Combating rumors on the internet : the use of rebuttals

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**COMBATING RUMORS ON THE INTERNET:
THE USE OF REBUTTALS**

PAL ANJAN

WEE KIM WEE SCHOOL OF COMMUNICATION AND INFORMATION

2021

**COMBATING RUMORS ON THE INTERNET:
THE USE OF REBUTTALS**

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WEE KIM WEE SCHOOL OF COMMUNICATION AND INFORMATION

A thesis submitted to the Nanyang Technological University
in partial fulfilment of the requirement for the degree of
Doctor of Philosophy

2021

STATEMENT OF ORIGINALITY

I hereby certify that the work embodied in this thesis is the result of original research, is free of plagiarised materials, and has not been submitted for a higher degree to any other University or Institution.

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SUPERVISOR DECLARATION STATEMENT

I have reviewed the content and presentation style of this thesis and declare it is free of plagiarism and of sufficient grammatical clarity to be examined. To the best of my knowledge, the research and writing are those of the candidate except as acknowledged in the Author Attribution Statement. I confirm that the investigations were conducted in accord with the ethics policies and integrity standards of Nanyang Technological University and that the research data are presented honestly and without prejudice.

19/02/2021

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Dr. Alton Chua

AUTHORSHIP ATTRIBUTION STATEMENT

This thesis contains materials from two papers published in the following peer-reviewed journal in which I am listed as an author:

Pal, A., Chua, A. Y., & Goh, D. H. L. (2020). How do users respond to online rumor rebuttals? *Computers in Human Behavior*.

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19/02/2021

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Summary

Rumors on the Internet have become a growing concern. A possible way to tackle rumors is the use of rebuttals, which refer to messages that are designed to debunk rumors on the Internet. However, the online community may not always accept rebuttals as the truth.

Hence, the goal of this research is to investigate the underlying mechanism of rebuttal acceptance, which was conceptualized as Internet users' belief in rebuttals and intention to share the debunking messages. Belief refers to individuals' level of trust in the rebuttals, while intention to share refers to their willingness to disseminate the rebuttals in order to spread the truth among members of the online community.

To achieve the goal, this research formulates two research objectives. The first research objective is to develop and empirically validate a conceptual model of rebuttal acceptance. Informed by the literature on rebuttals and information-processing behavior, the conceptual model seeks to explain the underlying mechanism of rebuttal acceptance. Specifically, it hypothesizes how perceived message properties of rebuttals could be related to perceived utilitarian and hedonic values, which in turn could be associated with rebuttal acceptance.

The second research objective is to examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement. Given the possibility that Internet users can confront a rebuttal when they are not even aware of the rumor, this research takes into account the role of exposure sequence of the two antithetical messages—rumor and its rebuttal—as one of the moderators. Moreover, the moderating roles of individuals' attitudinal predisposition and issue involvement are examined since

these individual differences are known to influence rumor-processing behavior.

Attitudinal predisposition refers to individuals' prior attitude towards an object. Issue

involvement refers to the extent to which individuals perceive an issue to be important.

A between-participants experimental design was adopted to manipulate the exposure sequence of a rumor and its rebuttal. Both quantitative and qualitative data were obtained. Complete responses from 305 social media users were admitted for analysis. Partial least squares structural equation modeling was employed to analyze the quantitative data. Perceived message properties were positively related to perceived utilitarian and hedonic values, which were further positively associated with rebuttal acceptance. Exposure sequence, attitudinal predisposition, and issue involvement significantly moderated the underlying mechanism of rebuttal acceptance. To gain further insights, an inductive content analysis was employed to analyze the qualitative data. In addition, the qualitative component was intended to enrich the experimental data. The emergent themes obtained from the qualitative responses not only complement the quantitative findings but also extend the understanding of users' perceptions of rebuttals. The qualitative findings particularly revealed that users can seek further information and express doubts when they receive rebuttals. Therefore, the use of rebuttals may require a follow-up that authorities could use to gain public trust and address related concerns.

This research contributes to the literature by explaining the underlying mechanism of rebuttal acceptance. This paves the way to inform practitioners and other Internet users about how rebuttals can serve as antidotes to rumors on the Internet.

CHAPTER ONE

INTRODUCTION

1.1. Background

Unprecedented technological advances have revolutionized how Internet users engage with online content (Diehl et al., 2016; Halliday, 2016; Hornik et al., 2015). For one, they can now easily create content on any topic using social media (Kim & Johnson, 2016; Vosoughi, Roy, & Aral, 2018). In addition, they are able to freely consume user-generated content available on such platforms (Hornik et al., 2015; Miyabe et al., 2014).

This development, however, comes with a downside. The absence of rigorous gatekeeping has turned the Internet into a breeding ground for online rumors (Oh et al., 2013; Waisbord, 2018). Online rumors refer to false messages circulating on the Internet to be passed off as facts (DiFonzo et al., 2013). Rumors have long afflicted society, and are not expected to cease to exist any time soon (Allport & Postman, 1946; Anthony, 1973; DiFonzo et al., 2013). In fact, they now spread faster than ever before as digital wildfires. Not only Internet users but also technology-enabled automated bots, known as “social bots”, facilitate the spread of online rumors (Bessi & Ferrara, 2016; Howard et al., 2018).

Online rumors gain traction because users tend to give sensational but spurious information the same weight as verified information from credible sources (Friggeri et al., 2014; Pal & Chua, 2019; Vista, 2015). Rumors can also be shared on social media platforms such as Facebook and Twitter (Berinsky, 2015; Lee & Hong, 2016).

1.2. Research Motivation

1.2.1. Problem Statement

Rumors are highly influential. Besides causing anxiety and panic among the public, they provoke real-life chaos, and sometimes dupe individuals into taking actions that they would not have taken otherwise (Ahern & Sosyura, 2015; Yang & Luo, 2014). For instance, rumors about child kidnappings have prompted mobs to beat innocent people to death in India (Goel et al., 2018; Martínez, 2018). Across the globe, several countries are facing issues where rumors exploit racial and religious fault lines. For instance, a dubious article about the alleged “Islamization” of London claimed that the city had closed down 500 churches and opened 423 new mosques (Snopes, 2018a). Conceivably, these rumors are difficult to separate from facts. If people end up believing the former at the expense of the latter, it would yield a perfect recipe for a social disaster.

Rumors spur during natural catastrophes (e.g., storms) and man-made disasters (e.g., terrorist attacks). During Hurricane Sandy in the US, for example, social media websites were flooded with rumors containing doctored images of sharks in the streets of New York (Holpuch, 2012). In the aftermath of Boston’s terrorist attack, a rumor that became viral confirmed a shutdown of cellular networks to restrain attackers from using phones to detonate explosives (Gross, 2013).

Moreover, there has been concern over health-related rumors. Individuals’ healthcare decision-making could be impaired due to rumors, thereby affecting their health and well-being (Pal et al., 2019; Zhang, Zhang, & Li, 2015). For instance, health rumors have previously caused public resistance to the administration of measles-mumps-rubella (MMR) vaccines (Grech, 2017). Rumors related to the treatment of diabetes may

actually make individuals' diabetes management even more difficult (FDA, 2018).

Moreover, rumors claiming the cancer risk posed by abortion and antiperspirants can mislead the public (American Cancer Society, 2019).

The threat posed by online rumors on businesses is also immense. When brand-related disparaging rumors spread on the Internet, they can hurt brands financially and distort users' perception of the brands. For instance, in 2008, a rumor claimed that the CEO of Apple Inc., Steve Jobs had passed away. It caused panic in the financial markets resulting in a loss of \$9bn to Apple's stock (Dubois et al., 2011). Online rumors such as Cadbury products contaminated with HIV, and McDonald's hamburgers containing worm meat became viral on the Internet, thereby severely affected the businesses (Jensen, 2015; Snopes, 2018b).

Online rumors can be tackled using at least three approaches. One approach involves stifling communication channels (Huang, 2017; Xinhua News Agency, 2012). Specifically referring to control over digital media, governments take steps to block websites, and shut down Internet services to control the spread of rumors (Huang, 2017; Liu, 2013). For example, the Sri Lanka government blocked several social media channels temporarily to curtail the spread of rumors in the wake of a terrorist attack (Fisher, 2019). However, adopting such an approach impedes the dissemination of not only rumors but also facts on the Internet. It also hampers people's freedom of speech, and free access to information.

Another approach involves detecting rumors amid non-rumors using machine-learning methods (Seo et al., 2012; Wu et al., 2015). The aim is to weed out fake content from the pool of content available on the Internet. However, the effectiveness of this

approach is thwarted by the complexity of online content (e.g., semantic disambiguation) and context (e.g., unverifiable statements, jokes and opinion) as well as the lack of properly annotated datasets (Berinsky, 2016; Kumar & Geethakumari, 2014; Simko et al. 2019). Moreover, although this approach assigns a false flag to rumors, it seldom facilitates explaining why they are false.

Hence, to complement rumor detection via machine-learning methods, rebuttals could be used. Rebuttals refer to messages that are designed to debunk rumors on the Internet (Aditya, 2014; Ozturk et al., 2015). Rebuttals issued by authoritative sources (Ozturk et al., 2015) and carrying concrete evidence (Paek & Hove, 2019) have been shown to be effective. When rumors gain traction and cause untold harm, authoritative sources intervene by issuing rebuttals to curtail the effects of rumors. Adopting this approach, the international coffee chain Starbucks debunked the rumor when it was alleged to give out discounts to all undocumented immigrants in the United States (Taylor, 2017).

Although the use of rebuttals to combat rumors is burgeoning (Ozturk et al., 2015), rebuttals may not always serve their intended purpose. There is evidence that lies travel faster than the truth on social media (Oremus, 2018; Vosoughi et al., 2018). In other words, rebuttals travel slower than rumors. In addition, rebuttals seem to have lower visibility compared with rumors. Unlike rumors that tend to be sensational (Wen et al., 2014), rebuttals have a relatively unexciting appearance (Friggeri et al, 2014; Vafeiadis et al., 2019; Vista, 2015). Moreover, individuals who read a rebuttal often remember only the rumor meant to be refuted (Lewandowsky et al., 2012). Clearly, they may not always

accept rebuttals as the truth. When rebuttals are not adequately believed and shared, they fail to win the battle against rumors.

This calls for an understanding of the mechanism of individuals' perceptions of online rebuttals and how those relate to their rebuttal acceptance, which can be conceptualized as users' belief in the debunking messages coupled with their intention to share the messages on the Internet (Dobrzynska & Blais, 2008; Perko et al., 2014). Belief refers to individuals' level of trust in rebuttals to take a stance in refuting rumors (Lee & Oh, 2017) while intention to share refers to users' willingness to disseminate the rebuttals in order to spread the truth among members of the online community (Pal et al., 2019; Torres et al., 2018). Both aspects are needed for rebuttals to gain social approval. Believing rebuttals helps correct individuals' misconceptions about the rumors, and sharing such messages spreads the truth among others (Lewandowsky et al., 2012; Marett & Joshi, 2009).

1.2.2. Research Gaps

The limited empirical research that looked into rebuttals has thus far found mixed results. Some works suggest that rebuttals considerably reduce individuals' tendency to believe and share rumors (Ozturk et al., 2015). Others however suggest that rebuttals can trigger a backfire effect, which reinforces the misconceptions about the rumors *per se* (Nyhan & Reifler, 2010).

In this body of literature, three research gaps can be identified. First, how message properties of rebuttals could play a part in debunking online rumors has not been widely investigated. Given that rebuttal acceptance largely depends on how individuals perceive

and process the debunking messages, perceived message properties including perceived argument quality and perceived source credibility of rebuttal could play a pertinent role in combating online rumors (Bordia et al., 2005; Lewandowsky et al., 2012). Perceived argument quality refers to the extent to which receivers perceive the arguments of a rebuttal as convincing and noteworthy (Chang et al., 2015; Zhang et al., 2014) while perceived source credibility refers to the extent to which receivers perceive the source of a rebuttal as reliable, competent, and trustworthy (Bordia et al., 2005; Zhang et al., 2014). Message properties of rebuttals have the potential to influence information-processing behavior, which refers to interpreting and synthesizing information in making decision (Tushman & Nadler, 1978).

Prior works have used several theories, but in isolation, to investigate how perceived message properties influence individuals' information-processing behavior (Bordia et al., 2005; Cheung et al., 2008; Hu et al., 2016; Tseng & Wang, 2016; Wang et al., 2019). These include Stimulus-Organism-Response (S-O-R) framework (Mehrabian & Russell, 1974), information adoption model (Sussman & Siegal, 2003), and elaboration likelihood model (Petty & Cacioppo, 1986). The S-O-R framework explains how message properties influence individuals' information processing, which further influence behavioral intention or actual behavior (Mehrabian & Russell, 1974; Wang et al., 2019). The information adoption model posits that argument quality and source credibility influence perceived information usefulness, which further determines information adoption (Sussman & Siegal, 2003). The elaboration likelihood model offers explanation of how individuals process information through two alternative routes of persuasion. Individuals with low elaboration likelihood process information through the peripheral

route whereas those with high elaboration likelihood process information through the central route (Petty, Cacioppo, & Schumann, 1983).

Second, how the exposure sequence of the two antithetical messages—a rumor and its rebuttal—could influence the underlying mechanism of rebuttal acceptance is currently unknown. Exposure sequence refers to the order in which individuals are exposed to the two antithetical messages in the online setting (Huang, 2017; Purnawirawan et al., 2012). The limited scholarly works on rebuttals (e.g., Bordia et al., 2005; Nyhan & Reifler, 2010) implicitly seem to assume that users would be exposed to a rebuttal only after they receive the rumor. However, in the online setting, users can be exposed to a rebuttal when they are not even aware of the rumor. Previous works on anchoring effect suggest that individuals' decision-making is often influenced by the first piece of information they obtain (Kwak et al., 2018; Tversky & Kahneman, 1974). In this vein, the role played by the anchoring effect can offer insights into how exposure sequence of a rumor and its rebuttal could influence the underlying mechanism of rebuttal acceptance.

Third, how individuals' attitudinal predisposition and issue involvement moderate the underlying mechanism of rebuttal acceptance has not been examined. Previous works on the theory of partisan motivated reasoning suggest that the acceptance of messages hinges on the individuals' attitudinal predisposition in a given context (Dobrzynska & Blais, 2008; Mafael et al., 2016; Perko et al., 2014). For instance, individuals' political orientation often influence how they process information related to politics (Flynn et al., 2017). Likewise, individuals' attitudes towards a brand often influence how they perceive messages related to the brand (Mafael et al., 2016). Thus, how individuals process a

rebuttal to decide whether to accept or reject it could be dependent on their predispositions such as political orientation and brand attitude. When refuting disparaging brand-related rumors, individuals with a pro-attitudinal predisposition towards the brand can accept rebuttals more readily compared with those having an anti-attitudinal predisposition (Weeks, 2015; Weeks & Garrett, 2014). Yet how individuals' attitudinal predisposition can moderate the underlying relationships from perceived message properties of rebuttals to acceptance of the debunking messages has not been widely examined.

Issue involvement, which is akin to personal relevance, refers to the extent to which individuals perceive an issue to be important (Angst & Agarwal, 2009; Seiders et al., 2005). Drawing from the elaboration likelihood model (Cacioppo et al., 1986; Petty & Cacioppo, 1986), previous works suggest that issue involvement can influence individuals' information-processing behavior (Tseng & Wang, 2016; Vafeiadis et al., 2019). The more involved individuals are with an issue, the more likely they are to dedicate their cognitive effort toward interpreting the issue (Angst & Agarwal, 2009). Stated otherwise, individuals with high issue involvement tend to process information more effortfully through the central route compared with those having low issue involvement. Moreover, scholars have also argued that individuals' involvement with an issue can elicit emotions that subsequently could influence information-processing behavior (McDonald & Härtel, 2000). Even previous works on rumors also showed that the amount of rumormongering varies based on individuals' involvement in an issue (Liu, Burton-Jones, & Xu, 2014; Oh et al., 2013). Yet in the context of rumor refutation, how

issue involvement can moderate the underlying mechanism of rebuttal acceptance has not been widely explored.

1.3. Research Goal

The goal of this research is to investigate the underlying mechanism of rebuttal acceptance as a way to combat rumors on the Internet. To accomplish the goal, this research seeks to develop a conceptual model by leveraging theories that could help explain the underlying mechanism of rebuttal acceptance.

As elaborated later in Chapter Two (Section 2.6), this research leverages two theoretical lenses from the rebuttal literature—the elaboration likelihood model, and the theory of partisan motivated reasoning—along with three additional theoretical lenses from the general information-processing literature—the Stimulus-Organism-Response (S-O-R) framework, the information adoption model, and the theory of anchoring effect—. These theoretical lenses help identify relevant constructs and propositions that cumulatively explain the underlying mechanism of rebuttal acceptance.

Informed by prior works (Bordia et al., 2005; Cheung et al., 2008; Wang et al., 2019), this research argues that perceived message properties of rebuttals could influence perceived utilitarian and hedonic values, which subsequently would determine individuals' acceptance of rebuttals. While perceived utilitarian value is defined as the extent to which individuals perceive rebuttals as being useful in refuting rumors, perceived hedonic value is defined as the extent to which emotional responses are elicited while processing rebuttals (Benlian, 2015; Chen & Lee, 2008; Hu et al., 2016; Wang et

al., 2019). These perceived values in turn could determine individuals' likelihood to believe and share the rebuttals.

This research also examines the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement on rebuttal acceptance. In the online setting, users can be exposed to the two antithetical messages—rumor and its rebuttal—in any order (Huang, 2017; Purnawirawan et al., 2012). It is therefore worthwhile examining how the underlying mechanism of rebuttal acceptance differs when the rumor is seen first versus when the rebuttal is seen first.

