disinformation, high social media users for news reported greater situational severity than middle or low social

media users for news, regardless of the presence of corrective information; that is to say, in the fear-arousing disinformation condition, high social media users for news reported greater situational severity when seeing simple corrective information than middle and low social media users (see Figure 6-a, 6-b and 6-c for comparison). High social media users for news who did not see any corrective information after seeing fear-arousing disinformation also reported greater situational severity than middle and low social media users for news.

The proposed hypothesis that simple corrective information may increase situational severity when fear-arousing disinformation is presented was only shown among low social media users for news. That said, of the low social media users for news who faced with fear-neutral disinformation, those who faced with simple corrective information reported less situational severity compared to those that did not see corrective information. However, when faced with fear-arousing disinformation, low social media users for news reported slightly greater situational severity after seeing simple corrective information compared to those who did not see corrective information.

Additionally, the interaction between disinformation type and social media news use was not significant within each condition of presence of corrective information when investigated separately. The interaction between corrective information type and social media news use was also not significant within each condition of disinformation when investigated separately.
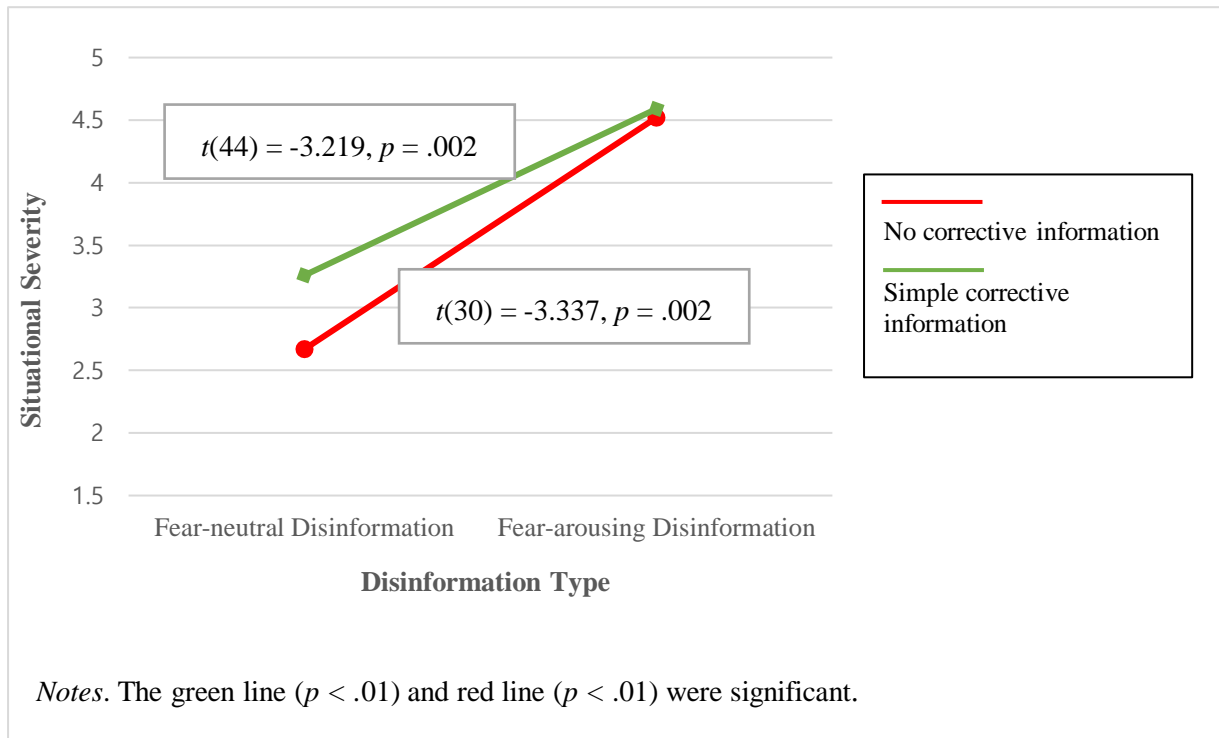
Figure 6-a. Interaction between disinformation type and presence of corrective information on situational severity among low social media news users (Study 1)
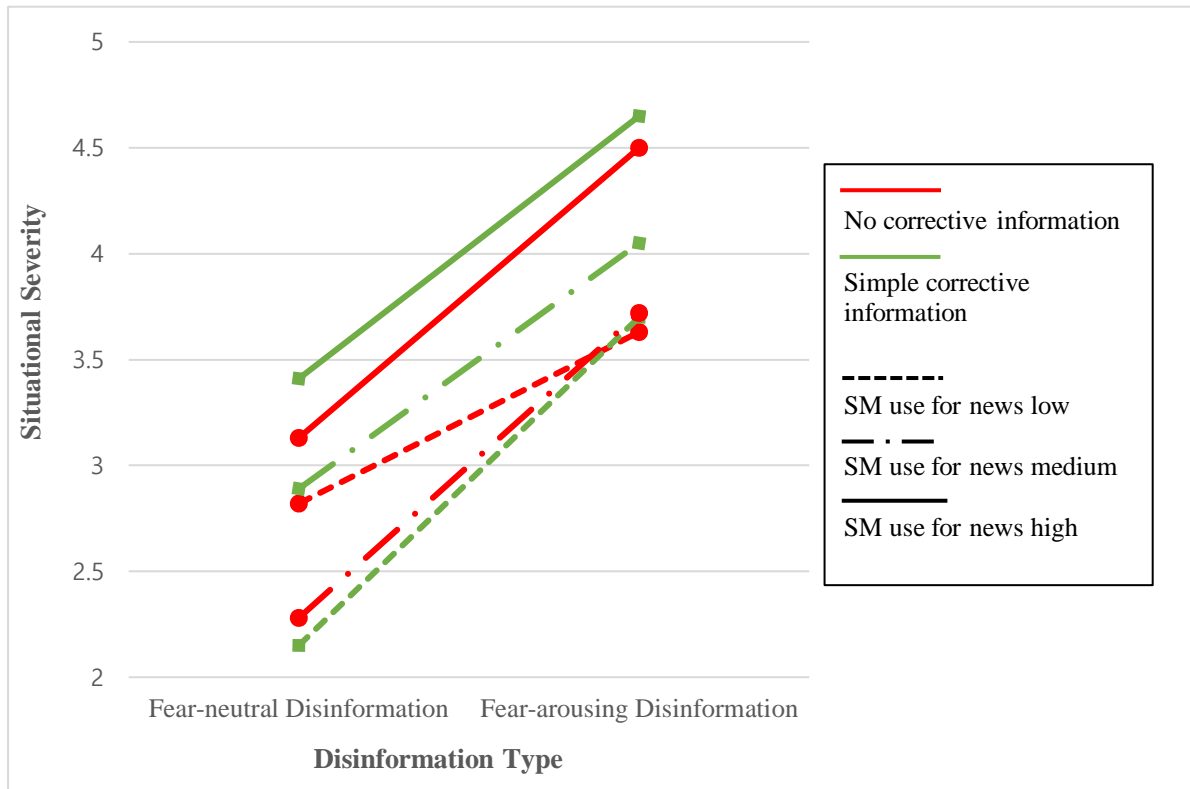

Notes. The green line was significant ($p < 01$).

Figure 6-b. Interaction between disinformation type and presence of corrective information on situational severity among medium social media news users (Study 1)

Notes. The green line ($p < .05$) and red line ($p < .01$) were significant.
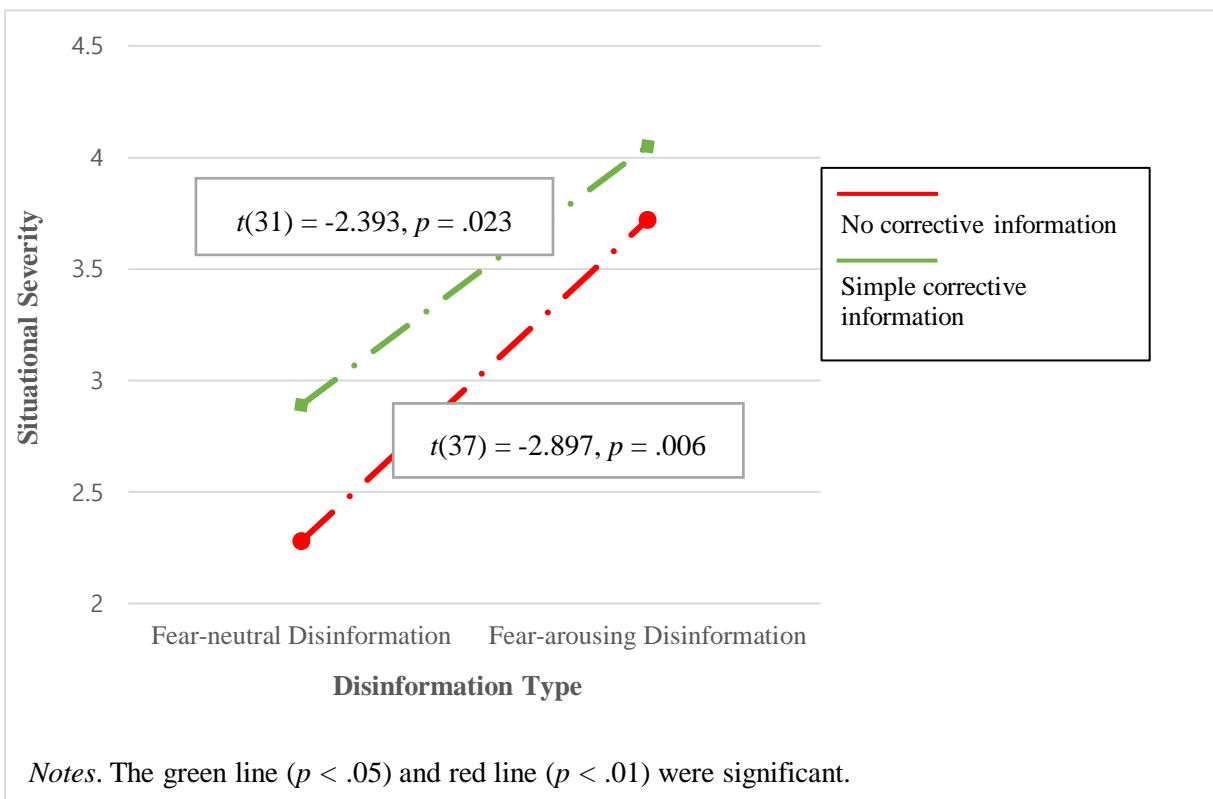
Figure 6-c. Interaction between disinformation type and presence of corrective information on situational severity among high social media news users (Study 1)

Notes. The green line ($p \leq .01$) and red line ($p < .05$) were significant.

A three-way interaction between disinformation condition, presence of corrective information, and health blog usage on situational susceptibility was significant at a marginal level ($\Delta R^2 = .015$, $p = .078$, $\beta = -.271$), according to the regression analysis. To plot this interaction, health blog usage was divided into three groups: low health blog usage (not at all), medium health blog usage (a few times a month), and high health blog usage (a few times a week, a few times a day, and regularly throughout the day). Figure 7 displays the interaction.

Figure 7. Three-way interaction between disinformation type, presence of corrective information, and health blog usage on situational susceptibility (Study 1)
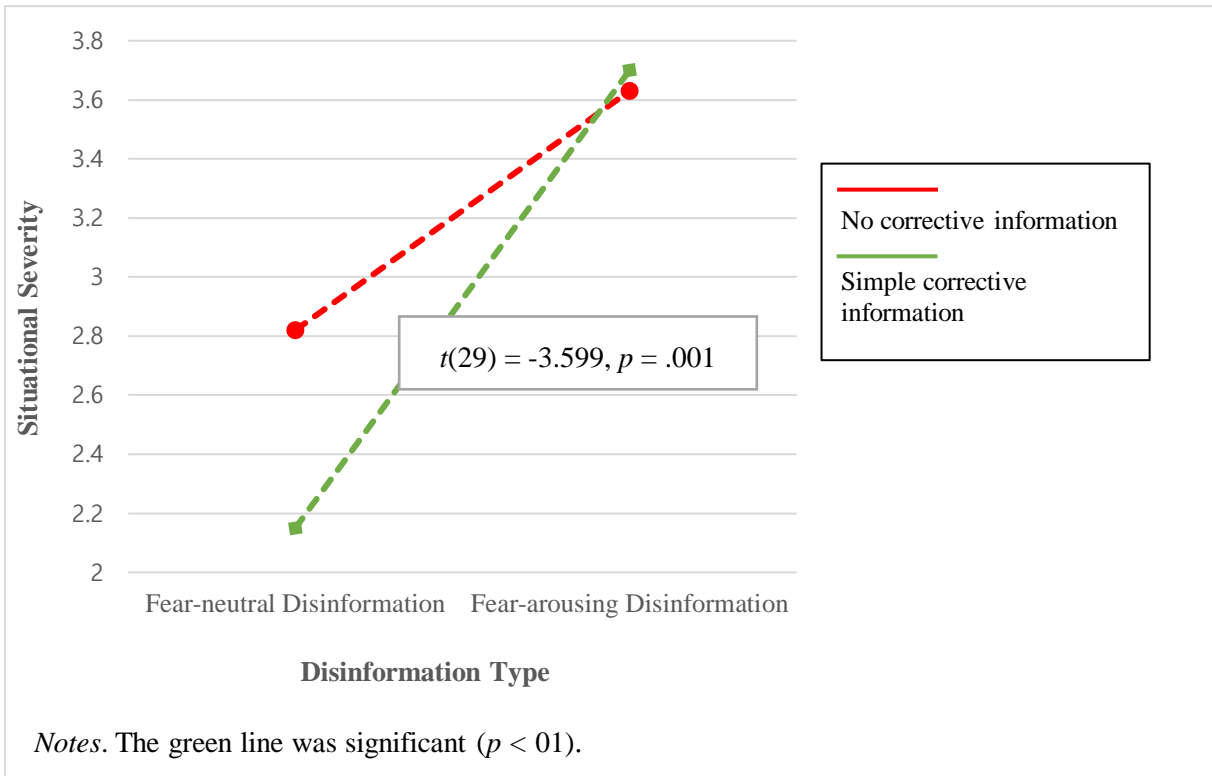

Although the interaction between disinformation condition and presence of corrective information was not significant for each level of health blog usage when investigated separately, the overall graph reveals that the interaction between disinformation type and presence of corrective information is reversed between low health blog users (see Figure 7-a) and high health blog users (see Figure 7-c).

The proposed hypothesis that simple corrective information may increase situational susceptibility when fear-arousing disinformation is presented was only shown among low health blog users. That said, of the low health blog users in the fear-neutral disinformation condition, participants who faced with simple corrective information reported less situational susceptibility compared to participants that did not see corrective information. However, when faced with fear-arousing disinformation, low health blog users reported greater

situational susceptibility after seeing simple corrective information than those that did not see any corrective information.

Conversely, for high health blog users, the simple corrective information increased situational susceptibility when fear-neutral disinformation is presented. Participants who faced with fear-neutral disinformation and simple corrective information reported greater situational susceptibility than those who faced with fear-neutral disinformation and did not see any corrective information. When faced with fear-arousing disinformation, high health blog users who read simple corrective information reported less situational severity than those who did not read corrective information.

Although the interaction between disinformation type and health blog usage was not significant within the simple corrective information condition, it was significant within the no corrective information condition ($\Delta R^2 = .045$, $p = .033$, $ß = .867$) (see Figure 7-d). In the no corrective information condition, high health blog users reported less situational susceptibility than low health blog users when faced with fear-neutral disinformation; however, high health blog users reported greater situational susceptibility than low health blog users when faced with fear-arousing disinformation.

However, the interaction between corrective information type and health blog usage was not significant within each condition of disinformation when investigated separately.
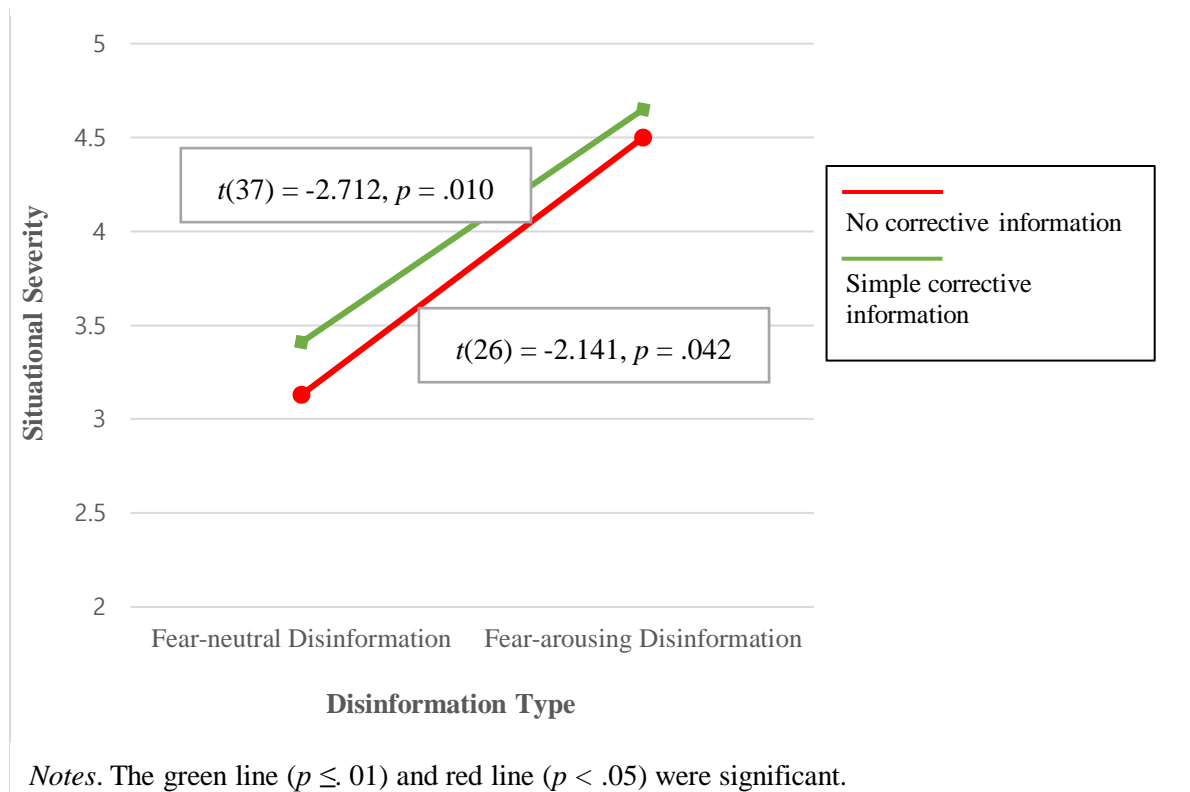
Figure 7-a. Interaction between disinformation type and presence of corrective information on situational susceptibility among low health blog users (Study 1)
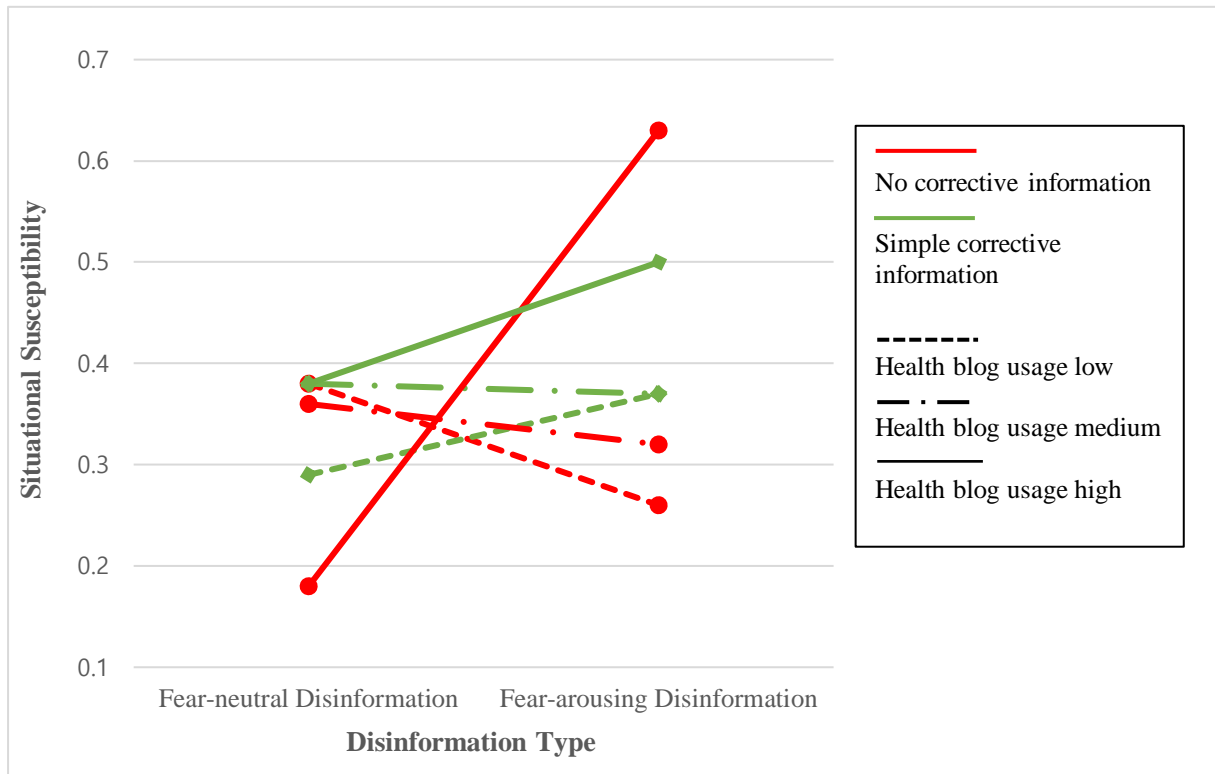

Notes. All unlabeled lines were not significant.
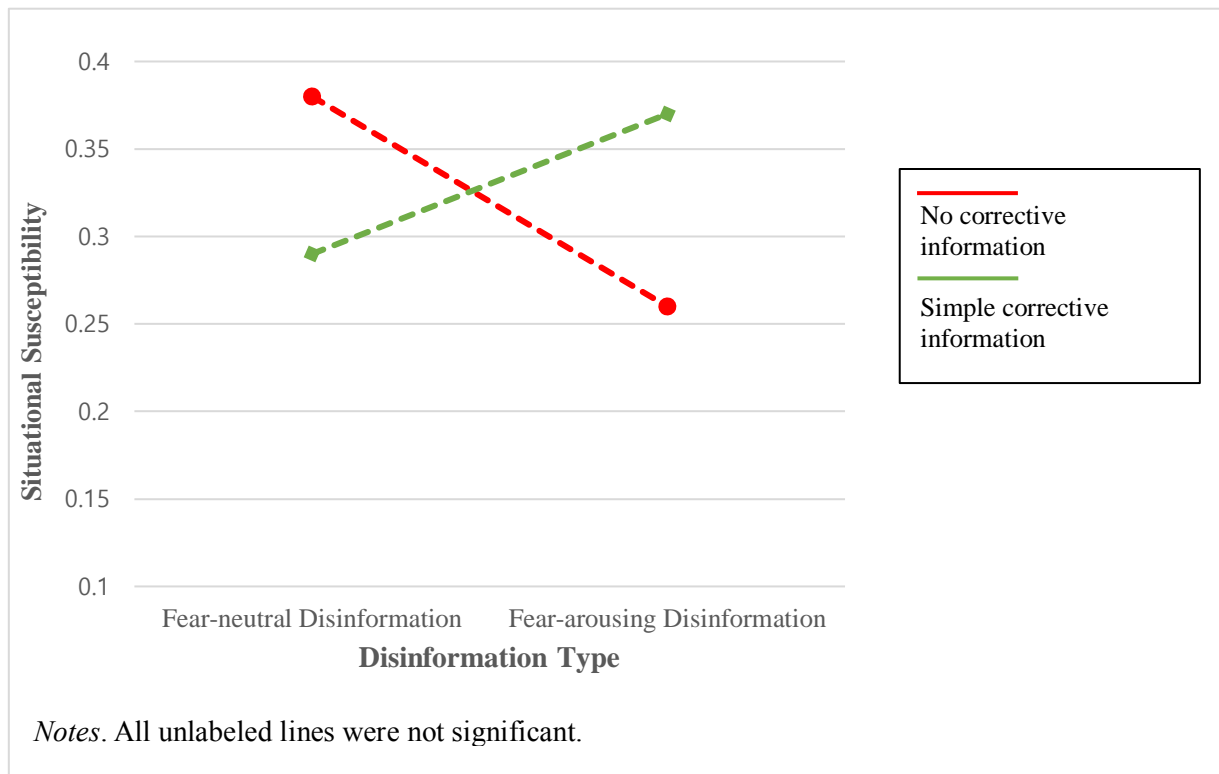
Figure 7-b. Interaction between disinformation type and presence of corrective information on situational susceptibility among medium health blog users (Study 1)

Notes. All unlabeled lines were not significant.
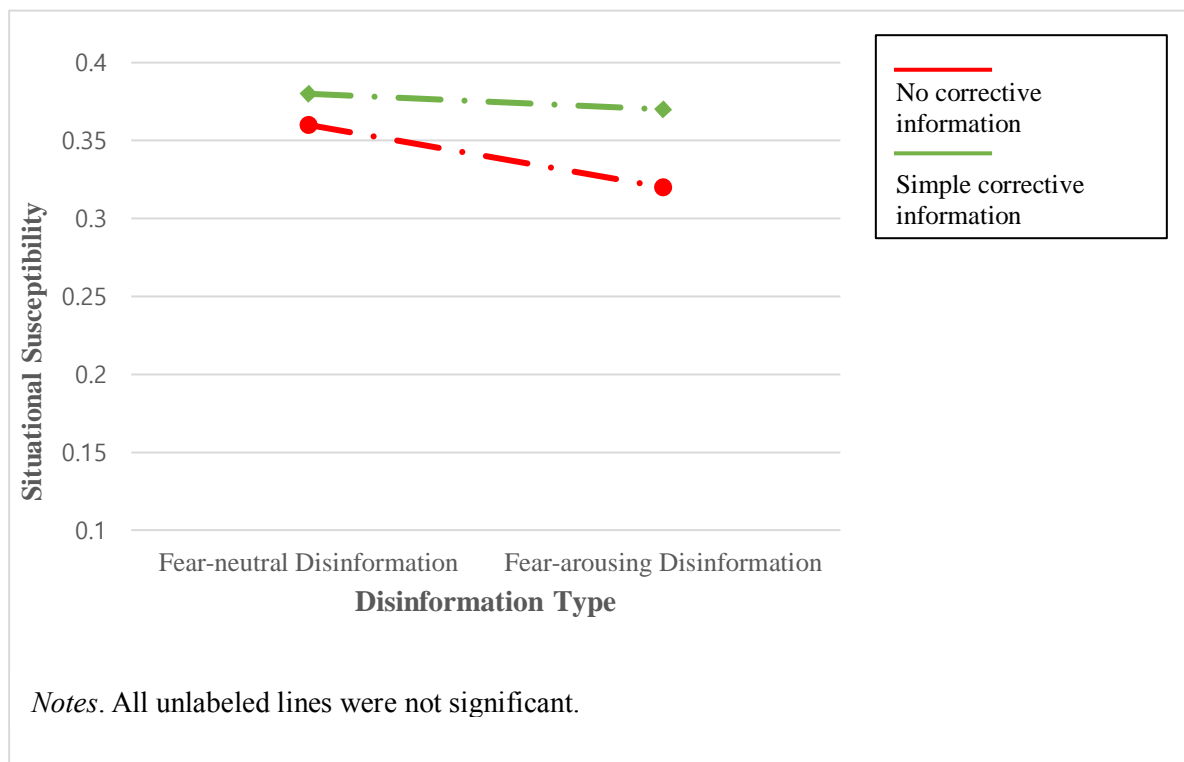
Figure 7-c. Interaction between disinformation type and presence of corrective information on situational susceptibility among high health blog users (Study 1)

Notes. The red line was significant ($p < .05$).
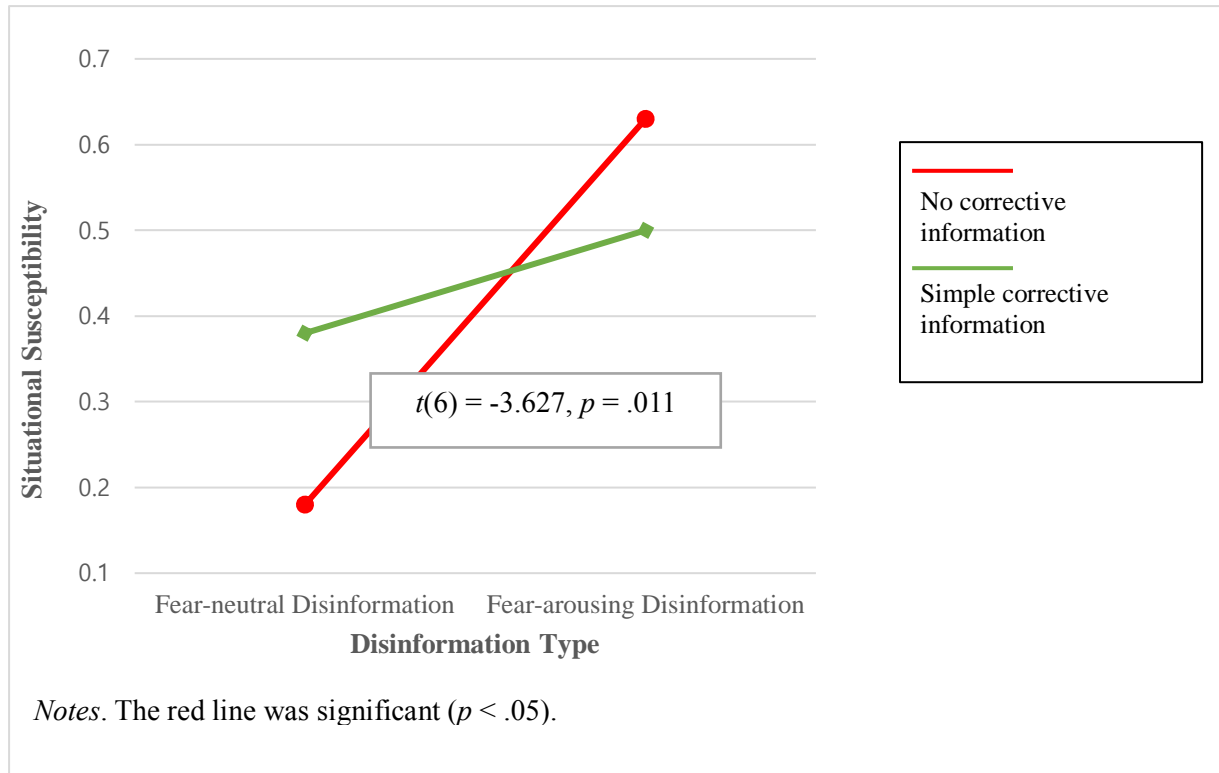
Figure 7-d. Interaction between disinformation type and health blog usage on situational susceptibility within no corrective information (Study 1)
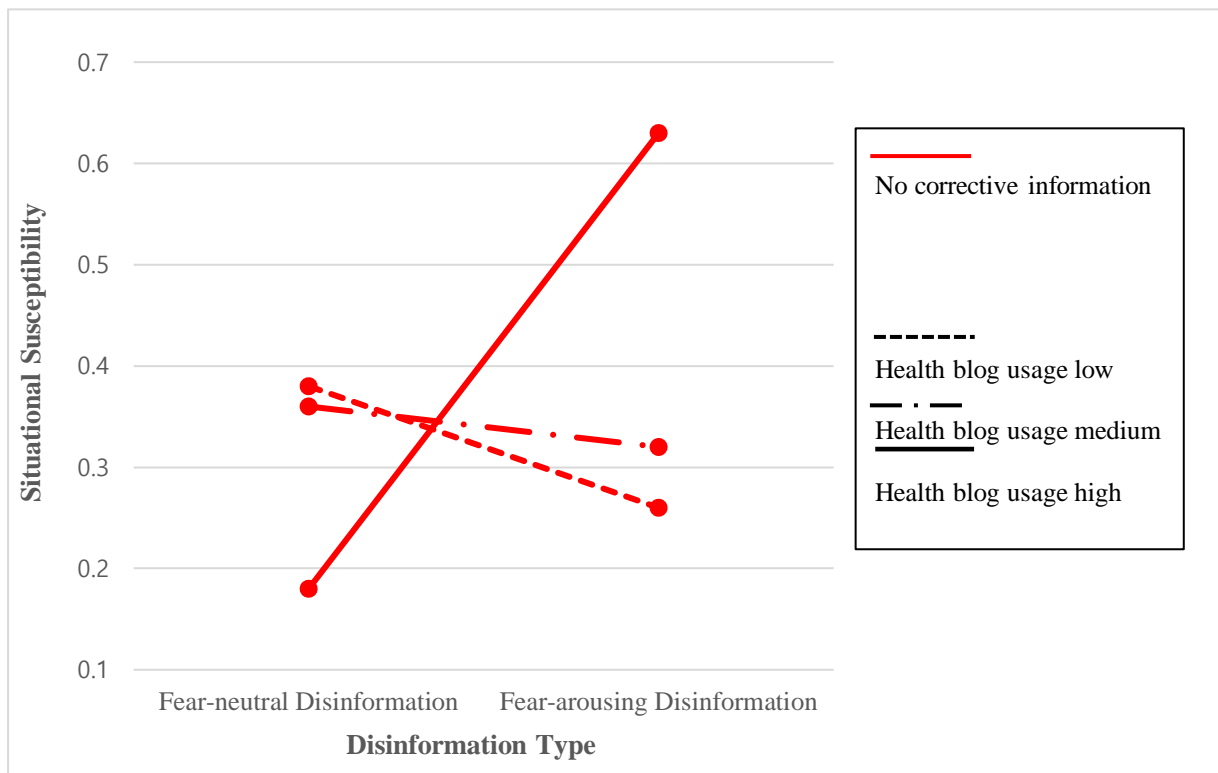
A three-way interaction between disinformation condition, presence of corrective information, and social media use for fact-finding on intentions to spread disinformation on social media was significant at a marginal level ($\Delta R^2 = .016$, $p = .064$, $\beta = -.240$), according to an independent *t*-Test analysis. To plot this interaction, social media use for fact-finding was divided into three groups: low social media use for fact-finding (below 3.75), medium social media use for fact-finding (from 3.75 to 4.75), and high social media use for fact-finding (above 4.75). Figure 8 displays the interaction.

Figure 8. Three-way interaction between disinformation type, presence of corrective information, and social media use for fact-finding on intentions to spread disinformation on social media (Study 1)
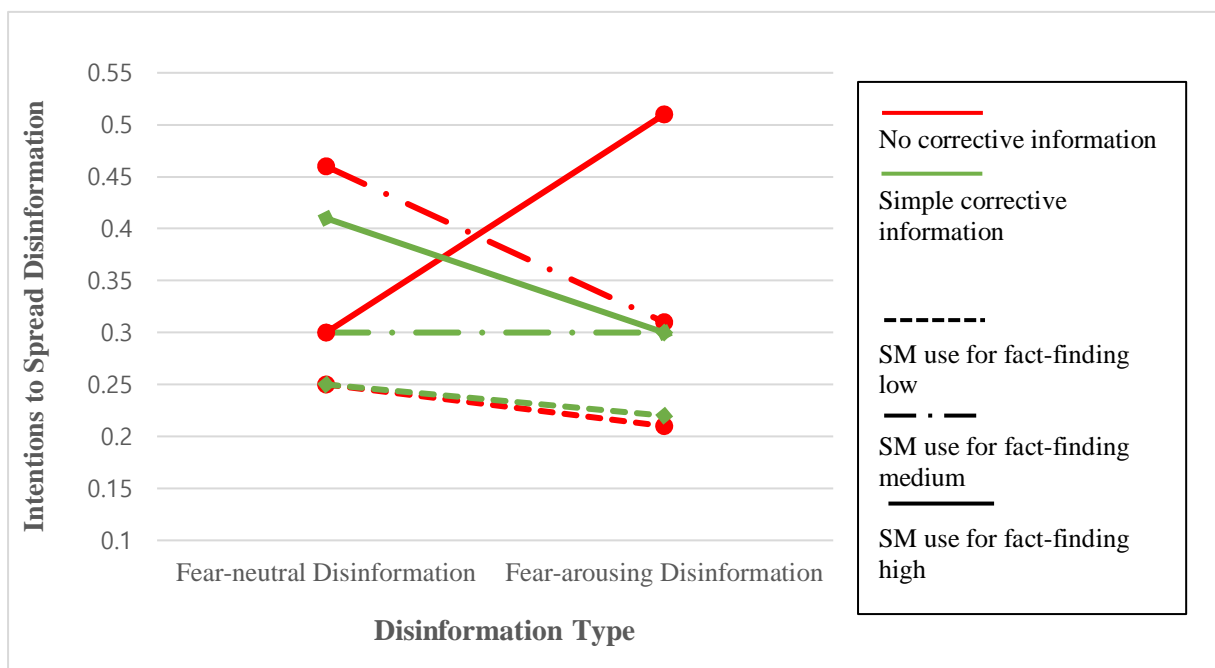
Then, the interaction was examined in each level of social media use for fact-finding. For participants with high social media use for fact-finding, the interaction between disinformation and presence of corrective information was significant ($F(1, 73) = 5.456$, *p*

= .022, see Figure 8-c), according to the ANOVA result. The interaction was not significant for those with medium (see Figure 8-b) and low social media use for fact-finding (see Figure 8-a). High fact-finding social media users reported greater intentions to spread disinformation on social media after seeing fear-neutral disinformation and simple corrective information, compared to participants that saw fear-neutral disinformation and no corrective information. This relationship reversed in the fear-arousing disinformation condition; that said, high fact-finding social media users reported less intentions to spread disinformation when facing fear-arousing disinformation and simple corrective information than those who saw fear-arousing disinformation and no corrective information. Interestingly, middle and low fact-finding social media users did not exhibit an effect of disinformation type or presence of corrective information.

Although the interaction between disinformation type and social media use for fact-finding was not significant within the simple corrective information condition, it was significant within the no corrective information condition at a marginal level, according to the regression analysis ($\Delta R^2 = .032$, $p = .059$, $\beta = .520$) (see Figure 8-d). In the no corrective information condition, high social media users for fact-finding exhibited clear differences compared to medium and low social media users for fact-finding. When faced with fear-neutral disinformation, high social media users for fact-finding reported less intentions to spread disinformation on social media than medium social media users for fact-finding. When faced with fear-arousing disinformation, high social media users for fact-finding reported greater intentions to spread disinformation on social media than medium and low social media users for fact-finding.

However, the interaction between corrective information type and social media use for fact-finding was not significant within each condition of disinformation when investigated separately.

Figure 8-a. Interaction between disinformation type and presence of corrective information on intentions to spread disinformation on social media among low social media users for fact-finding (Study 1)

Notes. All unlabeled lines were not significant.
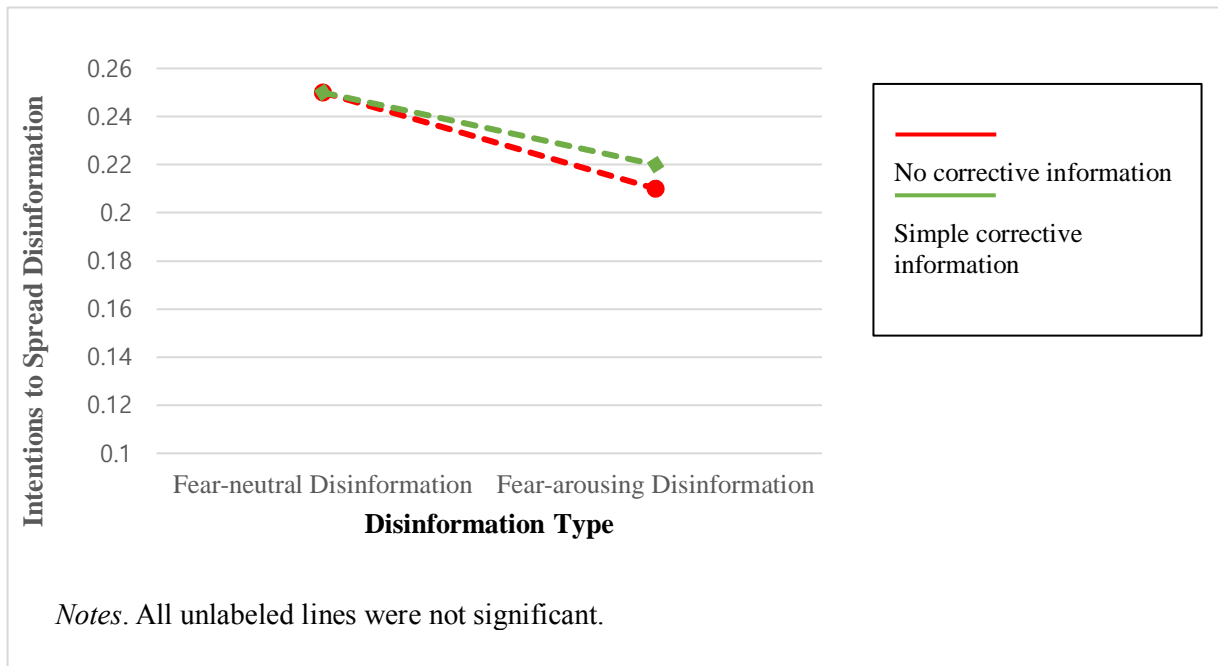
Figure 8-b. Interaction between disinformation type and presence of corrective information on intentions to spread disinformation on social media among medium social media users for fact-finding (Study 1)

Notes. All unlabeled lines were not significant.
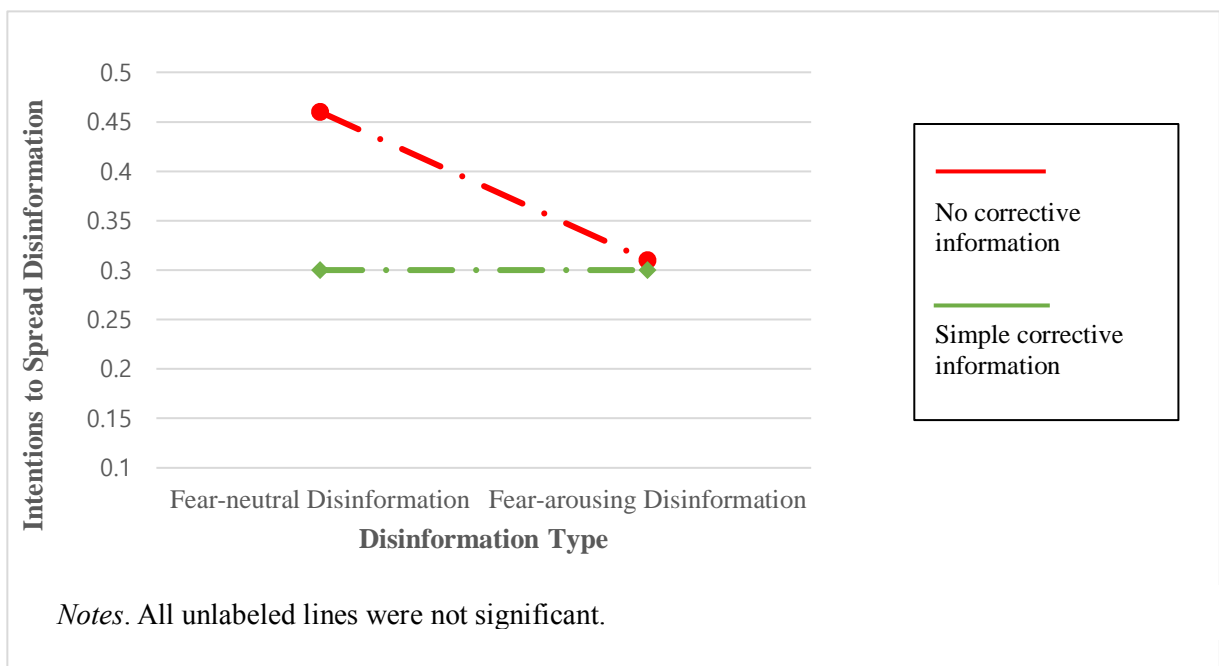
Figure 8-c. Interaction between disinformation type and presence of corrective information on intentions to spread disinformation on social media among high social media users for fact-finding (Study 1)

Notes. The red line was significant ($p < .05$). The presence of corrective information showed significant difference within the fear-arousing disinformation condition ($p < .05$).
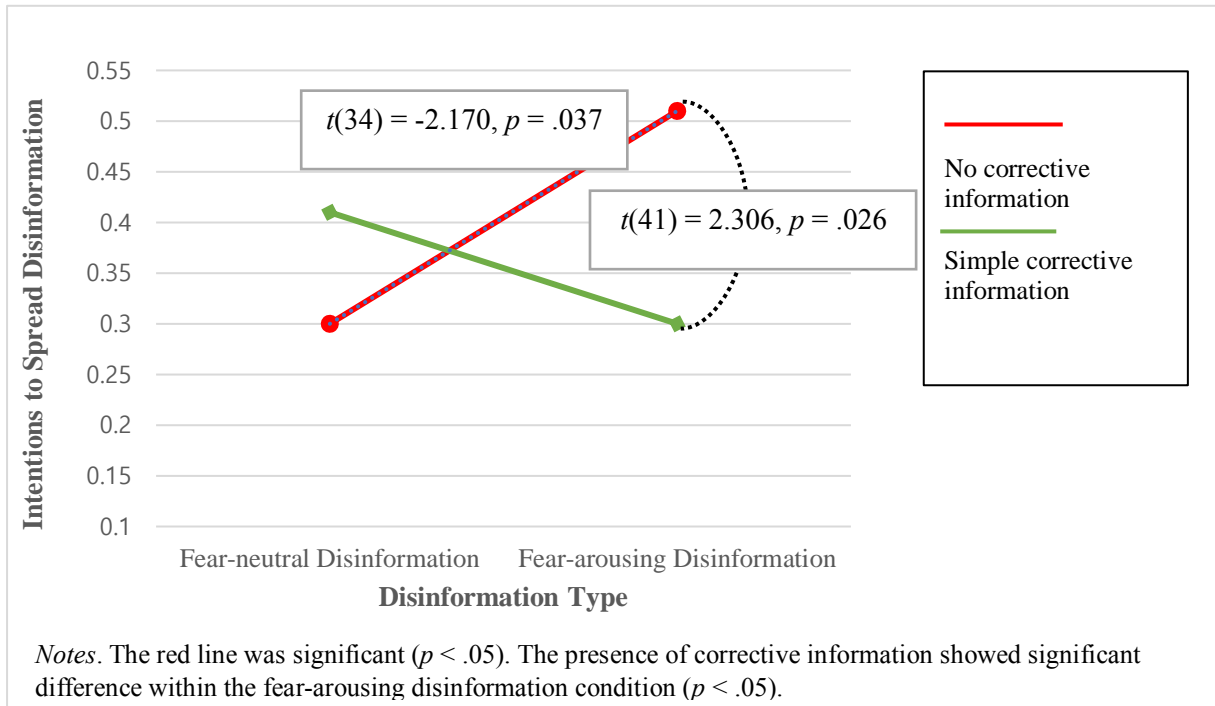
Figure 8-d. Interaction between disinformation type and social media use for fact-finding on intentions to spread disinformation within no corrective information (Study 1)
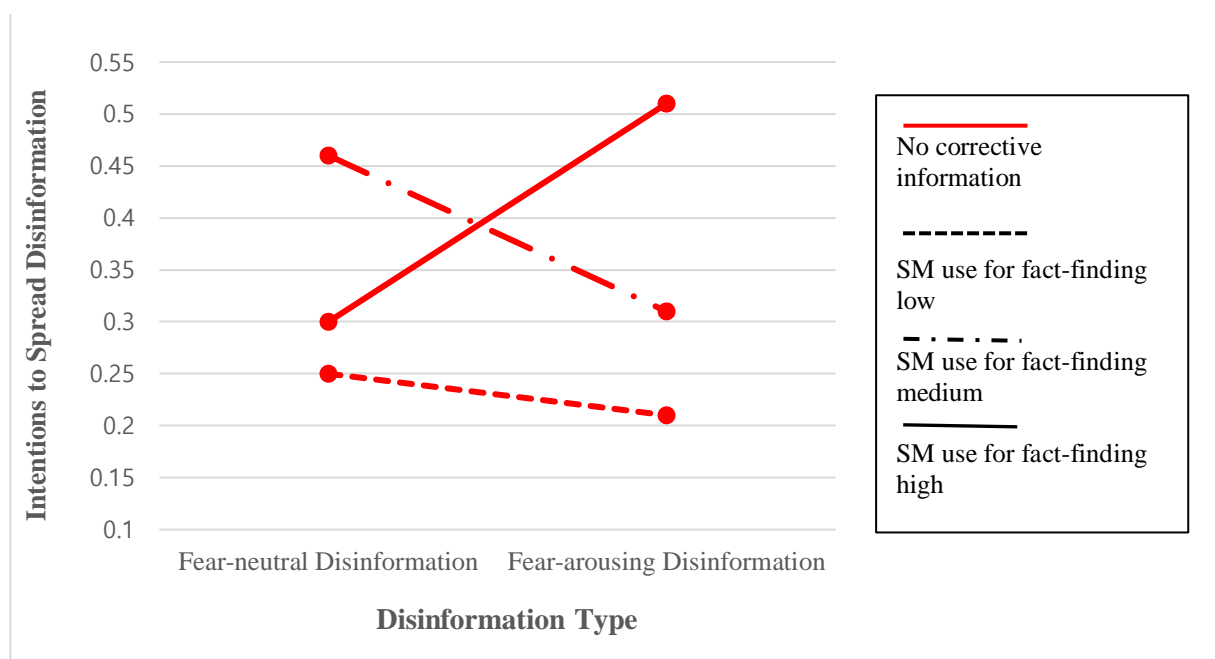
Mediation effects.

H6-H8: Because there were no significant effects of disinformation types × presence of corrective information on belief in disinformation or on intentions to spread disinformation on social media, mediation analyses (related to H6 - H8) following Baron and Kenny (1986) could not be conducted.

Discussion

The purpose of Study 1 was to examine how the impact of disinformation type (i.e., fear-neutral disinformation vs. fear-arousing disinformation) is moderated by the presence of corrective information (i.e., no corrective information vs. simple corrective information) on belief in said disinformation (a), situational fear (b), situational threat appraisal (c), and intentions to spread said disinformation on social media (d).

H1 hypothesized a main effect of disinformation type. Participants who saw fear-arousing disinformation reported lower belief in disinformation than those who saw fear-neutral disinformation, which was the opposite direction postulated in H1-a. This unexpected result could be interpreted by psychological reactance of fear-arousing disinformation. This is in line with reactance theory (Brehm, 1966) which argues people tend to feel a need to resist when facing restricted situations in which they lack control. In risky situations like the spread of an unknown health virus, activating fear may also activate a lack of control. This lack of control may cause participants to react such that they disagree with the disinformation as a coping strategy. Again, the result of H1-a suggests that fear-arousing disinformation under risks discourages belief in said disinformation. This suggests that excessive fear through fear-arousing disinformation could decrease persuasiveness of the message.

H1-b, which hypothesized a main effect of disinformation type on situational fear, was supported. In line with H1-b, H1-c, which postulated a main effect of disinformation type on situational threat appraisal, was partially supported because the main effect was shown on

situational severity but not on situational susceptibility. These findings suggest that fear-arousing disinformation is effective in increasing fear of the spread of a health virus and perception about the seriousness of the risky situation, but participants did not relate the disinformation content to their personal issues. Although fear-arousing disinformation resulted in greater situational fear and situational severity than fear-neutral disinformation, participants did not perceive that they were in danger of the situation. In addition, the lack of an effect of disinformation type on intentions to spread said disinformation on social media (H1-d) suggests that fear-arousing disinformation has no difference from fear-neutral disinformation in changing behaviors to spread disinformation on social media.

H2-H5 postulated interaction effects between disinformation type and presence of corrective information, and significant interaction effects emerged for situational fear (H3) and situational severity (H4-1), such that simple corrective information appeared to backfire, and elicit greater situational fear and situational severity when fear-arousing disinformation was presented. These findings are in line with previous studies (Schwarz et al., 2007) which argued that corrective information that simply repeats disinformation with an added statement "this information is false" is insufficient in decreasing misbeliefs. Based on the illusory truth effect (Begg et al., 1992), the web-on simple corrective information in this study could have reminded participants of the disinformation content they saw before. Such repeated exposure of disinformation content ultimately increased situational fear and situational severity by enhancing familiarity with the disinformation. Again, it is important to note that this illusory truth effect of simple corrective information was only shown among the participants who saw fear-arousing disinformation. From these findings, it could be argued that simple corrective information can have a backfire effect when emotional disinformation like fear-arousing disinformation is presented.

However, the backfiring of simple corrective information with emotional disinformation should not be generalized, given that several individual differences (i.e., social media usage, social media use for news, health blog usage, social media use for fact-finding) appeared to affect interaction between disinformation type and presence of corrective information on dependent variables of interest. These results suggest that individual differences play moderating roles of disinformation type and presence of corrective information such that the interaction is different across social media usage, social media use for news, health blog usage, and social media use for fact-finding. Specifically, 1) social media usage moderated the effect of the interaction between disinformation type and presence of corrective information on situational severity , 2) social media use for news moderated the effect of the interaction on situational severity , 3) health blog usage moderated the effect of the interaction on situational susceptibility , and 4) social media use for fact-finding moderated the effect of the interaction on intentions to spread disinformation on social media .

Of particular note from the significant three-way interactions is that the backfiring of simple corrective information for fear-arousing disinformation worked only for low social media users, low social media users for news, and low health blog users. These participants would not have been impacted by social media or health blog in processing disinformation and corrective information, and therefore, showed results as the current research expected. Low social media or health blog users would not have self-confidence that they have abilities to discern disinformation or corrective information on social media. This lack of self-confidence could lead participants to pay attentions to the given message.

For high social media users, high social media users for news, high health blog users, and high social media users for fact-finding, simple corrective information backfired for fear-neutral disinformation, not for fear-arousing disinformation. Particularly, high social media

users for fact-finding explicitly showed the significant interaction between disinformation type and presence of corrective information on intentions to spread disinformation on social media. That said, for high fact-finding social media users, simple corrective information backfired with fear-neutral disinformation in that it increased intentions to spread disinformation on social media, but it worked with fear-arousing disinformation. The backfire effect of simple corrective information with emotional disinformation, therefore, is not the case for high social media users for fact-finding.

These results could be interpreted by third-person effects of high social media users in fear-neutral disinformation. Participants who highly use social media, social media for news, social media for fact-finding, and health blogs could have confidence stemming from optimism for their abilities to understand information, which could ultimately result in not thinking deeply about the given information. Therefore, although simple corrective information was presented, these participants could have ignored the purpose of simple corrective information that says, "the disinformation is false" and be affected by the repetitive presentation of disinformation content per se. However, simple corrective information worked for fear-arousing disinformation to these participants. Again, this finding suggests that people who highly use social media, social media for news, social media for fact-finding, and health blogs could accept what the simple corrective information says as a coping strategy to fear-arousing disinformation. In this sense, excessive fear could be effective to these individuals in understanding the purpose of simple corrective information. In the situation where they experienced fearful emotions, they could pay more attentions to the corrective information content.

Proposed mediation effects (H6-H8) could not be conducted because there was a non-significant effect of disinformation type and presence of corrective information on belief in disinformation. Therefore, although interaction effects on situational fear and situational

severity were found, it cannot be argued that whether the situational fear and situational severity ultimately affect beliefs in disinformation and intentions to spread disinformation on social media.

Overall, the results found in Study 1 raise a need to design alternative message strategies of corrective information. The findings of Study 1 suggest that simple corrective information which shows disinformation content repeatedly and simply indicates the falsehood of disinformation may not be sufficient to impact belief in the said disinformation and desires to share the disinformation online. Therefore, Study 2 aims to examine narrative corrective information as an enhanced correction strategy and compare between narrative corrective information and simple corrective information.

Chapter 5: Study 2

Method

Design. Study 2 also received IRB approval. Using the case of a spread of an unknown health virus, Study 2 features an online experiment with a 2 (disinformation: fear-neutral vs. fear arousal) × 2 (corrective information: simple corrective information vs. narrative corrective information) between group factorial design resulting in four conditions: 1) fear-arousing disinformation and simple corrective information, 2) fear-arousing disinformation and narrative corrective information, 3) fear-neutral disinformation and simple corrective information, and 4) fear-neutral disinformation and narrative corrective information.

Participants. Participants for Study 2 were also recruited from Amazon MTurk between January 25 and February 4, 2019 when participants for Study 1 were recruited. Eligibility criteria for participants were the same as Study 1. Of the 215 data, one outlier who saw fear-neutral disinformation more than 447 seconds was detected and removed, which resulted in 214 data for an analysis.

The mean age of participants were 42.76 years old ($SD = 12.22$) with male (43.9%) and female (55.6%). Of the participants, 0.5% said they prefer not to respond their gender. Regarding their race, 73.4% were Caucasian, 6.5% were Latino/Hispanic, 1.4% were Middle Eastern, 11.7% were Black/African American, 0.5% were Caribbean/West Indian, 0.9% were South Asian, 4.7% were East Asian, and 0.9% were Mixed. As for the open-ended question asking about their ethnicity, participants who marked their race as Caucasian answered their self-identified ethnicity as follows: European American, German American, Northern European, Eastern European, Swedish, Scandinavian, Italian American, Portuguese/Irish/English/Greek, Polish/German.

Regarding their annual income, 21.0% of the participants were earning $0 – 24,999, 30.8% were $25,000 – 49,999, 27.1% were $50,000 – 74,999, 11.7% were $75,000 – 99,999, 5.6% were $100,000 – 149,999, 1.4% were $150,000 – 199,999, and 2.3% were $200,000 and above. From 0 (extremely liberal) to 100 (extremely conservative), the mean value of conservatism was 42.08 ($SD = 28.66$). Regarding their education, 0.5% indicated their education levels as less than high school, 8.9% were high school graduate, 22.0% were some college levels, 12.1% were 2-year degree, 39.3% were 4-year degree, 2.8% had professional degree (e.g., J.D., M.D., D.D.S.), 13.6% were master's degree, and 0.9% had doctoral degree.

Procedure. The procedure of Study 2 was identical to that of Study 1. Study 2 also took approximately 15 minutes to complete ($M = 931.33$ seconds, $SD = 398.19$ seconds) and participants received $1 as an incentive. Participants first read an informed consent when they accessed the Qualtrics survey from MTurk. Then they provided their birth year and answered screening questions about their activity on Facebook; participants who were born after 2002 or were not active on Facebook were forwarded to the end of the study. They then answered questions regarding their social media usage, self-efficacy, and their interest in the spread of an unknown health virus.

Participants then saw either fear-neutral disinformation or fear-arousing disinformation like in Study 1. The average time spent reading the disinformation was 94.02 seconds ($SD = 58.81$) and 12.6% participants read the disinformation for more than three minutes. After reading disinformation, participants answered PANAS, and responded to questions assessing their present fear of the disinformation, belief in the disinformation, and intentions to spread disinformation on social media. They also indicated which image was featured in the disinformation content they read.

Then, participants read either simple corrective information or narrative corrective information. Details of the stimuli are explained in the latter section. Participants in the

simple corrective information condition had to read the web add-on corrective information, which was used in Study 1 (see Appendix C). Participants in the narrative corrective information condition read the following statement:

> *Now consider the following scenario: However, Facebook user James later found out that the post you just read is false and wrote the following corrective post. Please read the following corrective information and answer the questions below.*

Participants in both the simple and narrative conditions had three minutes to read the corrective information and respond to the following open-ended question: "Briefly, please enter your immediate thoughts about the above post." Like Study 1, participants could advance to the next page whenever they finished. The average time spent reading the simple corrective information and answering the question was 33.17 (SD = 51.91), and 3.7% of the participants took more than three minutes to accomplish the task. The average time spent reading the narrative corrective information and answering the question was 40.24 (SD = 64.97). Around 3.3% of the participants read the narrative corrective information and answered the question more than three minutes.

After reading the corrective information, participants responded to the PANAS items again, and responded to items measuring how the corrective information elicited narrative effects, belief in corrective information, and intentions to spread corrective information on social media. Next, participants again reported their belief in the original disinformation, intentions to spread the original disinformation, items about heuristic-systematic information processing, and a manipulating check asking, "from whom did you see the corrective information?" with the opportunity to choose from a friend, Facebook, and someone else. They were then directed to questions about information seeking, sharing and avoidance intentions, situational threat appraisal, and negative emotions of the spread of health viruses including situational fear. Lastly, participants provided their demographic information. After

the completion of the survey, participants were debriefed and confirmed that their data could still be used. Table 13 presents the number of participants for each condition.

Table 13. Number of participants for each condition (Study 2)

	Disinformation		
Corrective Information	Fear-neutral	Fear-arousal	Total
Simple Corrective Information	63	42	105
Narrative Corrective Information	58	51	109
Total	121	93	214

Stimuli. Stimulus for fear-neutral disinformation, fear-arousing disinformation, and simple corrective information were adapted from the one used in Study 1. To develop the narrative corrective information condition, emphasis was placed on establishing an individual whose personal narrative would provide elaboration on an event and an experience of a narrator (Greene & Brinn, 2003). James, the narrator in the narrative corrective information condition, explains how he came to understand the story as false and how the story itself impacts a society. The following post was shown for the participants in the narrative corrective information condition (see Appendix C):

"One of my friends who owns an agricultural business lost a huge amount of money due to a lettuce sales drop due to the false rumor that an unnamed virus is spreading across the U.S. He is now deeply distressed. I searched and read a lot of articles about the virus and a fact-checking website says the rumor was originally from fake news website NewsWireforYou.com. Don't be deceived by this false information. Spreading the falsehood can directly impact our neighbors and communities."

Measures.

Individual differences.

The items for Study 2, including demographics, were identical to the ones used in Study 1. The means, standard deviations, and reliability scores for these measures using the Study 2 dataset is provided below.

Social media usage. The mean value of amount of social media usage was 4.38 (*SD* = .80). As for items comprising social media usage, a principal component analysis (PCA) was conducted. The result of the Kaiser-Meyer-Olkin measure indicated the sampling adequacy was acceptable (.844) because it was above the value of .50. Bartlett's test of sphericity was χ^2 (36) = 1111.980, *p* < .001. See Table 14 for the factor loadings after varimax rotation; Items (1)-(7) were factored together (Cronbach's α = .89, *M* = 5.06, *SD* = 1.18) and items (8)-(9) were factored (Cronbach's α = .80, *M* = 4.99, *SD* = 1.59). Like Study 1, the second component of social media usage was dropped out for an analysis.

Table 14. Rotated component matrix of social media usage items in Study 2

	Component	
	1	2
(1) Social media is part of my everyday activity	**.851**	.098
(2) I am proud to tell people I'm on social media	**.422**	.500
(3) Social media has become part of my daily routine	**.866**	.160
(4) I feel out of touch when I haven't logged onto social media for a while	**.775**	.170
(5) I feel I am part of the social media community	**.708**	.321
(6) I would be sorry if social media shut down	**.734**	.403
(7) I like using social media	**.620**	.530
(8) I often think about deactivating my social media accounts (reverse-coded)	.088	**.853**
(9) I am tired of using social media (reverse-coded)	.222	**.868**

Social media usage for news. The mean value of social media usage for news was 5.05 (*SD* = 1.38, Cronbach's α = .89).

Social media usage for fact-finding. The mean value of social media usage for fact-finding was 4.39 (*SD* = 1.41, Cronbach's α = .86).

Social media usage for social interaction. The mean value of social media usage for social interaction was 4.88 (*SD* = 1.61, Cronbach's α = .76).

Self-efficacy. Regarding items measuring self-efficacy, the mean value was 5.32 (*SD* = 1.16, Cronbach's α = .94).

Issue involvement. The mean value of issue involvement was 4.39 (*SD* = 1.28, Cronbach's α = .84).

Health consciousness. The mean value of health consciousness was 5.75 (*SD* = .87, Cronbach's α = .79).

Health blog usage. The mean value of health blog usage was 1.91 (*SD* = .68).

Positive and Negative Affect Schedule (PANAS). PANAS items used in Study 2 were identical to those in Study 1. These were used as a delay strategy. The items were measured on a 5-point scale (1 = *None at all*, 5 = *A great deal*).

Similar to Study 1, a principal component analysis (PCA) was conducted for PANAS items measured between the disinformation and corrective information conditions. The factor analysis results confirmed the results of Study 1. The result of the Kaiser-Meyer-Olkin measure indicated the sampling adequacy was acceptable (.899) because it was above the value of .50. Bartlett's test of sphericity was χ^2 (190) = 3031.492, p < .001. See Table 15 for the factor loadings after varimax rotation; Items (1), (3), (5), (9), (10), (14), (16), and (19) were factored together and termed as "positive PANAS" (Cronbach's α = .91, *M* = 2.68, *SD* = .97) and items (2), (4), (6), (7), (8), (11), (13), (15), (18), and (20) were factored and termed as "negative PANAS" (Cronbach's α = .94, *M* = 1.39, *SD* = .64). Remaining items (12) and (17) were factored and termed as "attentive PANAS" (Cronbach's α = .69, *M* = 3.71, *SD* = .99). Of the three PANAS factors, negative PANAS was used to see whether participants in the fear-arousing disinformation condition reported greater negative affect than those in the fear-neutral disinformation condition.

Table 15. Rotated component matrix of PANAS items measured between disinformation and corrective information in Study 2

	Component		
	1	2	3
(1) Interested	-.082	**.597**	.472
(2) Distressed	**.854**	.120	-.021
(3) Excited	.042	**.858**	-.016
(4) Upset	**.864**	-.112	-.006
(5) Strong	-.106	**.796**	.158
(6) Guilty	**.716**	.170	-.378
(7) Scared	**.880**	-.072	.117
(8) Hostile	**.715**	.031	-.296
(9) Enthusiastic	-.091	**.833**	.135
(10) Proud	-.087	**.831**	.017
(11) Irritable	**.752**	-.188	-.075
(12) Alert	-.003	.303	**.748**
(13) Ashamed	**.699**	.162	-.426
(14) Inspired	-.034	**.865**	.095
(15) Nervous	**.862**	-.110	.108
(16) Determined	-.062	**.576**	.479
(17) Attentive	-.202	.351	**.651**
(18) Jittery	**.711**	.127	-.285
(19) Active	.095	**.657**	.328
(20) Afraid	**.855**	-.112	.126

Fear of disinformation. Six items measuring fear of disinformation were used as a confirmation of effectiveness of fear-arousing disinformation (Cronbach's α = .96, M = 2.84, SD = 1.79).

Belief in disinformation. Items measuring belief in disinformation were measured twice: between the disinformation and corrective information and after the corrective information condition. This research used the items measured after the corrective information condition (Cronbach's α = .98, M = 2.82, SD = 1.73).

Intentions to spread disinformation on social media. Items measuring intentions to spread disinformation on social media were measured twice: between the disinformation and corrective information and after the corrective information condition. This research used the

items measured after the corrective information condition (Cronbach's α = .96, *M* = 2.38, *SD* = 1.57).

Heuristic-Systematic Information Processing. This variable was not used in the current analyses. The reliability, mean, and standard deviation were not reported because the current study did not use this variable.

Information seeking, sharing, and avoidance intentions. This variable was not used in the current analyses. Items were identical to those in Study 1. The reliability, mean, and standard deviation for each variable were not reported because the current study did not use these variables.

Situational threat appraisal. Situational severity was measured (Cronbach's α = .91, *M* = 3.48, *SD* = 1.78) and situational susceptibility also comprised of items described in Study 1 (Cronbach's α = .92, *M* = 2.59, *SD* = 1.46).

Situational fear. Of the items measuring negative emotions of the situation, fear of the unknown virus was measured (Cronbach's α = .97, *M* = 3.04, *SD* = 1.74). Items measuring other emotions (e.g., anger, sadness, hope) were not used in the current research.

Narrative effects. This measure was introduced specifically for Study 2. To confirm differences in corrective information, participants responded items borrowed from past research (Green & Brock, 2000; De Graaf, Hoeken, Sanders, & Beentjes, 2012) and were measured on a 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*): (a) The corrective information had an effect on my emotions, (b) I could relate to the situation described in the corrective information, (c) I feel that the corrective information made its point effectively, (d) I could identify with the situation that the message provides, (e) I could feel empathy with the situation that the message provides, (f) I was mentally involved in the message while reading it, and (g) During reading, I imagined what it would be like to be in the position of the person in the message (Cronbach's α = .86, *M* = 4.74, *SD* = 1.21).

Variable transformations

Normalizing transformations of dependent variables of interest were also conducted to reduce the skewness and kurtosis. Belief in disinformation, situational fear, and situational susceptibility were log-transformed because those variables were substantial positive skewed. The variable of intentions to spread disinformation on social media showed severe positive skewness; therefore, it was inversely transformed using a formula: 1/DV. This variable was then multiplied by -1 to hold positive correlations with the original dependent variable; see Table 16.

Table 16. Skewness and Kurtosis results for measured variables

Variable (Study 2)	Mean (SD)	Skewness	Kurtosis
Belief in disinformation	2.82 (1.73)	.736	-.551
Log Transformed	.37 (.28)	.020	-1.293
Situational fear	3.04 (1.74)	.528	-.896
Log Transformed	.40 (.27)	-.158	-1.240
Situational severity	3.48 (1.78)	.079	-1.244
Situational susceptibility	2.59 (1.46)	.674	-.559
Log Transformed	.34 (.25)	-.024	-1.274
Intentions to spread disinformation on social media	2.38 (1.57)	1.119	.178
Inversely Transformed	-.60 (.32)	-.171	-1.520

Statistical methodologies

Statistical methodologies the current research used were bivariate correlations, independent t-Test, analysis of variance (ANOVA), analysis of covariance (ANCOVA) for control variables, and regression analyses. Bivariate correlations were used to measure the relationships between variables. Independent t-Tests were used to compare the mean value of two independent groups and whether the difference is significant. ANOVA was used to check significant interactions between disinformation type and corrective information type on dependent variables of interest. Related, ANCOVA was used to check significant interactions

between disinformation type and corrective information type on dependent variables of interest when considering control variables (i.e., covariates). Regression analyses were used to find significant effects of an independent variable on dependent variables of interest when either control variables were considered or not. Each methodology that this study used is specifically mentioned for each analysis.