Social cognition research suggest that individuals' attitudinal predisposition can influence their information-processing behavior (Lord et al., 1979; Plassmann et al., 2012). People tend to accept attitude-consistent content more readily while rejecting attitude-discrepant content (Weeks, 2015; Weeks & Garrett, 2014). In other words, they tend to perceive the same information differently depending on their attitudinal predisposition. Therefore, it is important to investigate how individuals' attitudinal predisposition influences the underlying mechanism of rebuttal acceptance.

Issue involvement is an important factor that drives information acceptance based on individuals' inherent needs and interests (Angst & Agarwal, 2009; Seiders et al., 2005; Tseng & Wang, 2016). Research shows that individuals with high issue involvement are likely to process information more effortfully compared with those having low issue involvement (Angst & Agarwal, 2009). Therefore, it is interesting see whether issue involvement exerts a moderating effect on the underlying mechanism of rebuttal acceptance.

In summary, the research goal is translated into two research objectives (ROs). The first RO is to develop and empirically validate a conceptual model of rebuttal acceptance while the second RO examines the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. Each RO is further sub-divided into two research questions (RQs) as follows:

RO 1: To develop and empirically validate a conceptual model of rebuttal acceptance.

RQ 1.1: How are perceived message properties of rebuttals related to perceived utilitarian and hedonic values?

RQ 1.2: How are perceived utilitarian and hedonic values related to rebuttal acceptance?

RO 2: To examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance.

RQ 2.1: How are the relationships between rebuttals' perceived message properties and perceived values moderated by exposure sequence, attitudinal predisposition, and issue involvement?

RQ 2.2: How are the relationships between rebuttals' perceived values and rebuttal acceptance moderated by exposure sequence, attitudinal predisposition, and issue involvement?

RO 1 deals with the development and empirical validation of the conceptual model, which has been conceived later in Chapter Two. The empirical validation of the model is done by addressing the two subordinate RQs (RQ 1.1 and RQ 1.2).

RO 2 examines the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. It has been addressed by formulating two subordinate RQs (RQ 2.1 and RQ 2.2). The research overview is depicted in Figure 1.1. The methodological approach used for this research is briefly described in the next section.

Figure 1.1: Overview of the Research.

1.4. Methodological Outline

For the purpose of investigation, this research chose a brand-related rumor and its rebuttal. The choice of a brand-related online rumor was apt because brands are vulnerable to dubious messages circulating on the Internet (Pitt & Plangger, 2018; Sudhir & Unnithan, 2019). Some of the examples of viral brand-related rumors include Cadbury products contaminated with HIV (Snopes, 2018b), and Nutella—the popular hazelnut cocoa spread—contains a known carcinogen among its ingredients (Snopes, 2017).

This research administered a between-participants experiment to manipulate the exposure sequence of a rumor and its rebuttal. A between-participants experiment is one in which each participant is exposed to only one treatment. It is different from a within-participants experimental design, in which each participant is exposed to more than one of the treatments being tested.

This research manipulated the exposure sequence of a rumor and its rebuttal as a between-participants factor. Given the between-participants nature of the experiment, each participant was randomly assigned to one of the conditions. In the rumor-before-rebuttal condition, the participants first came across the rumor before they encountered the rebuttal. In the rebuttal-before-rumor condition, the participants first came across the rebuttal before they encountered the rumor.

Participants responded to a questionnaire that sought both quantitative and qualitative responses. Partial least squares structural equation modeling (PLS-SEM) was used to analyze the quantitative responses. To address RO 1, the analysis first involved developing the measurement models, and thereafter, evaluated the structural model. As explained later in Chapter Three (Section 3.4.1), the measurement models were used to

evaluate the relationships between the indicators and the respective construct while the structural model examined the relationships among the constructs.

To address RO 2, PLS multi-group analysis was employed to examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement. With respect to exposure sequence, the analysis was run separately to compare the two experimental conditions: the rumor-before-rebuttal condition, and the rebuttal-before-rumor condition. With respect to attitudinal predisposition, the analysis compared those having a pro-attitudinal predisposition with those having an anti-attitudinal predisposition. Likewise, with respect to issue involvement, the analysis compared those having high issue involvement with those having low issue involvement. The group comparison method was applied to identify if the path coefficients for the compared groups differed significantly (Banerjee & Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). For multi-group analyses, while testing for the moderating effect of a moderator, the other two moderators were statistically controlled. For instance, while testing for the moderating effect of exposure sequence, the other two moderators—attitudinal predisposition, and issue involvement—were statistically controlled.

Moreover, participants' open-ended comments were collected to examine nuances in their perception of rebuttals. An inductive coding approach was employed to analyze the open-ended responses. More details on the methodology of this research are provided later in Chapter Three.

1.5. Potential Contributions

This research has the potential to contribute to both theory and practice. On the theoretical front, it makes two important contributions. First, it shifts the scholarly focus from the dominant area of online rumors to the emerging area of rebuttals. The literature abounds with works on the spread of rumors (Han et al., 2015; Zhao et al., 2012), users' perception of rumors (Qi et al., 2017; Yang & Chung, 2014), and detection of rumors (Qazvinian et al., 2011; Zhang, Zhang, Dong et al. 2015). To advance the emerging body of previous works (e.g., Aditya, 2014; Ozturk et al., 2015), this research contributes to the online rebuttals literature by explicating the concept of rebuttal acceptance and theorizing its underlying mechanism. It also sheds greater insights into the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement on rebuttal acceptance.

Second, while the limited scholarly works on rebuttals implicitly seem to assume that rumors precede rebuttals, this research challenges the assumption. This was based on the rationale that one cannot rule out the possibility for users to be exposed to the rebuttal before the rumor in the online setting. Therefore, this research contributes to the literature by empirically investigating the role played by exposure sequence of the messages on social media. It draws the literature on the anchoring effect (Kwak et al., 2018; Wu & Cheng, 2011), and manipulates exposure sequence of a rumor and its rebuttal in an experiment. In doing so, it offers an understanding of how exposure sequence could influence the underlying mechanism of rebuttal acceptance.

On the practical front, this research has at least two potential contributions. First, it offers insights to practitioners such as website moderators and public relations

practitioners about the use of rebuttals to combat online rumors. Specifically, it sheds light on how rebuttals should be crafted to effectively debunk rumors. This is important because if rumors are left unchecked, they can have serious ramifications. At a point in time when brands and companies are feeling threatened by online rumors, this research will reveal how the use of rebuttals can help.

Second, this research has the potential to uncover rebuttal acceptance among the Internet users with varying levels of individuals' attitudinal predisposition, and issue involvement. It hopes to elevate Internet users' digital information literacy in general, and awareness of the perils of rumors in particular.

1.6. Research Delimitations

This research is demarcated by three delimitations. The first delimitation stems from its theoretical conceptualization. The conceptual model proposed and validated in the current research relies on the relationships between perceived messages properties of rebuttals, perceived values, and rebuttal acceptance while taking into account the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement. The three moderators were chosen because each of them is pertinent in the context of rumors and rebuttals (Bordia et al., 2005; Huang, 2017). However, other generic factors such as individuals' personality traits and altruistic behavior were excluded. Hence, these factors are beyond the scope of this research.

The second delimitation stems from the crafting of the rebuttal in this research. As described later in Chapter Three (Section 3.1.3), this research crafted rebuttals by combining an explicit warning label (as a false-tag) for the rumor claim with an

explanation to justify that the rumor was false. The message was brief enough to be communicated directly as a social media feed without requiring any clicks to additional webpages. Rebuttals that are in the form of video clips are beyond the scope of this research.

The third delimitation comes from the source of an online rumor. This research investigates rebuttal acceptance while controlling for the rumor source. Specifically, the source of the rumor was anonymized. Therefore, it is beyond the scope of this research to unearth how the degree of rebuttal acceptance will differ when the source of the rumor varies from a strong tie to a weak tie or from a seemingly authoritative source to a newbie in the online community.

1.7. Organization of the Thesis

The thesis is organized into six chapters, followed by appendices and references. This opening chapter has described the problem statement, and identified the research gaps in the literature. To plug the research gaps, it has presented the goal of this research. Thereafter, this chapter has provided a methodological outline of this research, which is followed by its potential theoretical and practical contributions. Next, the chapter has highlighted the delimitations of this research.

The remainder of the thesis is structured as follows. Chapter Two offers a review of the literature and the development of the conceptual model. Specifically, it explores different terminologies related to online falsehoods, and provides a holistic overview of the literature on rumors as well as rebuttals. Thereafter, this chapter justifies the choices of the underpinning theories, which lead to the development of the conceptual model for

this research. Next, it includes explications of the related constructs and their association in the conceptual model.

Chapter Three elaborates the methods used in this research. It specifies the methodological choices in terms of the research design and the research context. The chapter describes the manipulation of exposure sequence in a between-participants experimental design, which is followed by the procedure of data collection and the development of the questionnaire. Thereafter, the chapter describes its analytical procedure.

Chapter Four presents the findings of this research. It summarizes the descriptive statistics of the dataset, and assesses the measures in terms of their reliability and validity. Thereafter, the chapter shows the empirical validation of the conceptual model, which is followed by the moderation testing results for the roles of exposure sequence, attitudinal predisposition, and issue involvement. Then, it describes findings from the qualitative analysis.

Chapter Five discusses the research findings. Specifically, it forges connections between the findings and the literature by explaining the possible reasons for the associations between the constructs. It further holistically explains the conceptual model of rebuttal acceptance in light of the existing literature.

Chapter Six concludes the thesis by summarizing how it has fulfilled the two main research objectives. It also elaborates the research's contributions to theory and practice. Furthermore, it acknowledges the research limitations, and points out possible directions for future research.

CHAPTER TWO

LITERATURE REVIEW & CONCEPTUAL MODEL

The opening chapter has looked at the definition of online rumor, and highlighted the consequences when such a rumor becomes viral on the Internet. Among the ways to tackle online rumor, the chapter has introduced the strategy of using rebuttals that debunk rumors on the Internet. It has further described the problem statement, and identified the research gaps. To plug the gaps, it has presented the goal of this research, which is further broken down to granular research objectives and research questions. Thereafter, it has provided a methodological outline of this research, which is followed by its potential theoretical and practical contributions.

This chapter will review the related literature and is organized as follows: Section 2.1 explores different terminologies related to online falsehoods. Section 2.2 describes the rumor theory and its transformation. Thereafter, Section 2.3 reviews the extant research on online rumors.

Section 2.4 highlights three commonly employed strategies to combat rumors. As indicated earlier in Section 1.2.1, these include stifling the communication channel, detection of rumors, and the use of rebuttals.

Given the focus of this research is on the use of rebuttals, Section 2.5 reviews the literature on rebuttals, which consists of two major themes. While one deals with propagation of rebuttals, the other deals with users' perception of rebuttals.

Section 2.6 reviews the theoretical lenses that underpin this research. It further presents the rationale for including them, and justifies why some related theories are not considered.

Section 2.7 describes the underpinning theories. These include the S-O-R framework, the information adoption model, the theory of anchoring effect, the theory of partisan motivated reasoning, and the elaboration likelihood model.

Section 2.8 develops the conceptual model for this research from its underpinning theories. It explicates the related constructs, and hypothesizes their associations.

Finally, Section 2.9 summarizes the literature review and the conceptual model of this research. It also establishes a link between the current chapter and the next, which focuses on the methods employed in this research.

2.1. Online Falsehoods

Online falsehoods differ along at least two dimensions: facticity and intention to deceive (Tandoc et al., 2018). Facticity refers to the degree to which a message relies on facts. False messages with high facticity rely on facts, which are however taken out of context. For example, in the aftermath of Hurricane Harvey, a terrifying photo of a shark on the flooded streets of Houston made the rounds on social media. Eventually, the shark was confirmed to have been taken from a 2005 magazine issue of *Africa Geographic*. Over the years, a number of hoaxers have been photoshopping real sharks into urban settings. In contrast, false messages with low facticity do not have any factual basis and are completely fictitious. Pope Francis endorsing Donald Trump for the President of the US prior to the election in 2016 is one such example (Jang et al., 2018).

In terms of intention to deceive, online falsehoods can be either deliberate or unintentional. When the act of intentional sharing is involved, online falsehoods are referred to as disinformation. But when shared inadvertently, such messages are known as misinformation (Froehlich, 2020; Kumar et al., 2016; Tandoc et al., 2018).

Online falsehoods have now become widespread on the Internet (Ozturk et al., 2015; Tandoc, 2019). Worryingly, about 75% of people who come across dubious online messages end up believing the entries to be true (Silverman and Singer-Vine, 2016). The literature makes references to these messages using a variety of labels interchangeably including fake news, disinformation, misinformation, conspiracy, myth, gossip and rumor.

The term ‘fake news’ became popular during the 2016 US presidential election (Bakir & McStay, 2018; Nelson & Taneja, 2018; Tandoc et al., 2018). It has a political flavor and lacks a clear definition (Allcott & Gentzkow, 2017; Laxer et al., 2018; Wardle, 2017). A recent report by a parliamentary committee in the United Kingdom stated that the term “is bandied around with no clear idea of what it means, or agreed definition” (House of Commons, 2019, para. 1). This makes the term unsuitable for use in the thesis.

When disseminated intentionally, online falsehood is called disinformation but when shared inadvertently, it is known as misinformation (Froehlich, 2020; Tandoc et al., 2018). What is disinformation and what is misinformation cannot be distinguished on the basis of its content (Jones-Jang et al., 2020; Kumar et al., 2016), but on the intention of sharing, which is not always readily revealed. Since the focus of this thesis is not on the motivational intention of sharing rumors, these terms were avoided.

This thesis further refrains from using the term conspiracy, which typically originates from individuals who believe it to be true, and can provide an immediately

understandable picture of a situation: why something happened, who benefits from it, and who should be blamed (Wood, 2018). Speculations are difficult to confirm. On the contrary, the focus of this thesis is on messages that were proven to be false.

Myths are urban legends that have a supernatural element, and are inherently unverifiable (DiFonzo & Bordia, 2007). Since they cannot be debunked through evidence, they are beyond the scope of this thesis.

Gossip refers to evaluative social chat among individuals that arises in the context of forming, changing or maintaining social networks. It functions to inform, bond, exclude, enhance status and convey norms (Baumeister et al., 2004; DiFonzo & Bordia, 2007; Rojecki & Meraz, 2016). Gossip is usually motivated by interpersonal solidarity in a particular social setting such as workplace. It is relevant to a narrow audience in a particular context (Rojecki & Meraz, 2016), and hence is not the focus of this thesis.

This thesis uses the term ‘rumors’ to refer to false messages circulating on the Internet to be passed off as facts (DiFonzo et al., 2013). Similar to all earlier forms of online falsehoods, rumors can spread faster and farther than ever before with the proliferation of new media and digital technologies. When believed and shared, rumors have serious consequences. For instance, amid the COVID-19 pandemic, the rumor that methanol cures the coronavirus became viral. As people started to consume methanol, nearly 300 people have died and more than 1,000 sickened (Karimi & Gambrell, 2020).

2.2. The Rumor Theory and its Transformation

Rumors have existed throughout the history of mankind, and have been attracting scholarly attention since World War II. In some of the earliest research mostly conducted

by social psychologists, a dominant goal was to study the development and control of wartime-related rumors (Allport & Postman, 1946; Anthony, 1973; Prasad, 1935; Rosnow, 1991).

During this period, the seminal rumor theory was developed (Allport & Postman, 1946). It posits that the extent to which a rumor thrives depends on two conceptually distinct constructs: importance and ambiguity. Importance refers to the relevance of a rumor to its readers. The rumor would continue to be believed and propagated among like-minded individuals who consider it to be important. Ambiguity refers to uncertainty that exists in situations that require decision-making. For a rumor to be believed, individuals must have a need for cognitive interpretation and sense-making to clarify situational uncertainty.

Hence, the rumor theory is expressed as follows: $\text{Rumoring} = \text{Importance} \times \text{Ambiguity}$ (Allport & Postman, 1946). The extent of rumoring depends on the importance of the message to its readers times the ambiguity in the situation when the message is being circulated. The relation between importance and ambiguity is multiplicative, and not additive. This implies that when both importance and ambiguity are high, the situation would be highly conducive for rumoring. However, when any one of the two is low, the situation would not be highly conducive for rumoring (Allport & Postman, 1946).

Over the years, the original theory has been updated as follows: $\text{Rumoring} = \text{Anxiety} \times \text{Ambiguity}$ (Anthony, 1973). While ambiguity has withstood the test of time, anxiety has now become a proxy for importance. The argument was that individuals find it challenging to articulate the importance of a rumor. Nonetheless, it is relatively easier for them to articulate whether they feel anxious about the rumor. Therefore, anxiety

signals the extent to which the rumor is important to its recipients. Later, Rosnow (1991) incorporated personal involvement as a variable to understand rumor-sharing behavior. Personal involvement in the incident's subject matter often makes the situation conducive for a rumor to spread.

In summary, a rumor has three facets (DiFonzo, & Bordia, 2007). The first is the context in which it arises. The second is how individuals engage with it. And the third is its actual content. Rumors arise from situational contexts that are threatening or potentially threatening as well as ambiguous (DiFonzo et al., 2013). People often end up believing rumors because of cognitive biases with which they create their own subjective reality (Hilbert, 2012; Petersen, 2015; Prasad et al. 2009; Thorson 2015b). In particular, their ability to make sense of the reality is known to be severely impaired by confirmation bias, whereby individuals look for only information that confirm their a priori beliefs (Flynn, Nyhan, & Reifler, 2017; Wang & Song, 2020). Under the influence of confirmation bias, content that is consistent with prior-held beliefs is deemed as information whereas that which is contradictory to expectation is viewed as a rumor (Garrett, 2009; Knobloch-Westerwick). Rumors tend to elevate anxiety and chaos (Chua & Banerjee, 2018; Oh et al., 2013; Paek & Hove, 2019).

2.3. Research on Online Rumors

Previous works on online rumors can be grouped into three major themes. One theme deals with the spread of rumors. Some works related to this theme simulate the propagation of rumors (Han et al., 2015; Wang et al., 2014; Zhao et al., 2012; Zhao et al., 2013). These works have led to the development of rumor spreading simulation models

such as Susceptible-Infected-Recovered model, Susceptible-Infected-Hibernator-Removed model, and Spreaders-Ignorants-Fence-Stiflers model (Han et al., 2015; Zhao et al., 2012; Zhao et al., 2013). In these models, different nodes such as susceptible, infected and recovered were used to stimulate individuals' rumor-sharing behaviors. Susceptible nodes (also called Ignorants) simulate those humans who do not know the rumor. Infected nodes (also called Spreaders) simulate those humans who know and transmit rumors. Recovered nodes (also called Stiflers) simulate those humans who know the rumor but do not transmit it. Hibernator nodes simulate those who forget to spread rumors initially but later become spreaders again. Fence nodes simulate those humans who are aware of the rumor yet not spreading it but would possibly spread it in the future. By varying the proportion of parameters in simulation models, these works examine the pace and the breadth of rumor spreading in networks.

Other works related to this theme have investigated the spread of rumors by looking at burst-pattern of rumor propagation and individual differences (Arif et al., 2016; Chen et al., 2015; Maddock et al., 2015; Marett & Joshi, 2009). For instance, some works have examined the rumor spreading process in terms of burstiness and temporal progression (Arif et al., 2016; Maddock et al., 2015). Others have investigated rumor-sharing behavior by tapping on individuals' motivation to share, and personality traits (Chen et al., 2015; Marett & Joshi, 2009). These works found that individual differences such as altruism, sense of belongingness to the online community, and extraversion play crucial roles in accelerating the spread of online rumors.

The second theme deals with users' perceptions of rumors (Bae, in press; Qi et al., 2017; Yang & Chung, 2014). Since rumors rarely come with a warning label, such

messages are often mistaken as facts (Lewandowsky et al., 2012). Users perceive rumors as sensational and interesting in terms of interacting with others who perhaps may not be aware of such content (Cassady et al., 2012; Shigemura et al., 2015). According to previous research (DiFonzo, 2008; Kimmel & Audrain-Pontevia, 2010; Qi et al., 2017), dread rumors that convey negative or harmful consequences (e.g., Nutella—the popular hazelnut cocoa spread—contains a known carcinogen among its ingredients) are more prevalent than wish rumors that highlight positive or hoped-for consequences (e.g., Drinking or injecting bleach will protect you against Ebola).

Research on this theme also sheds light on the information environment on social media to understand how individuals process rumors online (Bae, in press; Kim, 2018; Oh et al., 2013). These works suggest that individuals who use social media as a news source tend to believe rumors more easily than those who consume news in traditional media (Bae, in press). Moreover, rumors are perceived as favorable when they are consistent with individuals' predispositions in a given context (Weeks & Garrett, 2014; Yang & Chung, 2014). Work such as Qi et al. (2017) also suggest that individuals with domain expertise are less likely to rely on online rumors compared with the lay populace. As found in Qi et al., (2017), medical personnel were less likely to believe and share health-related rumors on the Internet than that of the lay audience.

The third theme deals with the mitigation of rumors. Works related to this theme revolve around rumor detection (Qazvinian et al., 2011; Yang et al., 2012; Zhang, Zhang, Dong et al. 2015) and rumor refutation (Wang & Song, 2015; Ozturk et al., 2015). Prior works on rumor detection have employed machine-learning methods using a set of content-related, user-related, and propagation-related features (Sun et al., 2013; Wu,

Yang, & Zhu, 2015; Yang et al., 2012). Typical content-related features include tentative words, multimedia content, the presence of URLs, and sentiment polarity to detect rumors (Qazvinian et al., 2011; Yang et al., 2012). Commonly examined user-related features include the number of followers, number of users' posted messages, users' personal description, and users' registration time (Yang et al., 2012; Zhang, Zhang, Dong et al. 2015). Moreover, several propagation-related features such as the number of reposts, and the time interval between posts have also been taken into account to detect rumors (Wu et al., 2015; Yang et al., 2012).

Only a handful of works related to this theme has dealt with rumor refutation (Aditya, 2014; Hui et al., 2011; Ozturk et al., 2015). These works have focused on introducing rebuttals as counter messages in a network to reduce the spread of rumors (Hui et al., 2011). Results often suggest that rebuttals reduce users' likelihood to believe and share rumors, and thus help to mitigate online rumors (Hui et al., 2011; Ozturk et al., 2015). The current research engages with this body of literature. The three themes of research on online rumors are summarized in Table 2.1.

Table 2.1: Summary of the landscape of online rumor literature.

Themes	Descriptions	References
Spread of rumors	Simulation of rumor propagation	Han et al. (2015); Wang et al. (2014); Zhao et al. (2012); Zhao et al. (2013)
	Study of rumor propagation as a function of burstiness and individual differences	Arif et al. (2016); Chen et al. (2015); Maddock et al. (2015); Marett & Joshi (2009)
Users' perceptions of rumors	Study of users' perceptions and attitudes towards online rumors	Chua & Banerjee (2018); DiFonzo, (2008); Qi et al. (2017); Yang & Chung (2014)
Mitigation of rumors	Study of rumor detection	Qazvinian et al. (2011); Yang et al. (2012); Zhang, Zhang, Dong et al. (2015)
	Study of rumor refutation	Aditya (2014); Ozturk et al. (2015)

2.4. Approaches to Tackle Online Rumors

2.4.1. *Stifling the Communication Channel*

When the channel for communication is stifled, spreading rumors conceivably becomes impossible (Huang, 2015; Wines, 2012; Xinhua News Agency, 2012). Many governments around the world have explored this option to curb the spread of rumors. Adopting such an approach, the Cyberspace Administration of China has punished a number of Chinese websites for allegedly fabricating stories (Canaves, 2011; Chi-yuk, 2016; China Digital Times, 2013). For example, two Weibo websites were forced to shut down their comment function for three days following a coup rumor (Huang, 2015). To curtail the spread of rumors, the Sri Lanka Government blocked several social media channels temporarily in the wake of a terrorist attack (Fisher, 2019). In India, after a new

citizenship law was passed that could marginalize Muslims, authorities in northeast India imposed digital lockdown to curb the spread of rumors (Gettleman et al., 2019).

However, this approach impedes the dissemination of not only rumors but also facts on the Internet. Besides, it might not always work when rumors spread rampantly on the Internet. This is because regulatory measures may be difficult to implement. In any case, regulatory measures run the risk of undermining freedom of expression. Therefore, governments do not always have the liberty to choke the communication channel for mitigating the spread of rumors (Tang & Sampson, 2012; Tumber & Waisbord, 2004).

2.4.2. Detection of Online Rumors

Machine-learning methods are often used to detect and weed out rumors on the Internet (Seo et al., 2012; Wu et al., 2015). As indicated earlier in Section 2.3, prior works on rumor detection has identified several content-related features (e.g., multimedia content and URLs), user-related features (e.g., number of followers and friends), and propagation-related features (e.g., number of reposts, time interval between posts) to detect rumors amid non-rumors (Wu et al., 2015; Zhang, Zhang, Dong et al. 2015).

However, this approach might not work on the vast, decentralized, and the constantly evolving pool of content that is generated on the Internet in real-time. Fake content could easily slip through the cracks without being flagged. In reality, there can be many issues due to the complexity of the online content (e.g., semantic disambiguation) and context (e.g., unverifiable statements, jokes and opinion) as well as lack of properly annotated datasets (Berinsky, 2016; Kumar & Geethakumari, 2014; Nourbakhsh et al., 2015; Simko et al. 2019). For instance, the unverifiable statement, “the moon may have

been responsible for the Titanic's sinking," made its presence felt online during 2012 (Brown, McDonagh et al., 2013). Such unverifiable information raises questions on the applicability of this strategy on the pool of information repository on the Internet.

2.4.3. The Use of Rebuttals

Rebuttals are defined as messages that are designed to debunk rumors on the Internet (Aditya, 2014; Huang, 2017; Ozturk et al., 2015; Wang & Song, 2015).

Whenever rumors find traction on the Internet, authoritative sources commonly intervene by issuing rebuttals to refute rumors (Garrett, 2011; Ozturk et al., 2015). Adopting this strategy, the international coffee chain Starbucks debunked the rumor when it was alleged to give out discounts to all undocumented immigrants in the United States (Taylor, 2017). The United States government used the Federal Emergency Management Agency (FEMA) website to refute rumors when Hurricane Florence hit the nation in 2018 (The Department of Homeland Security, 2018).

While online communication has been weaponized to spread rumors, its ease of use and potential reach can also be harnessed to spread rebuttals (Pal et al., 2019; Vo & Lee, 2018; Zhao, Yin, & Song, 2016). They help explain the veracity of rumors by providing concrete evidence (Paek & Hove, 2019). Rebuttals issued by authoritative sources (Ozturk et al., 2015) and carrying concrete evidence (Paek & Hove, 2019) have been shown to be effective. When rumors gain traction and cause untold harm, authoritative sources intervene by issuing rebuttals to curtail the effects of rumors.

Notwithstanding their merits, empirical work on rebuttals in the online setting is still limited. Recent works have called for further research examining the use of rebuttals

as a way to combat online rumors (Ozturk et al., 2015; Pitt & Plangger, 2018). This research is a response to the call. Table 2.2 summarizes the strategies to combat rumors.

Table 2.2: Summary of the approaches to tackle online rumors.

Approaches to tackle rumors	Descriptions	References
Stifling communication channel	This approach involves choking the communication channel to stop the spread of rumors.	Canaves (2011); Chi-yuk (2016); Wines (2012)
Detection of online rumors	This approach involves detecting rumors to weed them out from other pool of information.	Seo et al. (2012); Wu et al. (2015); Zhang, Zhang, Dong et al. (2015)
The use of rebuttals	This approach involves using messages that debunk rumors on the Internet.	Bordia et al. (2005); Huang (2015); Ozturk et al. (2015)

2.5. Related Works on Online Rebuttals

Previous works dealing with the debunking of rumors use a variety of terms interchangeably such as correction (Bode & Vraga, 2018), denial (Bordia et al., 2005), refutation (Einwiller & Kamins, 2008), and rebuttal (Huang, 2017). To avoid ambiguity, this thesis uses the term ‘rebuttals’ which are defined as messages specifically crafted to debunk rumors on the Internet (Aditya, 2014; Huang, 2017; Ozturk et al., 2015).

The process of rumor refutation is no simple task, and requires adequate understanding. The literature suggests that rebuttals simply calling out a rumor might not always help (Johnson & Seifert, 1994; Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012; Swire, Ecker, & Lewandowsky, 2017), but could instead inadvertently strengthen the rumor belief (Nyhan & Reifler, 2010; Schwarz et al., 2007). Therefore, offering a

well-argued debunking message is necessary to reduce rumor persistence (Lewandowsky et al., 2012). Previous works suggest that an effective debunking message should provide detailed facts and evidence (Bode & Vraga, 2018; Johnson-Laird, 1994; Johnson & Seifert, 1994; Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012). Furthermore, source credibility of rebuttals plays a pertinent role in establishing the truth value of the debunking messages (Bode & Vraga, 2018; Huang, 2017). Rebuttals are likely to be perceived as true when receivers find the sources authentic and credible (Huang, 2017).

A rebuttal should come with a clear presentation of the counterclaim. It usually contains an explicit reference to the rumor that was being debunked. This is necessary because a debunking statement accompanied by the debunked rumor tends to be more effective than one that is isolated from the hoax (Aditya, 2014; Koller, 1993; Ozturk et al., 2015). To ensure that people are cognitively on guard and are less likely to be influenced by the rumor itself, the debunking messages ought to have an explicit warning before the rumor is cited (Lewandowsky et al., 2012). Rebuttals are effective in limiting misconceptions but contingent upon individuals' perceptions of source credibility of the corrective information (Bode & Vraga, 2018; Ecker et al., 2011; Guillory & Geraci, 2013).

The limited but so far available works have been reviewed, and can be grouped into two major themes. While one deals with the propagation of rebuttals, the other deals with users' perception of rebuttals.

2.5.1. Propagation of Rebuttals

Works related to this theme use simulation models to examine how rebuttals can spread on social networks (Ji, Liu & Xiang, 2014; Zhang, Huang et al., 2014; Zhao, Wang et al., 2014). Drawing from the basic SIR (Susceptible, Infected and Recovered) model of rumor spreading that was discussed earlier in Section 2.3, these works incorporate other nodes in the simulation model to facilitate refutation messages to spread in a network.

Stated differently, these works have extended the rumor propagation models by taking into account additional influencing factors—such as objective identification of rumors, and spread of truth—involved in creating anti-rumor dynamics on online networks. The extended simulation models treat some nodes as influential agents (e.g., government bodies and official accounts) to advocate truth in the network. Zhang, Huang et al., (2014) added new nodes such as truth carriers that simulate those humans who believe a rebuttal but do not spread it, and truth spreaders that simulate those humans who believe as well as spread the rebuttal. Thereafter, by varying the number of nodes that can spread the truth to adjacent nodes, the simulation models examine the spread of rebuttals to halt rumor propagation. Works such as Ji, Liu and Xiang (2014) explored time dependence of anti-rumor dynamics by using mean-field equations and numerical simulations on complex network. It examined the effect of the timing threshold by launching the anti-rumor at different delay time after the wake of a rumor outbreak. Previous work also demonstrates that the peak value of spreaders density can be reduced by increasing the ignorant's refutation rate (Zhao, Wang et al., 2014). Therefore, the authorities can employ strategies that increase the refutation rate to reduce the influence of a rumor in a network. However, since nodes are not real humans, it is not feasible for

simulation models to control for individuals' demographics (e.g., gender and age) and other contextual factors including individuals' attitudinal predisposition and issue involvement.

2.5.2. Users' Perception of Rebuttals

Works related to this theme investigate how users perceive rebuttals on the Internet. Some works suggest that rebuttals help reduce individuals' likelihood to believe and share rumors (Ozturk et al., 2015; Tanaka et al., 2013). The exposure to rebuttals increases individuals' critical thinking ability (Tanaka et al., 2013), thereby raising their alertness in information processing. Prior works also suggest that for rebuttals to be effective, they should meet at least two conditions. One, they should explain why a rumor is false instead of simply claiming the rumor to be false (Chan et al., 2017). Two, they must come from sources that are perceived as credible (Bordia et al., 2005).

Given that debunking rumors is no easy task, previous works have expressed their concern about whether rebuttals achieve their intended effect (Lewandowsky et al., 2012; Nyhan & Reifler, 2010). Confronting individuals with rebuttals can sometimes backfire by reinforcing the rumor belief (Nyhan & Reifler, 2010). Counter-attacking a rumor may have different effects because people often engage in information processing depending on their attitudinal predisposition (Weeks & Garrett, 2014).

Therefore, without an adequate understanding of rebuttal acceptance, it would be difficult to ascertain the efficacy of rebuttals as a way to combat rumor on the Internet. Although previous research often focuses on users' intentions to believe and share rumors (Chua & Banerjee, 2018; Ozturk et al., 2015; Weeks & Garrett, 2014), little research has

been trained on examining individuals' intentions to believe and share rebuttals as countermeasures against online rumors.

2.6. Choice of Theoretical Lenses

Although some research on the use of rebuttals exists as reviewed earlier in Section 2.5, current works are mostly fueled by practical concerns and seldom rely on well-established information processing theories (see Section 2.6.1 for a few exceptions). The theoretical paucity coupled with the complexity involved in rumor refutation highlights a need to theorize rebuttal acceptance on the Internet. After all, theorizing has long been heralded as the jewel in the crown of scholarly efforts to facilitate a systematic accumulation of knowledge (Eisenhardt, 1989; Gregor, 2006).

Among the approaches to theorizing, an efficient way is to build on existing theories. This is because theories provide explanation of phenomena. Specifically, a theory comprises a set of constructs and propositions, which provides a comprehensive understanding of a phenomenon in a logical and systematic way (Bhattacharjee, 2012; Bacharach, 1989). Therefore, this research seeks to harness theories to build a conceptual model of rebuttal acceptance.

2.6.1. Theories from Rebuttal Literature

The rebuttal literature was reviewed to identify theories that have been used in the specific context of rumor refutation. This body of literature, although limited, has used three theories: the mathematical theory of mean-field equations (Moreno, Nekovee, & Pacheco, 2004; Ji, Liu & Xiang, 2014; Zhang, Huang et al., 2014), the elaboration

likelihood model (Bordia et al., 2005; Petty & Cacioppo, 1986), and the theory of partisan motivated reasoning (Lodge & Taber, 2000; Weeks & Garrett, 2014).

The mathematical theory of mean-field equations deals with variations in the density of spreaders, ignorants, and stiflers over time in a network (Moreno, Nekovee, & Pacheco, 2004; Zhao, Wang, Chen et al., 2012). It allows simulation of message propagation but does not lend itself to the study of information processing. Hence, the mathematical theory of mean-field equations was deemed inappropriate to develop the conceptual model of this research.