Results

  Manipulation check for disinformation. When asked to indicate which image they had just seen, all of the participants in the fear-neutral disinformation condition chose the correct image of a lettuce head. Of the participants in the fear-arousing disinformation condition, 97.8% of the participants ($N = 91$) indicated the correct image (i.e., a picture of workers who wore masks and protective clothing to move dead bodies) while two other participants chose incorrect fear-arousing images.

  There was also a significant difference between the fear-arousing disinformation condition and the fear-neutral disinformation condition on fear of the disinformation such that participants who saw the fear-neutral disinformation reported significantly lower fear ($M = 2.54$, $SD = 1.70$) than those who saw the fear-arousing disinformation ($M = 3.23$, $SD = 1.83$) ($t(212) = -2.839$, $p = .005$). However, there was no effect of disinformation condition on negative affect or positive affect in general.

  Manipulation check for corrective information. When asked to answer a question—"From whom did you see the corrective information?"—, of participants in the simple corrective information condition, 4.8% ($N = 5$) said they saw the corrective information from their friends, 67.6% ($N = 71$) from Facebook, and 27.6% ($N = 29$) from someone else. Of the participants in the narrative corrective information condition, 30.3% ($N = 33$) said they saw the corrective information from their friends, 33.0% ($N = 36$) from Facebook, and 36.7% (N

= 40) from someone else. These problematic responses will be described in the discussion, but all data was used for analysis.

There was a significant difference between the simple corrective information and the narrative corrective information on narrative effects such that participants who saw simple corrective information reported significantly lower narrative effects ($M = 4.42$, $SD = 1.17$) compared to those who saw the narrative corrective information ($M = 5.01$, $SD = 1.18$) $t(200) = -3.545$, $p < .001$).

Correlations. RQ1 addressed the relationship between dependent variables of interest (i.e., belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media). Bivariate correlations revealed that all of the main variables in Study 2 were positively correlated to each other. Table 17 presents the results.

Table 17. Bivariate correlations of the main variables in Study 2

Study 2	Belief in disinformation	Situational fear	Situational severity	Situational susceptibility	Intentions to spread disinformation online
Belief in disinformation	-				
Situational fear	.478	-			
(*p*-value)	(.000)				
Situational severity	.391	.613	-		
(*p*-value)	(.000)	(.000)			
Situational susceptibility	.433	.700	.686	-	
(*p*-value)	(.000)	(.000)	(.000)		
Intentions to spread disinformation on social media	.642	.439	.374	.441	-
(*p*-value)	(.000)	(.000)	(.000)	(.000)	

RQ2 addressed the relationship between individual differences and the variables of interest. Bivariate correlations were conducted between individual differences and the variables of interest. Like in Study 1, individual differences included gender, age, education, race (whiteness), income, issue involvement, health consciousness, health blog usage, self-efficacy, conservatism, amount of social media usage, social media usage, social media usage for news, social media usage for fact-finding, and social media usage for social interaction; see Table 18.

Gender, income, health consciousness, and amount of social media usage were not related to any dependent variables of interest.

Age was correlated to intentions to spread disinformation on social media ($r = -.136$, $p = .047$) such that younger participants reported greater intentions to spread disinformation on social media.

Education showed a positive correlation with situational susceptibility ($r = .164$, $p = .016$), meaning that participants with higher education reported greater perceived susceptibility.

Regarding race, white participants reported less belief in disinformation ($r = -.219$, $p = .001$), situational fear ($r = -.214$, $p = .002$), situational severity ($r = -.225$, $p = .001$), and intentions to spread disinformation on social media ($r = -.177$, $p = .010$) compared to non-white participants.

Issue involvement showed significant correlations with situational fear ($r = .259$, $p < .001$), situational severity ($r = .290$, $p < .001$), and situational susceptibility ($r = .266$, $p < .001$) such that participants who thought the issue of health viruses is important to themselves reported greater situational fear, situational severity, and situational susceptibility.

Health blog usage showed positive correlations with belief in disinformation ($r = .166$, $p = .015$) and situational fear ($r = .163$, $p = .017$) such that participants who use health blog frequently reported greater belief in disinformation and situational fear.

Self-efficacy was negatively correlated to intentions to spread disinformation on social media ($r = -.154$, $p = .025$) such that participants with self-efficacy showed less intentions to spread disinformation on social media.

Conservatism was positively related to situational severity ($r = .160$, $p = .019$), situational susceptibility ($r = .153$, $p = .025$), meaning that participants with conservatism reported greater situational severity and susceptibility.

Social media usage showed positive correlations with situational fear ($r = .161$, $p = .018$) and intentions to spread disinformation on social media ($r = .177$, $p = .010$) such that participants who use social media frequently reported greater situational fear and intentions to spread disinformation on social media.

Social media usage for news was positively related with situational fear ($r = .235$, $p = .001$), situational severity ($r = .139$, $p = .042$), situational susceptibility ($r = .135$, $p = .048$), and intentions to spread disinformation on social media ($r = .303$, $p < .001$). This means that high social media users for news reported greater situational fear, situational severity, situational susceptibility, and intentions to spread disinformation on social media.

Social media usage for fact-finding was positively correlated with situational fear ($r = .269$, $p < .001$), situational severity ($r = .182$, $p = .007$), situational susceptibility ($r = .211$, $p = .002$), and intentions to spread disinformation on social media ($r = .377$, $p < .001$), such that high social media users for fact-finding reported greater situational fear, situational severity, situational susceptibility, and intentions to spread disinformation on social media.

Social motivation to use social media presented positive relations with main variables. High social media users for social interaction reported greater situational fear ($r = .253$, p

< .001), situational severity ($r = .219$, $p = .001$), situational susceptibility ($r = .217$, p

= .001), and intentions to spread disinformation on social media ($r = .255$, $p < .001$).

Table 18. Bivariate correlations of the individual differences and main variables in Study 2

Study 2	Gender	Age	Education	Whiteness	Income	Issue Involvement	Health Consciousness	Health Blog Usage	Self-efficacy	Conservatism	Amount of SM usage	SM usage	SM news	SM fact-finding	SM social interaction
Belief in Disinformation	-.060	-.130+	.052	-.219**	-.074	.023	-.032	.166*	-.056	.039	-.073	-.037	.029	.121+	.035
Situational fear	-.010	-.127+	.102	-.214**	.032	.259***	.049	.163*	-.070	.083	.028	.161*	.235**	.269***	.253***
Situational severity	-.093	-.026	.119+	-.225**	.034	.290***	.129+	.048	-.002	.160*	-.011	.076	.139*	.182**	.219**
Situational susceptibility	-.063	-.128+	.164*	-.093	.067	.266***	-.057	.093	-.053	.153*	-.018	.066	.135*	.211**	.217**
Intentions to spread disinformation on social media	-.069	-.136*	-.031	-.177**	-.054	.090	-.124+	.068	-.154*	-.015	.086	.177**	.303***	.377***	.255***

Notes. Significant correlations were highlighted. Gender (0 = Male, 1 = Female). ***$p < .001$, **$p < .01$, *$p < .05$, +$p < .10$

Main effects.

H9: H9 hypothesized that disinformation type (fear-neutral vs. fear-arousal) would

significant affect dependent variables (i.e., belief in disinformation, situational fear,

situational threat appraisal, and intentions to spread disinformation on social media).

According to an independent *t*-Test analysis, participants who saw fear-arousing

disinformation reported greater situational severity ($M = 3.89$, $SD = 1.78$) than those who saw

fear-neutral disinformation ($M = 3.17$, $SD = 1.73$) ($t(212) = -2.984$, $p = .003$).

No effects of disinformation type were observed on belief in disinformation, situational

fear, situational susceptibility, and intentions to spread disinformation on social media (see

Table 19).

Table 19. *t*-Test results on main effects of disinformation type on DVs of interest in Study 2

	Fear-neutral disinformation		Fear-arousing disinformation		
	M	*SD*	*M*	*SD*	*t*-test
Belief in disinformation	.39	.28	.34	.28	ns
Situational fear	.40	.28	.34	.28	ns
Situational severity	3.17	1.73	3.89	1.78	-2.984**
Situational susceptibility	.32	.27	.37	.24	ns
Intentions to spread disinformation on social media	-.60	.32	-.61	.31	ns

To further assess the effects of disinformation type, a stepwise liner regression was

conducted to control for individual differences that were correlated with each dependent

variable of interests. Individual differences that showed significant correlations with each

dependent variable were entered in step 1; disinformation type was entered in step 2. All of

the regression analyses confirmed the results of independent *t*-Test and did not show any

differences (see Table 20).

Table 20. Regression results of the main effects in Study 2

Predictor	Belief in disinformation		Situational fear		Situational severity		Situational susceptibility		Intentions to spread disinformation online	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	β	β	β	β	β	β	β	β	β	β
Age	-.059	-.074	-.064	-.060	--	--	-.168*	-.159*	-.023	-.028
Education	--	--	--	--	.101	.081	.140*	.134*	--	--
Whiteness	-.193**	-.193**	-.225**	-.225**	-.278***	-.269***	--	--	-.164*	-.164*
Issue involvement	--	--	.213**	.210**	.288***	.274***	.234**	.232**	--	--
Health consciousness	--	--	--	--	-.025	-.009	--	--	-.158*	-.159*
Health blog usage	.135*	.125+	.017	.020	--	--	--	--	--	--
Self-efficacy	--	--	--	--	--	--	--	--	-.089	-.088
Conservatism	--	--	--	--	.171**	.169**	.168**	.167**	--	--
Social media usage	--	--	-.036	-.037	--	--	--	--	-.007	-.005
Social media use for news	--	--	-.023	-.022	-.109	-.112	-.197+	-.195+	.092	.091
Social media use for fact-finding	.082	.079	.130	.131	.065	.077	.184+	.187+	.286**	.284**
Social media use for social interaction	--	--	.162	.161	.183*	.181*	.156+	.154+	.062	.062
Disinformation (Fear-neutral vs. Fear-arousal)		-.093		.025		.175**		.054		-.029
R^2	.082	.091	.179	.179	.219	.249	.179	.181	.215	.216
R^2 change	.082**	.008	.179***	.000	.219***	.030**	.179***	.003	.215***	.001
F	4.684**	4.147**	5.580***	4.956***	7.182***	7.499***	6.400***	5.679***	7.039***	6.257***

Notes. Dummy-coded variables: Whiteness (0 = Others, 1 = White), Disinformation (0 = Fear-neutral, 1 = Fear-arousal).
$^+p < .10$, $^*p < .05$. $^{**}p < .01$, $^{***}p < .001$.
Diagnostic plots are included in the Appendix H; the residuals for all of the regression models were roughly normal.

Interaction effects.

A series of ANOVAs was conducted to assess the interaction of disinformation condition (fear-neutral vs. fear-arousal) and corrective information condition (simple corrective information vs. narrative corrective information) on dependent variables of interest (H10-H13). Table 22 presents overall interaction results.

H10: H10 postulated a significant interaction between disinformation and corrective information on belief in the disinformation. According to a two-way ANOVA, the interaction was not a significant predictor of belief in disinformation. Furthermore, a two-way ANCOVA did not reveal any significant relationship interaction effect on belief in disinformation was not a significant predictor even when age, whiteness, health blog usage, and social media use for fact-finding were entered as covariates. When data were divided into simple corrective information and narrative corrective information, additional independent *t*-Tests did not show any significant effects of disinformation type on beliefs in said disinformation within the simple corrective information or within the narrative corrective information.

H11: H11 postulated a significant interaction between disinformation and corrective information on situational fear. A two-way ANOVA revealed that the interaction was not a significant predictor of situational fear. Furthermore, a two-way ANCOVA did not reveal any significant relationship after controlling for age, whiteness, issue involvement, health blog usage, social media usage, social media use for news, social media use for fact-finding, and social media use for social interaction. When data were divided into simple corrective information and narrative corrective information, additional independent *t*-Tests did not show any significant effects of disinformation type on beliefs in said disinformation within the simple corrective information or within the narrative corrective information.

H12: H12 postulated a significant interaction between disinformation and corrective information on situational threat appraisal, measured by situational severity (H12-1) and

situational susceptibility (H12-2). Two-way ANOVA analyses did not reveal a significant effect of the interaction on situational severity and situational susceptibility. Furthermore, a two-way ANCOVA confirmed the lack of significance after education, whiteness, issue involvement, health consciousness, conservatism, social media use for news, social media use for fact-finding, and social media use for social interaction were entered as covariates for situational severity. There was also no significant effect on situational susceptibility when age, education, issue involvement, conservatism, social media use for news, social media use for fact-finding, and social media use for social interaction were controlled.

Additional independent *t*-Tests showed that, within the simple corrective information condition, participants who read fear-arousing disinformation reported significantly greater situational severity ($M = 3.82$, $SD = 1.73$) than those who read fear-neutral disinformation ($M = 2.99$, $SD = 1.77$) ($t(103) = -2.375$, $p = .019$). Among those who saw narrative corrective information, participants who saw fear-arousing disinformation reported greater situational severity ($M = 3.94$, $SD = 1.83$) than those who saw fear-neutral disinformation ($M = 3.36$, $SD = 1.67$) and this was significant at a marginal level ($t(107) = -1.736$, $p = .085$) (see Table 21).

Table 21. *t*-Test results on the effect of disinformation type on situational severity by corrective information type in Study 2

Situational severity	Fear-neutral disinformation		Fear-arousing disinformation		t-test
	M	*SD*	*M*	*SD*	
Simple corrective information	2.99	1.77	3.82	1.73	-2.375 (*p* = .019)
Narrative corrective information	3.36	1.67	3.94	1.83	-1.736 (*p* = .085)

H13: Lastly, H13 postulated a significant interaction between disinformation and corrective information on intentions to spread disinformation on social media. A two-way ANOVA showed that the interaction between disinformation type and corrective information

type on intentions to spread disinformation on social media was not significant. A two-way

ANCOVA also showed no significant interaction on intentions to spread disinformation on

social media when age, whiteness, health consciousness, self-efficacy, social media usage,

social media use for news, social media use for fact-finding, and social media use for social

interaction were controlled; therefore, H13 was not supported. An additional analysis using

an independent t-Test did not show any significant results.

Table 22. Interaction results in Study 2

Predictor	Belief in disinformation			Situational fear			Situational severity			Situational susceptibility			Intentions to spread disinformation online		
	df	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value	*df*	F	*p*-value
Age	1	1.152	.284	1	.743	.390	--	--	--	1	5.558	.019	1	.163	.687
Education	--	--	--	--	--	--	1	1.828	.178	1	4.863	.029	--	--	--
Whiteness	1	6.438	.012	1	8.728	.004	1	16.904	.000	--	--	--	1	5.217	.023
Issue involvement	--	--	--	1	7.811	.006	1	14.231	.000	1	10.701	.001	--	--	--
Health consciousness	--	--	--	--	--	--	1	.028	.868	--	--	--	1	4.965	.027
Health blog usage	1	3.132	.078	1	.076	.784	--	--	--	--	--	--	--	--	--
Self-efficacy	--	--	--	--	--	--	--	--	--	--	--	--	1	1.532	.217
Conservatism	--	--	--	--	--	--	1	7.925	.005	1	7.890	.005	--	--	--
Social media usage	--	--	--	1	.315	.575	--	--	--	--	--	--	1	.016	.898
Social media use for news	--	--	--	1	.056	.813	1	1.155	.284	1	3.446	.065	1	.620	.432
Social media use for fact-finding	1	1.457	.229	1	1.832	.177	1	.624	.430	1	3.462	.064	1	7.745	.006
Social media use for social interaction	--	--	--	1	2.635	.106	1	3.901	.050	1	2.855	.093	1	.414	.521
Disinformation	1	2.093	.149	1	.087	.768	1	7.801	.006	1	.531	.467	1	.267	.606
Corrective Information	1	1.256	.264	1	2.990	.085	1	.400	.528	1	2.746	.099	1	.902	.343
Disinformation × Corrective Information	1	.053	.818	1	.000	.992	1	.289	.592	1	.042	.838	1	.001	.973
Error	206			202			202			203			202		

Notes. Dummy-coded variables: Whiteness (0 = Others, 1 = White), Disinformation (0 = Fear-neutral, 1 = Fear-arousal), Corrective information (1 = Simple correction, 2 = Narrative corrective information).

RQ3-2: RQ3-2 addressed the moderating roles of individual differences (i.e., education, age, whiteness, issue involvement, health consciousness, conservatism, health blog usage, social media usage, social media use for news, social media use for fact-finding, and social media use for social interaction) in interactions between disinformation (fear-arousing vs. fear-neutral) and corrective information (simple corrective information vs. narrative corrective information) on dependent variables of interest. A series of linear regressions were conducted to investigate the three-way interactions. In step 1, disinformation condition, corrective information condition, and a variable of individual difference were entered. In step 2, the subsequent two-way interactions (i.e., disinformation condition $\times$ corrective information condition, disinformation condition $\times$ a variable of individual difference, and corrective information condition $\times$ a variable of individual difference) were entered. In step 3, the three-way interaction (i.e., disinformation condition $\times$ corrective information condition $\times$ a variable of individual difference) was entered. See Appendix I for diagnostic plots on significant results. The residuals for all of the regression models were roughly normal.

Three-way interactions between disinformation type, corrective information type, and individual differences that correlated with each dependent variable of interest were not significant predictors of beliefs in said disinformation or situational fear.

A three-way interaction between disinformation condition, corrective information condition, and social media use for news on situational severity was significant ($\Delta R^2 = .025$, $p = .018$, $\beta = .705$), according to the regression analysis. To plot this three-way interaction, social media use for news was divided into three groups: low social media use for news (below 4.50), medium social media use for news (from 4.50 to 5.75) high social media use for news (above 5.75); see Figure 9.

Figure 9. Three-way interaction between disinformation type, corrective information type, and social media use for news on situational severity (Study 2)
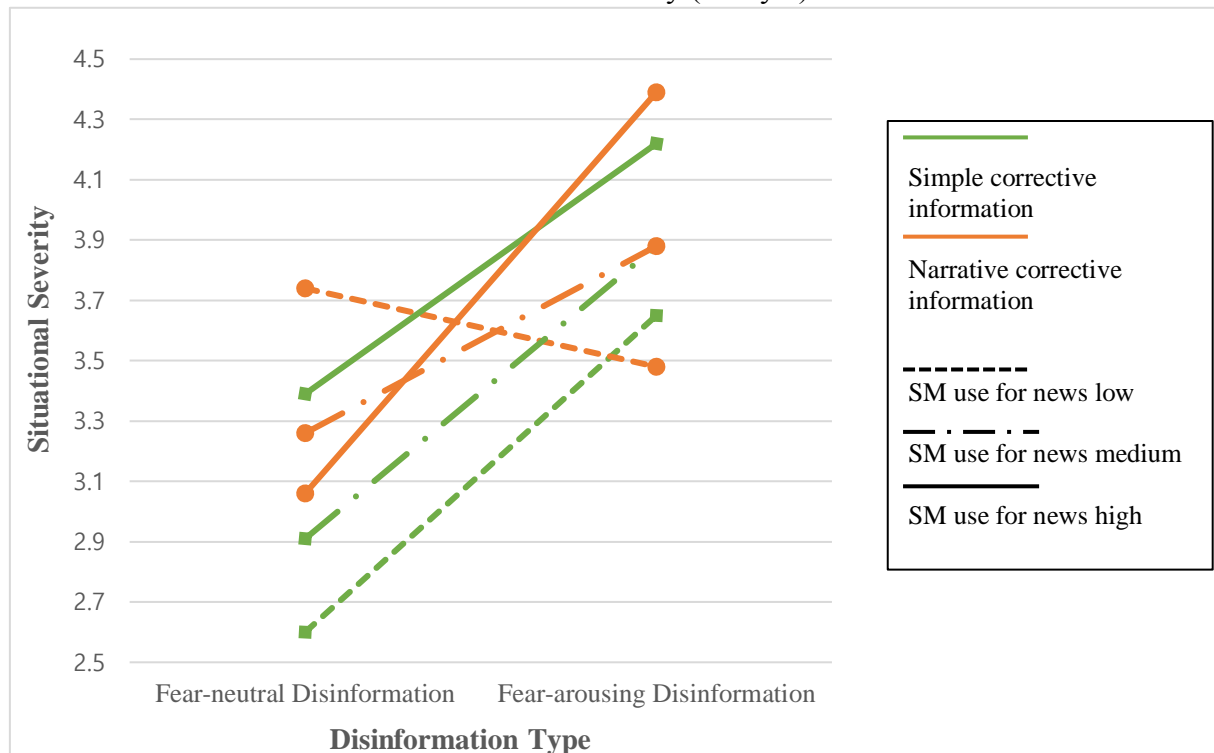
According to Figure 9, simple corrective information always backfires with fear-arousing disinformation because green lines are always increasing in fear-arousing disinformation when it comes to situational severity.

Although the interaction between disinformation condition and corrective information condition was not significant within each level of social media use for news when investigated separately, the overall graph reveals that narrative corrective information resulted in greater situational severity among high social media news users in the fear-neutral disinformation condition. For low social media users for news within the fear-neutral disinformation condition, participants who saw narrative corrective information reported greater situational severity than those who saw simple corrective information (see Figure 9-a). For high social media users within the fear-neutral disinformation condition, participants

who saw narrative corrective information reported less situational severity than those who saw simple corrective information (see Figure 9-b).

For low social media users within the fear-arousing disinformation condition, participants who saw narrative corrective information reported less situational severity than those who saw simple corrective information. For high social media users within the fear-neutral disinformation condition, participants who saw narrative corrective information reported greater situational severity than those who saw simple corrective information.

The effect of the interaction between disinformation condition and corrective information condition flipped between low and high social media users for news. For low social media users for news, narrative corrective information resulted in greater situational severity after seeing fear-neutral disinformation compared to participants who saw fear-neutral disinformation and simple corrective information. Low social media news users who saw fear-arousing disinformation and simple corrective information reported greater situational severity than those who saw fear-arousing disinformation and narrative corrective information. For high social media users for news, this relationship was reversed; high social media news users who saw fear-neutral disinformation and narrative corrective information reported less situational severity than those who saw fear-neutral disinformation and simple corrective information, but high social media news users reported greater situational severity after viewing fear-arousing disinformation and narrative corrective information compared to those who saw simple corrective information.

The interaction between disinformation type and social media news usage was not significant within each condition of corrective information when investigated separately. The interaction between corrective information type and social media news usage was also not significant within each condition of disinformation when investigated separately.

Figure 9-a. Interaction between disinformation type and corrective information type on situational severity among low social media news users (Study 2)

Notes. The green line was significant ($p < .10$). The corrective information type showed significant difference within the fear-neutral disinformation condition ($p < .05$).
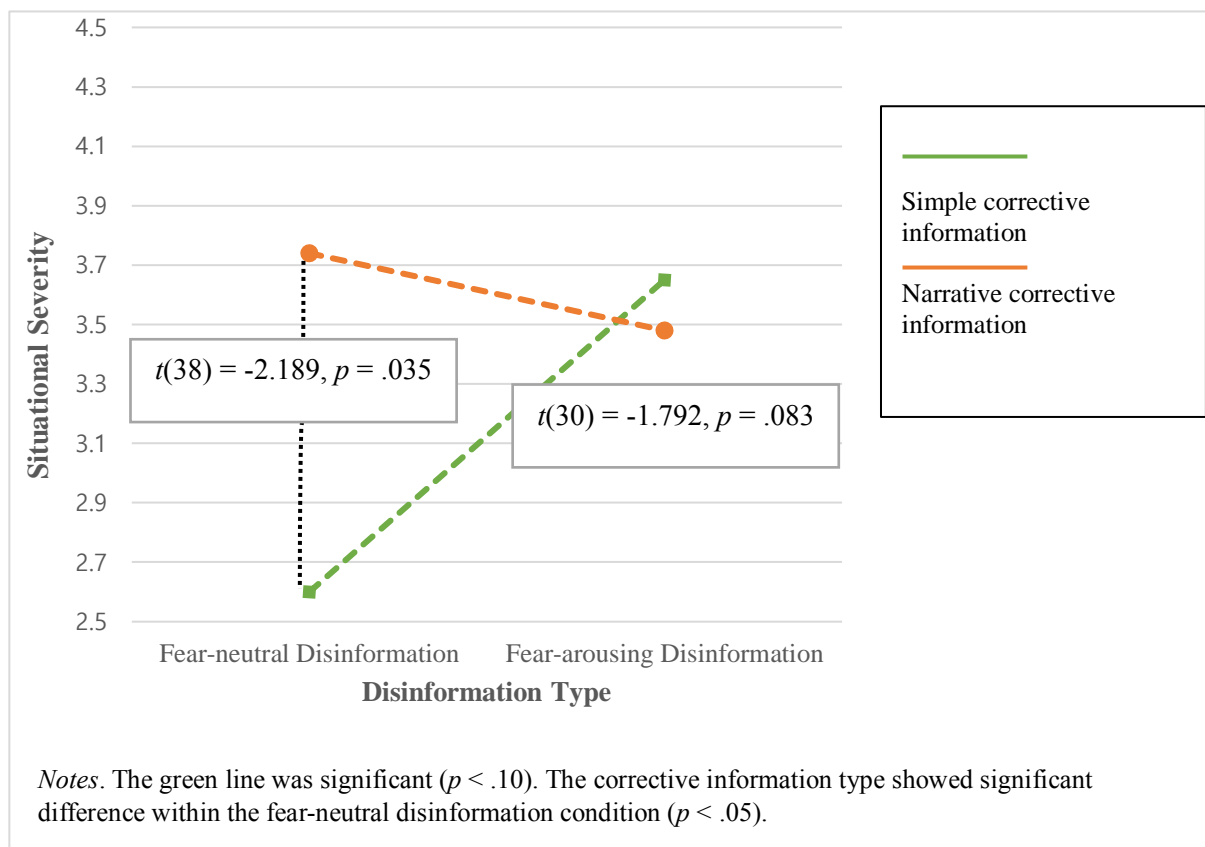
Figure 9-b. Interaction between disinformation type and corrective information type on situational severity among medium social media news users (Study 2)

Notes. All unlabeled lines were not significant.

Figure 9-c. Interaction between disinformation type and corrective information type on situational severity among high social media news users (Study 2)

Notes. The orange line was significant ($p < .05$).

A three-way interaction between disinformation condition, corrective information condition, and social media use for news was significant on situational susceptibility at a marginal level ($\Delta R^2 = .015$, $p = .067$, $\beta = .561$). This interaction was plotted in Figure 10.

Figure 10. Three-way interaction between disinformation type, corrective information type, and social media news use on situational susceptibility (Study 2)
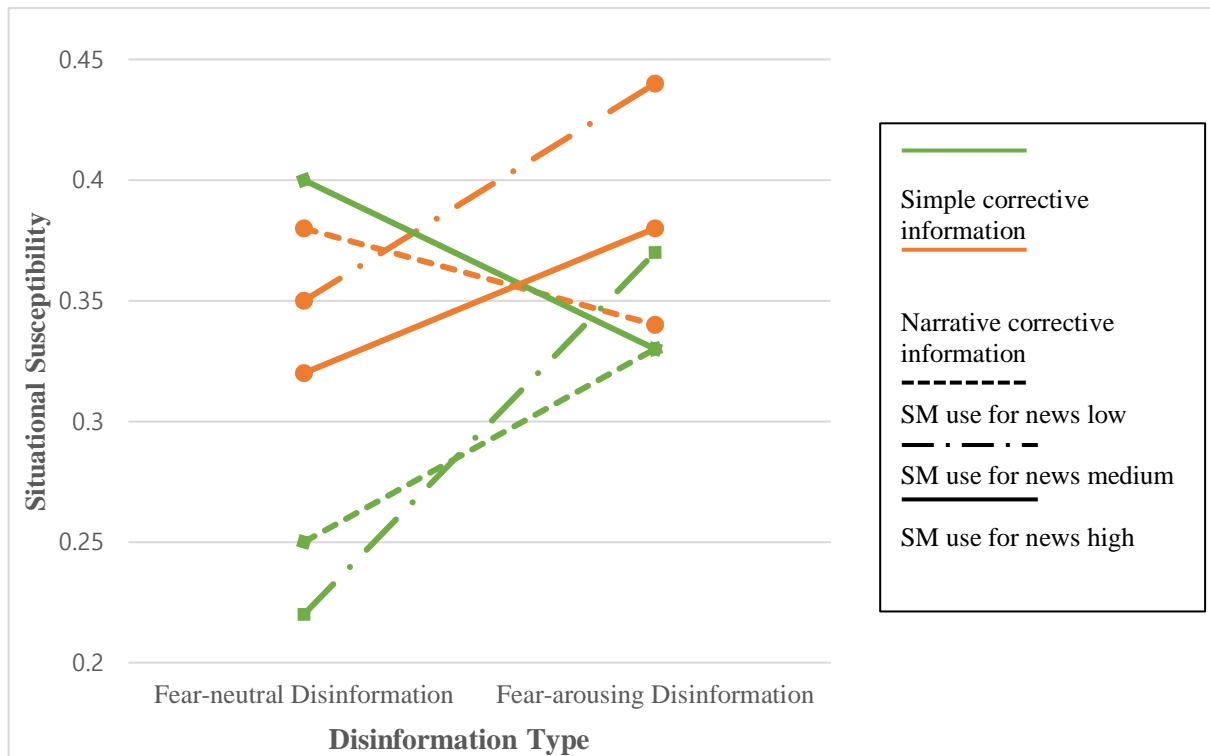
Although the interaction between disinformation type and corrective information type was not significant for each level of social media use for news when investigated separately, the overall graph reveals that for high social media news users, participants who faced with fear-neutral disinformation and narrative corrective information reported less situational susceptibility than participants who saw fear-neutral disinformation and simple corrective information. However, narrative corrective information increased situational susceptibility with fear-arousing disinformation for high social media news users (see Figure 10-c). This relationship reversed for low social media news users; Low social media news users who saw fear-neutral disinformation and narrative corrective information reported greater situational susceptibility than those who saw fear-neutral disinformation and simple corrective information (see Figure 10-a).

The interaction between disinformation type and social media news usage was not significant within each condition of corrective information when investigated separately. The interaction between corrective information type and social media news usage was also not significant within each condition of disinformation when investigated separately.

Figure 10-a. Interaction between disinformation type and corrective information type on situational susceptibility among low social media news users (Study 2)

Notes. All unlabeled lines were not significant.

Figure 10-b. Interaction between disinformation type and corrective information type on situational susceptibility among medium social media news users (Study 2)

$t(37) = -1.954, p = .058$

Notes. The green line was significant ($p < .10$).

Figure 10-c. Interaction between disinformation type and corrective information type on situational susceptibility among high social media news users (Study 2)

Notes. All unlabeled lines were not significant.

A three-way interaction between disinformation condition, corrective information condition, and whiteness was significant ($\Delta R^2 = .023$, $p = .025$, $\beta = -1.079$), according to the regression analysis. Figure 11 displays the interaction. The interaction was then tested in each non-whites and whites. For non-white participants, the interaction was significant at a marginal level, according to the ANOVA result ($F(1, 53) = 3.818$, $p = .056$), but the interaction was not significant among white participants. Hence, for non-white participants, narrative corrective information backfired with fear-arousing disinformation in that it increased intentions to spread disinformation on social media, although it worked with fear-neutral disinformation.

The interaction between disinformation type and whiteness was significant within the narrative corrective information condition, according to the regression analysis ($\Delta R^2 = .041$, $p = .033$, $\beta = -.386$, see Figure 11-a) but not within the simple corrective information condition. Additionally, the interaction between corrective information type and whiteness was significant within the fear-arousing disinformation condition, according to the regression analysis ($\Delta R^2 = .046$, $p = .034$, $\beta = -.806$).

Figure 11. Three-way interaction between disinformation type, corrective information type, and whiteness on intention to spread disinformation on social media (Study 2)
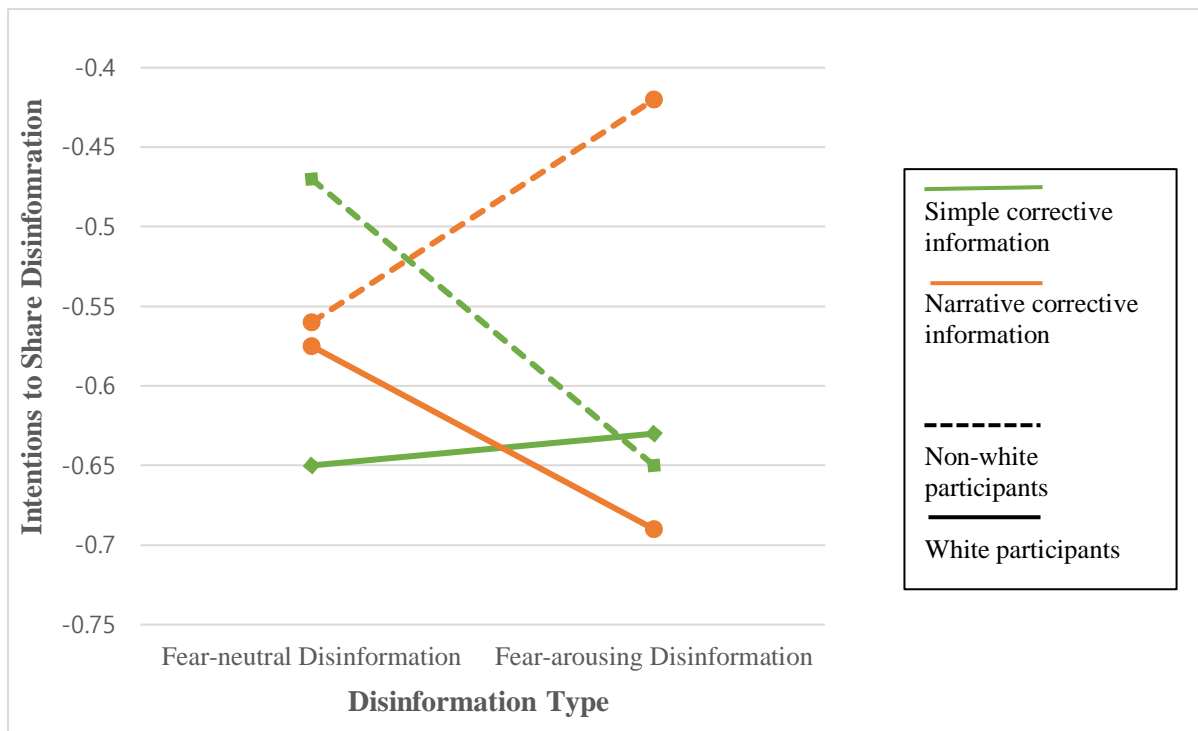
Figure 11-a. Interaction between disinformation type and whiteness on intentions to spread disinformation on social media within narrative corrective information (Study 2)
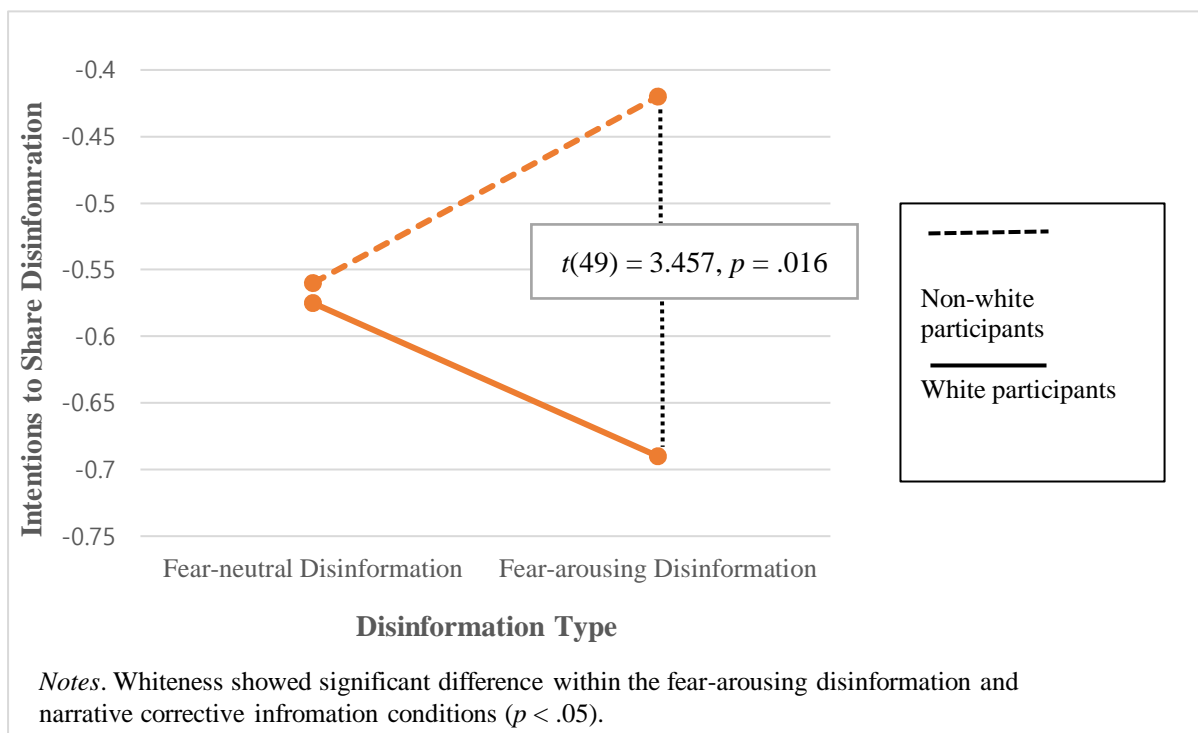
Notes. Whiteness showed significant difference within the fear-arousing disinformation and narrative corrective infromation conditions ($p < .05$).