The elaboration likelihood model suggests two alternative routes of persuasion. Individuals with low elaboration likelihood process information through the peripheral route whereas those with high elaboration likelihood process information through the central route (Petty, Cacioppo, & Schumann, 1983). The model has been commonly used to examine users' perceptions of message properties, namely, source credibility, and argument quality (Petty & Cacioppo, 1986; Bordia et al., 2005). These message properties, which have been defined earlier in Section 1.2.2, are also relevant to rebuttals, which are processed with high involvement by some and low involvement by others (Bordia et al., 2005). Hence, the elaboration likelihood model was deemed appropriate to support the inclusion of the construct issue involvement in the conceptual model of this research.

The theory of partisan motivated reasoning suggests that individuals favor information that is in line with their attitudinal predispositions (Lodge & Taber, 2000; Weeks, 2015). For instance, in the context of politics, people would be willing to accept information that is consistent with their political ideology. And, they tend to reject

attitude-discrepant information (Weeks, 2015; Weeks & Garrett, 2014). Clearly, this theory is relevant to include in the context of rebuttals that debunk brand-related disparaging rumors. Under such a circumstance, people with favorable brand attitude will process rebuttals differently from those with unfavorable attitude. Hence, the theory of partisan motivated reasoning was deemed appropriate to develop the conceptual model of this research.

2.6.2. Other Information Processing Theories

Apart from identifying the three theories used previously in the context of rebuttals, it was also necessary to locate general-purpose information-processing theories. The goal was to include theories that are possible to apply in a variety of contexts, including rebuttals. Specifically, three theoretical lenses were identified: the Stimulus-Organism-Response (S-O-R) framework (Mehrabian & Russell, 1974; Wang et al., 2019; Woodworth, 1928), the information adoption model (Cheung et al., 2008; Sussman & Siegal, 2003), and the theory of anchoring effect (Tversky & Kahneman, 1974; Wu & Cheng, 2011).

Of these, the S-O-R framework and the information adoption model are mutually reinforcing. The S-O-R framework explains how a message (stimulus) could influence individuals' internal states of processing (organism), and in turn their decision-making (response). The information adoption model explains how the message properties of argument quality and source credibility are related to information usefulness and in turn information adoption. Together, they help explain how individuals perceive and process information while making decisions to either accept or reject the messages. Hence, both

the S-O-R framework and the information adoption model were deemed appropriate to develop the conceptual model of this research.

In addition, the theory of anchoring effect complements the understanding of rebuttal acceptance because it lends itself readily to studying the effect of first impression. Anchoring effect occurs when individuals' decision-making heavily relies on the first piece of related information (as an anchor) obtained (Kwak et al., 2018; Tversky & Kahneman, 1974). Exposure sequence is important because the first message could influence individuals' decision-making on the other message. Unlike other information-processing contexts, anchoring effect could show a pronounced impact on rebuttal acceptance depending on the sequence in which users are exposed to rumors and rebuttals. Hence, it fits the purpose of examining the influence of exposure sequence of the two antithetical messages.

In sum, the conceptual model developed this research was informed by five theories, namely, (1) the S-O-R framework, (2) the information adoption model, (3) the theory of anchoring effect, (4) the theory of partisan motivated reasoning, and (5) the elaboration likelihood model. In particular, the S-O-R framework, and the information adoption model were used to develop the overarching structure of the conceptual model by explaining how perceived message properties of rebuttals could be associated with their acceptance. The other three theories—the theory of anchoring effect, and the theory of partisan motivated reasoning, and the elaboration likelihood model—were used to explore more micro-level dynamics in rebuttal acceptance by accounting for the role of exposure sequence, attitudinal predisposition, and issue involvement. Each of the five theories—is discussed in greater details in the next section.

2.7. Underpinning Theories

2.7.1. The Stimulus-Organism-Response Framework

The S-O-R framework comprises three related factors, namely, stimulus (S), organism (O) and response (R). Stimulus is defined as the external environment affecting individuals' internal states of processing. Organism is defined as the individuals' cognitive and affective states, which reflect the psychological processing of cues including perceived utilitarian and hedonic values respectively (Mehrabian & Russell, 1974; Wang et al., 2019). Cognitive state involves individuals' thought-based information processing, while the affective state reflects individuals' feeling or emotion (Benlian, 2015; Wang et al., 2019). Response is defined as individuals' behavioral actions to a stimulus (Davis & Luthans, 1980). The framework explains how various aspects of an external environment (Stimulus) can influence perceived utilitarian and hedonic values (Organism), which further influence individuals' behavioral intention (Responses) to the stimulus (Mehrabian & Russell, 1974; Kim & Johnson, 2016). The framework has widely been applied in various consumer research contexts such as online shopping (Koo & Ju, 2010), website perceptions (Peng & Kim, 2014), and sharing brand-related message (Kim & Johnson, 2016; Wang et al., 2019).

According to the framework, the organism manifests the processes that intercede between the stimulus and response. It is represented by cognitive and affective states, which reflect individuals' processing of perceived utilitarian and hedonic values when they interact with a stimulus (Mehrabian & Russell, 1974; Wang et al., 2019). While perceived utilitarian value refers to the extent to which individuals perceive rebuttals as useful in debunking rumors, perceived hedonic value refers to the extent to which

emotional responses are elicited while processing rebuttals (Hu et al., 2016; Wang et al., 2019). When individuals find utilitarian value and hedonic values during processing rebuttals, they would likely to show a favorable response to rebuttals. Response represents individuals' behavioral intention on a specific stimulus.

Along the three related factors, the framework often includes many different constructs such as perceived informativeness, perceived image appeal, perceived information quality, perceived utilitarian value, perceived hedonic value, pleasure, arousal, information pass along, intention to repost, and intention to purchase based on the research context (Kim & Johnson, 2016; Wang et al., 2019). However, it is not worthwhile to include all the constructs accumulated from many other studies into a single research. This is because some of the constructs are overlapping and not meant to be used together. For instance, perceived hedonic value and pleasure are often used interchangeably because of their overlapping nature. Therefore, this research identified conceptually distinct constructs related to perceived stimulus properties (perceived argument quality, and perceived source credibility), individuals' cognitive and affective states of processing (perceived utilitarian and hedonic values), and responses (belief, intention to share) to the stimulus, which were found to be relevant for the development of the conceptual model.

2.7.2. The Information Adoption Model

The information adoption model posits that argument quality and source credibility influence perceived information usefulness, which further determines information adoption (Sussman & Siegal, 2003). Information adoption refers to the extent

to which people accept information based on perceived usefulness (Lee & Yang, 2015). The model identifies two distinct informational variables—perceived argument quality and perceived source credibility in the process of information adoption (Bhattacharjee & Sanford, 2006; Cheung et al., 2008; Sussman & Siegal, 2003). Information adoption refers to the extent to which people accept information based on perceived usefulness (Lee & Yang, 2015). In other words, when people perceive information as useful, they are likely to adopt the information for their decision-making. The model has been applied in examining the information adoption process in the context of website information (Tseng & Wang, 2016) to electronic word-of-mouth adoption (Cheung et al., 2008).

The key constructs of the information adoption model are perceived argument quality, perceived source credibility, information usefulness, and information adoption. Of these, perceived argument quality and perceived source credibility were directly included in the conceptual model of this research. In addition, information usefulness has been mapped to the perceived utilitarian value adopted from the previous theoretical lens because of their overlapping nature of rebuttal usefulness in the context of this research. Moreover, this research maps information adoption to rebuttal acceptance, which has been conceptualized as intentions to believe and share the debunking messages.

2.7.3. The Theory of Anchoring Effect

Anchoring effect occurs when individuals' decision-making heavily relies on the first piece of related information (as an anchor) obtained (Kwak et al., 2018; Tversky & Kahneman, 1974). Previous works have explained anchoring effect in a variety of

contexts such as product price estimation (Book et al., 2016), opinion formation (Sheela & Mannering, in press), and Internet buyers' purchase intention (Cheng & Wu, 2010).

Anchoring effect can play a part in debunking rumors because users can encounter either a rumor or its rebuttal as the first piece of information (anchor) on the Internet. When users are exposed to a message (e.g., either a rumor or its rebuttal), they are likely to form a perception about the message. Thereafter, the exposure to the opposing message could further influence receivers' information processing depending on the perception of the anchor. For instance, users' favorable response to the first message may increase their likelihood to reject the other since the two messages are antithetical in the given context. Therefore, exposure sequence is relevant to include in the conceptual model of this research.

2.7.4. The Theory of Partisan Motivated Reasoning

The theory of partisan motivated reasoning suggests that individuals have an affinity for information that is consistent with their attitudinal predispositions (Lodge & Taber, 2000; Weeks, 2015; Weeks & Garrett, 2014). For instance, in the context of politics, people would be willing to accept information consistent with their political ideology. And, they tend to reject attitude-discrepant information (Weeks, 2015; Weeks & Garrett, 2014). Likewise, individuals are likely to provide a favorable response to a brand-related message when they have a positive attitude towards the brand.

Regardless of the veracity, people tend to accept information confirming their pre-existing attitude as more convincing than information disconfirming their predispositions. The theory has been used in the context of evaluating political information as well as

rumors and their rebuttals (Weeks, 2015; Weeks & Garrett, 2014). Therefore, the construct of attitudinal predisposition, which emerges from this theory, is relevant to include in the conceptual model of this research. Table 2.3 summarizes the descriptions of the five theories.

2.7.5. The Elaboration Likelihood Model

The elaboration likelihood model offers a theoretical explanation of how individuals process information. When individuals are exposed to a message, they will vary in how much cognitive effort they are willing to devote to process it (Petty & Cacioppo, 1986). Individuals with high elaboration likelihood would process the message effortfully through what is known as the central route. In contrast, those with low elaboration likelihood would process the message superficially using heuristics through what is called the peripheral route (Petty et al., 1983; Petty & Cacioppo, 1986).

Over the years, the elaboration likelihood model has been used to study the following major constructs: perceived argument quality, perceived source credibility, personal involvement, and behavioral intention. Therefore, this research includes the relevant constructs associated with perceived message-related properties of rebuttals (conceptualized as perceived argument quality, perceived source credibility), individuals' elaboration motivation (conceptualized as individuals' issue involvement), and in influencing individuals' behavioral intention of rebuttal acceptance (conceptualized as belief in rebuttals and intention to share rebuttals).

Table 2.3: Descriptions of the five theories.

Theories	Descriptions	Related constructs
S-O-R framework	The S-O-R framework predicts how an environment stimulus influences individuals' cognitive and affective states, which reflect the psychological processing of cues including perceived utilitarian and hedonic values respectively that in turn determine individuals' behavioral response to the stimulus (Woodworth, 1928; Wang et al., 2019).	Perceived message properties (as Stimulus), perceived utilitarian and hedonic values (as organism), behavioral intention (as response)
Information adoption model	The information adoption model suggests that argument quality and source credibility positively influence perceived information usefulness, which in turn determines information adoption (Cheung et al., 2008; Sussman & Siegal, 2003).	Perceived argument quality, perceived source credibility, perceived information usefulness, information adoption
Theory of anchoring effect	The theory of anchoring effect suggests that individuals' decision-making heavily relies on the first piece of related information (as an anchor) obtained (Kwak et al., 2018; Tversky & Kahneman, 1974).	Exposure sequence
Theory of partisan motivated reasoning	The theory of partisan motivated reasoning suggests that individuals evaluate information in ways that remain consistent with their attitudinal predispositions (Lodge & Taber, 2000; Weeks & Garrett, 2014).	Attitudinal predisposition
Elaboration likelihood model	The elaboration likelihood model suggests that individuals with high elaboration likelihood would process the message effortfully through what is known as the central route while those with low elaboration likelihood would process the message superficially using heuristics through what is called the peripheral route (Cacioppo et al., 1986; Petty et al., 1983; Petty & Cacioppo, 1986).	Perceived argument quality, perceived source credibility, issue involvement

2.8. Development of the Conceptual Model

This research conceives the task of developing a conceptual model as one that connects related constructs to understand a phenomenon of interest. It logically integrates constructs by hypothesizing their associations for empirical validation (Imenda, 2014; McLeod & Pan, 2005).

To develop the conceptual model, constructs and their associations were informed by the five theoretical lenses: (1) the S-O-R framework, (2) the information adoption model, (3) the theory of anchoring effect, (4) the theory of partisan motivated reasoning, and (5) the elaboration likelihood model. Specifically, this research allowed empirically testing for theories including the S-O-R framework, the information adoption model, the theory of anchoring effect, and the theory of partisan motivated reasoning whereas the elaboration likelihood model was not tested but was used to support the inclusion of the constructs perceived argument quality, perceived source credibility, and issue involvement in the conceptual model. After all, scholarly works often leverage theoretical lenses not to empirically test them but to justify the inclusion of variables (e.g., Eckes Peck, 1997; Hill & Kemp-Wheeler, 1989; Testa, Brown, & Wang, 2019).

In this vein, this research aims to explain the underlying relationships among perceived message properties, perceived values, and rebuttal acceptance. In addition, it has taken into account the role of exposure sequence of a rumor and its rebuttal. Given the lack of control over the exposure sequence of the messages in the online setting, users can confront a rebuttal when they are not even aware of the rumor. Therefore, it is pertinent to investigate how the underlying relationships among perceived message properties, perceived values, and rebuttal acceptance could be influenced by the exposure sequence

of the two antithetical messages—rumors and their rebuttals. Furthermore, this research investigates the role of individuals’ attitudinal predisposition and issue involvement on their acceptance of rebuttals.

Overall, the research identifies four predictor constructs—perceived argument quality, perceived source credibility, perceived utilitarian value, and perceived hedonic value—that are hypothesized to be associated with rebuttal acceptance, which has been conceptualized as users’ belief in rebuttals coupled with their intention to share the messages on the Internet. In addition, there are three moderators, namely, exposure sequence, attitudinal predisposition, issue involvement. The constructs are explicated as follows.

2.8.1. Explication of Constructs

Dependent constructs. There are two dependent constructs in the conceptual model: belief in rebuttals and intention to share rebuttals. Belief refers to individuals’ level of trust in rebuttals to take a stance in refuting rumors (Lee & Oh, 2017) while intention to share refers to users’ willingness to disseminate the rebuttals in order to spread the truth among members of the online community (Pal et al., 2019; Torres et al., 2018). Both these constructs were studied because believing rebuttals helps correct individuals’ misconceptions in their mental model about the rumors while sharing such messages spreads the truth to others (Lewandowsky et al., 2012; Marett & Joshi, 2009; Pal et al., 2019).

Independent constructs. There are four independent variables in the conceptual model: Perceived argument quality, perceived source credibility, perceived utilitarian value, and perceived hedonic value.

Perceived argument quality refers to the extent to which users perceive the arguments of a rebuttal as convincing and noteworthy (Chang et al., 2015; Zhang, Zhao, Cheung et al., 2014). Given the role of arguments in reflecting the strengths of a message, argument quality determines the extent to which information can influence receivers' perceptions in a given context (Petty & Cacioppo, 1986).

Perceived source credibility refers to the extent to which users perceive the source of a rebuttal as reliable, competent, and trustworthy (Bordia et al., 2005; Liu et al., 2019; Zhang, Zhao, Cheung et al., 2014). When users face difficulty in determining the veracity of online messages, they often look out for the track record of the message source (O'Reilly et al., 2016). The goal is to confirm whether the message has come from a credible source (Reinhard & Sporer, 2010). Therefore, users' perception of source credibility often influences their decision-making process (Zhang, Zhao, Cheung et al., 2014).

Perceived utilitarian value is defined as the extent to which individuals perceive rebuttals as being useful in refuting rumors (Chen & Lee, 2008; Wang et al., 2019). It is associated with the cognitive evaluation of information to assess its functional or instrumental benefits while engaging in thought-based processing (Hu et al., 2016; Overby & Lee, 2006; Sirdeshmukh et al., 2002).

Perceived hedonic value is defined as the extent to which emotional responses are elicited while processing rebuttals (Ladhari, 2007; Overby & Lee, 2006; Ping, 2013;

Wang et al., 2019). It is the most frequently studied affective dimension of information processing in influencing individuals' responses (Wang et al., 2019). Prior research suggests that perceived hedonic value reflects emotional benefits and self-fulfillment in refuting rumors on the Internet (Holbrook & Hirschman, 1982; Hyun et al., 2011).

Moderating variables. There are three moderating variables in the conceptual model: Exposure sequence, attitudinal predisposition, and issue involvement. Exposure sequence refers to the order in which individuals exposed to the two antithetical messages—rumor and its rebuttal—in the online setting (Huang, 2017; Purnawirawan et al., 2012). Exposure to messages might occur differently for users on the Internet specifically in the social media context. In some cases, users could get the rumor first and thereafter receive the rebuttal. However, in other cases, they could come across the rebuttal even before they are exposed to the rumor.

Attitudinal predisposition refers to individuals' prior attitude towards an object (Weeks & Garrett, 2014). It often influences how they assess information on the Internet (Guess & Coppock, 2018; Lee & Chun, 2016). Individuals evaluate information based on their rooted interest in a given context (Dobrzynska & Blais, 2008; Lodge & Taber, 2000; Mafael et al., 2016; Perko et al., 2014). For instance, individuals' attitudes towards a brand often influence how they perceive messages related to the brand (Mafael et al., 2016). In this vein, when refuting disparaging brand-related rumors, individuals with positive a brand attitude might accept rebuttals more readily compared with those having a negative brand attitude.

Issue involvement refers to the extent to which individuals perceive an issue to be important (Angst & Agarwal, 2009; Seiders et al., 2005). Research shows that individuals with high issue involvement tend to process information more effortfully compared with those having low issue involvement (Angst & Agarwal, 2009). Issue involvement is an important factor that drives information acceptance based on individuals' perceived importance to an issue (Seiders et al., 2005; Tseng & Wang, 2016). Even previous works on rumors also showed that the amount of rumormongering varies based on individuals' involvement with an issue (Liu et al., 2014; Rosnow, 1991). Table 2.4 summarizes the constructs included in the conceptual model of rebuttal acceptance.

Table 2.4: Constructs included in the conceptual model of rebuttal acceptance.

Construct	Underpinning Theory	Definition
Perceived argument quality (of rebuttals)	Elaboration likelihood model S-O-R framework Information adoption model	Perceived argument quality refers to the extent to which users perceive the arguments of a rebuttal as convincing and noteworthy (Chang et al., 2015; Zhang et al., 2014).
Perceived source credibility (of rebuttals)	Elaboration likelihood model S-O-R framework Information adoption model	Perceived source credibility refers to the extent to which users perceive the source of a rebuttal as reliable, competent, and trustworthy (Bordia et al., 2005; Liu et al., 2019; Zhang et al., 2014).
Perceived utilitarian value (of rebuttals)	S-O-R framework Information adoption model	Perceived utilitarian value is defined as the extent to which individuals perceive rebuttals as being useful in refuting rumors (Chen & Lee, 2008; Wang et al., 2019).
Perceived hedonic value (of rebuttals)	S-O-R framework	Perceived hedonic value is defined as the extent to which emotional responses are elicited while processing rebuttals (Overby & Lee, 2006; Wang et al., 2019).
Exposure sequence (of rumors and rebuttals)	Theory of anchoring effect	Exposure sequence refers to the order in which individuals are exposed to the two antithetical messages—rumor and its rebuttal—in the online setting (Huang, 2017; Purnawirawan et al., 2012)
Attitudinal predisposition (among individuals)	Theory of partisan motivated reasoning	Attitudinal predisposition refers to individuals' prior attitude towards an object (Weeks & Garrett, 2014).
Issue involvement (among individuals)	Elaboration likelihood model	Issue involvement refers to the extent to which individuals perceive an issue to be important (Angst & Agarwal, 2009; Seiders et al., 2005).
Belief (among individuals)	S-O-R framework Information adoption model	Belief refers to individuals' level of trust in a rebuttal to take a stance in refuting the rumor (Lee & Oh, 2017).
Intention to share (among individuals)	S-O-R framework Information adoption model	Intention to share refers to users' willingness to disseminate the rebuttals in order to spread the truth among members of the online community (Pal et al., 2019; Torres et al., 2018).

2.8.2. Hypotheses Development

Building on the five underpinning theories, the goal of this research is to investigate individuals' acceptance of rebuttals on the Internet. As indicated earlier in Section 1.3, this research goal is divided into two ROs. While the purpose of RO 1 was to develop and empirically validate a conceptual model of rebuttal acceptance, RO 2 sought to examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance.

To address RO 1, this research developed a conceptual model to explain how perceived message properties of rebuttals could be related to perceived utilitarian and hedonic values, which in turn might be associated with rebuttal acceptance (Wang et al., 2019; Wu & Li, 2018). Taking the cue from the literature (Bordia et al., 2005; Guillory & Geraci, 2013; Zhang et al., 2014), perceived message properties of rebuttals include two major dimensions, namely, perceived argument quality, and perceived source credibility, that could play a crucial role in debunking rumors on the Internet.

The argument of an effective rebuttal must be strong enough to convince receivers. Provided with relevant information, rebuttals could tap on individuals' cognitive and affective states by eliciting greater perceived utilitarian value and hedonic value respectively. Instead of simply stating that the rumor is not true, rebuttals should include alternative explanations to justify the falsity of rumors (Chan et al., 2017; Johnson-Laird, 2012; Lewandowsky et al., 2012). Prior works suggest that the continued influence of a rumor can be reduced using an alternative explanation that explains why the rumor was false (Johnson & Seifert, 1994; Lewandowsky et al., 2012). Rebuttals with alternative explanations fill the coherence gap caused by refutation, which also plays a pertinent role

in truth assessment. The provision of the necessary information in rebuttals helps strengthen its argument quality, thereby increasing its functional ability to dispel misconceptions about rumors (Henningsen et al., 2003). Therefore, rebuttals could facilitate greater perceived utilitarian value, which would make individuals more confident to reject the rumor and accept the truth. Hence, the following hypothesis is posited:

H1: Perceived argument quality of a rebuttal is positively associated with its perceived utilitarian value.

Perceived argument quality could influence individuals' hedonic perceptions (Chang et al., 2019; Rosselli et al., 1995; Wang et al., 2019). It could activate consumption emotions by eliciting affective responses when exposed to the truth (Ladhari, 2007; Westbrook & Oliver, 1991). Individuals could feel pleasure and less disquiet upon receiving the truth about a rumor. Therefore, perceived argument quality could result in eliciting perceived hedonic value during refutation. Hence, the following hypothesis is posited:

H2: Perceived argument quality of a rebuttal is positively associated with its perceived hedonic value.

Prior works suggest that online information sources influence individuals' information processing in the contexts of attitudes towards a message, information adoption and behavioral intentions (Sussman & Siegal, 2003; Visentin et al. 2019; Zhang et al., 2014). Individuals often perceive a source as credible when it provides information

in an objective way (Gunawan & Huarng, 2015; Liu et al., 2019). Rebuttals from credible sources make them appear genuine and newsworthy (Andrews et al., 2016; Visentin et al., 2019). Therefore, perceived source credibility of rebuttals could further strengthen its perceived utilitarian value. Hence, the following hypothesis is posited:

H3: Perceived source credibility of a rebuttal is positively associated with its perceived utilitarian value.

However, there is a lack of theoretical basis to assume source credibility to shape peoples' hedonic attitude in rumor refutation. In the context of rebuttals, authoritative sources are deemed to be unbiased entities that objectively add credence. They add to the utility of rebuttals but are not likely to give rise to any affective responses. Previous research has also linked source credibility with utilitarian value but not hedonic value (Cheung et al., 2008; Reichelt et al., 2014). Therefore, the relationship between perceived source credibility and perceived utilitarian value was not hypothesized.

Previous works suggest that perceived utilitarian and hedonic values play an important role in influencing individuals' decision-making and their responses (Kim & Lennon, 2013; Wang et al., 2019). In terms of perceived utilitarian value, receivers of rebuttals often engage in processing and evaluating the debunking messages in sufficient details. Not surprisingly, they can resort to an internal processing of information provided in a rebuttal. They can be sensitive towards the alternative explanations that provide evidence in justifying that the rumor was false (Lewandowsky et al., 2012). They might also engage in assessing the source of the rebuttals before making any decisions related to the acceptance of the rebuttals (Bordia et al., 2005). When individuals perceive a rebuttal

as convincing enough to refute the rumor, they might perceive the rebuttal as useful (Guo et al., 2020). This in turn makes them likely to believe rebuttals in order to reduce uncertainty and misconception associated with rumors. Hence, perceived utilitarian value could facilitate greater belief in rebuttals.

Furthermore, when individuals perceive rebuttals as useful to debunk false claims, they might feel a sense of responsibility to spread the truth (Bobkowski, 2015; Ha & Ahn, 2011; Zhao et al., 2016). Sharing rebuttals would not only facilitate coaxing the members of the online community to check facts (Andrews et al., 2016), but also prevent them from the risk of being deceived by rumors (Edy & Risley-Baird, 2016). Therefore, the following two hypotheses are posited:

H4: Perceived utilitarian value of a rebuttal is positively associated with users' belief in the rebuttal.

H5: Perceived utilitarian value of a rebuttal is positively associated with users' intention to share the rebuttal.

On the other hand, perceived hedonic value could elicit favorable responses to rebuttals. While rumors are known to induce emotional arousal (Kim & Bock, 2011), exposure to rebuttals could evoke hedonic perceptions. Consumption emotions can be activated, and individuals can experience perceived hedonic value upon receiving the truth about a rumor. This could trigger a favorable response in believing rebuttals on the Internet. Moreover, prior works suggest that perceived hedonic value can influence individuals' information-sharing behavior on social media (Stieglitz & Dang-Xuan, 2013; Wang et al., 2019). This is because information sharing behavior is often emotionally

oriented (Dobele et al., 2007; Stieglitz & Dang-Xuan, 2013). In this vein, this research argues that if rebuttals can influence individuals' affective state of psychological processing, users could be ended up sharing such messages with their online peers. Therefore, the following two hypotheses are posited:

H6: Perceived hedonic value of a rebuttal is positively associated with users' belief in the rebuttal.

H7: Perceived hedonic value of a rebuttal is positively associated with users' intention to share the rebuttal.

Table 2.5 summarizes all the hypotheses for RO 1. The relationships identified from the hypotheses are shown in Figure 2.1.

Table 2.5: Summary of the hypotheses for RO 1.

Research Questions (RQs)	Hypotheses
RQ 1.1: How are perceived message properties of rebuttals related to perceived utilitarian and hedonic values?	H1: Perceived argument quality of a rebuttal is positively associated with its perceived utilitarian value.
	H2: Perceived argument quality of a rebuttal is positively associated with its perceived hedonic value.
	H3: Perceived source credibility of a rebuttal is positively associated with its perceived utilitarian value.
RQ 1.2: How are perceived utilitarian and hedonic values related to rebuttal acceptance?	H4: Perceived utilitarian value of a rebuttal is positively associated with users' belief in the rebuttal.
	H5: Perceived utilitarian value of a rebuttal is positively associated with users' intention to share the rebuttal.
	H6: Perceived hedonic value of a rebuttal is positively associated with users' belief in the rebuttal.
	H7: Perceived hedonic value of a rebuttal is positively associated with users' intention to share the rebuttal.

Figure 2.1: Relationships identified from the hypotheses for RO1.

To address RO 2, this research also hypothesizes the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. Previous works on anchoring effect suggest that the exposure of the first message may serve as an anchor to influence individuals' responses to other related messages in a given context (Kwak et al., 2018; Mussweiler et al., 2000; Tversky & Kahneman, 1974; Wu & Cheng, 2011). Stated otherwise, anchoring effect occurs when individuals' decision-making takes an anchor point from the first piece of information they encountered.

In this vein, prior exposure to a rumor could influence individuals' responses to its rebuttal. Following the anchoring affect (Kwak et al., 2018; Mussweiler et al., 2000; Tversky & Kahneman, 1974), this research argues that exposure sequence of a rumor and its rebuttal can significantly moderate the underlying relationships from perceived message properties to rebuttal acceptance. Therefore, as indicated in Table 2.6, it posits seven hypotheses (H8a, H9a, H10a, H11a, H12a, H13a, H14a) to investigate the moderating role of the exposure sequence in the conceptual model of rebuttal acceptance.

The role of individuals' attitudinal predisposition and issue involvement in processing rebuttals remains a relevant gap in the literature. Attitudinal predisposition refers to individuals' prior attitude towards an object (Weeks & Garrett, 2014). Previous works suggest that individuals' attitudinal predisposition can influence their information-processing behavior (Lord et al., 1979; Plassmann et al., 2012). The ways in which individuals process a given piece of information varies based on their attitudinal predisposition (Lodge & Taber, 2000; Weeks, 2015; Weeks & Garrett, 2014). For one, they have an affinity for information that is aligned with their attitudinal predisposition. However, they resist information that challenges their attitudinal predisposition.

Drawing from the theory of partisan motivated reasoning (Lodge & Taber, 2000; Weeks, 2015; Weeks & Garrett, 2014), this research argues that people could perceive and process rebuttals differently depending on their attitudinal predisposition. For instance, when refuting disparaging brand-related rumors, individuals with positive a brand attitude accept rebuttals more readily compared with those having a negative brand attitude. Therefore, it is pertinent to investigate how individuals' attitudinal predisposition can significantly moderate the underlying relationships from perceived message properties

to rebuttal acceptance. As indicated in Table 2.6, this research posits seven hypotheses (H8b, H9b, H10b, H11b, H12b, H13b, H14b) to examine the moderating role of the attitudinal predisposition on the conceptual model of rebuttal acceptance.

Next, issue involvement plays an important role in influencing individuals' information processing behavior (Maddock et al., 2015, Oh et al., 2013). Previous works on rumoring phenomena suggest that the amount of rumormongering varies with the importance of the message to the individuals concerned (Rosnow 1991). For a rumor to spread, the issue or topic must be important and relevant. Otherwise, there is no incentive for the individuals to pass along the message to others. Besides rumor research, issue involvement is also pertinent to information adoption to the recipients (Seiders et al., 2005). In the context of commercial marketing, prior works have studied consumers' involvement with advertising messages (Andrews et al., 1990; Chun & Lee, 2016). This involvement can sometimes be enduring or situational. Enduring involvement refers to individuals' long-term orientations or connections with a brand while situational involvement refers to individuals' temporary feelings with an issue related to the brand (Chun & Lee, 2016; Mathews-Lefebvre & Valette-Florence, 2014; Richins et al., 1992). In the information adoption process, work such as Tseng and Wang (2016) found that issue involvement significantly moderated the relationships from perceived argument quality and perceived source credibility to perceived usefulness of information on travel websites.

Therefore, this research argues that issue involvement could also be an influential factor in rebuttal acceptance. To refute rumors, high-involvement individuals tend to evaluate message properties with careful deliberation compared with low-involvement

individuals (Angst & Agarwal, 2009). That is, high involvement entails more cognitive effort in evaluating messages before acceptance (Petty & Cacioppo, 1986). Yet the role played by issue involvement has not been explored in the context of rebuttal acceptance. Therefore, this research examined how issue involvement could moderate the underlying relationships from perceived message properties to rebuttal acceptance. As indicated in Table 2.6, it posits seven hypotheses (H8c, H9c, H10c, H11c, H12c, H13c, H14c) to examine the moderating role of the attitudinal predisposition on the conceptual model of rebuttal acceptance.

Table 2.6 summarizes all the hypotheses for RO 2.

Table 2.6: Summary of the hypotheses for RO 2.

Research Questions (RQs)	Hypotheses
RQ 2.1: How are the relationships between rebuttals' perceived message properties and perceived values moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement?	H8: The relationship between perceived argument quality and perceived utilitarian value of a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
	H9: The relationship between perceived argument quality and perceived hedonic value of a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
	H10: The relationship between perceived source credibility and perceived utilitarian value of a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
RQ 2.2: How are the relationships between rebuttals' perceived values and rebuttal acceptance moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement?	H11: The relationship between perceived utilitarian value and users' belief in a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
	H12: The relationship between perceived utilitarian value and users' intention to share a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
	H13: The relationship between perceived hedonic value and users' belief in a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.
	H14: The relationship between perceived hedonic value and users' intention to share a rebuttal is moderated by (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement.

In addition, Figure 2.2 shows the complete conceptual model of this research.

Figure 2.2: The conceptual model of rebuttal acceptance.

2.9. Summary of the Literature Review and the Conceptual Model

This chapter offered a review of the literature and the development of the conceptual model. Specifically, it provided a holistic overview of the literature on rumors and ways to tackle them. Next, it reviewed the related works on rebuttals. This was followed by the choice of theoretical lenses and the descriptions of the five underpinnings theories.

The chapter included explications of the constructs and their associations. This laid the foundation of the conceptual model of rebuttal acceptance (as shown in Figure 2.2) with testable hypotheses (as listed in Table 2.5 and Table 2.6), which need further empirical validation. The next chapter describes the methods employed in this research to carry out the empirical validation.

CHAPTER THREE

RESEARCH METHODS

The preceding two chapters have provided a concise description of the problem statement, laid out the research goal, and reviewed the related literature. Specifically, the last chapter has provided an overview of the literature on rumors and rebuttals. Informed by the theoretical lenses—the S-O-R framework, the information adoption model, the theory of anchoring effect, the theory of partisan motivated reasoning, and the elaboration likelihood model, it has developed the conceptual model of rebuttal acceptance with hypotheses, which need empirical testing.

This chapter describes the methods employed in this research to carry out the empirical validation. It is organized into five sections. Section 3.1 introduces the methodological choices made in this research. Specifically, it justifies the research design and the research context. In addition, it presents a specific rumor and its rebuttal as the experimental stimuli.

Section 3.2 describes the experiment conducted in this research. It includes the data collection and the experimental procedure.

Section 3.3 develops the questionnaire to be administered. It presents the measures, and explains how the measures are evaluated.

Section 3.4 describes the procedure of data analysis used in this research. Specifically, it describes the partial least squares structural equation modeling (PLS-SEM)

approach of quantitative data analysis, and the inductive content analysis for qualitative data analysis.

Finally, Section 3.5 summarizes the data analysis procedure for this research.

3.1. Methodological Choices

3.1.1. Research Design

This research adopts the realism paradigm, which combines both the positivist and the interpretivist approaches (McEvoy & Richards, 2006; Saunders et al., 2012). While positivism seeks to test hypotheses derived from theory, interpretivism allows researchers to derive meanings of social phenomena by considering the thoughts and feelings of the involved actors (Bryman, 2012; Saunders et al., 2012).

As explained earlier in Section 2.8, this research investigates rebuttal acceptance by developing hypotheses deductively from existing theories. The formulation of hypotheses followed by their statistical testing to an accepted level of probability matches the positivist paradigm (Snieder & Lerner, 2009). Furthermore, as described later in Section 3.2.2, this research also collects open-ended responses from participants to examine nuances in their perception of rebuttals. These qualitative responses are later subjected to inductive analysis, which matches the interpretivist paradigm.