A three-way interaction between disinformation condition, corrective information condition, and self-efficacy on intention to spread disinformation on social media was also significant at a marginal level ($\Delta R^2 = .016$, $p = .063$, $\beta = .579$), according to the regression analysis. To plot this interaction, self-efficacy was divided into three groups: low self-efficacy (below 4.75), medium self-efficacy (from 4.75 to 5.75), and high self-efficacy (above 5.75); see Figure 12.

Figure 12. Three-way interaction between disinformation type, corrective information type, and self-efficacy on intentions to spread disinformation on social media (Study 2)

Although the interaction between disinformation condition and corrective information condition was not significant for each level of self-efficacy when investigated separately using regression analyses, the overall graph reveals that narrative corrective information resulted in greater intentions to spread disinformation on social media among high self-efficacy participants in the fear-arousing disinformation condition. For low self-efficacy participants within the fear-neutral disinformation condition, participants who saw simple

corrective information reported less intention to spread disinformation on social media than those who saw narrative corrective information (see Figure 12-a). For high self-efficacy participants, participants who saw simple corrective information reported greater intention to spread disinformation on social media than those who saw narrative corrective information (see Figure 12-c). When facing fear-arousing disinformation, high self-efficacy participants reported greater intentions when seeing narrative corrective information than those who saw simple corrective information.
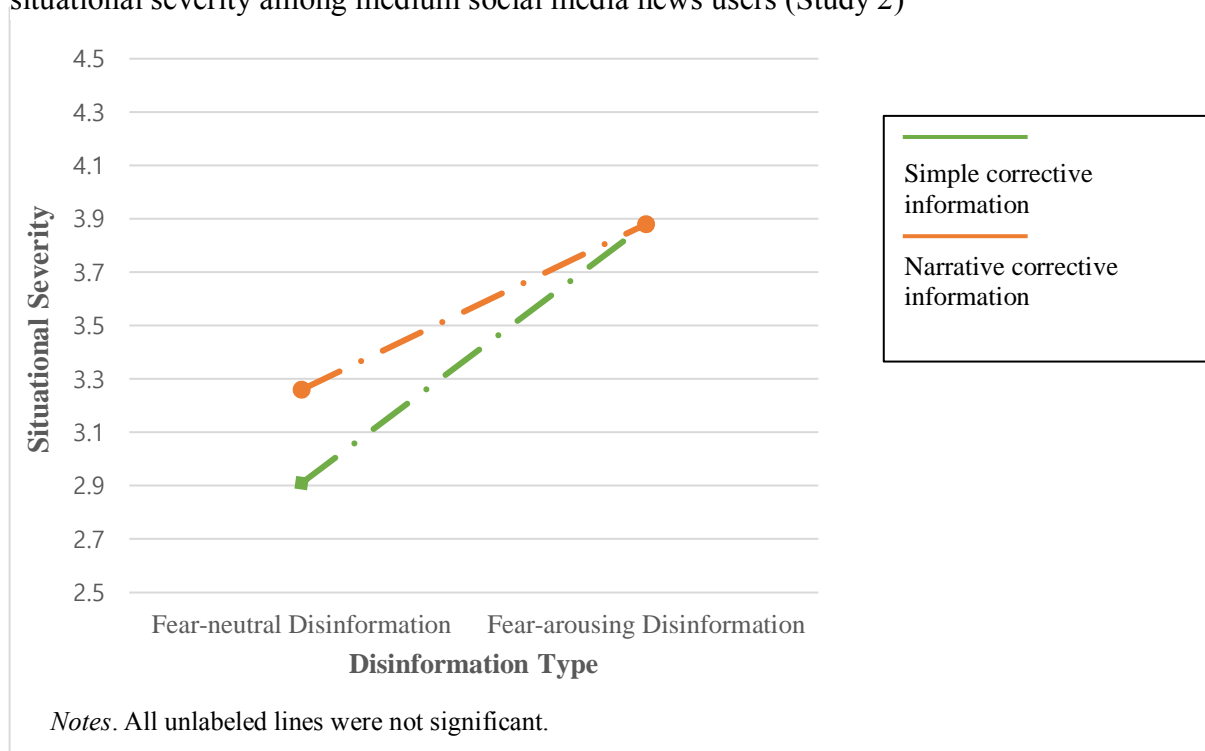
The effect of the interaction between disinformation condition and corrective information condition flipped between low and high self-efficacy participants. For low self-efficacy participants, narrative corrective information resulted in greater intentions to spread disinformation on social media after seeing fear-neutral disinformation compared to participants who saw fear-neutral disinformation and simple corrective information. This gap becomes closer in the fear-arousing disinformation condition because intentions to spread disinformation on social media increased for low self-efficacy participants who faced with fear-arousing disinformation and simple corrective information. For high self-efficacy participants, on the other hand, narrative corrective information resulted in greater intentions to spread disinformation on social media after seeing fear-arousing disinformation, but it resulted in less intentions to spread disinformation on social media after seeing fear-neutral disinformation. That said, when high self-efficacy participants faced with narrative corrective information, they reported greater intention to spread disinformation on social media after seeing fear-arousing disinformation, but they reported less intention to spread disinformation on social media after seeing fear-neutral disinformation.

The interaction between disinformation type and self-efficacy was not significant within each condition of corrective information when investigated separately using regression analyses. The interaction between corrective information type and self-efficacy was also not

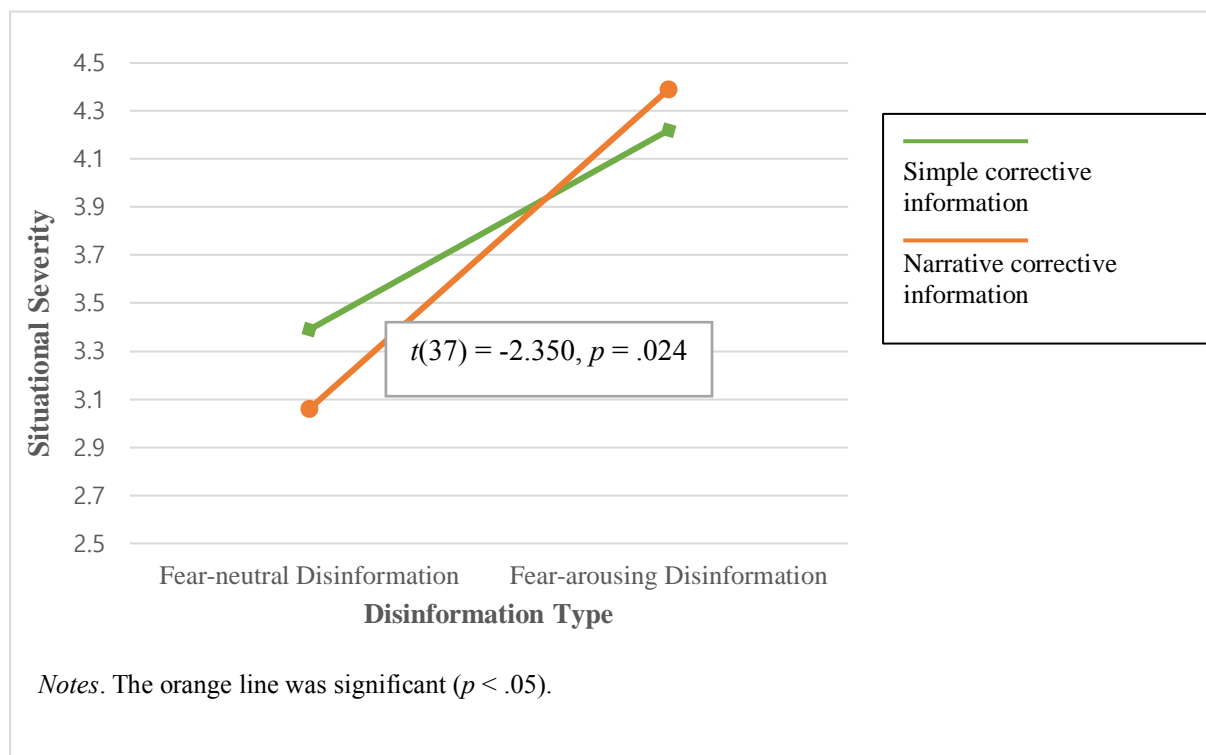significant within each condition of disinformation when investigated separately using

regression analyses.

Figure 12-a. Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among low self-efficacy participants (Study 2)

Notes. All unlabeled lines are not significant
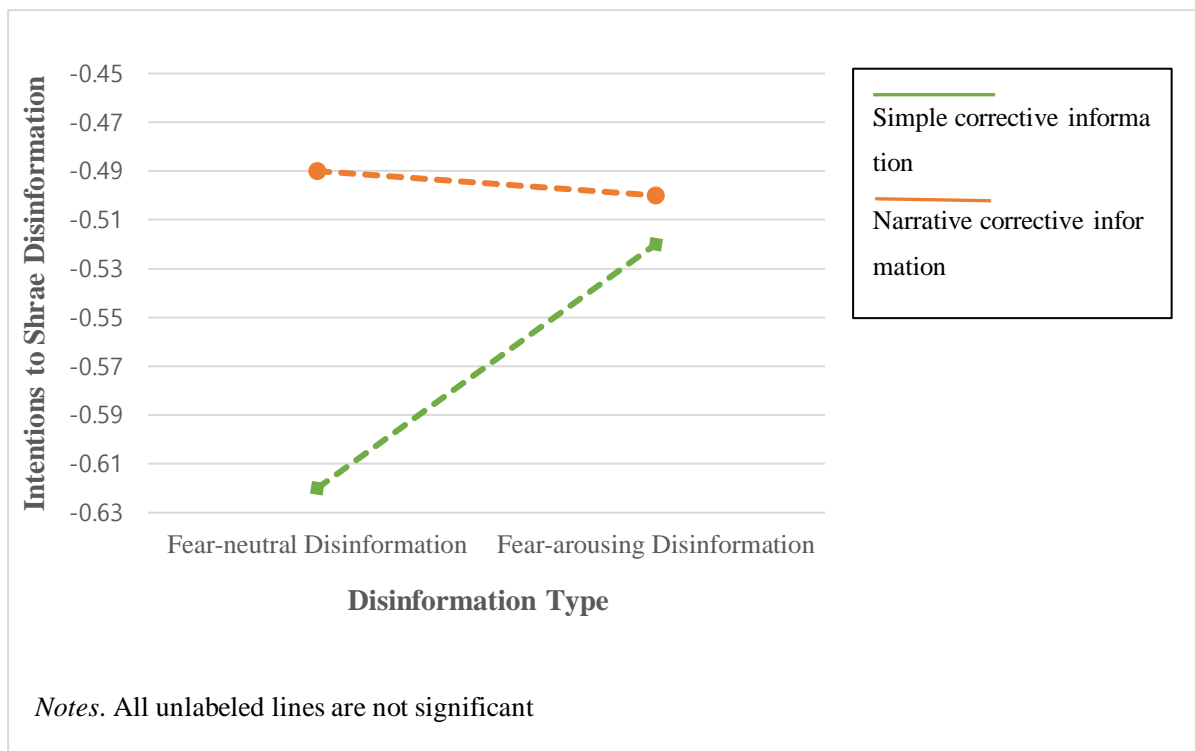
Figure 12-b. Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among medium self-efficacy participants (Study 2)

Notes. All unlabeled lines were not significant.
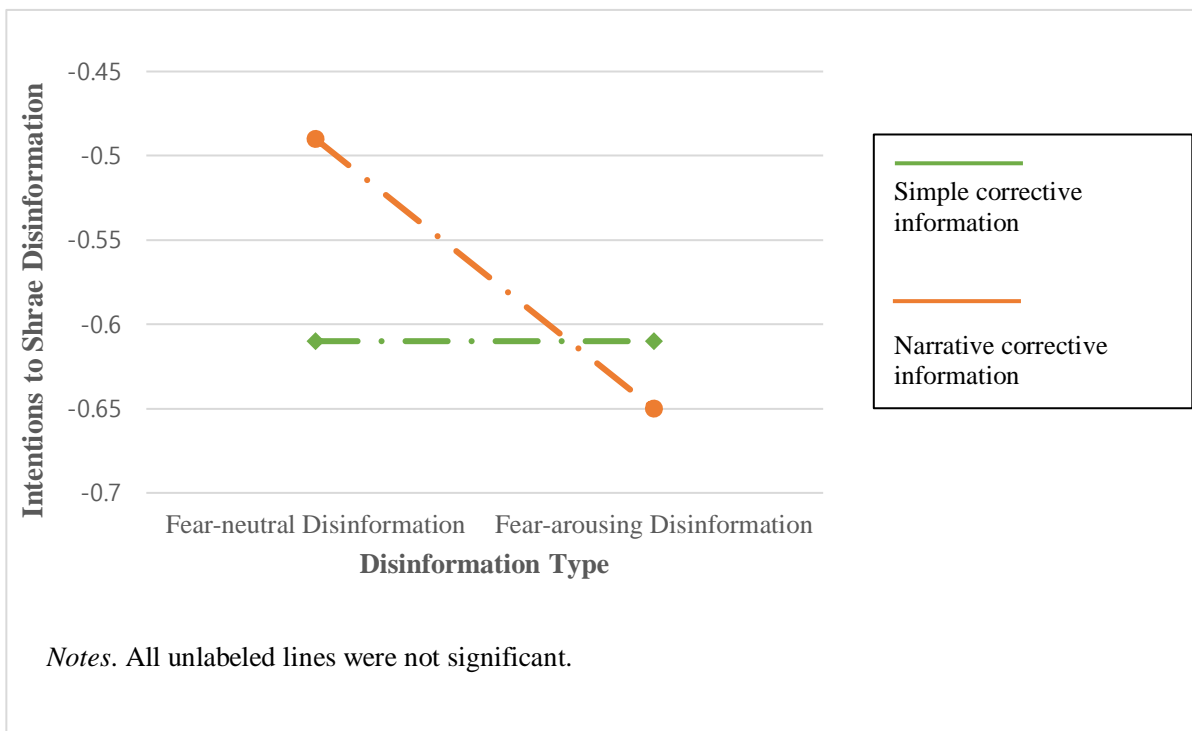
Figure 12-c. Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among high self-efficacy participants (Study 2)

Notes. All unlabeled lines were not significant.

A three-way interaction between disinformation condition, corrective information condition, and social media use for social interaction on intention to spread disinformation on social media was statistically significant ($\Delta R^2 = .021$, $p = .031$, $\beta = .693$), according to the regression analysis. To plot this interaction, social media use for social interaction was divided into three groups: low social media use for social interaction (below 4.50), medium social media use for social interaction (from 4.50 to 5.25) and high social media use for social interaction (above 5.25). Figure 13 displays the three-way interaction.

Figure 13. Three-way interaction between disinformation type, corrective information type, and social media use for social interaction on intention to spread disinformation on social media (Study 2)
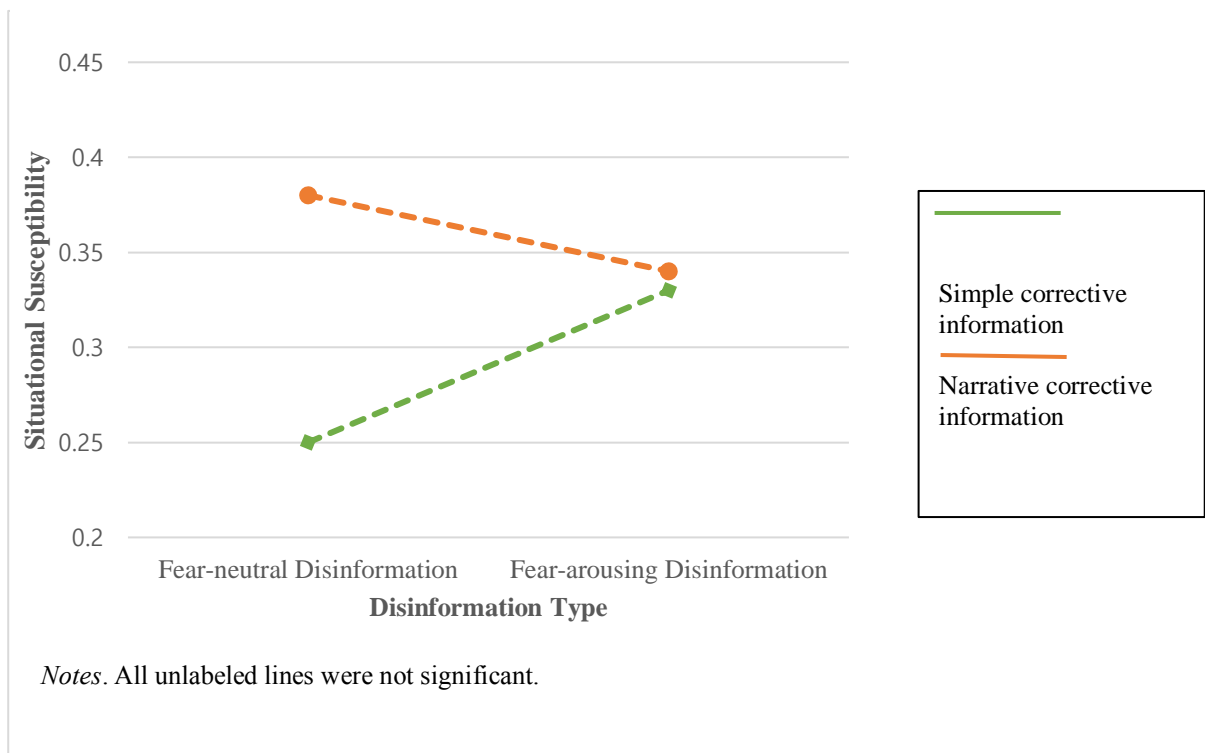

Although the interaction between disinformation condition and corrective information condition was not significant for each level of social media use for social interaction when investigated separately, the overall graph reveals that high social media users for social interaction showed a different interaction, compared to middle and low social media users for

social interaction (see Figure 13-a, 13-b, and 13-c for comparison). For high social media users for social interaction, those who faced with fear-neutral disinformation reported less intention to spread disinformation on social media after seeing narrative corrective information, compared to those who faced with simple corrective information. However, when high social media users for social interaction faced with fear-arousing disinformation, participants who read narrative corrective information reported greater intention to spread disinformation on social media than those who read simple corrective information.

For middle and low social media users for social interaction, narrative corrective information backfired for fear-neutral disinformation, but it worked for fear-arousing disinformation. That said, when faced with fear-neutral disinformation, middle and low social media users for social interaction who read narrative corrective information reported greater intention to spread disinformation on social media than those who read simple corrective information. In the fear-arousing disinformation condition, however, middle and low social media users for social interaction reported less intention to spread disinformation on social media when seeing narrative corrective information.
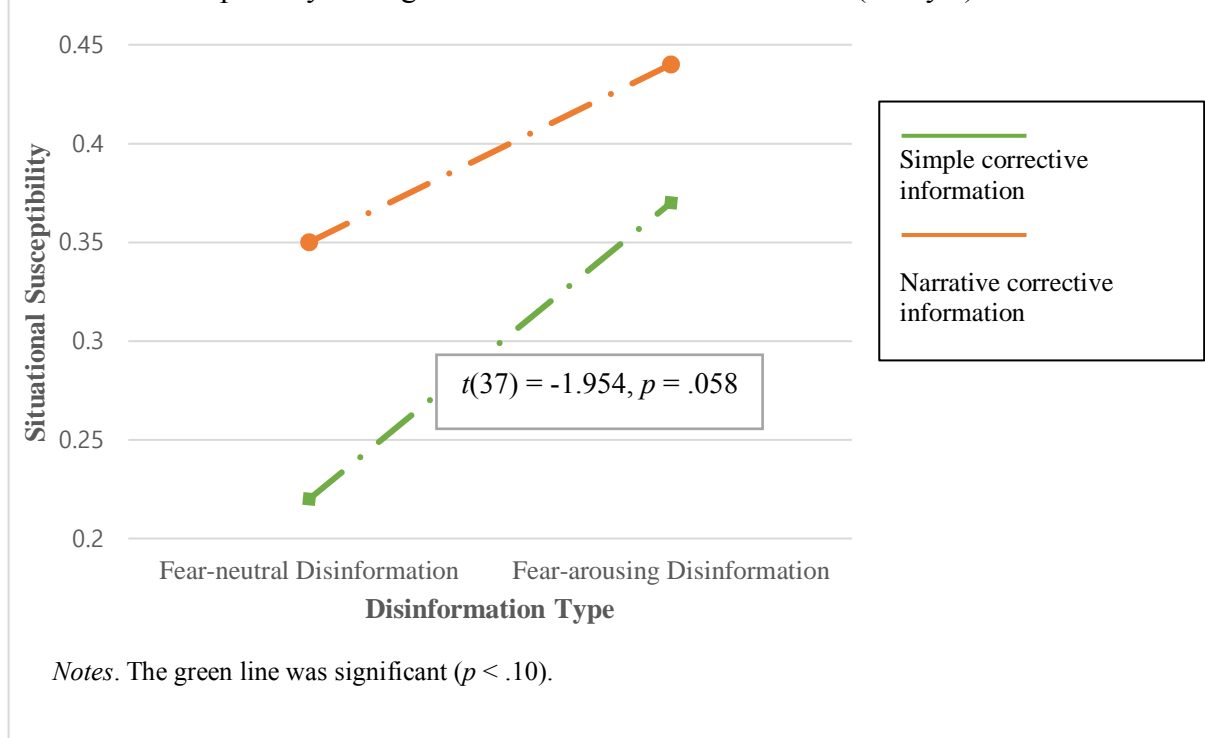
The interaction between disinformation type and social media use for social interaction was not significant within each condition of corrective information when investigated separately. The interaction between corrective information type and social media use for social interaction was also not significant within each condition of disinformation when investigated separately.
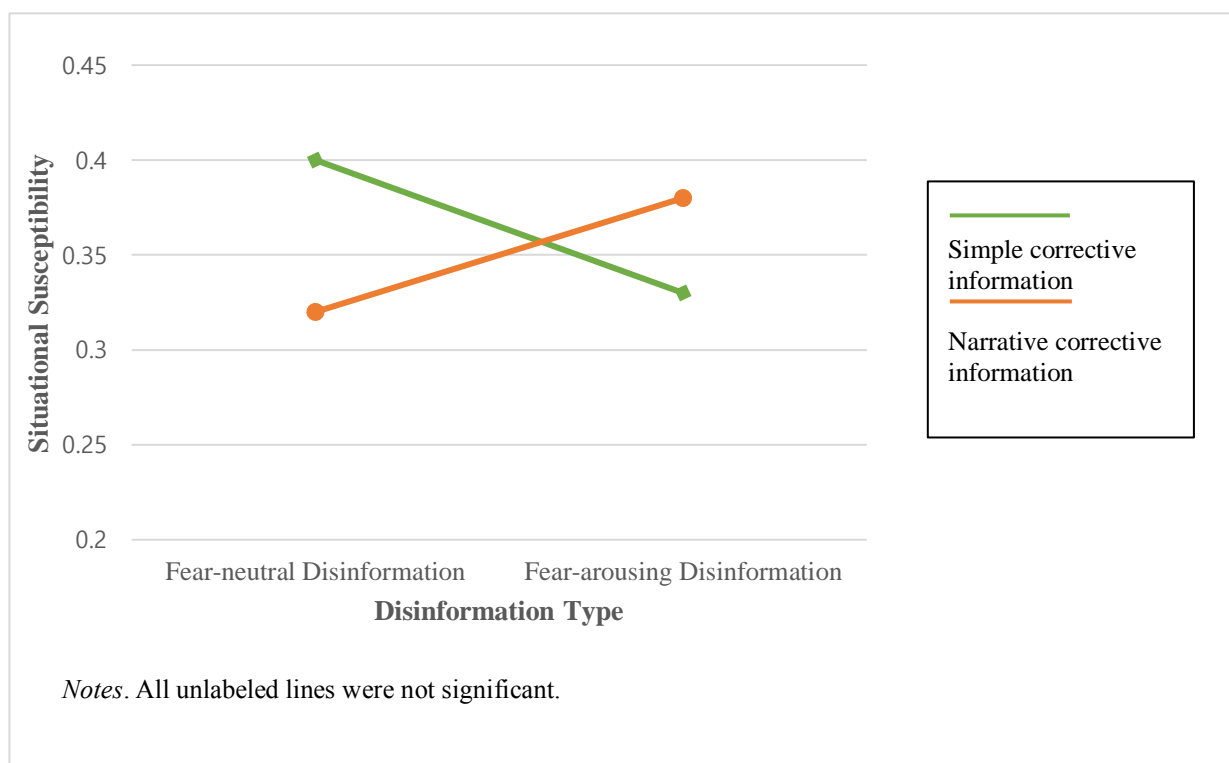
Figure 13-a. Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among low social media users for social interaction (Study 2)

Notes. All unlabeled lines are not significant
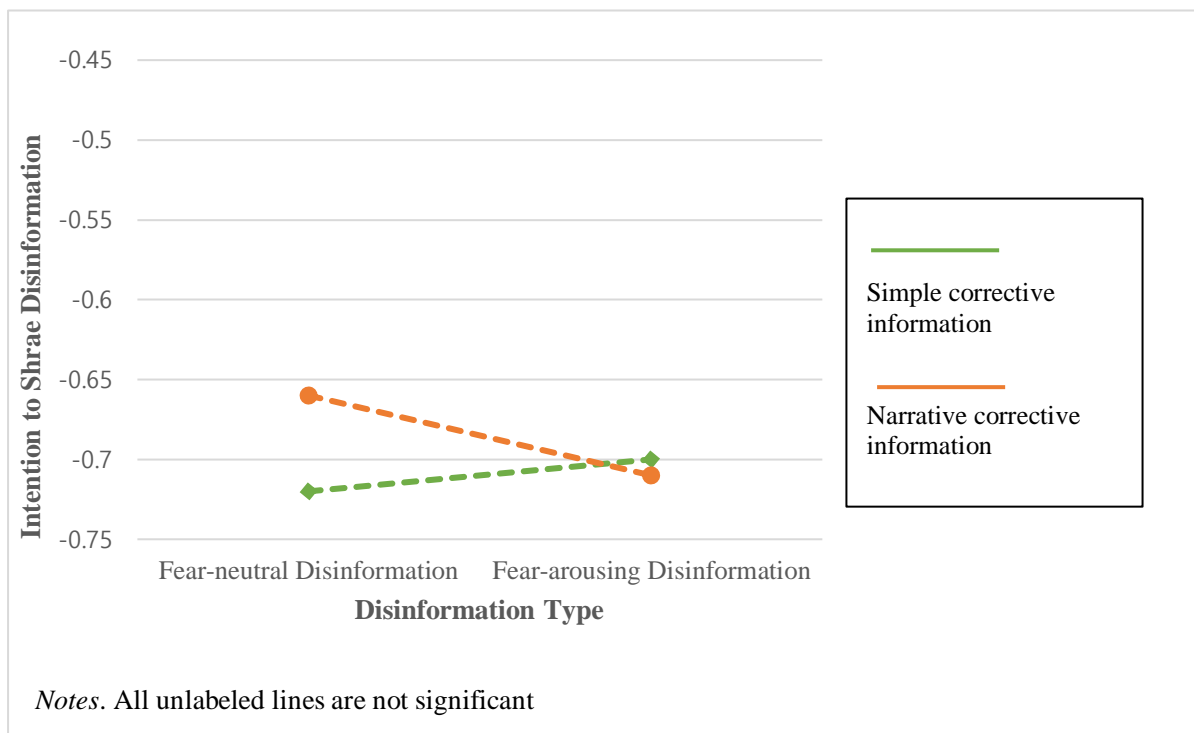
Figure 13-b. Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among medium social media users for social interaction (Study 2)

Notes. The corrective information type showed significant difference within the fear-neutral disinformation condition ($p < .10$).
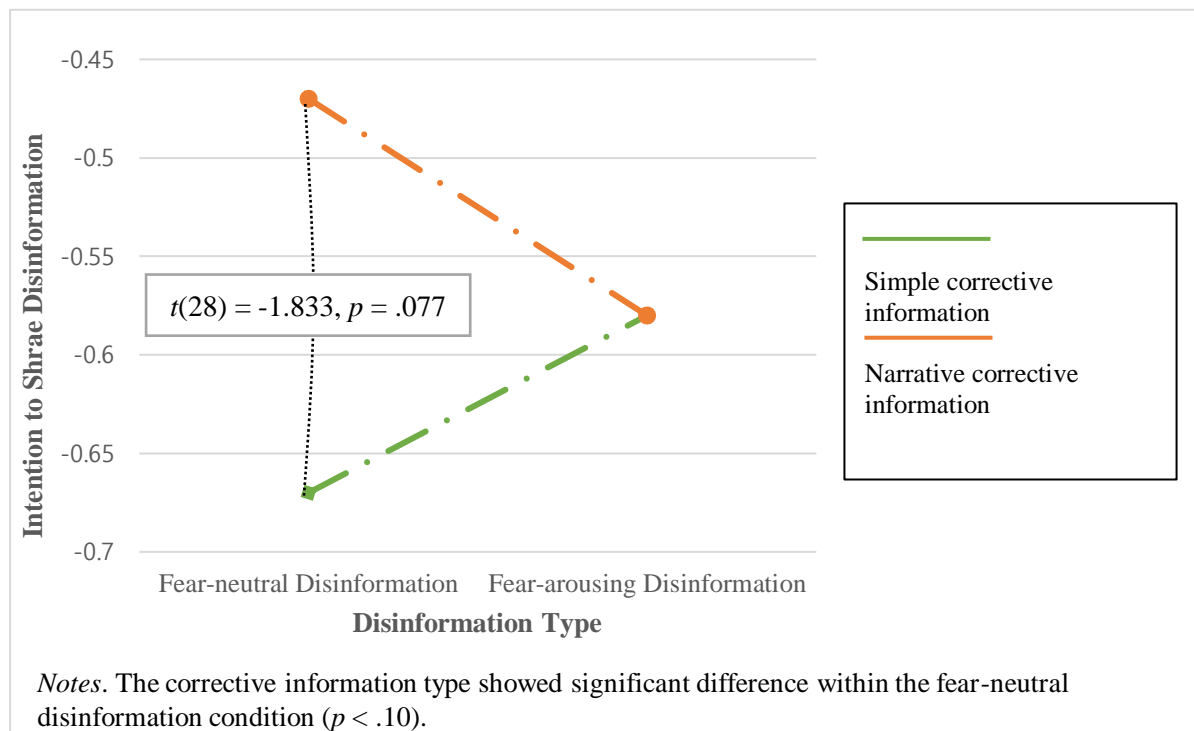
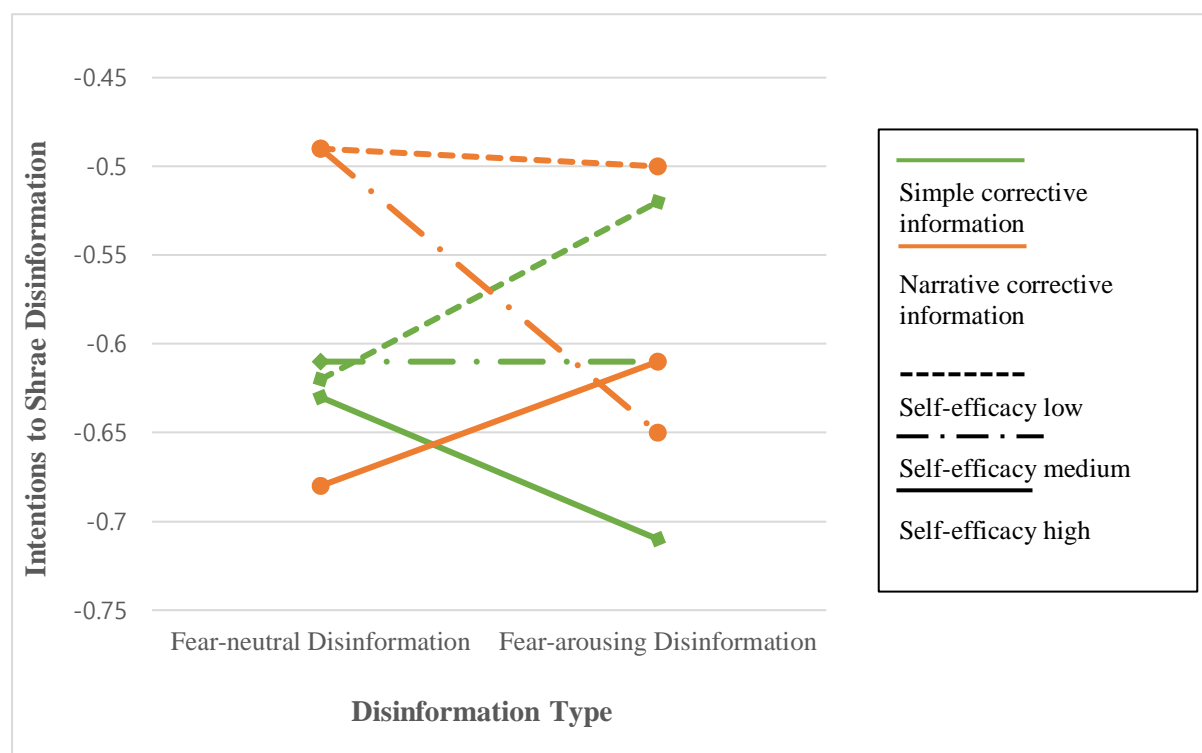**Figure 13-c.** Interaction between disinformation type and corrective information type on intentions to spread disinformation on social media among high social media users for social interaction (Study 2)

Notes. All unlabeled lines were not significant.
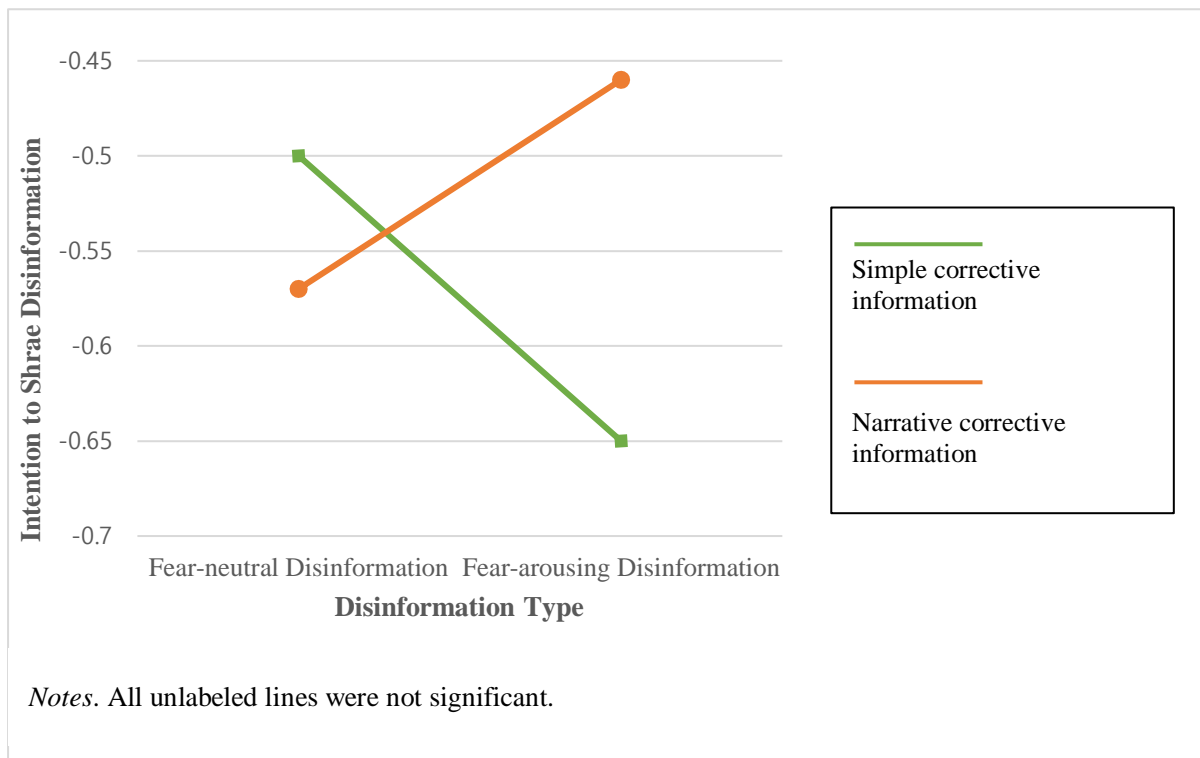
Mediation effects.