The research primarily used an experimental design to test a series of hypotheses. In addition, the qualitative component was intended to enrich the experimental data. The data collection involved the collection of quantitative as well as qualitative data roughly at the same time, and thereafter integrating the two forms of data in the overall interpretation

of the results (Akçayır, 2017; Creswell, 2013). Close-ended responses collected using scales constitute the quantitative data while open-ended responses obtained through a comment function constitute the qualitative data. The purpose is to facilitate a more comprehensive analysis than what either quantitative or qualitative data alone would have afforded.

With respect to data collection strategy, this research chose experiments to examine the causal impact of exposure sequence on rebuttal acceptance. An experiment is often considered as the “gold standard” in terms of data collection strategy (Rubin, 2008). It is appropriate to investigate the extent to which a manipulation is associated with a change in the outcome of interest. It also helps demonstrate how the manipulation creates a difference in inter-construct associations in a research model (Charness et al., 2012; Imai et al., 2011).

Surveys, interviews and focus groups are other ways to collect data. Surveys are commonly used to collect data from a population of interest under study (Hinkin, 1998). Although surveys allow obtaining responses from a desired sample of individuals, they are not able to establish the impact of manipulating the exposure sequence of a rumor and its rebuttal (Helm et al., 2009). In other words, experiments are better suited than surveys to tackle the goal of this research. Additionally, experimental designs are regarded as more rigorous in terms of internal validity than other methods.

Interviews and focus groups are popular ways of obtaining qualitative data when a research adopts the interpretivism paradigm. These data collection methods are not appropriate for research that adopts the realism paradigm. In other words, experiments are better suited than either interviews or focus groups to tackle the goal of this research.

Specifically, this research designs a between-participants experiment. A between-participants experiment is one in which each participant is exposed to only one treatment. This experimental design is different from a within-participants experimental design, in which each participant is exposed to more than one of the treatments being tested.

This research manipulated the exposure sequence of a rumor and its rebuttal as a between-participants factor. The rumor preceded its rebuttal in the rumor-before-rebuttal condition while the rebuttal preceded the rumor in the rebuttal-before-rumor condition.

A between-participants experimental design was preferred to a within-participants experimental design. The between-participants design allowed to test for the effect of exposure sequence of the antithetical messages, under the assumption that all other differences between the conditions are held equal by random assignment. Such a design is appropriate where there is a large number of participants and it is not possible to expose a participant to multiple treatment conditions, here, the rumor-before-rebuttal condition, and the rebuttal-before-rumor condition. Within-participants experimental design would not have been appropriate because being tested in one condition of exposure sequence would bias their responses in the other condition. Moreover, a between-participants experimental design is useful to lower participants' boredom and fatigue and avoid carry-over effects (Goh et al., 2011; Tay et al., 2016).

3.1.2. Research Context

This research selected a brand-related rumor for both theoretical and practical reasons. Theoretically, research on brand-related online rumors is far and few. Among the existing works related to online rumors, the focus has been commonly on the contexts of

politics (Bae, in press; Weeks & Garrett, 2014), natural disasters (Oh et al., 2010; Wang & Zhuang, 2018), and health (Chua & Banerjee, 2018; Wood et al., 2018). Works on brand-related rumors are relatively less conspicuous. This has probably prompted scholars to call for research on how rumors can be effectively countered when brands are under the threat of online falsehoods (Pitt & Plangger, 2018).

In response to the research call, this research extends the handful of previous works on brand-related rumors (Aditya, 2014; Visentin et al., 2019) in a number of ways. For one, unlike those works, it examines how exposure sequence of a rumor and its rebuttal could influence the underlying mechanism of rebuttal acceptance. In addition, it considers the role of individuals' attitudinal predisposition towards a brand in examining rebuttal acceptance.

On the practical front, brand-related online rumors constitute a research-worthy topic because brands are vulnerable to dubious messages circulating on the Internet. Some of the examples of brand-related rumors include Cadbury products contaminated with HIV (Snopes, 2018b), and Nutella—the popular hazelnut cocoa spread—contains a known carcinogen among its ingredients (Snopes, 2017). These rumors became viral easily on the Internet (Pitt & Plangger, 2018; Sudhir & Unnithan, 2019).

Brands becoming victim of falsity have serious repercussions (Pitt & Plangger, 2018). As described earlier in Section 1.2.1, brand-related rumors can cause substantial damage to reputation and financial performance (Aditya, 2014; Visentin et al., 2019). For instance, in 2008, a rumor—the CEO of Apple Inc., Steve Jobs, have passed away—caused panic in the financial markets resulting in a loss of \$9bn to Apple's stock (Dubois et al., 2011).

This research specifically relies on a brand-related dread rumor as its test case for investigation. Dread rumors, as the name suggests, are those that depict negative or harmful consequences. They are different from wish rumors that depict positive or hoped-for consequences (Chua & Banerjee, 2018; Kimmel & Audrain-Pontevia, 2010). The literature unanimously confirms that dread rumors are attended to more easily than wish rumors (Kimmel & Audrain-Pontevia, 2010; Tsugawa & Ohsaki, 2015). The former is also more prevalent than the latter (Chua & Banerjee, 2018; Kimmel & Audrain-Pontevia, 2010). Hence, this research selected a brand-related dread rumor instead of a brand-related wish rumor.

3.1.3. Specific Rumor and Rebuttal as Experimental Stimuli

This research specifically studies the case of a brand-related rumor in which the global fast-food chain Kentucky Fried Chicken (KFC) was alleged to have served a deep fried rat instead of chicken to a customer in California in the year 2015. The rumor became viral on social media with a picture of a rodent shaped piece of meat in the meal. Eventually, an independent DNA test confirmed that KFC ‘fried rat’ was actually a chicken.

The rumor stated that KFC serves ‘fried rat’ instead of chicken wings. As shown in Appendix A (Figure A1), the statement was accompanied with a picture of a rodent-shaped piece of meat that became viral on the Internet. Such a negative sensational rumor for a real brand ensured authenticity and realism of the experimental stimuli, thereby facilitating ecological validity (Chen & Cheng, in press; Fragale & Heath, 2004; Lee & Chun, 2016; Sung et al., 2012).

The rebuttal was crafted by using the DNA test result as an alternative explanation to debunk the rumor. Prior works suggest that an alternative explanation helps fill the coherence gap left behind by refuting rumors (Johnson-Laird, 2012; Lewandowsky et al., 2012). Moreover, as shown in Appendix A (Figure A2), the rebuttal made a reference to the rumor claim using an explicit warning label. This is because prior works suggest that the use of explicit warning restrains the rumor from being reinforced (Lewandowsky et al., 2012). The rebuttal appeared to mimic a social media feed from the BBC News outlet, which is ranked highly in terms of perceived source credibility (Pew Research Center, 2015). In the stimuli, efforts were made to make the source BBC News conspicuous by showing its name and logo as shown in Figure A2.

The experiment included a debriefing note that clarified that ‘KFC fried rat’ was actually a hoax. This ensured that the brand reputation of KFC was not hampered because of this research.

3.2. Experiment

3.2.1. Participant Recruitment

After getting the university’s IRB approval as given in Appendix B, the study participation advertisement, shown in Appendix C, was posted on various notice boards within the premises of Nanyang Technological University. It was also posted online through social media. To recruit participants from the Internet population, similar approaches are widely followed (Benson, Saridakis, & Tennakoon, 2015; Smith, Stibric, & Smithson, 2013; Pentina & Tarafdar, 2014). The advertisement confirmed a monetary incentive of SGD 8 as a token of appreciation.

Participant recruitment was done using two eligibility criteria. The first was that participants had to be social media users, which ensured that participants could readily relate the exposure of messages and the related task of sharing messages with others on social media. The second criterion was that participants had to be aged between 21 and 60 years, which was required to ensure that data were not collected from vulnerable groups such as children and senior citizens. Individuals who met these eligibility criteria and were willing to participate were asked to contact the researcher via email. Upon meeting the two eligibility criteria, participants were asked to contact the researcher via email.

Participants who contacted the researcher stating that they were keen to take part, and fulfilled the eligibility criteria received the study URL via email. This continued for a period of eight months from mid-January 2019 to mid-September 2019.

3.2.2. Experimental Procedure

As described earlier in Section 3.1.1, this research adopted a between-participants experimental design in which the exposure sequence of a rumor and its rebuttal was manipulated. Two study websites were created. In one, the rumor preceded its rebuttal. In the other, the rebuttal preceded the rumor. The websites did not allow visitors to navigate back-and-forth. This ensured the integrity of the exposure sequence manipulation.

In the rumor-before-rebuttal condition, the participants first came across the rumor before they encountered the rebuttal. In the rebuttal-before-rumor condition, the participants first came across the rebuttal before they encountered the rumor. Since this is an objective difference between the two groups in the experiment, no manipulation check

was necessary (O'Keefe, 2003; Walther, Jang, & Hanna Edwards, 2018). Its potential effects are revealed in the analyses that follow.

To control for extraneous variables, participants were assigned randomly, and hence each participant had an equal chance to be assigned to one of the two conditions in the experiment (Fisher, 1935, 1956). This helped mathematically equate individuals in the conditions on factors that are known, unknown, measured, or unmeasured.

Informed consent was obtained upfront. Participants were asked to indicate their brand attitude towards KFC (measures in Section 3.3.1). Thereafter, they were exposed to the experimental stimuli of the rumor and its rebuttal in the manipulated sequence. The rumor and the rebuttal were separated by three unrelated filler messages. The filler messages helped create an exposure gap between the two antithetical messages (Manis et al., 1974; Pryor & Lander, 1984).

Immediately after exposure to the rumor and the rebuttal, participants were asked to indicate their intentions to believe and share the messages. Next, they were required to indicate their perceived message properties (perceived argument quality and perceived source credibility), and their perceived values (perceived utilitarian and hedonic values) for the rebuttal. Thereafter, participants' open-ended comments about the rebuttal were solicited. Finally, they had to provide their demographic details, and indicate their familiarity with the case as well as issue involvement (measures in Section 3.3.1).

The experiment improved internal validity in three ways: manipulation, randomization, and blinding. First, this research administered a between-participants experiment to manipulate the exposure sequence of a rumor and its rebuttal. The manipulation resulted in two conditions: rumor-before-rebuttal, and rebuttal-before-

rumor. Second, participants were randomly assigned to one of the two experimental conditions. In other words, every participant had the equal likelihood of being exposed to the rumor before the rebuttal or the other way round. Third, the use of blinding meant that participants were not explicitly told whether a message was a rumor or a rebuttal. This was necessary because a rumor or a rebuttal online seldom comes with such labels, using which could have biased participants' responses.

The experiment limits external validity on two fronts. First, the research did not involve random sampling. Non-probability sampling was used because it was difficult to select participants randomly from the entire population of Internet users. Therefore, the recruited participants may not be representative of the entire online population. Second, the experiment was done using a brand-related rumor. Therefore, the current research can be replicated in other contexts related to health rumors and political rumors.

3.3. Questionnaire Development

3.3.1. Measures

The questionnaire included items to measure eight constructs. One, brand attitude was measured by asking participants to indicate their view about KFC as unfavorable–favorable, unpleasant–pleasant, dislike–like, and negative–positive on a five-point semantic differential scale (MacKenzie, Lutz, & Belch, 1986; MacKenzie & Lutz, 1989; Mitchell & Olson, 1981; Stubb & Colliander, 2019). A composite index was created by averaging participants' responses to the four items. Higher score in this index indicated favorable brand attitude.

Two, belief—in rumor as well as rebuttal—was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “I am willing to rely on this message,” “I am likely to believe this message,” and “I trust this message” (Bordia et al., 2005; Lee & Oh, 2017; Xu 2014). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater belief.

Three, intention to share, for the rumor as well as the rebuttal, was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “I intend to share this message,” “I expect to share this message,” and “I plan to share this message” (Lee & Ma, 2012; Pal et al., 2019). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater intention to share.

Four, perceived argument quality of the rebuttal was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “The arguments of this message are convincing,” “The arguments of this message are strong,” and “The arguments of this message are conveyed effectively” (Zhang et al., 2014). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater perceived argument quality of the rebuttal.

Five, perceived source credibility of the rebuttal was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “The source providing this message is knowledgeable,” “The source providing this message is trustworthy,” and “The source providing this message is

credible” (Bhattacharjee & Sanford, 2006, Gunawan & Huarng, 2015; Liu et al., 2019; Zheng et al., 2013). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater perceived source credibility of the rebuttal.

Six, perceived utilitarian value of the rebuttal was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “I perceive that the content of this message is useful,” “I perceive that the content of this message is valuable,” and “I perceive that the content of this message is helpful” (Erkan & Evans 2016; Hussain et al., 2017; Wang et al., 2019). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater perceived utilitarian value of the rebuttal.

Seven, perceived hedonic value of the rebuttal was measured by asking participants to indicate the extent to which the message made them unhappy–happy, annoyed–pleased, and dissatisfied–satisfied on a five-point semantic differential scale (Kim & Johnson, 2016; Wang et al., 2019). A composite index was created by averaging participants’ responses to the three items. Higher score in this index indicated greater perceived hedonic value of the rebuttal.

Eight, issue involvement was measured by asking participants to indicate their degree of agreement with the three items on a five-point Likert scale: “The issue highlighted in the KFC fried rat messages is important to me,” “The issue highlighted in the KFC fried rat messages is relevant to me,” and “I am interested in this issue highlighted in the KFC fried rat messages” (Jung et al., 2016; Lim et al., 2015). A

composite index was created by averaging participants' responses to the three items. Higher score in this index indicated greater issue involvement.

Furthermore, participants were asked whether they had heard about the KFC fried rat case before participating in this study using a yes/no question. This was necessary because the rumor became viral on social media, and participants' rumor familiarity might have influenced their rebuttal acceptance. Therefore, this research filtered out responses from the participants who were familiar with the rumor case.

Finally, open-ended responses about the rebuttal were obtained through a comment function. The questionnaire also sought demographic details that included gender, age group, and highest educational qualification. The items for each of the variables are listed in Table 3.1.

Table 3.1: Questionnaire items for the constructs.

Constructs	Items	Sources
Attitudinal predisposition	ATT1: unfavorable – favorable ATT2: unpleasant – pleasant ATT3: dislike – like ATT4: negative – positive	MacKenzie & Lutz (1989) MacKenzie & Lutz (1989) MacKenzie, Lutz, & Belch (1986) MacKenzie, Lutz, & Belch (1986)
Belief	BEF1: I am willing to rely on this message. BEF2: I am likely to believe this message. BEF3: I trust this message.	Xu (2014) Lee & Oh (2017) Bordia et al. (2005)
Intention to share	ITS1: I intend to share this message. ITS2: I expect to share this message. ITS3: I plan to share this message.	Lee & Ma (2012) Lee & Ma (2012) Lee & Ma (2012)
Perceived argument quality	PAQ1: The arguments of this message are convincing. PAQ2: The arguments of this message are strong. PAQ3: The arguments of this message are conveyed effectively.	Zhang et al., (2014) Zhang et al., (2014) Zhang et al., (2014)
Perceived source credibility	PSC1: The source providing this message is knowledgeable. PSC2: The source providing this message is trustworthy. PSC3: The source providing this message is credible.	Bhattacharjee & Sanford, (2006) Bhattacharjee & Sanford, (2006) Bhattacharjee & Sanford, (2006)
Perceived utilitarian value	PUV1: I perceive that the content of this message is useful. PUV2: I perceive that the content of this message is valuable. PUV3: I perceive that the content of this message is helpful.	Erkan & Evans (2016) Hussain et al. (2017) Hussain et al. (2017)
Perceived hedonic value	PHV1: unhappy – happy PHV2: annoyed – pleased PHV3: dissatisfied – satisfied	Kim & Johnson (2016) Kim & Johnson (2016) Kim & Johnson (2016)
Issue involvement	INV1: The issue highlighted in the KFC fried rat messages is important to me. INV2: The issue highlighted in the KFC fried rat messages is relevant to me. INV3: I am interested in this issue highlighted in the KFC fried rat messages.	Jung et al. (2016) Jung et al. (2016) Lim et al. (2015)

3.3.2. Evaluation of the Measures

Before the data collection, face validity and content validity were checked. Face validity refers to the extent to which participants of a research judge items of a questionnaire to be appropriate for the targeted construct (Anastasi, 1988; Tharenou et al., 2007; Ware et al., 1981). To ensure face validity, two Information Studies professors and two doctoral students examined the questionnaire, and thereafter a pilot test was carried out with 10 coders to further refine the questionnaire. A high level of consensus that the questionnaire items represented the measured construct ensured face validity.

Content validity is defined as the degree to which the questionnaire items cover the theoretical content of the construct that it is supposed to measure (Casaló et al., 2008; Leong et al., 2013). The questionnaire was informed by the literature, which ensured considerable content validity of the measures.

After collecting the data, the questionnaire items were assessed for their reliability and validity (Fornell & Larcker, 1981; Luo et al., 2012; Oliveira et al., 2016; Zhang, Benyoucef, & Zhao, 2015). Internal consistency reliability refers to the homogeneity of the items that are consistent among themselves intended to measure the same concept (Joo & Sang, 2013). Cronbach's Alpha (α) is the most frequently used indicator to determine the internal consistency of the items for a construct. Cronbach's α ranges from 0 to 1, and a score above 0.70 is considered acceptable. Composite reliability (CR) has also been used to ensure the internal consistency of the items for a construct, considering an acceptable reliability score of 0.70 (Fornell & Larcker, 1981; Zheng, Zhao, & Stylianou, 2013).

Convergent validity suggests whether questionnaire items converge on the same construct (Fornell & Larcker, 1981; Tharenou et al., 2007). It was checked in terms of average variance extracted (AVE) of each construct.

Divergent validity, also known as discriminant validity suggests whether the quantitatively-measured questionnaire items of unrelated constructs differ from one another (Oliveira et al., 2016). It was evaluated using two criteria. First, the Fornell-Larcker criterion suggests that the square root of AVE should exceed inter-construct correlations (Chin, 1998). Second, the cross-loadings criterion suggests that the loading of each indicator should exceed cross-loadings (Fornell & Larcker, 1981).

Finally, common method bias was tested using Harman's single factor test (Podsakoff & Organ, 1986; Shiau & Luo, 2012). It occurs when the majority of the variance is explained by a single factor.

3.4. Procedure of Data Analysis

3.4.1 *Quantitative Analysis*

Analysis of data using Structural Equation Modeling (SEM). Data were analyzed using SEM that provides a comprehensive statistical approach involving one or more exogenous and endogenous constructs to testing hypotheses (Anderson & Gerbing, 1988; De Carvalho & Chima, 2014). Such a statistical approach has widely been acknowledged for investigations of both measurement and theoretical issues in order to validate conceptual models in research (Baumgartner & Homburg, 1996; Gonzalez-Jimenez et al., 2019; Zhang, Benyoucef, & Zhao, 2015).

Two broad approaches to SEM include covariance-based SEM (CB-SEM), and partial least squares based SEM (PLS-SEM) (Gefen et al., 2000). CB-SEM involves the covariance matrix of the data and estimates the model parameters by only considering common variance without focusing on explained variance (Jöreskog & Sörbom, 1982). On the other hand, PLS-SEM is a variance-based approach, and accounts for the total variance to estimate the model parameters (Chin, 1998; Hair et al., 2017).

Although both CB-SEM and PLS-SEM approaches are complementary rather than competitive, the latter was more appropriate. This is because PLS-SEM is better suited to deal with moderators than CB-SEM (Chen et al., 2017; Liang et al., 2007; Zhang, Benyoucef, & Zhao, 2015). This research includes three moderators, namely, exposure sequence, attitudinal predisposition, and personal involvement.

Partial least squares structural equation modeling (PLS-SEM). PLS-SEM is referred to as variance-based approach, which accounts for the total variance to estimate the model parameters (Hair et al., 2011; 2017). For PLS-SEM, the minimum sample size equals 10 times the greater of the maximum number of indicators in a formative, or the maximum number of structural paths associated with a single endogenous construct (Chin, 1998). As evident from Figure 2.2 (in Section 2.8.2), the maximum number of structural paths associated with an endogenous construct—belief in rebuttal—is two. Eventually, as reported later in Section 4.1.1, complete responses from 305 participants were admitted for the purpose of the analysis, which largely exceeded the sample size requirement for the analysis.

When applying PLS-SEM, the model specification deals with the set-up of the outer and the inner models. The outer models, also called as the measurement models,

determines the relationships between the indicators (also known as items) and their corresponding construct. The inner model, also called as the structural model, represents the relationships between the constructs in a conceptual model. In this vein, the analysis first involved the development of the measurement models, and thereafter, entailed the assessment of the structural model (Anderson & Gerbing, 1988).

In terms of assessing the measurement models, the questionnaire items were evaluated to ensure reliability and validity of the measures. As described earlier in Section 3.3.2, internal consistency reliability was examined through Cronbach's alpha and composite reliability. Validity was checked in terms of convergent validity and discriminant validity.

In terms of assessing the structural model, the standard assessment criteria include the coefficient of determination (R^2), the effect size (f^2), and the cross-validated redundancy measure (Q^2). The coefficient of determination (R^2) measures the variance in endogenous constructs, and therefore, determines the model's explanatory power (Chin, 1998; Velayutham et al., 2012). The R^2 value of above 67%, 33% and 19% are considered as substantial, adequate and weak respectively (Velayutham et al., 2012).

For the conceptual model shown in Figure 2.2, the variability in the endogenous constructs—perceived utilitarian and hedonic values—were explained by other exogenous constructs associated with perceived message properties of rebuttals. Furthermore, the endogenous constructs—intentions to believe and share rebuttals—were explained by perceived utilitarian and hedonic values.

The magnitude of the statistical relations was checked based on effect size (f^2). Values of f^2 higher than 0.35, 0.15, and 0.02 indicate large, medium and small effect sizes respectively (Cohen, 1988; Hair et al., 2019).

The predictive accuracy of the PLS path model was checked in terms of Q^2 (Hair et al., 2019; Geisser, 1974; Rigdon, 2014). To ensure the predictive accuracy of the model, the Q^2 values should be greater than zero for an endogenous construct (Hair et al., 2019; Rigdon, 2014).

Addressing RO 1 using PLS-SEM. The analysis involved examining the relationships from perceived message properties of rebuttals to its acceptance. Specifically, as indicated in Table 2.5, each of the seven hypotheses (H1 to H7) was tested for statistical significance. The path coefficient values were examined for all the hypothesized relationships in the conceptual model.

The purpose was to determine how perceived message properties were associated with perceived values, which in turn determined rebuttal acceptance. Using the SmartPLS 2.0 software, the bootstrap procedure with 5000 resamples was employed to check for statistical significance (Reinares-Lara et al., 2018; Ringle et al., 2005).

Addressing RO 2 using PLS multi-group analysis. Multi-group analysis is a type of moderation in which a dataset is split based on a grouping variable, and thereafter, a research model is tested for the compared groups. With respect to exposure sequence, the analysis was run separately for the two groups of data. While one group of data comes from the rumor-before-rebuttal condition, the other group of data comes from the rebuttal-before-rumor condition. Thereafter, the group comparison method was applied to identify if the path coefficients for the two groups of participants differed significantly (Banerjee

& Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). While testing for the moderating effect of exposure sequence, the other two moderators—attitudinal predisposition, and issue involvement—were statistically controlled.

With respect to attitudinal predisposition, the conceptual model was further tested by taking participants' attitudinal predisposition towards the brand as a moderator. The participants were categorized as having either pro-attitudinal predisposition or anti-attitudinal predisposition towards the chosen brand based their attitudinal predisposition index. Those within $\pm \frac{1}{2}$ standard deviation around the index were removed to limit the PLS multi-group analysis to participants who showed either pro-or-anti attitude towards the brand (Casaló et al., 2011). Thereafter, the group comparison method was applied to identify if the path coefficients for the two groups of participants (in terms of their attitudinal predisposition) differed significantly (Banerjee & Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). While testing for the moderating effect of attitudinal predisposition, the other two moderators—exposure sequence and issue involvement—were statistically controlled.

Similarly, the conceptual model was tested by taking issue involvement as a moderator. The participants were categorized as having either low or high issue involvement based on their issue involvement index. Those within $\pm \frac{1}{2}$ standard deviation around the index were removed to limit the PLS multi-group analysis to participants who showed either low or high issue involvement (Casaló et al., 2011). Thereafter, the group comparison method was applied to identify if the path coefficients for the two groups of participants (in terms of their issue involvement) differed significantly (Banerjee & Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). While testing for the moderating

effect of issue involvement, the other two moderators—exposure sequence and attitudinal predisposition—were statistically controlled.

3.4.2 Qualitative Analysis

A qualitative analysis was employed on the open-ended responses to the rebuttal. In addition to the quantitative analysis, this analytical approach allowed obtaining further insights into participants' perceptions of the rebuttal, allowing for greater triangulation. Such a methodological integration combining quantitative and qualitative data is increasingly encouraged (Akçayır et al., 2016; Molina-Azorin, 2016).

Specifically, an inductive analysis was employed. It involves looking for emerging categories from qualitative data as opposed to following predetermined set of categories (Drouin et al., 2016; Elo & Kyngäs, 2008). The researcher and another coder, who were trained in qualitative research methods and regular social media users, did the analysis.

Guided by previous works (Black et al., 2016; Drouin et al., 2016; Schamber, 2000; Stemler, 2000), the analytical procedure involved two steps. The first step was meant to generate initial codes from the data. For this purpose, comments to the rebuttal were read to develop an overall understanding of the open-ended responses. In order to develop a coding scheme, the researcher and the coder examined all the responses to identify a set of potential codes. Thereafter, they discussed the codes to develop a common coding scheme.

The second step involved revisiting the data with the coding scheme. To establish inter-coder reliability, the coders independently coded all the open-ended responses using

the coding scheme. They were free to discuss any newly emergent codes if arrived during the coding process.

3.5. Summary of the Research Methods

This chapter has described the methods of this research. Specifically, it began with the methodological choices that were made in terms of research design, research context, and the development of the experimental stimuli. Next, it explained the procedure of the experiment, which was followed by the description of data collection. The questionnaire development was described next. Thereafter, the chapter provides the procedure of data analysis, which is summarized in Figure 3.1.

Figure 3.1: Summary of the procedure of data analysis.

Having explained the research methods, this chapter has prepared the ground to present the research findings. The next chapter presents the findings of this research.

CHAPTER FOUR

RESEARCH FINDINGS

The preceding three chapters have provided a concise description of the problem statement, laid out the research goal, reviewed the related literature, and presented the research methods. Specifically, the last chapter has described the methods employed in this research to carry out the empirical validation. Specifically, a between-participants experiment was designed, which manipulated the exposure sequence of a rumor and its rebuttal. Thereafter, it has explained the procedure of data analysis using the partial least squares structural equation modeling (PLS-SEM) approach for the close-ended responses (quantitative data), and the inductive content analysis for the open-ended responses (qualitative data).

This chapter presents the research findings, which is organized into five sections. Section 4.1 summarizes the descriptive statistics of the dataset. Specifically, it offers a description of the sample, the questionnaire responses, as well as reliability and validity of the measures.

Section 4.2 shows the empirical validation of the conceptual model proposed in this research. In particular, it includes assessment of the structural model, and the results of the hypotheses testing. This is accomplished through PLS-SEM analysis.

Section 4.3 presents the moderation testing results pertaining to the roles of exposure sequence, attitudinal predisposition, and issue involvement. This is accomplished through a series of PLS multi-group analysis.

Section 4.4 describes findings from the qualitative analysis. This is accomplished through an inductive coding on participants' open-ended responses to the rebuttal.

Finally, Section 4.5 concludes the chapter with a summary. It also establishes a link between the current chapter and the next, which discusses the research findings.

4.1. Descriptive Statistics

4.1.1. Sample

In response to the study participation advertisement, 400 participants indicated their willingness to take part in the study. Of these, 18 participants dropped off mid-way. Therefore, complete responses were obtained from 382 participants (400-18).

Moreover, responses from 77 participants were eliminated because of their familiarity about the rumor case before participating in this research. As indicated in earlier Section 3.3.1, prior familiarity of the case would have influenced rebuttal acceptance.

Therefore, the final analysis included responses from the remaining 305 participants (382-77). Of these, the rumor-before-rebuttal condition received 150 complete responses while the rebuttal-before-rumor condition included 155 complete responses.

Among the 305 participants, 171 (56.1%) were males, and 134 (43.9%) were females. With respect to age groups, 225 (73.8%) were between 21 and 30 years, 67 (22%) were between 31 and 40 years, 10 (3.3%) were between 41 and 50 years, and the remaining 3 (1%) were between 51 and 60 years. The demographic details of the

participants for the two experimental conditions are summarized in Table 4.1. The descriptive statistics of the constructs from the sample are reported in Table 4.2.

Table 4.1: Demographic details of the participants.

Scales	The rumor-before-rebuttal condition (N ₁ =150)		The rebuttal-before-rumor condition (N ₂ =155)		Full sample (N ₁ + N ₂ =305)	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	80	53.30%	91	58.70%	171	56.10%
Female	70	46.70%	64	41.30%	134	43.90%
Age-group in years						
21-30	113	75.30%	112	72.30%	225	73.80%
31-40	30	20%	37	23.90%	67	22%
41-50	5	3.30%	5	3.20%	10	3.30%
51-60	2	1.30%	1	0.60%	3	1%
Highest Educational qualification						
GCE 'O' or 'A' Levels	27	18%	34	21.90%	61	20%
Diploma	22	14.70%	17	11%	39	12.80%
Bachelor	56	37.30%	51	32.90%	107	35.10%
Master	39	26%	42	27.10%	81	26.60%
PhD	6	4%	11	7.10%	17	5.60%

Table 4.2: Descriptive statistics of the constructs.

Constructs	The rumor-before-rebuttal condition (M ± SD)	The rebuttal-before-rumor condition (M ± SD)	Full sample (M ± SD)
Attitudinal predisposition	3.342 ± 0.975	3.376 ± 1.024	3.359 ± 0.998
Issue involvement	3.920 ± 0.992	3.560 ± 1.007	3.737 ± 1.014
Belief in rumor	2.920 ± 1.188	2.217 ± 1.082	2.563 ± 1.186
Intention to share rumor	3.242 ± 1.351	2.344 ± 1.195	2.786 ± 1.349
Belief in rebuttal	3.684 ± 0.998	2.994 ± 1.271	3.333 ± 1.119
Intention to share rebuttal	3.346 ± 1.178	2.626 ± 1.294	3.034 ± 1.119
Perceived argument quality	3.544 ± 0.901	3.202 ± 0.986	3.370 ± 0.959
Perceived source credibility	3.951 ± 1.027	3.585 ± 1.116	3.765 ± 1.087
Perceived utilitarian value	3.733 ± 0.889	3.469 ± 0.946	3.599 ± 0.927
Perceived hedonic value	3.424 ± 0.857	3.071 ± 0.912	3.245 ± 0.901

Note. Sample size for the rumor-before-rebuttal condition = 150.

Sample size for the rebuttal-before-rumor condition = 155.

Sample size for the full dataset = 305.

4.1.2. Reliability and Validity of the Measures

When assessing the measurement models, the questionnaire items were evaluated in two steps to ensure reliability and validity of the measures. The first step involved assessing reliability of the measures. As indicated in Table 4.3, values of composite reliability (CR) exceeded 0.65, and those of Cronbach's α exceeded 0.70 for all the reflective constructs. This offers confidence in the reliability of the measures.

The second step involved assessing the validity of the measures. Convergent validity was checked in terms of the average variance extracted (AVE) of each construct. As shown in Table 4.3, all AVE values exceeded the minimum threshold of 0.50 (Fornell & Larcker, 1981; Pavlou et al., 2007). This showed that construct-related variance was much higher than error variance for all constructs. Therefore, convergent validity was confirmed.

Table 4.3: Convergent validity and internal consistency reliability of measurements.

Constructs	CR	Cronbach's α	AVE
Attitudinal predisposition	0.941	0.925	0.798
Issue involvement	0.918	0.866	0.788
Belief in rumor	0.956	0.933	0.877
Intention to share rumor	0.976	0.964	0.932
Belief in rebuttal	0.968	0.950	0.910
Intention to share rebuttal	0.978	0.967	0.937
Perceived argument quality	0.925	0.878	0.804
Perceived source credibility	0.969	0.952	0.913
Perceived utilitarian value	0.955	0.930	0.877
Perceived hedonic value	0.953	0.927	0.872

Note. CR = Composite Reliability.

AVE = Average Variance Extracted.

Thereafter, discriminant validity was checked. Table 4.4 shows that the square roots of AVE exceeded inter-correlations, confirming discriminant validity (Fornell & Larcker, 1981). The most positive correlation was found between perceived argument quality and perceived source credibility ($r = 0.708$) whereas the most negative correlation was between individuals' belief in rumors and their attitudinal predisposition ($r = -0.092$).

Moreover, all items loaded on their respective constructs. Appendix D shows the item loadings and the cross-loading loadings of the constructs. Thus, discriminant validity was confirmed for the measurement models.

Furthermore, Harman's one-factor test was employed to examine common method bias. It included all items in a principal component factor analysis (Podsakoff & Organ, 1986; Shiau & Luo, 2012). More than one factor emerged. Hence, common method bias was not a problem.

Table 4.4: Discriminant validity of measurements.

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Attitudinal predisposition	0.893									
(2) Issue involvement	0.185	0.888								
(3) Belief in rumor	-0.092	0.177	0.936							
(4) Intention to share rumor	-0.036	0.328	0.702	0.965						
(5) Belief in rebuttal	0.124	0.268	0.275	0.247	0.954					
(6) Intention to share rebuttal	0.099	0.345	0.281	0.519	0.634	0.968				
(7) Perceived argument quality	0.095	0.225	0.196	0.300	0.629	0.617	0.897			
(8) Perceived source credibility	0.107	0.221	0.208	0.230	0.623	0.512	0.708	0.956		
(9) Perceived utilitarian value	0.178	0.264	0.209	0.232	0.615	0.533	0.657	0.660	0.936	
(10) Perceived hedonic value	0.335	0.212	-0.036	0.077	0.451	0.417	0.470	0.443	0.452	0.934

Note. The shaded diagonal values are the square root of AVE. Off diagonal values present the correlations between constructs. The square root of AVE exceeded inter-correlations, confirming discriminant validity.

4.2. Empirical Validation of the Conceptual Model

The first research objective (RO 1) required addressing the following RQs.

RQ 1.1: How are perceived message properties of rebuttals related to perceived utilitarian and hedonic values?

RQ 1.2: How are perceived utilitarian and hedonic values related to rebuttal acceptance?