H14-H16: Analyses for proposed mediation effects could not be conducted because there was no effect of the interaction on belief in disinformation, situational fear, situational threat appraisal, and intentions to spread disinformation on social media. Therefore, H14-H16 were not supported.

Discussion

The purpose of Study 2 was to examine how the impact of disinformation type (i.e., fear-neutral disinformation vs. fear-arousing disinformation) is moderated by corrective information type (i.e., simple corrective information vs. narrative corrective information) on belief in said disinformation (a), situational fear (b), situational threat appraisal (c), and intentions to spread said disinformation on social media (d).

H9 postulated a main effect of disinformation type. Analyses revealed a significant effect only on situational severity such that participants who read fear-arousing disinformation reported greater situational severity than those who read fear-neutral disinformation. This finding replicates the significant main effect of disinformation type on situational severity found in Study 1. This suggests that fear-arousing disinformation is more effective in raising perception of seriousness of the risky situation than fear-neutral disinformation, regardless of corrective information type.

However, no significant main effects of disinformation type on belief in disinformation and situational fear in Study 2 were inconsistent with the findings of Study 1. A possible reason is that belief in disinformation and situational fear could be affected by corrective information type. The dependent variables of interest were measured after the corrective information was shown; therefore, corrective information type (i.e., no corrective information, simple corrective information vs. narrative corrective information) could affect the direct effects of disinformation type on belief in disinformation and situational fear.

There were no significant effects of the two-way interaction between disinformation type and corrective information type on any of the dependent variables of interest (H10-13), which were counter to the hypotheses. This lack of significant findings implies that the effects of narrative corrective information on decreasing belief in said disinformation, situational fear, situational susceptibility, and intentions to spread disinformation on social media were not significantly different compared to simple corrective information. This is also counter to prior literature, which suggested that narrative corrective information could be used as an enhanced corrective information strategy by increasing engagement with corrective information content and replacing one's preexisting mental model (Cappella et al., 2015). Simply engaging with the narrative story may not be sufficient to decrease effects of disinformation in either fear-arousing or fear-neutral disinformation conditions. A possible

explanation of this finding is that while reading the narrative corrective information, participants could not perceive the content as their own stories under risky situations. Narrative corrective information could be of high interest and emotionally engage readers in the story. However, it could also free up cognitive processing, allowing flexible processing of the content (McDaniel, Waddill, Finstad, & Bourg, 2000). This flexible cognitive processing might cause participants not to be persuaded by the narrative corrective information content.

It is important to note, however, the effect of disinformation type on situational severity was significant in both the simple corrective information and the narrative corrective information condition. Specifically, participants who saw fear-arousing disinformation and simple corrective information reported greater situational severity than those who saw fear-neutral disinformation and simple corrective information. Also, participants who saw fear-arousing disinformation and narrative corrective information reported greater situational severity than those who saw fear-neutral disinformation and narrative corrective information. These results suggest that regardless of corrective information type, fear-arousing disinformation plays a key role in increasing situational severity. This could be also interpreted again by the backfire effect of corrective information on situational severity when fear-arousing disinformation is presented. Corrective information might remind participants of disinformation content and this reminder could increase situational severity in the fear-arousing disinformation condition. Participants who saw fear-arousing disinformation could recall the fearful disinformation content by reading corrective information and perceive the seriousness of the situation.

Interestingly, there were significant findings of moderating roles of several individual differences. Social media use for news significantly moderated the interaction between disinformation type and corrective information type on situational severity and situational susceptibility, which implies that the interaction could be different across the frequency of

social media use for news. Whiteness, self-efficacy, and social media use for social interaction significantly moderated the interaction on in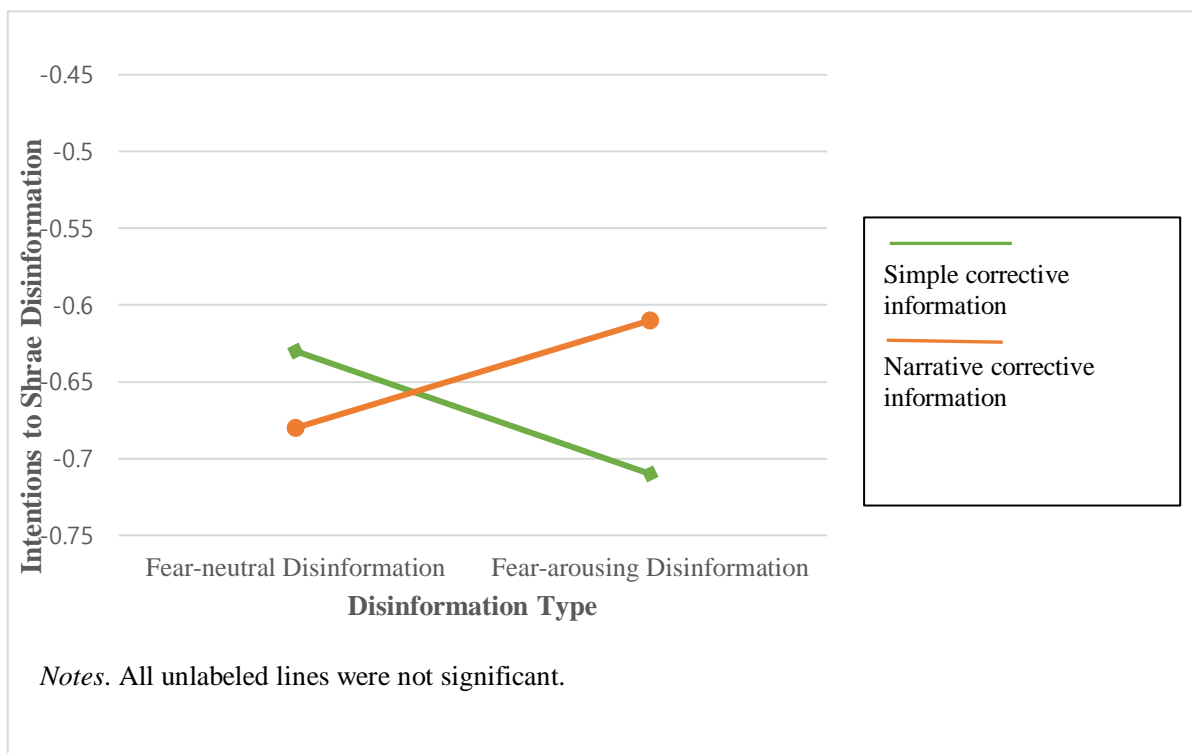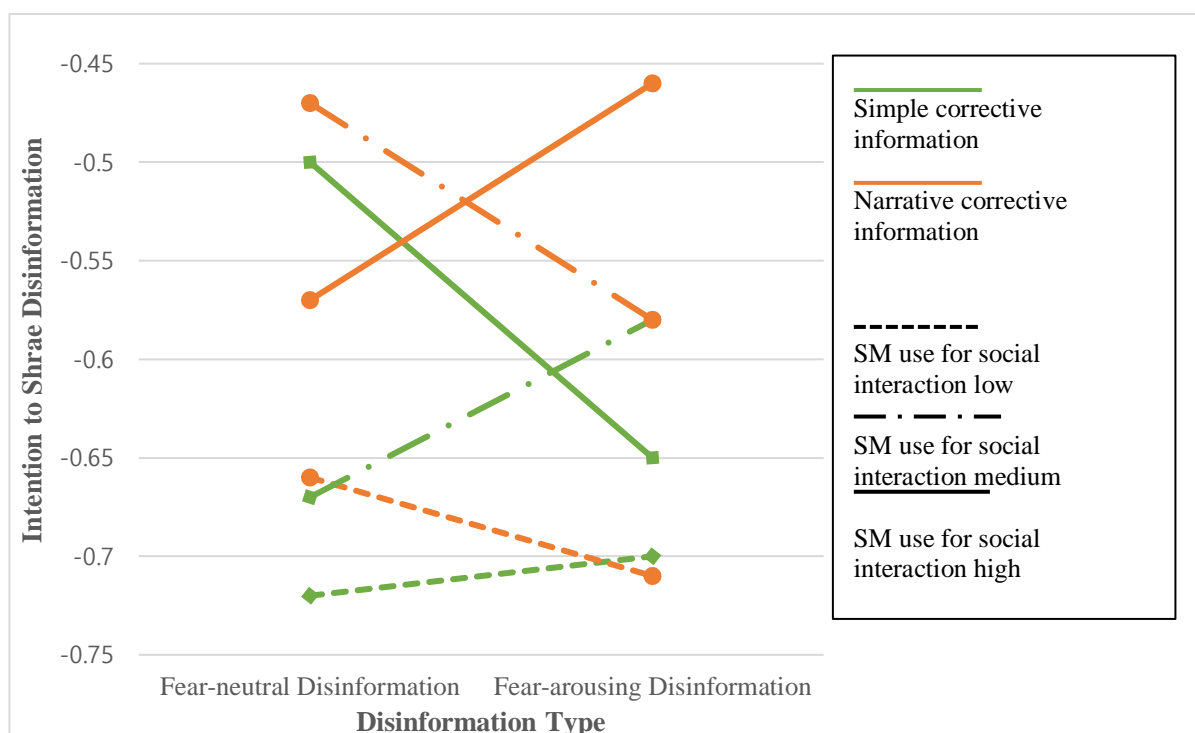tentions to spread disinformation on social media. These results add to the non-significant interaction between disinformation and corrective information on intentions to spread disinformation on social media such that the interaction could be differed by whiteness, self-efficacy, and social media use for social interaction.

Of particular note is that for high social media users for news, for high social media users for social interaction, and for high self-efficacy participants, narrative corrective information backfired with fear-arousing disinformation, but it worked for fear-neutral disinformation. For these participants, simple corrective information backfired for fear-neutral disinformation while it worked for fear-arousing disinformation.

First, high social media news users and social interaction users might have confidence in themselves that they have abilities to discern disinformation from corrective information, based on their frequent usage of social media. They could believe that they themselves are well-informed because of the information they receive from news outlets or their friends on social media. They might have perceived abilities to distinguish real from fake news. Such high self-confidence on media literacy could distort their perceptions on the disinformation and corrective information in the current research. In addition, their fearful emotions could cause information overload, which led them to reject the complicated content in the narrative corrective information. The findings shown among participants with high self-efficacy again suggest that self-confidence that these participants might have could lead them not to pay attentions to simple corrective information after seeing fear-neutral disinformation. Raising fear might be a key for these participants to pay attentions to simple corrective information. However, for them, narrative corrective information could result in backfiring when they experience fear of the disinformation. Instead of being used as an enhanced corrective

strategy, narrative corrective information in the fear-arousing disinformation condition could remind these participants of disinformation content. In sum, fearful emotions could determine an effective corrective information type depending on levels of social media usage for news social media usage for social interaction, and self-efficacy.

Particularly for non-white participants, narrative corrective information backfired with fear-arousing disinformation in that it increased intentions to share the disinformation on social media; however, narrative corrective information worked with fear-neutral disinformation because it resulted in lower intentions to spread the disinformation. Such finding could be not validated in the current research given the low number of non-white participants.

The inability to assess mediation effects given the lack of significant findings again suggest that narrative corrective information does not serve as an effective corrective strategy to decrease belief in disinformation or intention to spread disinformation on social media when fear-arousing disinformation or fear-neutral disinformation is presented. The findings of Study 1 raised the need to design complicated corrective information strategies, but narrative corrective information did not show a difference from simple corrective information.

Chapter 6: General Discussion

The prevalence of disinformation has increased since the emergence of social media (Joyce, 2016). Particularly, fear-mongering disinformation circulates under risky situations. Effects of fear under risky situations are problematic because it aggravates the situation by paralyzing our decision-making processes. To counter the spread of disinformation, communication scholars have suggested effective corrective information strategies (Lewandowsky et al., 2012; Tenney et al., 2009). However, past research on disinformation and corrective information did not tackle several important issues including context of disinformation, features of disinformation, emotional responses, and underlying psychological mechanisms in processing disinformation and corrective information. This research is the first to explore how the presence and composition of corrective information affects emotional responses, situational assessment, and behavioral intentions, when fear-neutral or fear-arousing disinformation is presented in the spread of an unknown health virus.

The key implications from Study 1 and Study 2 are three-fold: 1) Fear-arousing disinformation does not increase belief in disinformation under risky situations and it may even result in lower beliefs in the disinformation content as a coping strategy in the absence of corrective information. 2) Simple alerts that state the falsehood of information can serve as an effective corrective strategy when fear-neutral disinformation is shown but can backfire when fear-arousing disinformation is presented. 3) Although differences between simple corrective information and narrative corrective information were minimal, differences emerged mainly for the effects of high and low social media users.

When taken together, fear-arousing disinformation resulted in lower beliefs when the disinformation is not corrected. Study 2 did not validate the Study 1 finding that fear-neutral disinformation resulted in greater belief in disinformation compared to fear-arousing disinformation. However, given that only those in the no corrective information condition

reported a significant difference in belief in disinformation contrary to the hypothesized direction, the result from Study 1 suggests a possibility of psychological reactance of fear-arousing disinformation in the no corrective information condition. This is counter to prior research that emphasizes the persuasiveness of fear appeals (Das et al., 2003; De Hoog et al., 2005) and that argues anxiety and uncertainty increase credibility to disinformation (Oh et al., 2013; Rosnow, 1980, 1991, 2001); the current research builds on extant theoretical discussions on persuasive effects of fear-arousing messages. As explained earlier, individuals may be willing to avoid the fearful situation in which they have lack of control. From the conclusion of the current research, future research should measure levels of feelings of control to systematically test whether the psychological reactance theory for fear-arousing disinformation is supported. By investigating persuasive effects of fear-arousing disinformation and fear-neutral disinformation, this research expands features of disinformation in terms of fear under risk. Excessive fear can discourage belief in the disinformation only when corrective information is not presented. The finding suggests a possibility that individuals who face fear-arousing disinformation may deny the disinformation content as a coping strategy in the absence of corrective information.

When fear-arousing disinformation is presented, simple corrective information increased situational fear and situational severity across both studies. This backfiring of simple corrective information in the fear-arousing disinformation condition across all studies suggests that repeated exposure of disinformation content can raise fearful emotions and perceptions of threat, even if the corrective information states the falsehood of disinformation. The theory of the illusory truth effect and motivated reasoning explain this. Based on the illusory truth effect (Begg et al., 1992), multiple exposure to fear-arousing disinformation content can increase familiarity. Therefore, their fearful emotions and perceptions of the severity of the risky situation increased when reading simple corrective

information. In this case, a corrective information statement (e.g., "This story has been debunked!") that flags disinformation did not reduce situational fear and threat appraisal for those who saw fear-arousing disinformation but did reduce situational fear and threat appraisal for those who saw fear-neutral disinformation. Interestingly, simple corrective information decreased situational fear and situational threat appraisal for participants who read fear-neutral disinformation. Fear activates biased information processing, according to motivated reasoning, which argues that emotions lead people to process the given information in a biased way such that emotions color perceptions and inhibit people from understanding information rationally (Taber & Lodge, 2006). From the current research, it appears that simple corrective information results in superficial processing because it can simply remind of the disinformation content. Fear plays an important role in eliciting illusory truth effect of simple corrective information. Therefore, the negative effect of simple corrective information cannot be generalized because it can backfire when people see fear-arousing disinformation.

Unexpectedly, there was no general effect of corrective information type: Increasing complexity of corrective information did not reduce emotional responses, beliefs in disinformation, and disinformation sharing behaviors, compared to simple corrective information because there was no difference between narrative corrective information and simple corrective information. While prior research has suggested a possibility that narrative corrective information can serve as an enhanced correction strategy by replacing one's mental model (Cappella et al., 2015; Lewandowsky et al., 2012), the empirical findings from this research do not support the effectiveness of narrative corrective information. This raises a careful need to employ complicated corrective information to corrective information. The backfire of simple corrective information in fear-arousing disinformation, and particularly, the failure of narrative corrective information is in line with feeling-as-information theory,

which argues that people tend to rely upon their emotions in decision-making (Schwarz & Clore, 1983; Schwarz, 2002). According to this theory, humans evaluate a target positively when they are in a positive mood, but they evaluate the target negatively when they have negative emotions (Schwarz, 2002). When applying this theory to the current research, participants who read fear-arousing disinformation could evaluate the situation as risky. This fear-as-information phenomenon could be still shown even after the exposure of corrective information. In this sense, regardless of corrective information type, corrective information per se is not sufficient to subdue fearful emotions and perceived severity, which were already established when reading fear-arousing disinformation. In the fear-arousing disinformation condition, presenting corrective information can even increase fearful emotions and perceived severity through disinformation retrieval. Counter-disinformation messages may not work when emotion is prevalent but may work in the absence of emotion.

In the social media sphere, publics often face personal stories from their friends or stories manipulated by social media algorithms. However, given the findings in this research, these stories may be inappropriate for correction strategies under risks. In order to mitigate the prevalence of emotions during risky situations, posting unrelated stories or corrective information that uses facts or numbers to explain the truth, instead of simply debunking the disinformation, could help publics subdue their fears and ultimately, forget about the disinformation content. A deeper consideration of the multitude of ways in correcting disinformation is needed. These may include add-on correction including blogs or articles that refutes disinformation.

There is also a possibility that James' story used as narrative corrective information could not have replaced preexisting mental models of participants that were established by the disinformation content. The narrative corrective information in the current research have simply introduced new information about the disinformation content to participants and

added another information to their existing mental models. Given this possibility, it is important to consider in future research that how to replace mental models established by disinformation with corrective information. Corrective information with explanations of experts or numbers, for example, could be an effective strategy as a substitute for narrative corrective information to replace existing mental model. Individuals could have higher levels of credibility toward experts or messages containing scientific data than the James' personal story, and this credibility could be helpful in replacing mental model established by disinformation.

However, social media usage moderated the effect of corrective information (presence and type) in both studies. Although the backfire effect of simple corrective information emerged in the fear-arousing disinformation condition overall, when investigated separately, simple corrective information backfired for low social media users and narrative corrective information backfired for high social media users. The expected results were shown low social media users and this might result from their lack of opportunities to receive information on social media or lack of self-confidence in their abilities to discern disinformation from corrective information. Low social media users could have unbiased views on information. Alternatively, the presence of corrective information may work with fear-arousing disinformation for high social media users as a way to make them pay attention to the corrective information content. Simple alerts that state disinformation is false may be effective for high social media users when fear is prevalent by pulling out of their preexisting thoughts on information. However, alternative information as a correction can cause information overload when high social media users experience excessive fear, distracting them from understanding the purpose of correction. Therefore, it is important to note that not all corrective information may not work for high social media users because providing text-heavy correction could distract their understandings of the correction when experiencing fear.

These results suggest that fear, complexity of corrective information, and social media usage are intermingled with each other in combatting disinformation. Hence, it should not be generalized that narrative corrective information works and simple corrective information backfires.

The spread of an unknown health virus in the current research is unique crisis that generates fear continuously. Such situation could be termed as diffuse crisis events, which are invisible and not affecting a physical environment. Compared to health crisis, other crisis such as natural disasters, man-made disasters (e.g., terrorism, war), or financial crisis could be termed as discrete crisis events. Fear in these discrete crisis events could also emerge but may not continue in the aftermath of the crisis. Such types of crisis could affect a physical environment but the prevalence of fear surrounding the crisis may be temporary. Particularly, man-made disasters could raise anger among publics because anger needs an object who is responsible for disasters (Pantti & Wahl-Jorgensen, 2011). Given these differences between crisis types, the spread of an unknown health virus which belongs to health crisis should be paid attention by scholars, particularly being associated with fear.

Limitations

There are several limitations in the current research, which might have impacted the findings. First, in the case of the manipulation check, the current research might not have phrased the question clearly or the manipulation of messages was not clear. In Study 2, participants responded at random to the source of the corrective information but this question might have sounded unclear. James Smith, a narrator of the narrative corrective information might have been seen as Facebook or as a friend to participants. The questions can also ask participants to recall and write about what they read before. Future work can examine whether different results are shown between participants who chose James, Facebook, or a friend as a corrective information source. Related to the stimulus, the current research did not

consider PANAS as a main outcome because its main focus was to test whether fear-arousing disinformation actually raised fear of the disinformation compared to fear-neutral disinformation. Since diverse types of emotion can be considered in using PANAS items, future research can further investigate whether disinformation raises other types of emotion and how those emotions affect disinformation and corrective information processing.

The dependent variables of interest used in the current research (i.e., belief in disinformation, situational fear, situational severity, and intentions to spread disinformation on social media) were measured after the exposure of disinformation and corrective information. Corrective information type in this research included no corrective information, simple corrective information, and narrative corrective information. This raised a concern that different corrective information conditions prevented us from examining a pure effect of disinformation type on dependent variables of interest. The main effects of disinformation type on dependent variables of interests did not show same results across Study 1 and Study 2.

Adding to the measured variables, self-efficacy in the current research is about health, not about self-confidence for media literacy, because the items comprising of self-efficacy asked participants to mark their abilities to utilize health resources against the spread of a health virus. It should be acknowledged that there is a distinction between self-efficacy in general, self-efficacy about health, and self-efficacy about media literacy. Therefore, self-efficacy cannot be used as a proxy for self-confidence in this research. This gives an idea for future research to examine a linkage between self-efficacy about media literacy and social media usage and test whether self-efficacy mediates the backfire effect caused by social media usage.

In relation to the sample, the current research might have demographic biases in general. All of the participants in this research were United States residents. Although the

current research did not specifically ask the national identity of the participants, it should be acknowledged that cultural differences may be another influencer of processing disinformation and corrective information. Participants in this research who are in an individualistic country with a for-profit media industry could have various levels of belief in social media platforms. Moreover, most of the participants were heavy social media users who use social media a few times day or regularly throughout the day, and this could inhibit the current research from comparing between low and high social media users. As for whiteness, most of the participants (82%) in the current research were white and this unevenly distributed race could have affected the results. The image of the fear-arousing disinformation contained non-white workers moving dead bodies; therefore, compared to non-whites, whites could not be identified by the image. In addition, using MTurk as a source of participants could contain some bias and limited external validity. These MTurk workers could be younger, of lower income, and less diverse in terms of race, compared to the national samples (Walters, Christakis, & Wright, 2018). Although the current research is conducted by an online experiment that the representativeness of the national population is less important than a survey, it is important to acknowledge any potential biases that this research could have. In addition to that, participants who have experienced the spread of a health virus could be more prone to feel fearful emotions and perceive severity and susceptibility from the crisis. On the other hand, these participants could have built more efficacy on themselves based on their past experiences. Future scholars can consider characteristics of specific individuals when testing the effects of disinformation and corrective information in the context of crisis.

There is also a limitation of an online experiment. Online participants can be easily distracted by other external factors because of the absence of researchers during the experiment. In addition to that, participants could have confused with the items about

dependent variables of interest. Although the items specifically indicated which ones are about disinformation or corrective information, it is possible that confounding effects could occur. With regard to the limitation of an online experiment, future research can conduct an offline experiment and examine whether the offline experiment produces the similar results to the current research. Future researchers also need to go through the whole questions with a third-person in advance of a main study.

Another point that needs to be discussed is that the findings of the current research may not be limited to disinformation but be generalizable to information processing. This research showed disinformation to participants as a first step and then showed corrective information. For participants, the only way of knowing it was disinformation was the explanation that the story was false. The similar outcomes can be possibly shown when participants received factual information as a first step and read the false information later. In this sense, the current research can be generalizable to any situation where information is contested.

Overall Implications and Recommendations

Taken together, this research yields important theoretical and practical ramifications. Theoretically, this research demonstrated trends in how disinformation and corrective information is processed in terms of fear as emotion and threat appraisal as cognition, particularly focusing on the spread of a health virus. This research also expands online deception research by focusing on features of disinformation and corrective information. Different types of disinformation and corrective information can be shown depending on situations—for example, fear-arousing disinformation is prevalent in risky situations. With a focus on fear-arousing disinformation, web add-on corrective information, and narrative corrective information, this research discusses features of disinformation and corrective information under risks such that simple corrective information may backfire for fear-

arousing disinformation, and this trend can be changed depending on levels of social media usage.

When relating to the theories specifically, the major contributions of the current research to a theoretical field are as follows. First, fear does not always lead individuals to process information in a biased way, which revisits motivated reasoning theory and heuristic-systematic information processing. In interpreting the result that fear-arousing disinformation did not increase belief in the disinformation when compared to fear-neutral disinformation, fear may not always activate the biased information processing that makes people believe the given disinformation. As psychological reactance theory for fearful emotions argues, individuals may be willing to avoid the situation in which excessive fear is prevalent. With a focus on the role of fear in information processing, the current research could build on motivated reasoning, heuristic-systematic information processing, and psychological reactance theory in the context of disinformation.

Second, the current research expanded the illusory truth effect in terms of emotional and cognitive responses. Simple corrective information increased fearful emotions and threat perceptions when fear-arousing disinformation is presented. This backfire effect of simple corrective information is in line with the illusory truth effect that presenting disinformation repeatedly can increase its effects in terms of emotion and cognition. Although it was not found that simple corrective information increases belief in disinformation and disinformation sharing intentions, the current research expands the illusory truth effects to emotional and cognitive aspects.

Furthermore, the findings of the failure of narrative corrective information revisit the theory of mental model. Narrative corrective information in the current research could not have replaced the participants' existing mental model. Then, the next question that future research should ask will be: How should narrative corrective information be designed to

entirely replace one's existing mental model? The failure of narrative corrective information in the current research could be attributed to the risky situation. Fear in the risky situation might be prevalent among participants and narrative corrective information might have limited power to subdue their fearful feelings. The current research suggests that research should consider the situation in order to design narrative corrective information that can replace existing mental models.

The current research also expands the uses and gratification theory in terms of disinformation and corrective information on social media by showing that high and low social media users processed disinformation and corrective information differently. More research is needed to interpret the characters of high and low social media user such that whether high social media users have self-confidence and optimism on their abilities in understanding information. Beyond this limitation, the current research supports the argument of the uses and gratification theory that social media usage emerges as a key factor in moderating the interaction of disinformation and corrective information type.

As for practical implications, social media users should also be mindful of information they may face on social media and be critical of what they read. When seeing disinformation that contains fear, social media users need to view the disinformation content critically and pay attentions to corrective information, even if the correction simply alerts that the disinformation is false. Social media users should develop their abilities to discern disinformation from corrective information and not to be easily swayed by disinformation. The current research can be helpful for social media users to understand various types of disinformation and corrective information and what results may occur according to the different message types.

Media practitioners should design different corrective information strategies depending on features of disinformation and individual characteristics. They need to consider using

alternative corrective information to counter fear-arousing disinformation, rather than presenting simple alerts that refute the disinformation content. Social media platforms such as Facebook should particularly consider not presenting succinct corrective information (i.e., corrective information enabled a simple warning) to low social media users, and should avoid exposing complex corrective information with one's stories to high social media users when fearful emotions are prevalent in the society. They should be careful of using simple corrective information, which simply marks the falsehood of disinformation, particularly during the fearful situation. They need to consider features of disinformation and social media use of individuals in designing corrective information.

Future Directions

There are other remaining ideas for future work, aside from the limitations of the current research. Future directions will address effects of sources, effects of actual platform experiences, emotional diversification as construct as well as crisis diversification, and diversified types of complex correction. Each direction is elaborated as follows.

Future work can investigate differences between individuals who perceive the disinformation or corrective information they read either from their friends, from a social media platform, or from other people. This research acknowledges that a source of corrective information may have an effect on disinformation and corrective information processing, but has not considered sources in analyzing the data. In addressing this gap, future research can contribute to our understanding about when does fear-arousing disinformation actually arouse fear in terms of sources. Individuals who perceive the source of corrective information as their friends could have less beliefs in the disinformation, and this may be depending on source credibility. Related to sources, future research should consider measuring levels of credibility toward sources of disinformation and corrective information, which was the out of focus of the current research. This research attempted to hold constant trust (i.e., ceteris

paribus) by creating a generic individual who was delivering the disinformation and corrective information. The manipulations of disinformation provided by an anonymous source and corrective information provided by James Smith with a faceless profile image were purposefully done. However, this approach can disregard the levels of credibility toward disinformation and corrective information. Future research should consider from whom the disinformation and corrective information are received.

When thinking about our real lives, we face a mixture of disinformation, corrective information, and unrelated posts on social media. Future research can examine how unrelated posts in the no corrective information condition can result in debunking effects. This approach will provide insights that are more realistic to scholars and professionals given the prevalence of disinformation on social media in our current society. If future work would find that the exposure to unrelated posts work as a correction, this would add to the current literature in that distracting social media users from their thoughts on disinformation content needs to be considered as an effective strategy to mitigate the problems of disinformation and disinformation sharing behaviors. In addition to that, future research can include unrelated posts to each condition of disinformation (i.e., fear-neutral disinformation or fear-arousing disinformation) and corrective information (i.e., no corrective information, simple corrective information or complex corrective information) and explore longitudinal effects. When facing unrelated posts between the disinformation and corrective information conditions, individuals may forget the disinformation content and pay more attentions to corrective information with a fresh insight. Related to this, the quantity of unrelated posts between disinformation and corrective information conditions can moderate the effects of corrective information. For example, there may be different results between participants who do not see any unrelated posts, those who see one unrelated post, those who see three unrelated posts, and those who see seven different posts of unrelated stories. A possible outcome may be that

as more unrelated posts participants read, the influence of disinformation may decrease. Participants who read seven different unrelated posts can be much more distracted and put the disinformation content behind. Future research can also consider features of unrelated posts. Positive unrelated posts with a picture of happiness could show different outcomes when compared to negative posts with a picture of other crisis or neutral posts about weather conditions. There is much more room to investigate unrelated posts as to disinformation and corrective information processing. A social value of disinformation and corrective information is another consideration for future research. High levels of virality metrics of posts such as the number of likes, comments, or reshares) can increase message sharing behaviors and believability of messages because people may easily rely on those.

In terms of emotion, this research focused on fear, but future research can consider distinct emotions such as positive moods (e.g., hope) and other negative emotions (e.g., anger, sadness) in examining awareness of disinformation and corrective information. Emotion research has suggested that negative emotions elicit a more vigilant information processing than positive emotions (Cohen, Pham, & Andrade, 2008), which may offer an insight to the roles of emotion type in processing disinformation and corrective information. An expectation might be that individuals experiencing hopeful emotions would not pay attentions to disinformation or corrective information because of their optimism about the situation. Research comparing between positive emotions and negative emotions can highlight the importance of emotion type in perceiving disinformation and corrective information. Furthermore, people may perceive the spread of a health virus differently depending on their social salience. In the situation in which the Ebola virus actually spreads, publics could perceive the health virus issue more seriously. The results of the current research may show different outcomes when it comes to a financial crisis. People may perceive the financial crisis as more severe and serious when the recession actually occurs.

Therefore, future scholars need to apply the idea of the current research to various crisis types.

Lastly, from the failure of narrative corrective information in the current research, future research can test the effect of corrective information with numbers, figures, or other details and compare between statistic-based corrective information and narrative corrective information. Although past research has noted that narrative has more persuasive effects than other messages using statistics in risky situations (Van Laer et al., 2013), statistical data such as numbers can be effective in reducing misperceptions because it can deliver corrective information with details about the situation. The current research concluded that complex corrective information (i.e., narrative corrective information) might not work, but the question remains about the extent of complexity of corrective information. Corrective information with statistical data can also be perceived as complex corrective information, so it is the role of future research in examining which complex corrective information type may be effective in decreasing disinformation effects. In so doing, future work can build on current literature in terms of features of alternative corrective information.

Final Thoughts

The current research adds to the discussions among communication scholars and practitioners who have raised concerns over the spread of disinformation on social media and tried to find ways to decrease this problem. This research addresses important questions: How does emotion play role in disinformation in risky situations? When does corrective information work or backfire? In answering these questions, the current work ensured that disinformation and corrective information type matters in health crisis, particularly for low and high social media users. From this research, it is important to note that corrective information strategies should reflect situational characteristics and individual differences.

Social media platforms have attempted to develop disinformation detection methods, but this research provided important findings that designing effective correction is not a simple task. It may be not enough to state simply that the disinformation is false. One's narrative story may not be the absolute way for alleviate the spread of disinformation. On the heels of the development of personalization in social media algorithms in the current media environment, scholars and practitioners need to take efforts to understand diversified situational and individual characteristics and employ personalized corrective information strategies.

Appendices

Appendix A. Samples of images used for the selection of the most relevant one to the given disinformation content

1. Fear-neutral

2. Fear-arousal

Appendix B. Stimulus of fear-neutral and fear-arousing disinformation

An unnamed virus is spreading across the U.S. Avoid eating lettuce because it could carry the virus. People have a mild stomachache due to this virus. But one bite of lettuce will not cause pain. The U.S. government is working on a cure at this time. Make your family and friends aware.

👍 Like   💬 Comment

Write a comment...

An unnamed, FATAL virus is rapidly spreading across the U.S. Do NOT eat lettuce because it could carry the virus. Many people have DIED due to this deadly virus. One bite of lettuce is DEADLY. The U.S. government is working on a cure at this time. Make your family and friends aware.

👍 Like   💬 Comment

Write a comment...

Appendix C. Stimulus of simple corrective information (first row) and narrative corrective information (second row)

FAKE This story has been debunked!
Share this debunk with the original poster.

An unnamed virus is spreading across the U.S. Avoid eating lettuce because it could carry the virus. People have a mild stomachache due to this virus. But one bite of lettuce will not cause pain. The U.S. government is working on a cure at this time. Make your family and friends aware.

Like · Comment · Write a comment...

FAKE This story has been debunked!
Share this debunk with the original poster.

An unnamed, FATAL virus is rapidly spreading across the U.S. Do NOT eat lettuce because it could carry the virus. Many people have DIED due to this deadly virus. One bite of lettuce is DEADLY. The U.S. government is working on a cure at this time. Make your family and friends aware.

Like · Comment · Write a comment...

James Smith

One of my friends who owns an agricultural business lost a huge amount of money due to a lettuce sales drop due to the false rumor that an unnamed virus is spreading across the U.S. He is now deeply distressed. I searched and read a lot of articles about the virus and a fact-checking website says the rumor was originally from fake news website NewsWireforYou.com. Don't be deceived by this false information. Spreading the falsehood can directly impact our neighbors and communities.

Like · Comment

Write a comment...
Press Enter to post.

Appendix D. Informed Consent and Debriefing
Informed Consent

The role of emotion in processing information on social media

S.I. Newhouse School of Public Communications 215 University Place, Syracuse, NY 13244

Our names are Jiyoung Lee, a doctoral student at Syracuse University, and Charisse L'Pree Corsbie-Massay, an assistant professor at Syracuse University. We are inviting you to participate in a research study about how emotion affects processing of information and actions on social media.

Involvement in the survey is completely voluntary, so you may choose to participate or not. The survey questions will ask for some demographic information, your social media use, and your thoughts and attitudes regarding social media in general and regarding a specific post(s).

This study is being conducted for research purposes. Completing this study will take approximately 20 minutes of your time. Your participation in this study is completely voluntary, and your answers will be confidential, and your name will not be reported or associated with the answers you provide. Whenever one works with e-mail or the internet, there is always the risk of compromising privacy, confidentiality, and/or anonymity. Your confidentiality will be maintained to the degree permitted by the technology being used.

It is important for you to understand that no guarantees can be made regarding the interception of data sent via the internet by third parties. If you have any questions contact us at jlee08@syr.edu. We will do our best to keep your information confidential. All data is in a password-protected electronic format. To help protect your confidentiality, the survey does not contain questions requiring information that will personally identify you.

The results of this study will be used for scholarly purposes only. The findings of this study are exploratory in nature and seek to better understand the public's perception of information under risky situations.

Compensation: Respondents completing this survey will be compensated in the amount of $1. To receive compensation respondents MUST enter the randomly assigned code provided. Be advised that this code is randomly selected and no personal information will be received in the processing of the payment through Amazon Mechanical Turk. Respondents who fail to enter the code will not be compensated.

If you have any questions, concerns, or complaints about this research, contact Jiyoung Lee, Newhouse School of Public Communications, at 315-436-2751. If you have any questions about your rights as a research participant; have questions, concerns, or complaints that you wish to address to someone other than the researchers; or if you cannot reach either of us, contact the Syracuse University Institutional Review Board at 315-443-3013.

Be advised: You may withdraw your participation in this study at anytime without penalty.

Thank you for your participation.

Clicking to the next screen indicates that:
- You have read the above information;
- You voluntarily agree to participate in this study;
- You are a Facebook user;
- You are at least 18 years of age; and
- You understand you may withdraw your participation at any time

Debriefing
Thank you for your participation in this survey experiment. The goal of this study was to examine the effects of false information and corrective information under risky situations. We were interested in how you would process the information in the spread of an unknown health virus.

Your participation is greatly appreciated by the researchers involved, and the data collected could possibly aid people working with viral information and designing corrective information. The nature of the phenomenon we are investigating required showing unconfirmed information before the correction was shown.

If you have any questions about this study, please contact us:

Jiyoung Lee; Ph.D. student at S.I. Newhouse School of Public Communications, Syracuse University; jlee08@syr.edu

Charisse L'Pree Corsbie Massay; Assistant Professor at S.I. Newhouse School of Public Communications, Syracuse University; clcorsbi@syr.edu

Finally, we urge you not to discuss this study with anyone else who is currently participating or might participate at a future point in time.

Thank you for your participation!

Are you still willing to have your data included in this research after the debriefing?
1 = Yes, 2 = No

Appendix E. Measurement Items and Citations
(*The items without citations are developed by the author)

Birthyear (Screening Question)
Please enter the year you were born (open-ended question)
*Respondents who indicated above 2002 were opted-out of participating the experiment.

Active Social Media (Screening Question)
On which of the following social media sites do you have an account?

( ) Facebook	( ) Flickr	( ) Google
( ) Instagram	( ) Linkedin	( ) Pinterest
( ) Reddit	( ) Snapchat	( ) Tumblr
( ) Twitter	( ) Youtube	( ) Other (Please specify)

*Respondents who did not mark Facebook were opted-out of participating the experiment.

Amount of Social Media Usage
The following questions ask about your social media usage. Social media sites are websites or platforms that are designed to allow individuals to share information and express their opinions efficiently (e.g., Facebook, Twitter, Instagram, etc.).
How often do you use ANY social media (e.g., Facebook, Twitter, Instagram, etc.) in your daily life?
1 = Not at all, 2 = A few times a month, 3 = A few times a week, 4 = A few times a day, 5 = Regularly throughout the day

Social Media Usage
The following statements ask how you think about social media in general including any and all platforms like Twitter, Facebook, Instagram, YouTube, etc. Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree
1. Social media is part of my everyday activity (Ellison et al., 2007)
2. I am proud to tell people I'm on social media (Ellison et al., 2007)
3. Social media has become part of my daily routine (Ellison et al., 2007)
4. I feel out of touch when I haven't logged onto social media for a while (Ellison et al., 2007)
5. I feel I am part of the social media community (Ellison et al., 2007)
6. I would be sorry if social media shut down (Ellison et al., 2007)
7. I like using social media
8. I often think about deactivating my social media accounts (reverse-coded)
9. I am tired of using social media (reverse-coded)

Citation:
Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143-1168.

Social Media Usage for News
Please read each statement carefully and rate your agreement or disagreement.

1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. Social media help me to stay informed about current events and public affairs (Gil de Zúñiga et al., 2012)
2. Social media help me to stay informed about the local community (Gil de Zúñiga et al., 2012)
3. Social media help me to get news about current events from mainstream news media (Gil de Zúñiga et al., 2012)
4. Social media help me to get news about current events through friends (Gil de Zúñiga et al., 2012)

Citation:

Gil de Zúñiga, H., Jung, N., & Valenzuela, S. (2012). Social media use for news and individuals' social capital, civic engagement and political participation. *Journal of Computer-Mediated Communication*, *17*(3), 319-336.

Social Media Usage for Fact-Finding
1. Social media help me to find fact-based information
2. Social media help me to check accuracy of information (Lee & Choi, 2018)
3. Social media help me to find a counter-argument
4. Social media help me to find additional resources

Citation:

Lee, J., & Choi, Y. (2018). Informed public against false rumor in the social media era: Focusing on social media dependency. *Telematics and Informatics, 35*(5), 1071-1081.

Social Media Usage for Social Interaction
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

5. Social media help me to get ideas about how to approach others in important or difficult situations (Kim et al., 2015)
6. Social media help me to have fun with family or friends (Kim et al., 2015)
7. Social media help me to have something to do with my friends (Kim et al., 2015)
8. Social media help me to be a part of social events you enjoy without having to be there (Kim et al., 2015)

Citation:

Kim, Y. C., Shin, E., Cho, A., Jung, E., Shon, K., & Shim, H. (2015). SNS dependency and community engagement in urban neighborhoods: The moderating role of integrated connectedness to a community storytelling network. *Communication Research*, *46*(1), 7-32.

Self-efficacy
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. It is easy for me to get help against the spread of a health virus (So, Kuang, & Cho, 2016)
2. Getting help against the spread of a health virus is no problem for me (So, Kuang, &

Cho, 2016)

3. I am able to go to get help against the spread of a health virus easily (So, Kuang, & Cho, 2016)
4. I have the capability to utilize health resources against the spread of a health virus

Citation:
So, J., Kuang, K., & Cho, H. (2016). Reexamining fear appeal models from cognitive appraisal theory and functional emotion theory perspectives. *Communication Monographs*, *83*(1), 120-144.

Issue Involvement
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. I think about health viruses with a great deal (Flora & Maibach, 1990)
2. I consider myself at risk of influences of health viruses (Flora & Maibach, 1990)
3. The spread of health viruses is personally relevant topic for me (Ryu & Kim, 2015)
4. The issue of the spread of health viruses is meaningful for me (Ryu & Kim, 2015)
5. I personally feel very interested in judging the issue of the spread of health viruses (Ryu & Kim, 2015)

Citation:
Flora, J. A., & Maibach, E. W. (1990). Cognitive responses to AIDS information: The effects of issue involvement and message appeal. *Communication Research*, *17*(6), 759-774.
Ryu, Y., & Kim, S. (2015). Testing the heuristic/systematic information-processing model (HSM) on the perception of risk after the Fukushima nuclear accidents. *Journal of Risk Research, 18*(7), 840-859.

Health Consciousness
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. Living life in the best possible health is very important to me (Dutta-Bergman, 2004)
2. Eating right, exercising, and taking preventive measures will keep my healthy for life (Dutta-Bergman, 2004)
3. My health depends on how well I take care of myself (Dutta-Bergman, 2004)
4. I actively try to prevent disease and illness (Dutta-Bergman, 2004)
5. I do everything I can to stay healthy (Dutta-Bergman, 2004)

Citation:
Dutta-Bergman, M. J. (2004). Primary sources of health information: Comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Communication, 16*, 273–288.

Health Blog usage
How often do you visit medical-related websites (e.g., WebMD)?
1 = Not at all
2 = A few times a month
3 = A few times a week

4 = A few times a day

5 = Regularly throughout the day

Positive and Negative Affect Schedule (PANAS)
This scale consists of a number of words that describe different feelings and emotions. Read each item and indicate to what extent you feel this way right now, that is, at the present moment.
1 = None at all, 2 = A little, 3 = A moderate amount, 4 = A lot, 5 = A great deal
1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

Citation:
Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.

Fear of Disinformation
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree
1. The post I just read made me feel nervous
2. The post I just read made me feel fear (Dillard & Peck, 2000)
3. The post I just read made me feel scared (Dillard & Peck, 2000)
4. The post I just read made me anxious
5. The post I just read made me frustrated
6. The post I just read made me afraid (Dillard & Peck, 2000)

Citation:
Dillard, J. P., & Peck, E. (2000). Affect and persuasion: Emotional responses to public service announcements. *Communication Research, 27*(4), 461-495.

Narrative Effect of Narrative Corrective Information
Please read each statement carefully and rate your agreement or disagreement. "LIKE" is to click a thumbs-up or otherwise response without comments.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree
1. The corrective information had an effect on my emotions (Green & Brock, 2000)
2. I could relate to the situation described in the corrective information (Green & Brock, 2000)
3. I feel that the corrective information made its point effectively (Developed by the author based on Green & Brock, 2000)
4. I could identify with the situation that the message provides (De Graaf et al., 2012)
5. I could feel empathy with the situation that the message provides (De Graaf et al., 2012)
6. I was mentally involved in the message while reading it (Green & Brock, 2000)
7. During reading, I imagined what it would be like to be in the position of the person in the message (De Graaf et al., 2012)

Citation:
Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701-721.
De Graaf, A., Hoeken, H., Sanders, J., & Beentjes, J. W. (2012). Identification as a mechanism of narrative persuasion. *Communication Research, 39*(6), 802-823.

Belief in Disinformation (Corrective Information)
Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree
1. I think the post I just read (the corrective post) is accurate (Appelman & Sundar, 2016)
2. I think the post I just read (the corrective post) is authentic (Appelman & Sundar, 2016)
3. I think the post I just read (the corrective post) is believable (Appelman & Sundar, 2016)
4. I think the post I just read (the corrective post) is trustworthy (Appelman & Sundar, 2016)
5. I think the post I just read (the corrective post) is reasonable

Citation:
Appelman, A., & Sundar, S. S. (2016). Measuring message credibility: Construction and validation of an exclusive scale. *Journalism & Mass Communication Quarterly, 93*(1), 59-79.

Intention to Spread Disinformation (Corrective Information)
Please read each statement carefully and rate your agreement or disagreement. "LIKE" is to click a thumbs-up or otherwise response without comments.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree
1. I would "LIKE" the post that argued the spread of the unknown virus (the corrective

post) if I receive on Facebook (Alhabash et al., 2015)

2. I would "COMMENT" on or "REPLY" to the post that argued the spread of the unknown virus (the corrective post) if I receive on Facebook (Alhabash et al., 2015)

3. I would "SHARE" the post that argued the spread of the unknown virus (the corrective post) if I receive on Facebook (Alhabash et al., 2015)

4. The post that argued the spread of the unknown virus (the corrective post) is worth sharing with others (Alhabash et al., 2013)

5. I would recommend the post that argued the spread of the unknown virus (the corrective post) to others (Alhabash et al., 2013)

Citation:
Alhabash, S., McAlister, A. R., Hagerstrom, A., Quilliam, E. T., Rifon, N. J., & Richards, J. I. (2013). Between likes and shares: Effects of emotional appeal and virality on the persuasiveness of anticyberbullying messages on Facebook. *Cyberpsychology, Behavior, and Social Networking*, *16*(3), 175-182.
Alhabash, S., McAlister, A. R., Lou, C., & Hagerstrom, A. (2015). From clicks to behaviors: The mediating effect of intentions to like, share, and comment on the relationship between message evaluations and offline behavioral intentions. *Journal of Interactive Advertising, 15*(2), 82-96.

Heuristic-Systematic Information Processing
Reflecting on the social media posts from earlier, please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. [Systematic] I approached the spread of the health virus with a cautious stance (Ryu & Kim, 2015)

2. [Systematic] I thought about how the spread of the health virus relates to other things I know (Kahlor et al., 2003)

3. [Systematic] I found myself making connections between the spread of the health virus and information I get elsewhere (Kahlor et al., 2003)

4. [Systematic] It took a lot of mental effort to understand about the spread of the health virus issue (Neuwirth et al., 2002)

5. [Heuristic] When I read stories about the spread of the health virus, I only paid attention to the portion that seemed interesting (Neuwirth et al., 2002)

6. [Heuristic] I skimmed through stories about the spread of the health virus (Kahlor et al., 2003)

7. [Heuristic] When I read stories about the spread of the health virus, I didn't spend much time thinking about the information (Kahlor et al., 2003)

Citation:
Kahlor, L., Dunwoody, S., Griffin, R. J., Neuwirth, K., & Giese, J. (2003). Studying heuristic-systematic processing of risk communication. *Risk Analysis*, *23*(2), 355-368.
Neuwirth, K., Frederick, E., & Mayo, C. (2002). Person-effects and heuristic-systematic processing. *Communication Research, 29*(3), 320-359.
Ryu, Y., & Kim, S. (2015). Testing the heuristic/systematic information-processing model (HSM) on the perception of risk after the Fukushima nuclear accidents. *Journal of Risk Research, 18*(7), 840-859.

Information Seeking, Sharing, and Avoidance Intentions
Please reflect on future actions you may take with respect to potential health viruses rate your agreement or disagreement on the following statements.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. I plan to seek information about the virus using online media in the near future (Griffin et al., 2008; Yang & Kahlor, 2013)
2. I will try to seek information about the virus using online media in the near future (Griffin et al., 2008; Yang & Kahlor, 2013)
3. I intend to find more information about the virus using online media (Griffin et al., 2008; Yang & Kahlor, 2013)
4. I will look for information related to the virus using online media in the near future (Griffin et al., 2008, Yang & Kahlor, 2013)
5. I am willing to initiate conversation in online media about the spread of the virus (Kim & Grunig, 2011)
6. I am willing to talk about the spread of the virus on online media (Kim & Grunig, 2011)
7. I am willing to share information on online media about the spread of the virus (Kim & Grunig, 2011)
8. I will avoid information about the virus (Kahlor et al., 2006; Yang & Kahlor, 2013)
9. I will refuse to listen to information about the virus (Kahlor et al., 2006; Yang & Kahlor, 2013)
10. I will ignore information about the virus (Kahlor et al., 2006; Yang & Kahlor, 2013)
11. I will tune out information about the virus (Kahlor et al., 2006; Yang & Kahlor, 2013)

Citation:
Griffin, R. J., Yang, Z., ter Huurne, E., Boerner, F., Ortiz, S., & Dunwoody, S. (2008). After the flood: Anger, attribution, and the seeking of information. *Science Communication, 29,* 285-315.
Kahlor, L., Dunwoody, S., Griffin, R. J., & Neuwirth, K. (2006). Seeking and processing information about impersonal risk. *Science Communication, 28*, 163-194. doi:10.1177/1075547006293916
Kim, J. N., & Grunig, J. E. (2011). Problem solving and communicative action: A situational theory of problem solving. *Journal of Communication*, *61*(1), 120-149.
Yang, Z. J., & Kahlor, L. (2013). What, me worry? The role of affect in information seeking and avoidance. *Science Communication*, *35*(2), 189-212.

Situational Threat Appraisal (Severity and Susceptibility)
The following questions ask about your thoughts regarding the spread of health viruses. Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. [Severity] The spread of the unknown virus would be a very serious threat to my quality of life (Averbeck et al., 2011)
2. [Severity] The spread of the unknown virus would be a very severe threat to my health (Averbeck et al., 2011)

3. [Severity] The spread of the unknown virus would be harmful to my well-being (Developed by the author based on Witte, 1996)

4. [Severity] I believe the unknown virus is probably the worst illness that a person suffers (Iriyama et al., 2011)

5. [Susceptibility] I believe that I am at risk of getting the unknown virus (Averbeck et al., 2011; Witte, 1996)

6. [Susceptibility] I believe that I might contract the unknown virus (Iriyama et al., 2007; Witte, 1996)

7. [Susceptibility] I believe that the chances are high that I can get the unknown virus (Iriyama et al., 2007)

8. [Susceptibility] It is likely that I will develop the unknown virus (Averbeck et al., 2011)

Citation:

Averbeck, J. M., Jones, A., & Robertson, K. (2011). Prior knowledge and health messages: An examination of affect as heuristics and information as systematic processing for fear appeals. *Southern Communication Journal, 76*(1), 35-54.

Iriyama, S., Nakahara, S., Jimba, M., Ichikawa, M., & Wakai, S. (2007). AIDS health beliefs and intention for sexual abstinence among male adolescent students in Kathmandu, Nepal: a test of perceived severity and susceptibility. *Public Health, 121*(1), 64-72.

Witte, K. (1996). Predicting risk behaviors: Development and validation of a diagnostic scale. *Journal of Health Communication, 1*(4), 317-342.

Negative Emotions including Situational Fear
The following questions ask about how you feel about the spread of health viruses. Please read each statement carefully and rate your agreement or disagreement.
1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree nor disagree, 5 = Somewhat agree, 6 = Agree, 7 = Strongly agree

1. [Situational fear] I am afraid of the spread of the unknown virus (Dillard & Peck, 2000)

2. [Situational fear] I am frightened by the spread of the unknown virus

3. [Situational fear] I am scared of the spread of the unknown virus (Dillard & Peck, 2000)

4. [Situational fear] I am anxious about the spread of the unknown virus

5. [Situational fear] I am fearful of the spread of the unknown virus (Dillard & Peck, 2000)

6. [Situational fear] I feel tense when I think about the spread of the unknown virus

7. [Situational fear] I am worried about the spread of the unknown virus

8. [Situational sadness] I feel depressed about the spread of the unknown virus (Leach et al., 2007)

9. [Situational sadness] I feel sad about the spread of the unknown virus (Leach et al., 2007)

10. [Situational sadness] I feel hopeless about the spread of the unknown virus (Leach et al., 2007)

11. [Situational anger] I am angry with the spread of the unknown virus (Butt et al., 2005)

12. [Situational anger] I am annoyed at the spread of the unknown virus (Butt et al., 2005)

13. [Situational anger] I am irritated by the spread of the unknown virus (Butt et al.,

2005)

14. [Situational hope] I feel hopeful about the situation of the spread of the unknown virus (Chadwick, 2015)
15. [Situational hope] I am optimistic about the situation of the spread of the unknown virus (Chadwick, 2015)
16. [Situational hope] I am feeling positive about the situation of the spread of the unknown virus (Chadwick, 2015)

Citation:

Butt, A. N., Choi, J. N., & Jaeger, A. M. (2005). The effects of self-emotion, counterpart emotion, and counterpart behavior on negotiator behavior: A comparison of individual-level and dyad-level dynamics. *Journal of Organizational Behavior, 26,* 681–704. doi:10.1002/job.328.

Chadwick, A. E. (2015). Toward a theory of persuasive hope: Effects of cognitive appraisals, hope appeals, and hope in the context of climate change. *Health Communication*, *30*, 598-611.

Dillard, J. P., & Peck, E. (2000). Affect and persuasion: Emotional responses to public service announcements. *Communication Research, 27*, 461-495.

Leach, C. W., Iyer, A., & Pedersen, A. (2007). Angry opposition to government redress: When the structurally advantaged perceive themselves as relatively deprived. *British Journal of Social Psychology*, *46*, 191-204.

Gender
Please indicate your gender: 1 = Male, 2 = Female, 3 = Prefer not to respond

US Born
Where were you born?: 1 = United States, 2 = Other (Please enter)

US State
In which state do you currently reside?

Race
What racial/ethnic group do you most identify with? Please select from the following categories.
1 = White/Caucasian, 2 = Latino/Hispanic, 3 = Middle Eastern, 4 = Black/African American, 5 = Caribbean/West Indian, 6 = South Asian, 7 = East Asian, 8 = Mixed, 9 = Others (Please specify)

Ethnicity
In your own words, what racial/ethnic group do you most identify with. You do not have to use the categories above, you are encouraged to self-identify with any terms you choose.

Education
What is the highest degree or level of school you have completed? If currently enrolled, the highest degree received.
1 = Less than high school, 2 = High school graduate, 3 = Some college, 4 = 2-year degree, 5 = 4-year degree, 6 = Professional degree (e.g., J.D., M.D., D.D.S.), 7 = Master's degree, 8 = Doctoral degree

Income
What is your annual income?
1 = 0 - $24,999, 2 = $25,000 - $49,999, 3 = $50,000 - $74,999, 4 = $75,000 - $99,999, 5 =
$100,000 - $149,999, 6 = $150,000 - $199,999, 7 = $200,000 and above

Political Identity
Generally speaking, do you usually think of yourself politically as a Republican, a Democrat,
an Independent, or something else?
1 = Republican, 2 = Democrat, 3 = Independent, 4 = Other, 5 = No preference

Conservatism
Below is a scale on which the political views that people might hold are arranged from
extremely liberal (0 on the left) to extremely conservative (100 on the right). Where would
you place yourself on this scale?

Appendix F. Diagnostic plots of regression models of main effects of disinformation type (Study 1)

1. Main effect of disinformation type on belief in disinformation
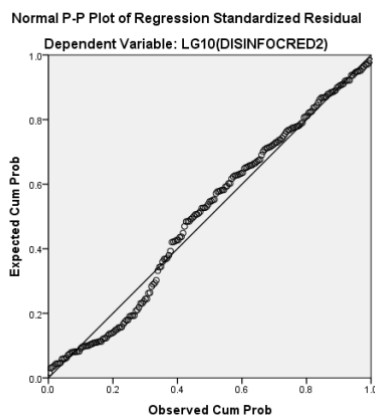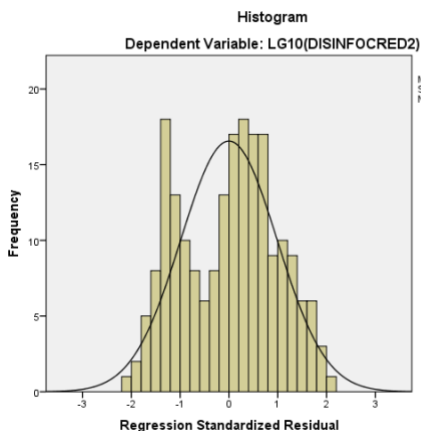
2. Main effect of disinformation type on situational fear
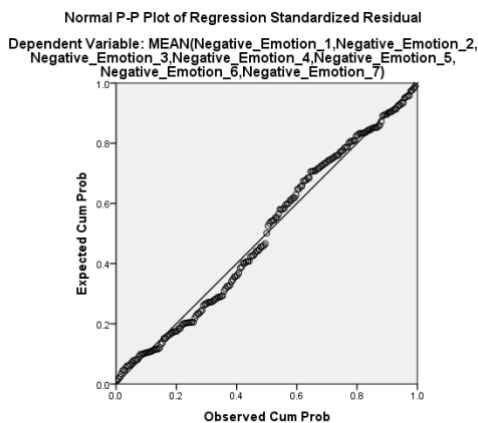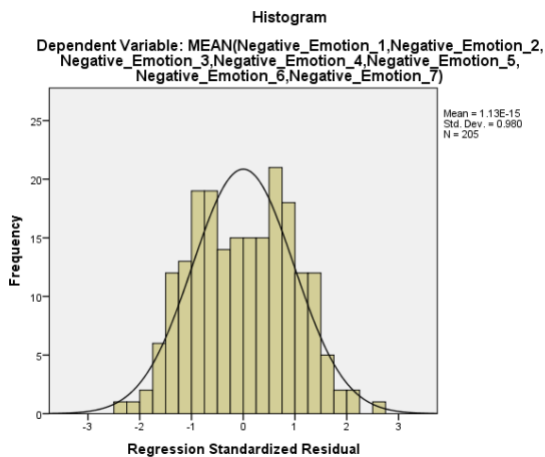
3. Main effect of disinformation type on situational severity

4. Main effect of disinformation type on situational susceptibility

5. Main effect of disinformation type on intentions to spread disinformation on social media
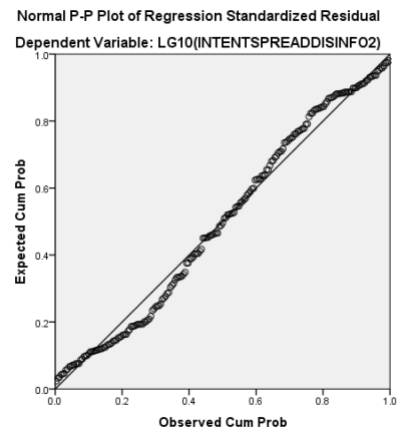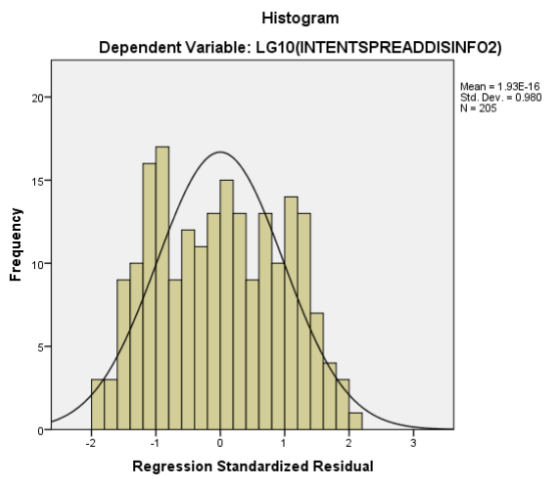
Appendix G. Diagnostic plots of regression models of three-way interaction effects of disinformation type, presence of corrective information, and individual differences; Plots for the significant effects only (Study 1)

1. Disinformation type × Presence of corrective information × Social media usage ➔ Situational severity ($\Delta R^2 = .017$, $p = .040$, $\beta = -.306$).
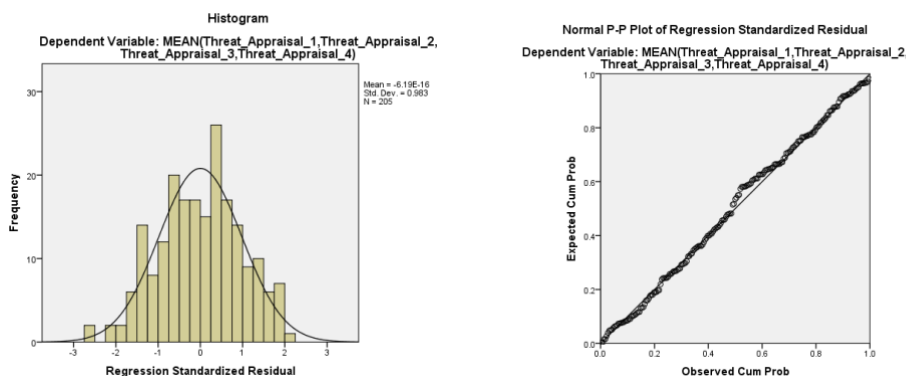
2. Disinformation type × Presence of corrective information × Social media news use ➔ Situational severity ($\Delta R^2 = .013$, $p = .080$, $\beta = -.236$).
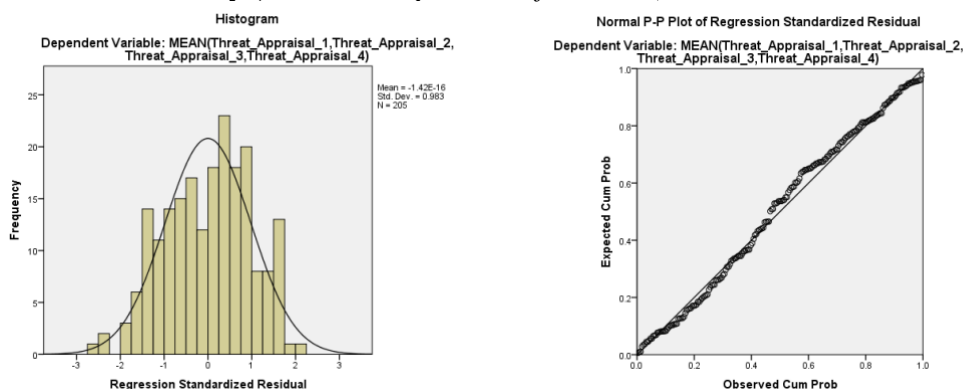
3. Disinformation type × Presence of corrective information × Health blog usage ➔ Situational susceptibility ($\Delta R^2 = .015$, $p = .078$, $\beta = -.271$).
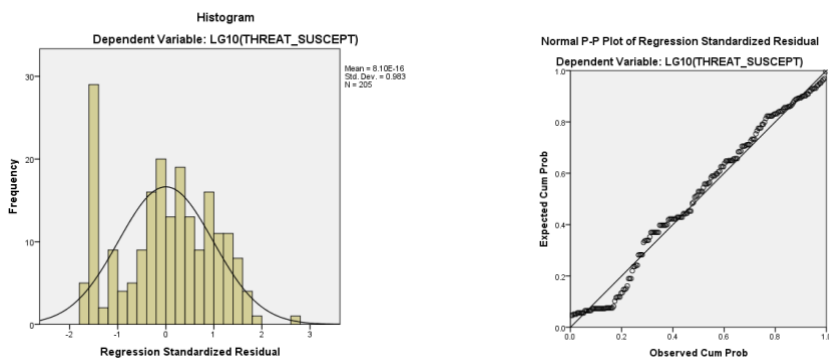
4. Disinformation type $\times$ Presence of corrective information $\times$ Social media use for fact-finding ➔ Intentions to spread disinformation on social media ($\Delta R^2 = .016$, $p = .064$, $\beta = -.240$).
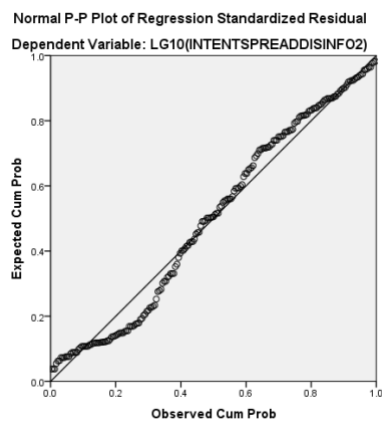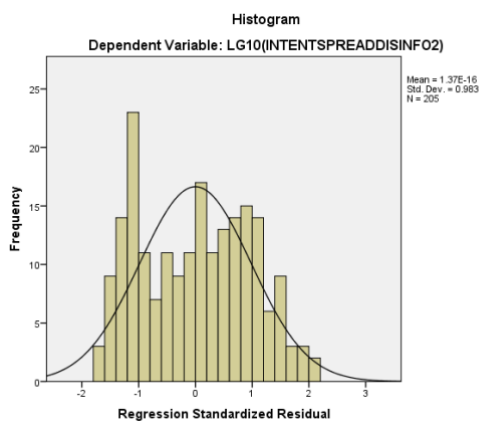
Notes. Variables of individual differences were all mean-centered for multicollinearity. A series of VIF tests showed that multicollinearity for regression models was acceptable. The Ordinary Least Square (OLS) is a best linear unbiased estimator (BLUE) for the original results.

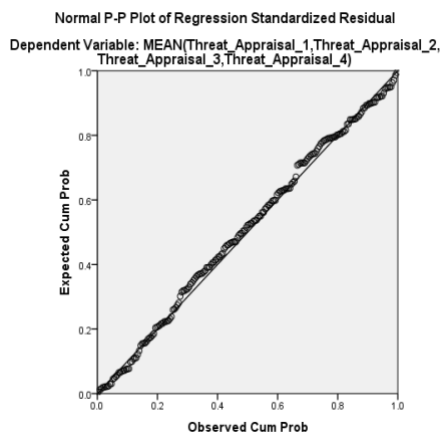**Appendix H.** Diagnostic plots of regression models of main effects of disinformation type (Study 2)
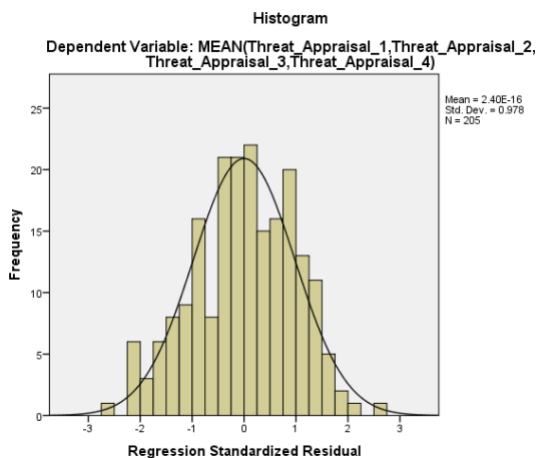
1. Main effect of disinformation type on belief in disinformation

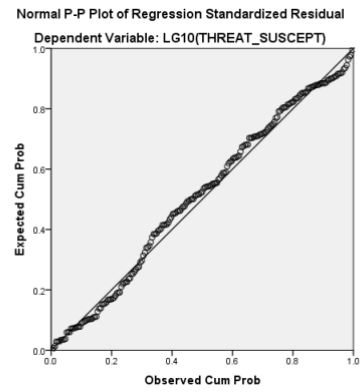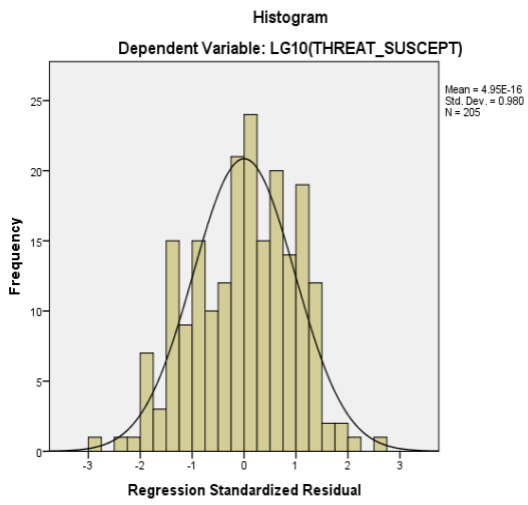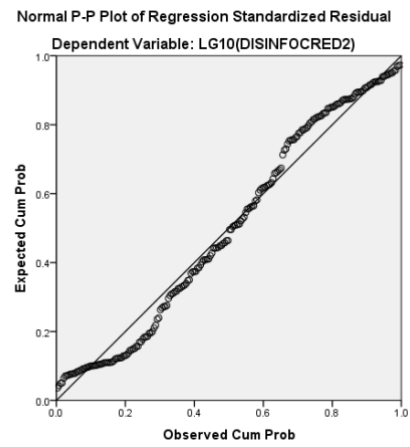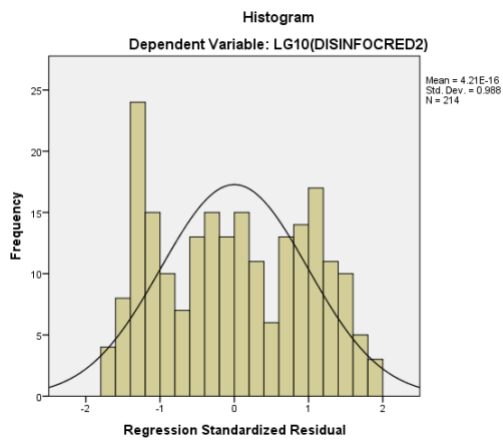## 2. Main effect of disinformation type on situational fear

3. Main effect of disinformation type on situational severity

4. Main effect of disinformation type on situational susceptibility

Histogram

Dependent Variable: LG10(THREAT_SUSCEPT)

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: LG10(THREAT_SUSCEPT)

5. Main effect of disinformation type on intentions to spread disinformation on social media

Histogram

Dependent Variable: (1/INTENTSPREADDISINFO2)*(-1)

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: (1/INTENTSPREADDISINFO2)*(-1)
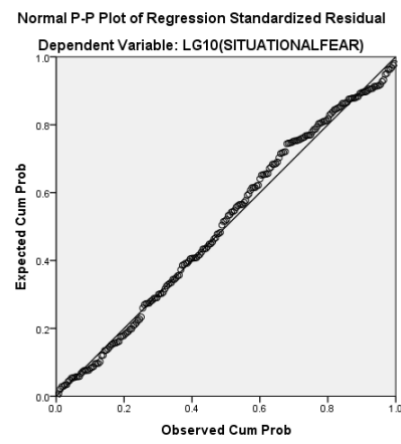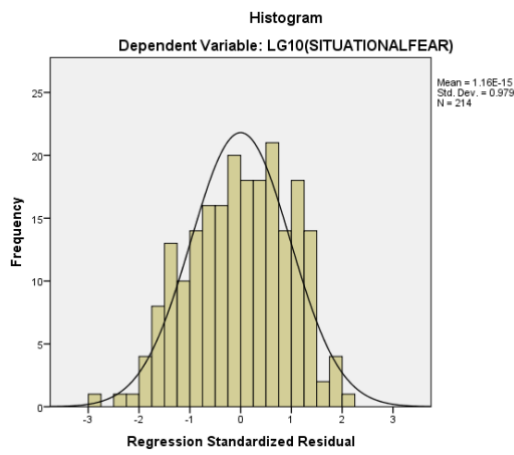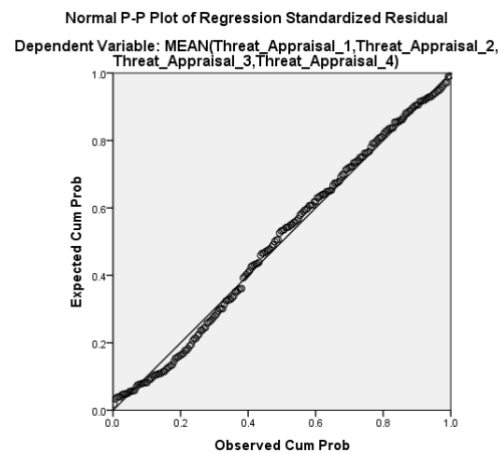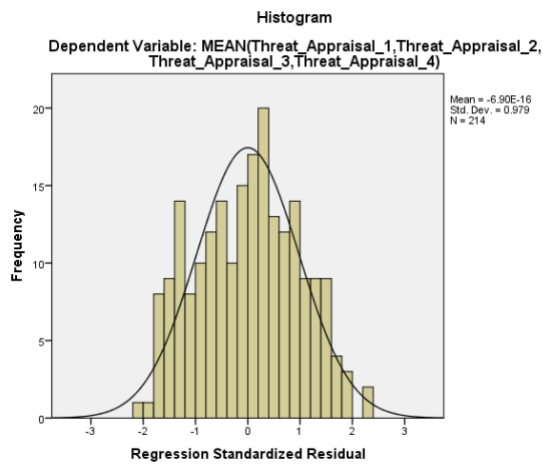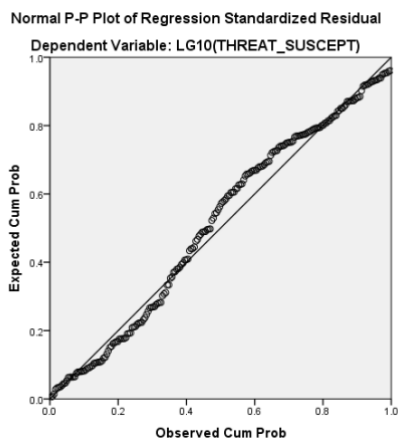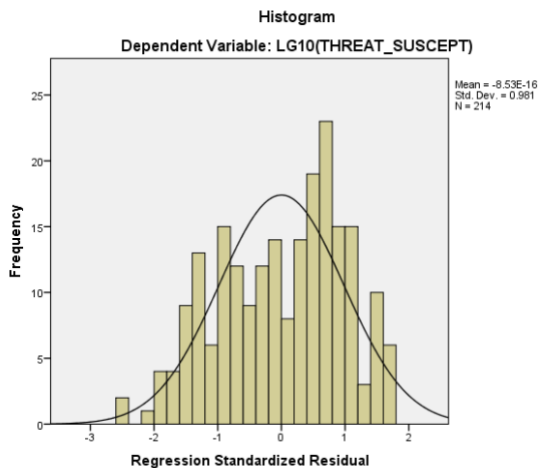
Appendix I. Diagnostic plots of regression models of three-way interaction effects of disinformation type, corrective information type, and individual differences; Plots for the significant effects only (Study 2)

1. Disinformation type × Corrective information type × Social media news use ➜ Situational severity ($\Delta R^2 = .025$, $p = .018$, $ß = .705$).
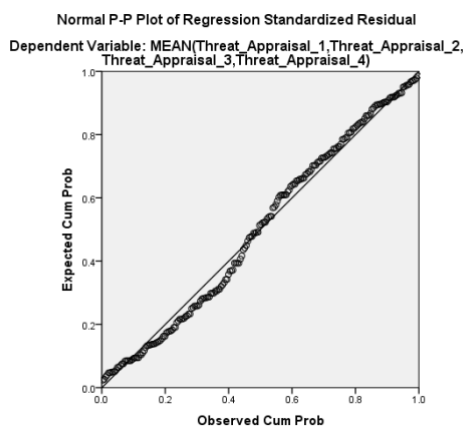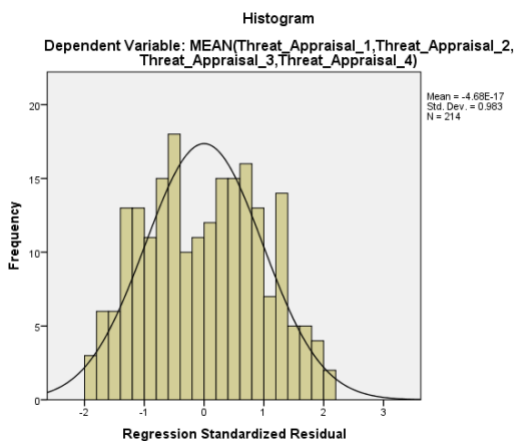
2. Disinformation type × Corrective information type × Social media news use ➜ Situational susceptibility ($\Delta R^2 = .015$, $p = .067$, $ß = .561$).
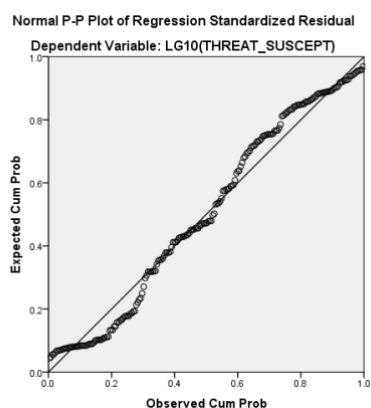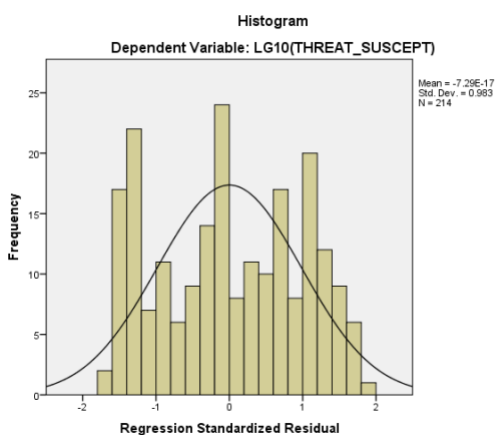
3. Disinformation type × Corrective information type × Whiteness ➜ Intentions to spread disinformation on social media ($\Delta R^2 = .023$, $p = .025$, $\beta = -1.079$).
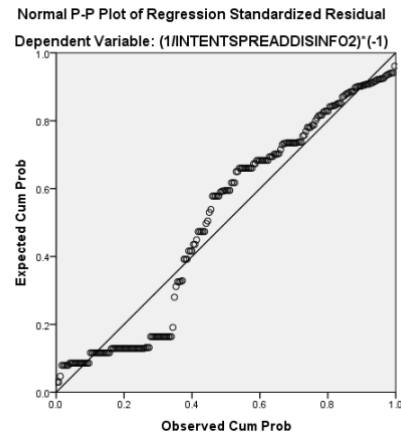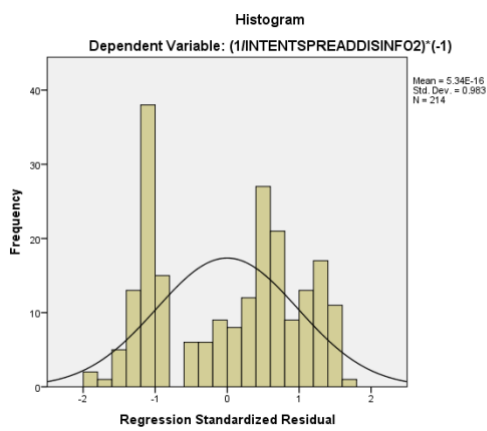
4. Disinformation type × Corrective information type × Self-efficacy ➜ Intentions to spread disinformation on social media ($\Delta R^2 = .016$, $p = .063$, $\beta = .579$).
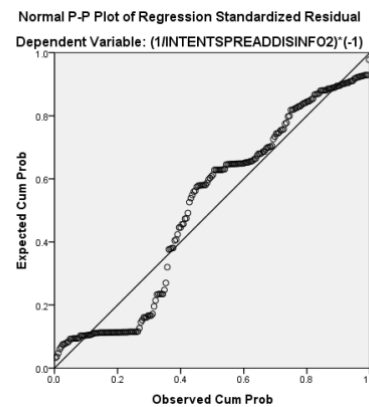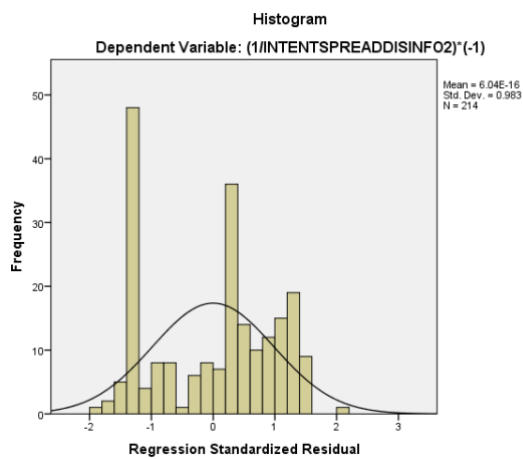
5. Disinformation type × Corrective information type × Social media use for social interaction ➜ Intentions to spread disinformation on social media ($\Delta R^2 = .021$, $p = .031$, $\beta = .693$).
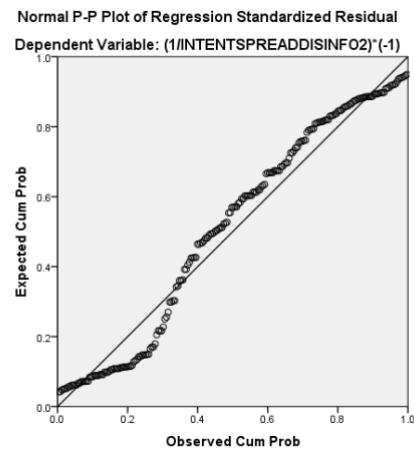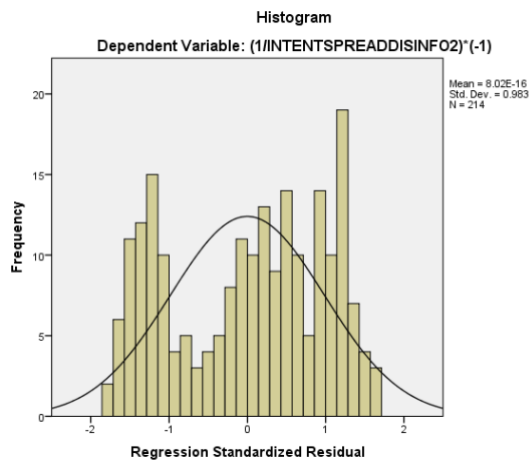
Notes. Variables of individual differences were all mean-centered for multicollinearity. A series of VIF tests showed that multicollinearity for regression models were high when corrective information type was coded as: 1 = simple corrective information and 2 = narrative corrective information). However, even after the corrective information type was recoded as 0 = simple corrective information and 1 = narrative corrective information and rerunning the analyses to decrease multicollinearity, the p-levels for significance were same as the original results. The Ordinary Least Square (OLS) is still a best linear unbiased estimator (BLUE) for the original results.

References

Abelson, R. P. (1963). Computer simulation of "hot cognitions." In S., Tomkins,S. Messick, (Eds.),*Computer simulation of personality*. New York: Wiley.

Alhabash, S., McAlister, A. R., Lou, C., & Hagerstrom, A. (2015). From clicks to behaviors: The mediating effect of intentions to like, share, and comment on the relationship between message evaluations and offline behavioral intentions. *Journal of Interactive Advertising*, *15*(2), 82-96.

Allport, F. H., & Lepkin, M. (1945). Wartime rumors of waste and special privilege: Why some people believe them. *The Journal of Abnormal and Social Psychology, 40,* 3–36. doi:10.1037/ h0058110

Allport, G. W., & Postman, L. (1947). *The psychology of rumor*. New York: Henry Holt & Co.

Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors*, *64*, 287-293. doi: https://doi.org/10.1016/j.addbeh.2016.03.006

Appelman, A., & Sundar, S. S. (2016). Measuring message credibility: Construction and validation of an exclusive scale. *Journalism & Mass Communication Quarterly*, *93*(1), 59-79.

Averbeck, J. M., Jones, A., & Robertson, K. (2011). Prior knowledge and health messages: An examination of affect as heuristics and information as systematic processing for fear appeals. *Southern Communication Journal*, *76*(1), 35-54.

Bakir, V., & McStay, A. (2018). Fake news and the economy of emotions: Problems, causes, solutions. *Digital Journalism*, *6*(2), 154-175. doi: 10.1080/21670811.2017.1345645

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 5,* 1173-1182.

Begg, I. M., Anas, A., & Farinacci, S. (1992). Dissociation of processes in belief: Source recollection, statement familiarity, and the illusion of truth. *Journal of Experimental Psychology: General*, *121*(4), 446-458.

Berger, J. (2011). Arousal increases social transmission of information. *Psychological science*, *22*(7), 891-893.

Berinsky, A. J. (2017). Rumors and health care reform: Experiments in political misinformation. *British Journal of Political Science, 47,* 241–262. doi:10.1017/S0007123415000186

Bessi, A., & Ferrara, E. (2016). Social bots distort the 2016 US Presidential election online discussion. *First Monday. 21*(11). Retrieved from: http://firstmonday.org/article/view/7090/5653

Bode, L., & Vraga, E. K. (2015). In related news, that was wrong: The correction of misinformation through related stories functionality in social media. *Journal of Communication*, *65*(4), 619-638.

Bode, L., & Vraga, E. K. (2018). See something, say something: Correction of global health misinformation on social media. *Health Communication*, *33*(9), 1131-1140. doi: 10.1080/10410236.2017.1331312

Brehm, J. W. (1966). *A theory of psychological reactance*. Oxford, England: Academic Press.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on Psychological Science*, *6*(1), 3-5. doi: 10.1177/1745691610393980

Burgess, D. C., Burgess, M. A., & Leask, J. (2006). The MMR vaccination and autism controversy in United Kingdom 1998–2005: Inevitable community outrage or a failure of risk communication?. *Vaccine*, *24*(18), 3921-3928. doi: 10.1016/j.vaccine.2006.02.033

Burke, B. L., Martens, A., & Faucher, E. H. (2010). Two decades of terror management theory: A meta-analysis of mortality salience research. *Personality and Social Psychology Review, 14,* 155–195.

Cappella, J. N., & Jamieson, K. H. (1997). *Spiral of cynicism: The press and the public good*. New York: Oxford University Press.

Cappella, J. N., Maloney, E., Ophir, Y., & Brennan, E. (2015). Interventions to correct misinformation about tobacco products. *Tobacco Regulatory Science*, *1*(2), 186-197. doi: 10.18001/TRS.1.2.8

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*(5), 752 -766. doi: 10.1037/0022-3514.39.5.752

Chaiken, S. (1987). The heuristic model of persuasion. In Social influence: the ontario symposium (Vol. 5, pp. 3-39).

Chaiken, S., & Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. New York, NY, US: Guilford Press.

Chandrasekaran, N., Gressick, K., Singh, V., Kwal, J., Cap, N., Koru-Sengul, T., & Curry, C. L. (2017). The utility of social media in providing information on Zika virus. *Cureus*, *9*(10). doi: 10.7759/cureus.1792

Chen, X., Sin, S. C. J., Theng, Y. L., & Lee, C. S. (2015). Why students share misinformation on social media: Motivation, gender, and study-level differences. *The Journal of Academic Librarianship*, *41*(5), 583-592. doi: 10.1016/j.acalib.2015.07.003

Cohen, E. L. (2014). What makes good games go viral? The role of technology use, efficacy, emotion and enjoyment in players' decision to share a prosocial digital game. *Computers in Human Behavior*, *33*, 321-329.

Cohen, J. B., Pham, M. T., & Andrade, E. B. (2008). The nature and role of affect in consumer behavior. In C. P. Haugtvedt, P. M. Herr, & F. R. Kardes (Eds.), *Handbook of consumer psychology* (pp. 297-348). New York, NY: Psychology Press.

Crites Jr, S. L., Fabrigar, L. R., & Petty, R. E. (1994). Measuring the affective and cognitive properties of attitudes: Conceptual and methodological issues. *Personality and Social Psychology Bulletin*, *20*(6), 619-634. doi: 10.1177/0146167294206001

Crook, B., Glowacki, E. M., Suran, M., K. Harris, J., & Bernhardt, J. M. (2016). Content analysis of a live CDC Twitter chat during the 2014 Ebola outbreak. *Communication Research Reports*, *33*(4), 349-355.

Das, E. H., De Wit, J. B., & Stroebe, W. (2003). Fear appeals motivate acceptance of action recommendations: Evidence for a positive bias in the processing of persuasive messages. *Personality and Social Psychology Bulletin*, *29*(5), 650-664. doi: 10.1177/0146167203029005009

Davison, W. P. (1983). The third-person effect in communication. *Public Opinion Quarterly*, *47*(1), 1-15. doi: https://doi.org/10.1086/268763

De Graaf, A., Hoeken, H., Sanders, J., & Beentjes, J. W. (2012). Identification as a mechanism of narrative persuasion. *Communication Research, 39*(6), 802-823.

De Hoog, N., Stroebe, W., & De Wit, J. B. (2005). The impact of fear appeals on processing and acceptance of action recommendations. *Personality and Social Psychology Bulletin*, *31*(1), 24-33. doi: 10.1177/0146167204271321

De Hoog, N., Stroebe, W., & De Wit, J. B. (2007). The impact of vulnerability to and severity of a health risk on processing and acceptance of fear-arousing communications:

A meta-analysis. *Review of General Psychology, 11*(3), 258-285. doi: 10.1037/1089-2680.11.3.258

Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G.,. . . Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences, 113*(3), 554–559. doi:10.1073/pnas.1517441113

DiFonzo, N., & Bordia, P. (2007). *Rumor psychology: Social and organizational approaches* (Vol. 1, pp. 1-34). Washington, DC: American Psychological Association.

Dillard, J. P., & Peck, E. (2000). Affect and persuasion: Emotional responses to public service announcements. *Communication Research*, *27*(4), 461-495.

Dutta-Bergman, M. J. (2004). Primary sources of health information: Comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Communication, 16*, 273–288.

Dyer, R. F., & Kuehl, P. G. (1978). A longitudinal study of corrective advertising. *Journal of Marketing Research*, 39-48. doi: 10.2307/3150399

Ecker, U. K. (2017). Why rebuttals may not work: the psychology of misinformation. *Media Asia*, *44*(2), 79-87.

Ecker, U. K., Lewandowsky, S., & Apai, J. (2011). Terrorists brought down the plane!—No, actually it was a technical fault: Processing corrections of emotive information. *Quarterly Journal of Experimental Psychology*, *64*(2), 283-310.

Ecker, U. K., Lewandowsky, S., Swire, B., & Chang, D. (2011). Correcting false information in memory: Manipulating the strength of misinformation encoding and its retraction. *Psychonomic Bulletin & Review*, *18*(3), 570-578.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143-1168. doi: 10.1111/j.1083-6101.2007.00367.x

Escalas, J. E., & Stern, B. (2003). Sympathy and empathy: Emotional responses to advertising dramas. *Journal of Consumer Research, 29*, 566–578. doi:10.1086/346251

Fallis, D. (2015). What is disinformation?. *Library Trends*, *63*(3), 401-426. doi: 10.1353/lib.2015.0014

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, *454*(7208), 1079-1083.

Fernández-Luque, L., & Bau, T. (2015). Health and social media: perfect storm of information. *Healthcare Informatics Research*, *21*(2), 67-73. doi: 10.4258/hir.2015.21.2.67

Ferrara, E. (2016, November 8). How Twitter bots affected the US presidential campaign. *The Conversation.* Retrieved from: http://theconversation.com/how-twitter-bots-affected-the-us-presidential-campaign-68406

Fetzer, J. H. (2004). Disinformation: The use of false information. *Minds and Machines, 2*(14), 231–240. doi: 10.1023/B:MIND.0000021683.28604.5b

Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, *13*(1), 1-17. doi: 10.1002/(SICI)1099-0771(200001/03)13:1<1::AID-BDM333>3.0.CO;2-S

Flora, J. A., & Maibach, E. W. (1990). Cognitive responses to AIDS information: The effects of issue involvement and message appeal. *Communication Research*, *17*(6), 759-774.

Gerodimos, R., & Justinussen, J. (2015). Obama's 2012 Facebook campaign: Political communication in the age of the like button. *Journal of Information Technology & Politics*, *12*(2), 113-132.

Gil de Zúñiga, H., Jung, N., & Valenzuela, S. (2012). Social media use for news and individuals' social capital, civic engagement and political participation. *Journal of*

Computer-Mediated Communication, *17*(3), 319-336. doi: 10.1111/j.1083-6101.2012.01574.x

Gilovich, T., Griffin, D., & Kahneman, D. (Eds.). (2002). *Heuristics and biases: The psychology of intuitive judgment*. New York, NY, US: Cambridge University Press.

Green, M. C. (2006). Narratives and cancer communication. *Journal of Communication*, *56*(suppl_1), S163-S183. doi: 10.1111/j.1460-2466.2006.00288.x

Greene, K., & Brinn, L. S. (2003). Messages influencing college women's tanning bed use: Statistical versus narrative evidence format and a self-assessment to increase perceived susceptibility. *Journal of Health Communication*, *8*(5), 443-461.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701–721. doi: 10.1037/0022-3514.79.5.701

Guille, A., Hacid, H., Favre, C., & Zighed, D. A. (2013). Information diffusion in online social networks: A survey. *ACM Sigmod Record*, *42*(2), 17-28.

Gyenes, N. & Mina, X. (2018, August 30). How misinfodemics spread disease. The Atlantic. Retrieved from: https://www.theatlantic.com/technology/archive/2018/08/how-misinfodemics-spread-disease/568921/

Habermas, J. (1984). *The theory of communicative action: Vol. 1. Reason and the rationalization of society* (T. McCarthy, Trans.). Boston, MA: Beacon Press.

Hale, J. L., Lemieux, R., & Mongeau, P. A. (1995). Cognitive processing of fear-arousing message content. *Communication Research*, *22*(4), 459-474.

Hamann, S. B., Ely, T. D., Grafton, S. T., & Kilts, C. D. (1999). Amygdala activity related to enhanced memory for pleasant and aversive stimuli. *Nature Neuroscience*, *2*(3), 289-293. doi: 10.1038/6404

Harding, S. (2007). Man-made disaster and development: The case of Iraq. *International Social Work, 50*(3), 295-306. doi: 10.1177/0020872807076041

Heath, C., Bell, C., & Sternberg, E. (2001). Emotional selection in memes: the case of urban legends. *Journal of Personality and Social Psychology*, *81*(6), 1028-1041. doi: 10.1037/0022-3514.81.6.1028

Heath, C. & Heath, D. (2007). Made to stick: why some ideas survive and others die. New York: Random House.

Henkel, L. A. & Mattson, M. E. (2011). Reading is believing: The truth effect and source credibility. *Consciousness and Cognition*, *20*(4), 1705-1721. doi: 10.1016/j.concog.2011.08.018

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education & Behavior*, *34*(5), 777-792.

Hovland, C.I., Janis, I.L., & Kelley, H.H. (1953). *Communication and persuasion*. New Haven, CT, US: Yale University Press.

Illing, S. (2017, November 6). America's misinformation problem, explained. *Vox*. Retrieved from: https://www.vox.com/2017/11/6/16504454/misinformation-fake-news-media-trump

Iriyama, S., Nakahara, S., Jimba, M., Ichikawa, M., & Wakai, S. (2007). AIDS health beliefs and intention for sexual abstinence among male adolescent students in Kathmandu, Nepal: a test of perceived severity and susceptibility. *Public Health*, *121*(1), 64-72.

Ives, M. (2016, October 18). When Epidemics Go Viral. *The Atlantic.* Retrieved from: https://www.theatlantic.com/health/archive/2016/10/when-epidemics-go-viral/504503/

Janis, I. L. (1967). Effects of fear arousal on attitude change: Recent developments in theory and experimental research. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 3). New York: Academic Press.

Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly*, *11*(1), 1-47. doi: 10.1177/109019818401100101

Johnson, H. M., & Seifert, C. M. (1994). Sources of the continued influence effect: When misinformation in memory affects later inferences. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20, 1420–1436. doi:10.1037/0278-7393.20.6.1420

Jolley, D., & Douglas, K. M. (2014). The effects of anti-vaccine conspiracy theories on vaccination intentions. *PloS one*, *9*(2), e89177. doi: 10.1371/journal.pone.0089177

Joyce, G. (2016). We're more misinformed than ever: Looking at the prevalence of fake news. *Brandwatch*. Retrieved from: https://www.brandwatch.com/blog/react-the-prevalence-of-fake-news-and-why-we-are-more-misinformed-than-ever/

Karlova, N. A., & Fisher, K. E. (2013). Plz RT": A social diffusion model of misinformation and disinformation for understanding human information behaviour. *Information Research*, *18*(1), 1-17.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The public Opinion Quarterly*, *37*(4), 509-523.

Kim, Y. C., Shin, E., Cho, A., Jung, E., Shon, K., & Shim, H. (2015). SNS dependency and community engagement in urban neighborhoods: The moderating role of integrated connectedness to a community storytelling network. *Communication Research*, *46*(1), 7-32.

Kirkpatrick, N. (2015, June 10). How one joke photo has become a symbol of South Korea's fears about MERS. *The Washington Post*. Retrieved from:

https://www.washingtonpost.com/news/morning-mix/wp/2015/06/10/how-one-joke-photo-has-become-a-symbol-of-south-koreas-fears-about-mers/?noredirect=on&utm_term=.41921eec8fbd

Knapp, R. H. (1944). A psychology of rumor. *Public Online Quarterly,* 8, 22-27.

Kuklinski, J. H., Quirk, P. J., Jerit, J., Schwieder, D., & Rich, R. F. (2000). Misinformation and the currency of democratic citizenship. *The Journal of Politics*, *62*(3), 790-816.

Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, *108*(3), 480-498. doi: 10.1037/0033-2909.108.3.480

Kwon, K. H., & Rao, H. R. (2017). Cyber-rumor sharing under a homeland security threat in the context of government Internet surveillance: The case of South-North Korea conflict. *Government Information Quarterly*, *34*(2), 307-316.

Lang, P. J. (1984). Cognition in emotion: Concept and action. In Carroll E. Izard, Jerome Kagan & Robert E. Zajonc (eds.), Emotions, Cognition and Behavior. New York: Cambridge University Press, *Emotions, cognition, and behavior* (pp. 192-226).

Lee, J., & Choi, Y. (2018). Informed public against false rumor in the social media era: Focusing on social media dependency. *Telematics and Informatics*, *35*(5), 1071-1081. doi: 10.1016/j.tele.2017.12.017

Leventhal, H. (1970). Findings and Theory in the Study of Fear Communications. In *Advances in Experimental Social Psychology* (Vol. 5, pp. 119-186). New York: Academic Press. doi: 10.1016/S0065-2601(08)60091-X

Leventhal, H., & Cameron, L. (1987). Behavioral theories and the problem of compliance. *Patient Education and Counseling*, *10*(2), 117-138. doi: 10.1016/0738-3991(87)90093-0

Leventhal, H., & Niles, P. (1964). A field experiment on fear arousal with data on the validity of questionnaire measures 1. *Journal of Personality*, *32*(3), 459-479. doi: 10.1111/j.1467-6494.1964.tb01352.x

Leventhal, H., Singer, R., & Jones, S. (1965). Effects of fear and specificity of recommendation upon attitudes and behavior. *Journal of Personality and Social Psychology*, *2*(1), 20-29. doi: 10.1037/h0022089

Levine, L. J., & Pizarro, D. A. (2004). Emotion and memory research: A grumpy overview. *Social cognition*, *22*(5: Special issue), 530-554. doi: 10.1521/soco.22.5.530.50767

Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and its correction: Continued influence and successful debiasing. *Psychological Science in the Public Interest*, *13*(3), 106-131.

Lodge, M., & Taber, C. S. (2005). The automaticity of affect for political leaders, groups, and issues: An experimental test of the hot cognition hypothesis. *Political Psychology*, *26*(3), 455-482. doi: 10.1111/j.1467-9221.2005.00426.x

MacGuill, D. (2018, August 22). Did a 'new deadly spider' species kill several people in the U.S. in the summer of 2018?. *Snopes*. Retrieved from: https://www.snopes.com/fact-check/new-deadly-spider/

Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, *44*(1), 1-23. doi: 10.3758/s13428-011-0124-6

Mayer, N. D., & Tormala, Z. L. (2010). "Think" versus "feel" framing effects in persuasion. *Personality and Social Psychology Bulletin*, *36*(4), 443-454. doi: 10.1177/0146167210362981

Mccoy, C. (2015, July 24). Why are vaccination rates dropping in America? *The New Republic.* Retrieved from: https://newrepublic.com/article/122367/why-are-vaccination-rates-dropping-america

McDaniel, M. A., Waddill, P. J., Finstad, K., & Bourg, T. (2000). The effects of text-based interest on attention and recall. *Journal of Educational Psychology*, *92*(3), 492-502. doi: 10.1037/0022-0663.92.3.492

McGuire, W. J. (1968). Personality and susceptibility to social influence. In E. F. Borgatta & W. W. Lambert (Eds.), *Handbook of personality theory and research*. Skokie, IL: Rand McNally.

Meijnders, A. L., Midden, C. J., & Wilke, H. A. (2001). Role of negative emotion in communication about CO2 risks. *Risk Analysis*, *21*(5), 955-955.

Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, *36*(1), 26-52. doi: 10.1111/j.1468-2958.2009.01367.x

Mulvey, J. (2015, January 22). Why fear spreads faster than facts on social media. Retrieved from: https://blog.hootsuite.com/citizen-engagement-crisis-management-on-social-media/

Murphy, S. T., Frank, L. B., Chatterjee, J. S., & Baezconde-Garbanati, L. (2013). Narrative versus nonnarrative: The role of identification, transportation, and emotion in reducing health disparities. *Journal of Communication*, *63*(1), 116-137.

Muthusamy, N., Levine, T. R., & Weber, R. (2009). Scaring the already scared: Some problems with HIV/AIDS fear appeals in Namibia. *Journal of Communication*, *59*(2), 317-344. doi: 10.1111/j.1460-2466.2009.01418.x

Mwanamilongo, S. (2018, May 18). Congo's Ebola risk 'very high' as confirmed virus cases rise. *USA Today*. Retrieved from:

https://www.usatoday.com/story/news/world/2018/05/18/ebola-congo-emergency-meeting/622232002/

Nahon, K., & Hemsley, J. (2013). *Going viral.* Cambridge, England: Polity Press.

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, *2*(2), 175-220.

Nowak, K. (2001, May). Defining and differentiating copresence, social presence and presence as transportation. Paper presented at the *Presence 2001 Conference*, Philadelphia, PA.

Nyhan, B., & Reifler, J. (2010). When corrections fail: The persistence of political misperceptions. *Political Behavior*, *32*(2), 303-330.

Nyhan, B., Reifler, J., & Ubel, P. A. (2013). The hazards of correcting myths about health care reform. *Medical Care*, *51*(2), 127-132.

Oh, O., Agrawal, M., & Rao, H. R. (2013). Anxiety and rumor: exploratory analysis of Twitter posts during the Mumbai terrorist attack. In *Rumor and Communication in Asia in the Internet Age* (pp. 157-169). London, UK: Routledge.

Oliver, M. B., Dillard, J. P., Bae, K., & Tamul, D. J. (2012). The effect of narrative news format on empathy for stigmatized groups. *Journalism & Mass Communication Quarterly, 89*(2), 205-224.

Ophir, Y., & Jamieson, K. H. (2018). Intentions to use a novel Zika vaccine: the effects of misbeliefs about the MMR vaccine and perceptions about Zika. *Journal of Public Health*. doi: 10.1093/pubmed/fdy042

Oxford Dictionary. (2016). Word of the year 2016 is…Retrieved from: https://en.oxforddictionaries.com/word-of-the-year/word-of-the-year-2016.

Park, N., Kee, K. F., & Valenzuela, S. (2009). Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *CyberPsychology & Behavior*, *12*(6), 729-733. doi: 10.1089/cpb.2009.0003

Pantti, M. K., & Wahl-Jorgensen, K. (2011). 'Not an act of God': anger and citizenship in press coverage of British man-made disasters. *Media, Culture & Society*, *33*(1), 105-122.

Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology*, *37*(10), 1915-1926. doi: 10.1037/0022-3514.37.10.1915

Poland, G. A., & Spier, R. (2010). Fear, misinformation, and innumerates: how the Wakefield paper, the press, and advocacy groups damaged the public health. *Vaccine*, *28*(12), 2361. doi: 10.1016/j.vaccine.2010.02.052

Prasad, M., Perrin, A. J., Bezila, K., Hoffman, S. G., Kindleberger, K., Manturuk, K., & Powers, A. S. (2009). "There must be a reason": Osama, Saddam, and inferred justification. *Sociological Inquiry*, *79*(2), 142-162. doi: 10.1111/j.1475-682X.2009.00280.x

Ratkiewicz, J., Conover, M., Meiss, M., Gonçalves, B., Patil, S., Flammini, A., & Menczer, F. (2010). Detecting and tracking the spread of astroturf memes in microblog streams. *arXiv preprint arXiv:1011.3768*. doi: 10.1145/1963192.1963301

Redlawsk, D. (2002). Hot cognition or cool consideration: Testing the effects of motivated reasoning on political decision making. *Journal of Politics, 64*, 1021–1044.

Rogers, R.W. (1983) Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In: J.T. Cacioppo and R.E. Petty (Eds.), *Social Psychophysiology: A Sourcebook* (pp. 153-176). New York: Guilford Press.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1994). The health belief model and HIV risk behavior change. In R. J. DiClemente & J. L. Peterson (Eds.), *Preventing AIDS: Theories and methods of behavioral interventions*. New York: Plenum Press.

Rosnow, R. L. (1980). Psychology of rumor reconsidered. *Psychological Bulletin*, 87, 578–591.

Rosnow, R. L. (1991). Insider rumor: A personal journey. *American Psychologist*, 146, 484–496.

Rosnow, R. L. (2001). Rumor and gossip in interpersonal interaction and beyond: A social exchange perspective. In R. M. Kowalski (Ed.), *Behaving badly: Aversive behaviors in interpersonal relationships* (pp. 203–232). Washington, DC: American Psychological Association

Rosnow, R. L., & Fine, G. A. (1976). *Rumor and gossip: The social psychology of hearsay*. New York: Elsevier.

Ross, J., Irani, L., Silberman, M., Zaldivar, A., & Tomlinson, B. (2010, April). Who are the crowdworkers?: Shifting demographics in mechanical turk. In *CHI'10 extended abstracts on Human Factors in Computing Systems* (pp. 2863-2872). ACM.

Routledge, C., & Juhl, J. (2010). When death thoughts lead to death fears: Mortality salience increases death anxiety for individuals who lack meaning in life. *Cognition and Emotion*, *24*(5), 848-854.

Runyan, R. C. (2006). Small Business in the Face of Crisis: Identifying Barriers to Recovery from a Natural Disaster. *Journal of Contingencies and crisis management*, *14*(1), 12-26.

Ryu, Y., & Kim, S. (2015). Testing the heuristic/systematic information-processing model (HSM) on the perception of risk after the Fukushima nuclear accidents. *Journal of Risk Research, 18*(7), 840-859.

Sangalang, Ophir, & Cappella (2018). The potential for narrative correctives to reduce belief echoes. Paper presented at *International Communication Association*, Prague, Czech Republic.

Sarmah, S. (2014). Fighting the endless spread of Ebola misinformation on social media. *Fast Company.* Retrieved from: https://www.fastcompany.com/3034380/fighting-the-endless-spread-of-ebola-misinformation-on-social-media

Schwarz, N. (2002). Situated cognition and the wisdom of feelings: Cognitive tuning. In L. Feldman Barrett & P. Salovey (Eds.), *The wisdom in feelings* (pp.144-166). New York: Guilford.

Schwarz, N., & Clore, G. L. (1988). How do I feel about it? Informative functions of affective states. In K. Fiedler & J. Forgas (Eds.), *Affect, cognition, and social behavior* (pp. 44- 62). Toronto: Hogrefe International.

Schwarz, N., Sanna, L. J., Skurnik, I., & Yoon, C. (2007). Metacognitive experiences and the intricacies of setting people straight: Implications for debiasing and public information campaigns. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 39, pp. 127–191). San Diego, CA: Academic Press. doi:10.1016/S0065-2601 (06)39003-X127

Seifert, C. M. (2002). The continued influence of misinformation in memory: What makes a correction effective?. *Psychology of Learning and Motivation*, *41*, 265-294.

Shafir, E., Simonson, I., & Tversky, A. (1993). Reason-based choice. *Cognition, 49*(1-2), 11-36. doi: 10.1016/0010-0277(93)90034-S

Sherman, D. K., & Kim, H. S. (2002). Affective perseverance: The resistance of affect to cognitive invalidation. *Personality and Social Psychology Bulletin*, *28*(2), 224-237. doi: 10.1177/0146167202282008

Shklovski, I., Burke, M., Kiesler, S., & Kraut, R. (2010). Technology adoption and use in the aftermath of Hurricane Katrina in New Orleans. *American Behavioral Scientist*, *53*(8), 1228-1246. doi: 10.1177/0002764209356252

Shklovski, I., Palen, L., & Sutton, J. (2008, November). Finding community through information and communication technology in disaster response. In *Proceedings of the 2008 ACM conference on Computer supported cooperative work* (pp. 127-136). ACM.

Simon, T., Goldberg, A., Aharonson-Daniel, L., Leykin, D., & Adini, B. (2014). Twitter in the cross fire—the use of social media in the Westgate Mall terror attack in Kenya. *PloS one*, *9*(8), e104136.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis, 24,* 311–322. doi: 10.1111/j.0272-4332.2004.00433.x

So, J., Kuang, K., & Cho, H. (2016). Reexamining fear appeal models from cognitive appraisal theory and functional emotion theory perspectives. *Communication Monographs*, *83*(1), 120-144.

Sorensen, J. H., & Sorensen, B. (2007). Community processes: Warning and evacuation. In H. Rodríguez, E. L. Quarantelli, & R. R. Dynes (Eds.), *Handbook of disaster research* (pp. 183–199). New York, NY: Springer.

Stahl, B. C. (2006). On the Difference or Equality of Information, Misinformation, and Disinformation: A Critical Research Perspective. *Informing Science*, *9*.

Starbird, K., Maddock, J., Orand, M., Achterman, P., & Mason, R. M. (2014). Rumors, false flags, and digital vigilantes: Misinformation on twitter after the 2013 boston marathon bombing. *IConference 2014 Proceedings*.

Stukal, D., Sanovich, S., Bonneau, R., & Tucker, J. A. (2017). Detecting bots on Russian political Twitter. *Big Data, 5*(4), 310-324. doi: 10.1089/big.2017.0038

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.

Taber, C. S., & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American Journal of Political Science*, *50*(3), 755-769.

Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics*, *38*(4), 402-418.

Tenney, E. R., Cleary, H. M. D., & Spellman, B. A. (2009). Unpacking the doubt in "beyond a reasonable doubt": Plausible alternative stories increase not guilty verdicts. *Basic and Applied Social Psychology, 31,* 1-8. doi: 10.1080/01973530802659687

Thorson, E. A. (2013). *Belief echoes: The persistent effects of corrected misinformation*. Unpublished dissertation, University of Pennsylvania, Philadelphia, PA

Thorson, E. (2016). Belief echoes: The persistent effects of corrected misinformation. *Political Communication, 33,* 460–480. doi:10.1080/10584609.2015.1102187.

Tversky, B., & Marsh, E. J. (2000). Biased retellings of events yield biased memories. *Cognitive Psychology*, *40*(1), 1-38.

Van Laer, T., De Ruyter, K., Visconti, L. M., & Wetzels, M. (2013). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer research*, *40*(5), 797-817. doi: 10.1086/673383

Verkoeijen, P. P., Rikers, R. M., & Schmidt, H. G. (2004). Detrimental influence of contextual change on spacing effects in free recall. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *30*(4), 796-800.

Vogel, L. (2017). Viral misinformation threatens public health. *CMAJ. 189*(50), E1567. doi: 10.1503/cmaj.109-5536

Walter, N., & Murphy, S. T. (2018). How to unring the bell: A meta-analytic approach to correction of misinformation. *Communication Monographs*, 1-19. doi: 10.1080/03637751.2018.1467564

Walters, K., Christakis, D. A., & Wright, D. R. (2018). Are Mechanical Turk worker samples representative of health status and health behaviors in the US?. *PloS one, 13*(6), e0198835. Doi: https://doi.org/10.1371/journal.pone.0198835

Wardle, C. (2017, February 16). Fake news. It's complicated. *First Draft*. Retrieved from: https://medium.com/1st-draft/fake-news-its-complicated-d0f773766c79

Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science, 311*(5765), 1301–1303.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.

Whiting, A., & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research: An International Journal*, *16*(4), 362-369. doi: 10.1108/QMR-06-2013-0041

Wilkes, A. L., & Leatherbarrow, M. (1988). Editing episodic memory following the identification of error. *The Quarterly Journal of Experimental Psychology*, *40*(2), 361-387. doi: 10.1080/02724988843000168

Wirtz, J. G., Sar, S., & Duff, B. R. (2016). Does it matter if I feel sorry or sorry for you? Testing the roles of empathy and sympathy as mechanisms driving viewer response to a dramatic ad. *Communication Research Reports*, *33*(2), 111-118. doi: 10.1080/08824096.2016.1154835

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process

model. *Communications Monographs*, *59*(4), 329-349. doi:

10.1080/03637759209376276

Witte, K. (1994). Fear control and danger control: A test of the extended parallel process

model (EPPM). *Communications Monographs*, *61*(2), 113-134. doi:

10.1080/03637759409376328

Witte, K. (1995). Generating effective risk messages: How scary should your risk

communication be? In B. R. Burleson (Ed.), *Communication yearbook* (vol. 18, pp.

229–254). Thousand Oaks, CA: Sage.

Witte, K. (1996). Predicting risk behaviors: Development and validation of a diagnostic

scale. *Journal of Health Communication*, *1*(4), 317-342. doi:

10.1080/108107396127988

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective

public health campaigns. *Health Education & Behavior*, *27*(5), 591-615. doi:

10.1177/109019810002700506

Wood, M. J. (2018). Propagating and debunking conspiracy theories on twitter during the

2015–2016 Zika virus outbreak. *Cyberpsychology, Behavior, and Social Networking*,

21(8), 485-490.

Woollacott, E. (2014, October 9). The viral spread of Ebola rumors. Forbes. Retrieved from:

https://www.forbes.com/sites/emmawoollacott/2014/10/09/the-viral-spread-of-ebola-

rumors/#158e842c19d8

Worland, J. (2015, June 10). This photo symbolizes just how much MERS is taking over

South Korea. *Time.* Retrieved from: http://time.com/3915714/south-korea-mers-viral-

photo/

Zastrow, M. (2015, October 1). The hacker who exposed South Korea's deadly epidemic.

PBS. Retrieved from: http://www.pbs.org/wgbh/nova/next/body/mers-south-korea/

Zhou, L., & Zhang, D. (2007). An ontology-supported misinformation model: Toward a

digital misinformation library. *IEEE Transactions on Systems, Man, and Cybernetics-*

Part A: Systems and Humans, *37*(5), 804-813. doi: 10.1109/TSMCA.2007.902648.

Vita

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FORMAL EDUCATION

Ph.D. in Mass Communications **2019**
S.I. Newhouse School of Public Communications, Syracuse University, NY, USA.

M.A. in Communication **2016**
Department of Communication, Ewha Womans University, Seoul, Republic of Korea
▪ Best Graduate Student Thesis Prize, Valedictorian, Summa Cum Laude

B.A. in Journalism **2014**
Department of Communication and Media, Ewha Womans University, Seoul, Republic of Korea

SCHOLARLY AWARD

2018 **1st place at 3-Minutes Thesis Competition,** Korean American Communication Association (KACA)

2018 **Catherine L. Covert Research Award**, S.I. Newhouse School of Public Communications, Syracuse University

2018 **3-Minutes Thesis Semi-Finalist,** Syracuse University

2017 **1st place Faculty Paper Award**, Association for Education in Journalism and Mass Communication (AEJMC), Communicating Science, Health, Environment, and Risk (ComSHER) Division

2017 **2nd place Faculty Paper Award,** Association for Education in Journalism and Mass Communication (AEJMC), Korean American Communication Association (KACA) Division

2017 **Catherine L. Covert Research Award**, S.I. Newhouse School of Public Communications, Syracuse University

2017 **Top Student Paper,** International Communication Association (ICA), Korean American Communication Association (KACA) Division

2017 **1st Paper Award,** Broadcast Education Association (BEA), News Division

2016 **Best Graduate Student Thesis Prize**, Ewha Womans University

2014-2016 **Top Student Full-Scholarship** (M.A.), Ewha Womans University

2014 **Third Prize**, South Korea-China-Japan Trilateral Conflict Thesis
    Competition, Foreign Affairs of the Republic of Korea

2012-2014 **Tuition Scholarship, Nominated as Dean's List,** Ewha Womans University

2013 **Third Prize**, National University Students' Debate Competition, Planned
    Population Federation of Korea and Ministry of Health and Welfare of
    Republic of Korea

2013 **Speaker Prize**, National University Students' Debate Competition,
    The Central Election Management Committee of Republic of Korea

2012 **Silver Prize,** National University Students' Book Review Debate
    Competition, Kyoboo Books Center and Sookmyung Women University

PUBLICATION

Peer-Reviewed Academic Journals

Lim, J., **Lee, J.-Y.,** & Lim, S. (Forthcoming). Presumed influence of the anti-panhandling
  Campaign messages on promotional behaviors and charitable giving. *Journal of
  Promotion Management.*

Jung, S., **Lee, J.-Y.,** Kim, J., & Biocca, F. (2019). Projecting health information onto the
  body: How embodied augmented reality projection alters the users' the sense of
  presence and increases attitude change and behavioral intention. *Cyberpsychology,
  Behavior, and Social Networking*. doi: https://doi.org/10.1089/cyber.2018.0028

Lee, J.-Y. & Choi, Y. (2019). Effects of Network Heterogeneity on Social Media on Opinion
  Polarization among South Koreans: Focusing on Fear and Political Orientation.
  International Communication Gazette. doi: https://doi.org/10.1177/1748048518820499

Lee, J.-Y., Jung, S., Kim, J., & Biocca, F. (2018). Applying spatial augmented reality to
  anti-smoking message: Focusing on spatial presence, negative emotions, and threat
  appraisal. *International Journal of Human-Computer Interaction*. 1-10. doi:
  https://doi.org/10.1080/10447318.2018.1489581

Lee, J.-Y. (2018). "Self" takes it all in mental illness: Examining the dynamic role of health consciousness, negative emotions, and efficacy in information seeking. *Health Communication*. 1-11. doi: https://doi.org/10.1080/10410236.2018.1437528

Lee, J.-Y. & Choi, Y. (2018). Understanding social viewing through discussion network and emotion: A focus on South Korean presidential debates. *Telematics & Informatics*. *35*, 1382-1391. doi: https://doi.org/10.1016/j.tele.2018.03.009

Lee, J.-Y. & Choi, Y. (2018). Expanding affective intelligence theory through social viewing: Focusing on the South Korea's 2017 presidential election. *Computers in Human Behavior. 83,* 119-128. doi: https://doi.org/10.1016/j.chb.2018.01.026

Lee, J.-Y. & Choi, Y. (2018). Hasty discussion, cross-cutting exposure, and tolerance: A comparative study of South Korean and American online discussants. *International Communication Gazette*. 1-25. doi: https://doi.org/10.1177/1748048518754376

Lee, J.-Y. & Kim, Y., Kim, Y. (2018). An examination of fundamental cause theory in health communication: Focusing on fear appeals and efficacy. *Asian Communication Research. 15*, 13-48.

Kim, Y., **Lee, J.-Y.,** & Ham, S (2018). The effects of narrative messages on optimistic bias: A focus on controllability, collectivism, and risk perception in a massive fire crisis. *Asian Journal of Communication.* 1-20. doi: https://doi.org/10.1080/01292986.2018.1462392

Lee, J.-Y. & Choi, Y. (2017). Informed public against false rumor in the social media era: Focusing on social media dependency. *Telematics & Informatics*. 35, 1071-1081. doi: https://doi.org/10.1016/j.tele.2017.12.017
*Best Graduate Student Thesis Prize at Ewha Womans University

Lee, J.-Y. & Choi, Y. (2017). Shifting from audience to active public in social viewing: Focusing on discussion networks. *Computers in Human Behavior*. 75, 301–310. doi: https://doi.org/10.1016/j.chb.2017.05.027
 *Top student paper award at 2017 ICA KACA Division

Lim, J., **Lee, J.-Y.,** Kim. S., & Chang, J. (2017). Effects of perceived sensationalism and susceptibility to the disease on cognitive and emotional third-person perceptions of the MERS news coverage. *International Journal of Health & Media Research. 1,* 1-16.

Kim, Y. & **Lee, J.-Y.** (2017). Television news formats and constructing public sphere in disaster: A case study on the Sewol ferry disaster. *Korean Observer. 48*(3), 453-488. ***1ˢᵗ place winner at 2017 BEA News Division**

Kim, Y. & **Lee, J.-Y.** (2016). The effect of mortality salience on opinion polarization and altruistic behavior in the bontext of the Sewol ferry special law: A focus on moderating effects of psychological distance and collectivism. *Korean Journal of Journalism & Communication Studies. 60*(4), 297-327.

Kim, Y. & **Lee, J.-Y.** (2016). How was the Sewol ferry disaster constructed in South Korean broadcasting news?: An analysis of news frames, news sources, and news interviewees. *Crisisnomy. 12*(6).

Book Chapter

Lee, J.-Y., Liebler, C., & Powless, N. (2018). "Locker Room Talk" as "Small Potatoes": Women of the GOP and the 2016 Presidential Election. In C. A. Kray, T. W. Carroll., & H. Mandell (Eds.) *Nasty Women and Bad Hombres: Historical Reflections on the 2016 Presidential Election*. Rochester, NY: University of Rochester Press - Boydell and Brewer.

Other Creative Work

Lee, J.-Y. (2017, December). Journalism innovation from an audience-centered approach: Cases of digital journalism in the United States [in Korean]. *Korean Press Arbitration Commission*. 106-113.

Lee, J.-Y. (2017, June). An examination of fake news in the situational and personal context [in Korean]. *Korean Press Arbitration Commission*. 98-104.

TEACHING EXPERIENCE

Adjunct Instructor

Spring, 2019   **PRL 215: Advanced Public Relations Writing in Digital Media Era**
- Currently teaching 12 undergraduates. Students will be taught how to use a variety of social media analysis tools and apply those to analyze audiences. They will learn how to respond to crisis situations within the social sphere effectively using new media.

Fall, 2018   **PRL 215: Advanced Public Relations Writing in Digital Media Era**

- Taught 15 undergraduates. Focused on how to use and develop content for online public relations tools and how to leverage technology platforms to monitor conversations on the internet, engage online communities, identify influencers, and establish thought leadership.

Spring, 2018   **COM 107: Communication and Society**
- Co-taught approximately 50 undergraduate students. Defined and differentiated the roles of advertising, public relations, news, social media, and entertainment media in American society (Student Evaluation: 4.26/5.00)

Teaching Assistant

Fall, 2017   **COM 107: Communication and Society** (Dr. Makana Chock)
- Guest lectured for approximately 75 undergraduate students about imaged audiences, misinformation in digital media; Graded papers, made up current event quizzes per week, and mentored students

Summer, 2017   **COM 107: Communication and Society** (Dr. Brad Gorham)
- Syracuse University Summer College for high school students to explore college majors and experience college life
- Assisted the instructor to teach high school students about basic communication theories

CONFERENCE PRESENTATION

Conference Talks

Lee, J.-Y. (October 2018). Fear-arousing Disinformation and Narrative Corrective Information on Social Media in the Spread of a Health Virus
: A Focus on Situational Fear, Situational Threat Appraisal, and Belief in Disinformation. *2018 Locked out of Social Platforms: An iCS (Information, Communication, & Society) Symposium on Challenges to Studying Disinformation. Copenhagen, Denmark.*

Lee, J.-Y. & Choi, Y. (May 2018). Understanding social viewing through discussion network and emotion: A focus on South Korean presidential debates. *2018 International*

Communication Association (ICA), Mass Communication Division. Prague, Czech Republic.

Lee, J.-Y., Jung, S., & Kim, J. (May 2018). Applying spatial augmented reality to anti-smoking message: Focusing on spatial presence, negative emotions, threat appraisal. *2018 International Communication Association (ICA), Communication and Technology Division. Prague, Czech Republic.*

Lee, J.-Y. (May 2018). Stay informed in the spread of false rumors!: Examining the roles of SNS social dependency, negative emotions, and relevant channel beliefs in information seeking. *2018 International Communication Association (ICA), Information Systems Division. Prague, Czech Republic.*

Jung, S., **Lee, J.-Y.,** Kim, J., & Biocca, F. (May 2018). Projecting health information onto the body: How embodied augmented reality projection alters the users the sense of presence and increases attitude change and behavior. *2018 International Communication Association (ICA), Information Systems Division. Prague, Czech Republic.*

Kim, Y. & **Lee, J.-Y.** (May 2018). The power of fear in pictorial tobacco warnings: Emotions, health cognition and smoking cessation intention. *2018 International Communication Association (ICA), Health Communication Division. Prague, Czech Republic.*

Kim, S., Buntain, N., Wirzburger, A., Park. K., Morntountak, A., **Lee, J.-Y.,** Hu, J., Gayle, G., Gaggin, K., Domenico, I., Canuelas, L., Rao, H., & Ri, S. (May 2018). Eyewitness: Stereotype priming, memory, and attitude change in a virtual reality environment. *2018 International Communication Association (ICA), Information Systems Division. Prague, Czech Republic.*

Gaggin, K., Park, K., **Lee, J.-Y.,** Kim, S., Buntain, N., Domenico, I., Canuelas, L., Gayle, G., Hu, J., Morntountak, A., Rao, H., Wirzburger, A., & Zhang, J. (May 2018). The bag stands alone: Stereotype processing in virtual reality. *2018 International Communication Association (ICA), Information Systems Division. Prague, Czech Republic.*

Dosono, B., **Lee, J.-Y.,** Britton, L., Dobreski, B., Bratt, S., Peterman, G., Bova, K., Sharma, K., Semaan, B. (September 2017). Regaining normalcy after war: ICT-enabled 'transition resilience' among military veterans. *Wisconsin Warrior Summit 2017, Wisconsin, US.*

Lee, J.-Y. & Jiang, H. (August 2017). Risk as anxiety in mental illness: Negative emotions, coping responses, and campaign engagement intention. *2017 Association for Education*

in Journalism and Mass Communication (AEJMC), Communicating Science, Health, Environment, and Risk Division (ComSHER). Chicago, Illinois, US.

Lee, J.-Y., Powless, N., & Liebler, C. (August 2017). "Locker room talk" as "small potatoes": Women of the GOP and the 2016 presidential election. *2017 Association for Education in Journalism and Mass Communication (AEJMC), Commission on the Status of Women. Chicago, Illinois, US.*

Kim, Y. & **Lee, J.-Y.** (August 2017). How do health messages and self-stigma operate in extended parallel process model? *2017 Association for Education in Journalism and Mass Communication (AEJMC), Korean American Communication Association (KACA) Division. Chicago, Illinois, US.*
*Second place faculty paper award

Lim, J., **Lee, J.-Y.,** & Lim, S. (August 2017). The effects of message desirability and first-person perception of anti-panhandling campaigns on prosocial behaviors. *2017 Association for Education in Journalism and Mass Communication (AEJMC), Mass Communication and Society Division. Chicago, Illinois, US.*

Lee, J.-Y. (May 2017). Informed public against false rumor in the social media era: Focusing on social media dependency. *2017 International Communication Association (ICA), Information Systems Division. San Diego, California, US.*

Lee, J.-Y. (May 2017). Hasty discussion, cross-cutting exposure, and tolerance: A comparative study of South Korean and American online Discussants. *2017 International Communication Association (ICA), Intercultural Communication Division. San Diego, California, US.*

Lee, J.-Y. (May 2017). Shifting from audience to active public in social viewing: Focusing on interpersonal relationships. *2017 International Communication Association (ICA), Korean American Communication Association (KACA) Division. San Diego, California, US.*

Kim. Y. & **Lee, J.-Y.** (April 2017). Television news formats and constructing public sphere in disaster: A case study on the Sewol ferry. *2017 The Broadcast Education Association (BEA), News Division. Las Vegas, US.*

Lee, J.-Y. & Powless, N. (March 2017). Republican women's perceptions of media portrayal of female politician's unethical issues. *2017 Association for Education in Journalism and Mass Communication (AEJMC) Midwinter Conference, Commission on the Status of Women. Oklahoma, US.*

Lee, J.-Y. (November 2016). Network heterogeneity on SNS and opinion polarization under threatening situation: Focusing on North Korea's threats. *2016 The National Communication Association (NCA), Korean American Communication Association (KACA) Division. Philadelphia, Pennsylvania. US.*

Lee, J.-Y. (April 2016). How is an informed public constructed in rumor communication?: Understanding the effects of rumor credibility and SNS dependency. *2016 Korean Women's Association for Communication Studie*s. *Seoul, South Korea.*

Lee, J.-Y. & Kim, M. (February 2015). An analysis based on briefings of the South Korean government for cooperative communication: Focusing on the remarks of Dokdo Island issue. *2015 Social Science Korea Forum*. *Seoul, South Korea.*

Poster Presentations

Lee, J.-Y. & Kim, Y. (August 2018). Revisiting the effects of threat appraisal and self-efficacy on protection motivation from a terror management theory perspective. *2018 Association for Education in Journalism and Mass Communication (AEJMC), Communicating Science, Health, Environment, and Risk Division (ComSHER). Washington, District of Columbia, US.*

Hemsley, J., Jackson, S., **Lee, J.-Y.,** & Espinosa, D. (March 2018). The viral diffusion of campaign messages about political issues during the 2016 U.S. presidential election. *iConference 2018, Sheffield, UK*.

PROFESSIONAL EXPERIENCE

January 2015 – May 2016	**English News Editor** YTN (a 24-hour news broadcasting channel operating from Seoul, Korea) **Duties**: Covered domestic news in South Korea and international news; Wrote top daily news regarding South Korea issues; Produced news program and edited news video clips; In charge of news anchoring; Monitored domestic events & updated breaking news in a timely manner
March 2016 – July 2016	**Prime Time News Reporter** TBS efm (a 24-hour foreign language radio channel operating from Seoul, Korea) **Duties:** Reported news on political, international, and societal issues

February 2014 – December 2014	**Assistant Reporter**
	Thomson Reuters Seoul Bureau, Korean Language News Service

> **Duties:** Covered global financial news; Edited and translated global financial news; Wrote about market conditions of U.S. and Asia; Analyzed financial data related to Asia market with fast pace and accurate manner

June 2013 – September 2013	**Associated Press Television News Intern**
	Associated Press Seoul Bureau

> **Duties:** Wrote broadcasting news reports on a regular basis; Covered diverse news issues related to South Korea including North Korea Issues, especially regarding crimes against the humanity, diplomatic, and social news

March 2013 – June 2013	**Student Radio producer**
	Mapo FM (a radio channel operating from Mapo-gu, Seoul, South Korea)

July 2012 – August 2012	**Summer Student Internship in Financial Division**
	Hankook Ilbo (a Korean language daily newspaper published by the Hankook Ilbo Media Group in Seoul, South Korea)

SERVICE

To Syracuse University

2019	**Teaching Mentor Selection Committee**
	Graduate School, Syracuse University

2018 – current	**Teaching Mentor**
	Graduate School, Syracuse University

> **Duties**: Assisting TA orientation program and mentoring of all incoming teaching assistants; Leadership role with the TA Orientation Program
> **Sessions Presented**: Dealing with Challenges in the Classroom, Humanities & Social Sciences, Using Kahoot! And Other Online Technologies in the Classroom
> (Student Evaluation: 5.00/5.00)

2018 – current	**International Student Advisory Board (ISAB)**
	Slutzker Center for International Services, Syracuse University

Duties: Informing and advising the Slutzker Center for International Services on intercultural programs, services and issues that concern undergraduate and graduate international students at Syracuse University

2017 – 2018   **Peer Consultant**
Slutzker Center for International Services, Syracuse University
Duties: Planning, scheduling, conducting and coordinating orientation programs for new international undergraduate students; Analyzing post-event data, balancing budgets, preparing documents and presentations

To the Profession or To the Academy

2017 – current   **International Communication Association (ICA) Korean American Communication Association (KACA) subcommittee**
Duties: Paper reviewer recruitment, paper/panel session design, business meeting participation, award/grant selection, and social events design (social dinner and graduate student social gathering)

2018 – current   **Membership Chair**
Communicating Science, Health, Environment and Risk (ComSHER) Division, Association for Education in Journalism and Mass Communication (AEJMC)
Duties: Organizing social events for AEJMC 2019

2018   International Communication Association (ICA) Student Volunteer Work

2018   International Communication Association (ICA) Health Communication Division, "Effects of Social Media on Health Risk Perceptions and Healthy Behavior" Session Chair

2017 – 2018   **Graduate Student Representative Ambassador**
Communicating Science, Health, Environment and Risk (ComSHER) Division, Association for Education in Journalism and Mass Communication (AEJMC)
Duties: Connecting with and supporting graduate students who specializes in the ComSHER field

2017 – 2018   **Student News Editor**
Korean Communication Association (KACA)
Duties: Assisting in reporting news of KACA member

2017 – 2018   **Foreign Correspondent**
Korean Press Arbitration Commission
     Duties: Writing biannual reports on media trends in South Korea and the United States

Referee/Reviewer

Cyberpsychology, Behavior, and Social Networking
Journal of Health Communication
Computers in Human Behavior
Chinese Journal of Communication
International Communication Association (ICA) Mass Communication Division
International Communication Association (ICA) Health Communication Division
International Communication Association (ICA) Information Systems Division
International Communication Association (ICA) Communication and Technology Division

Professional Memberships
International Communication Association (2016 – Current)
National Communication Association (2016 – Current)
The Association for Education in Journalism and Mass Communication (AEJMC) (2016 – Current)

PROFESSIONAL TRAINING

May 29 – June 3, 2018   **4th International Summer School**
"Trusted in Mediated Communication"
University of Münster, Germany

2017 – 2018   **Future Professoriate Program (FPP)**
Graduate School, S.I. Newhouse School of Public Communications, Syracuse University

2016   **City U Summer School 2016 Advances in Computational Social Science Research**
Department of Media and Communication, City University of Hong Kong

Certifications and Software

Certification   2018   **Certificate in University Teaching**   Syracuse University

November 2014	**Social Analyst Certification**	Human Resources Development Service of Korea
Software	**SPSS, Mplus, AMOS, R, STATA, NVIVO, EDIUS 6**	
Language	**Korea, English**	

GRANTS

Dissertation Grant

2018 — 2019   Dissertation funded by S.I. Newhouse School of Public Communications, Syracuse University ($2,000)

Conference Travel Grant

2017 — 2018   Student Travel Grant, International Communication Association (ICA)
- Health Communication Division (2018)
- Communication and Technology Division (2018)
- Main Registration (2018)
- Korean American Communication Association (KACA) Division (2017)

2017 — 2018   Student Travel Grant, Graduate Student Organization, Syracuse University

2017   Student Travel Grant, 2017 Association for Education in Journalism and Mass Communication (AEJMC), Mass Communication & Society (MC&S) Division

2016   Student Travel Grant, 2016 Advances in Computational Social Science Research, Department of Media and Communication, City University of Hong Kong

2014   Student Travel Grant, The Internet & Television Association (NCTA) Conference, Los Angeles, California. Supported by GSSHOP and Korean Association for Broadcasting & Telecommunication Studies