As indicated earlier in Section 3.4.1, a PLS-SEM analysis was employed on a sample 305 participants. The purpose was to empirically validate the conceptual model, which was developed to investigate how perceived message properties of rebuttals are related to perceived values, which in turn determine rebuttal acceptance. Perceived message properties included perceived argument quality, and perceived source credibility. Perceived values included perceived utilitarian value, and perceived hedonic value. Rebuttal acceptance was measured in terms of users' belief in rebuttals, and intention to share the debunking messages. The model controlled for age group, gender, educational qualification, exposure sequence of a rumor and its rebuttal, individuals' attitudinal predisposition towards the brand, issue involvement, belief in the rumor, and intention to share the rumor.

4.2.1. Assessment of the Structural Model

After evaluating the measurement models as shown earlier in Section 4.1.2, the next step was to assess the structural model. For this purpose, the standard assessment

criteria include the coefficient of determination (R^2), the effect size (f^2), and the cross-validated redundancy measure (Q^2).

The R^2 values for the endogenous constructs perceived utilitarian value, perceived hedonic value, belief in rebuttal, and intention to share rebuttal were 50.8%, 22.1%, 47.8%, and 53% respectively. According to the literature (Chin, 1998; Velayutham et al., 2012), the R^2 values above 67%, 33% and 19% are considered as substantial, adequate and weak respectively. Based on these thresholds, perceived messages properties explained perceived utilitarian value adequately (50.8%), but perceived hedonic value weakly (22.1%). Next, both perceived utilitarian and hedonic values adequately explained rebuttal acceptance in terms of belief (47.8%) and intention to share the rebuttal (53%).

With respect to the performance of the model, the effect sizes (f^2) for belief and intention to share were 1.128 and 1.101 respectively, which indicated a large effect size for both the dependent variables. As a rule of thumb, values higher than 0.35, 0.15, and 0.02 indicate large, medium and small effect sizes respectively (Cohen, 1988; Hair et al., 2019). In other words, the magnitude of the statistically significant relations was substantial in explaining rebuttal acceptance.

The cross-validated redundancy measure (Q^2) was examined. With an omission distance of seven, the positive Q^2 ($Q^2 > 0$) values for the endogenous constructs—perceived utilitarian value, perceived hedonic value, belief in rebuttal, and intention to share rebuttal—ensured that the model fit well with the data (Hair et al., 2019; Urbach & Ahlemann, 2010).

4.2.2. Hypotheses Testing

Each of the hypotheses was tested by assessing the statistical significance of the path coefficients. Among the control variables, intention to share rumor was significantly associated with intention to share rebuttal ($\beta = 0.476$, $t = 3.980$, $p < 0.001$). As shown in Appendix F (Table F1), the other control variables were non-significant.

After accounting for the control variables, the following hypothesized relationships were found to be significant: Perceived argument quality of the rebuttal was positively associated with perceived utilitarian value ($\beta = 0.380$, $t = 3.354$, $p < 0.001$) and perceived hedonic value ($\beta = 0.470$, $t = 6.307$, $p < 0.001$), indicating support for H1 and H2. Also, perceived source credibility of the rebuttal was positively associated with perceived utilitarian value of the message ($\beta = 0.392$, $t = 3.127$, $p < 0.01$). This lent support to H3. Furthermore, perceived utilitarian value was positively associated with users' belief in a rebuttal ($\beta = 0.461$, $t = 4.479$, $p < 0.001$), and intention to share the rebuttal ($\beta = 0.342$, $t = 3.599$, $p < 0.001$), thus supporting H4 and H5. Similarly, perceived hedonic value was positively associated with users' belief in a rebuttal ($\beta = 0.221$, $t = 2.208$, $p < 0.05$), and intention to share the rebuttal ($\beta = 0.187$, $t = 2.002$, $p < 0.05$), thus supporting H6 and H7. Table 4.5 summarizes the results of the hypotheses testing.

Table 4.5: Hypotheses testing results.

	Full dataset		
	β	Std. Error	t-stat
<i>Hypotheses testing</i>			
H1: Perceived argument quality → Perceived utilitarian value	0.380	0.113	3.354***
H2: Perceived argument quality → Perceived hedonic value	0.470	0.075	6.307***
H3: Perceived source credibility → Perceived utilitarian value	0.392	0.125	3.127**
H4: Perceived utilitarian value → Belief in rebuttal	0.461	0.103	4.479***
H5: Perceived utilitarian value → Intention to share rebuttal	0.342	0.095	3.599***
H6: Perceived hedonic value → Belief in rebuttal	0.221	0.100	2.208*
H7: Perceived hedonic value → Intention to share rebuttal	0.187	0.093	2.002*
<i>R² Value</i>			
Perceived utilitarian value		50.8%	
Perceived hedonic value		22.1%	
Belief in rebuttal		47.8%	
Intention to share rebuttal		53%	

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample size = 305.

Control variables: Age group, gender, educational qualification, exposure sequence, attitudinal predisposition, issue involvement, belief in rumor, and intention to share rumor.

Thus, these results cumulatively helped address RQ 1.1 and RQ 1.2 as presented in the first research objective. Figure 4.1 shows the results of the structural model.

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 4.1: Results of the structural model.

4.3. Moderation Testing

The second research objective (RO 2) required addressing the following RQs.

RQ 2.1: How are the relationships between rebuttals' perceived message properties and perceived values moderated by exposure sequence, attitudinal predisposition, and issue involvement?

RQ 2.2: How are the relationships between rebuttals' perceived values and rebuttal acceptance moderated by exposure sequence, attitudinal predisposition, and issue involvement?

As indicated earlier in Section 3.4.1, a series of PLS multi-group analysis were conducted to examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement. These analyses revealed how the three moderators influence the relationships between perceived message properties and perceived values, as well as those between perceived values and rebuttal acceptance.

4.3.1. Moderating Role of Exposure Sequence

The conceptual model called for examining the extent to which exposure sequence could moderate the underlying mechanism of rebuttal acceptance. This moderating effect was examined with a sample size of 150 for the rumor-before-rebuttal condition, and a sample size of 155 for the rebuttal-before-rumor condition. Table 4.6 summarizes the descriptive statistics of the constructs for the two conditions.

Participants' belief in a rumor was significantly higher in the rumor-before-rebuttal-condition (2.920 ± 1.188) than the other way round (2.217 ± 1.082), $t = 5.407$, $p < 0.001$. Participants' intention to share a rumor was significantly higher in the rumor-before-rebuttal-condition (3.242 ± 1.351) than the other way round (2.344 ± 1.195), $t = 6.156$, $p < 0.001$.

With respect to rebuttal acceptance, participants' belief in a rebuttal was significantly higher in the rumor-before-rebuttal-condition (3.684 ± 0.998) than the other way round (2.994 ± 1.127), $t = 5.661$, $p < 0.001$. Similarly, participants' intention to share a rebuttal was significantly higher in the rumor-before-rebuttal-condition (3.456 ± 1.178) than the other way round (2.626 ± 1.294), $t = 5.850$, $p < 0.001$.

Table 4.6: Differences between rumor-before-rebuttal and rebuttal-before-rumor conditions.

	The rumor-before-rebuttal condition (M ± SD)	The rebuttal-before-rumor condition (M ± SD)	t(df)
Attitudinal predisposition	3.342 ± 0.975	3.376 ± 1.024	-0.298 (303)
Issue involvement	3.920 ± 0.992	3.560 ± 1.007	3.152 (303)**
Belief in rumor	2.920 ± 1.188	2.217 ± 1.082	5.407 (303)***
Intention to share rumor	3.242 ± 1.351	2.344 ± 1.195	6.156 (303)***
Belief in rebuttal	3.684 ± 0.998	2.994 ± 1.127	5.661 (303)***
Intention to share rebuttal	3.456 ± 1.178	2.626 ± 1.294	5.859 (301.881)***
Perceived argument quality	3.544 ± 0.901	3.202 ± 0.986	3.162 (303)**
Perceived source credibility	3.951 ± 1.027	3.585 ± 1.116	2.980 (303)**
Perceived utilitarian value	3.733 ± 0.889	3.469 ± 0.946	2.516 (302.766)*
Perceived hedonic value	3.424 ± 0.857	3.071 ± 0.912	3.489 (302.721)**

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample size for the rumor-before-rebuttal condition = 150.

Sample size for the rebuttal-before-rumor condition = 155.

PLS multi-group analysis for exposure sequence. A multi-group PLS analysis was conducted for the two groups of exposure sequence. Age group, gender, educational qualification, attitudinal predisposition, issue involvement, belief in rumor, and intention to share rumor were included as control variables. After accounting for the control variables as shown in Appendix F (Table F2), the path coefficients and standard errors for the two groups are reported in Table 4.7. The group comparison method showed significant differences in the underlying relationships for the two groups. Compared with the participants in the rebuttal-before-rumor condition, those in the rumor-before-rebuttal condition showed stronger relations between (1) perceived hedonic value and belief in a rebuttal ($t = 23$, $p < 0.001$), and (2) perceived hedonic value and intention to share a rebuttal ($t = 2.091$, $p < 0.05$).

Compared with the participants in the rumor-before-rebuttal condition, those in the rebuttal-before-rumor condition showed stronger relations between (1) perceived source credibility and perceived utilitarian value ($t = -7.357, p < 0.001$), and (2) perceived utilitarian value and belief in a rebuttal ($t = -9.667, p < 0.001$).

Table 4.7: PLS multi-group results for exposure sequence.

	The rumor-before-rebuttal condition		The rebuttal-before-rumor condition		t-stat
	β	Std. Error	β	Std. Error	
Perceived argument quality → Perceived utilitarian value	0.376**	0.124	0.372***	0.098	0.308
Perceived argument quality → Perceived hedonic value	0.444***	0.081	0.458***	0.077	-1.556
Perceived source credibility → Perceived utilitarian value	0.335*	0.143	0.438***	0.104	-7.357***
Perceived utilitarian value → Belief in rebuttal	0.401***	0.111	0.517***	0.102	-9.667***
Perceived utilitarian value → Intention to share rebuttal	0.345***	0.100	0.331***	0.099	1.273
Perceived hedonic value → Belief in rebuttal	0.361***	0.099	0.108	0.095	23***
Perceived hedonic value → Intention to share rebuttal	0.202*	0.092	0.179	0.099	2.091*
<i>R² Value</i>					
Perceived utilitarian value		42%		56.8%	
Perceived hedonic value		19.7%		21%	
Belief in rebuttal		44.8%		46.8%	
Intention to share rebuttal		58%		43.3%	

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample size for the rumor-before-rebuttal condition = 150.

Sample size for the rebuttal-before-rumor condition = 155.

Control variables: Age group, gender, educational qualification, attitudinal predisposition, issue involvement, belief in rumor, and intention to share rumor.

4.3.2. Moderating Role of Attitudinal Predisposition

The conceptual model called for examining the extent to which participants' attitudinal predisposition towards the brand could moderate the underlying mechanism of rebuttal acceptance. This moderating effect was not examined for all the 305 complete responses admitted for the analysis. Rather, it was done for the participants who had either pro-attitudinal predisposition or anti-attitudinal predisposition towards the brand (Casaló et al., 2011). For this purpose, as described in Section 3.4.1, participants within $\pm \frac{1}{2}$ standard deviation around the index were removed (Casaló et al., 2011). Hence, the scope of the analysis was confined to a pro-attitudinal predisposition group (4.376 ± 0.391) with a sample size of 113 participants, and an anti-attitudinal predisposition group (2.094 ± 0.465) with a sample size of 88 participants.

Participants' belief in a rumor for the pro-attitudinal predisposition group (2.437 ± 1.097) was significantly lower than that for the anti-attitudinal predisposition group (2.799 ± 1.352), $t = -2.046$, $p < 0.05$. Likewise, intention to share rumor for the pro-attitudinal predisposition group (2.693 ± 1.352) was not significantly differ than that for the anti-attitudinal predisposition group (2.973 ± 1.382), $t = -1.444$, $p > 0.05$.

With respect to rebuttal acceptance, participants' belief in a rebuttal for the pro-attitudinal predisposition group (3.490 ± 1.184) did not significantly differ from that for the anti-attitudinal predisposition group (3.318 ± 0.992), $t = -1.117$, $p > 0.05$. Likewise, intention to share rebuttal for the pro-attitudinal predisposition group (3.212 ± 1.333) did not significantly differ from that for the anti-attitudinal predisposition group (3.152 ± 1.246), $t = 0.331$, $p > 0.05$. Table 4.8 summarizes the descriptive statistics of all the constructs for the pro- and anti-attitudinal predisposition groups.

Table 4.8: Differences between pro-attitudinal and anti-attitudinal predisposition groups.

Constructs	Pro-attitudinal predisposition (M ± SD)	Anti-attitudinal predisposition (M ± SD)	t(df)
Attitudinal predisposition	4.376 ± 0.391	2.094 ± 0.465	37.780 (199)***
Issue involvement	3.985 ± 0.846	3.515 ± 1.151	3.214 (154.303)**
Belief in rumor	2.437 ± 1.097	2.799 ± 1.352	-2.046 (165.288)*
Intention to share rumor	2.693 ± 1.352	2.973 ± 1.382	-1.444 (199)
Belief in rebuttal	3.490 ± 1.184	3.318 ± 0.992	1.117 (197.930)
Intention to share rebuttal	3.212 ± 1.333	3.152 ± 1.246	0.331 (199)
Perceived argument quality	3.434 ± 0.944	3.428 ± 1.012	0.040 (199)
Perceived source credibility	3.899 ± 1.032	3.860 ± 1.153	0.258 (199)
Perceived utilitarian value	3.788 ± 0.894	3.530 ± 0.919	1.999 (199)
Perceived hedonic value	3.487 ± 1.033	2.924 ± 0.795	4.361 (198.980)***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Sample size for pro-attitudinal predisposition = 113.
Sample size for anti-attitudinal predisposition = 88.

PLS Multi-group analysis for attitudinal predisposition. A PLS multi-group analysis was employed to examine the extent to which participants' attitudinal predisposition towards the brand could moderate the underlying relationships between perceived message properties and rebuttal acceptance. The group comparison method was applied to identify if the path coefficients for the two groups of participants differed significantly (Banerjee & Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). Age group, gender, educational qualification, exposure sequence, issue involvement, belief in rumor, and intention to share rumor were included as control variables.

After accounting for the control variables as shown in Appendix F (Table F3), the path coefficients and standard errors for the two groups are reported in Table 4.9. The group comparison method showed significant differences in the underlying relationships

for the two groups. Compared with participants who did not have a favorable attitude towards the brand, those who had a favorable attitude showed stronger relations between (1) perceived argument quality and perceived hedonic value ($t = 17.455, p < 0.001$), (2) perceived source credibility and perceived utilitarian value ($t = 3.789, p < 0.001$), (3) perceived hedonic value and belief in a rebuttal ($t = 23, p < 0.001$), and (4) perceived hedonic value and intention to share a rebuttal ($t = 33.615, p < 0.001$).

Compared with participants who had a favorable attitude towards the brand, those who did not have a favorable attitude showed stronger relations between (1) perceived argument quality and perceived utilitarian value ($t = -7.875, p < 0.001$), (2) perceived utilitarian value and users' belief in a rebuttal ($t = -19.846, p < 0.001$), (3) perceived utilitarian value and intention to share a rebuttal ($t = -26.308, p < 0.001$).

Another set of PLS multi-group analysis was conducted by dividing the sample using a median split. The results of this analysis are reported in Table G1 of Appendix G.

Table 4.9: PLS multi-group results for attitudinal predisposition.

	Pro-attitudinal predisposition		Anti-attitudinal predisposition		t-stat
	β	Std. Error	β	Std. Error	
Perceived argument quality → Perceived utilitarian value	0.311**	0.105	0.437***	0.123	-7.875***
Perceived argument quality → Perceived hedonic value	0.558***	0.074	0.366***	0.076	17.455***
Perceived source credibility → Perceived utilitarian value	0.395**	0.131	0.323*	0.136	3.789***
Perceived utilitarian value → Belief in rebuttal	0.374***	0.092	0.632***	0.080	-19.846***
Perceived utilitarian value → Intention to share rebuttal	0.232*	0.093	0.574***	0.101	-26.308***
Perceived hedonic value → Belief in rebuttal	0.337***	0.089	0.038	0.094	23***
Perceived hedonic value → Intention to share rebuttal	0.380***	0.081	-0.057	0.102	33.615***
<i>R² Value</i>					
Perceived utilitarian value		40.9%		50.8%	
Perceived hedonic value		31.1%		13.4%	
Belief in rebuttal		55.3%		52.5%	
Intention to share rebuttal		60.3%		50.5%	

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.

Sample size for pro-attitudinal predisposition = 113.

Sample size for anti-attitudinal predisposition = 88.

Control variables: Age group, gender, educational qualification, exposure sequence, issue involvement, belief in rumor, and intention to share rumor.

4.3.3. Moderating Role of Issue Involvement

The conceptual model called for examining the extent to which participants' issue involvement could moderate the underlying mechanism of rebuttal acceptance. Again, this moderating effect was not examined for all the 305 complete responses admitted for the analysis. Rather, it was done for the participants who had either a low issue involvement or a high issue involvement with the rumor case (Casaló et al., 2011). For this purpose, as described in Section 3.4.1, participants within $\pm \frac{1}{2}$ standard deviation around the index were removed (Casaló et al., 2011). Hence, the scope of the analysis was confined to a low issue involvement group (2.313 ± 0.609) with a sample size of 82 participants, and a high issue involvement group (4.640 ± 0.272) with a sample size of 123 participants.

Participants' belief in a rumor was significantly higher among participants with high issue involvement (2.816 ± 1.259) than of those with low issue involvement (2.358 ± 1.207), $t = -2.594$, $p < 0.05$. Likewise, intention to share a rumor was significantly higher among participants with high issue involvement (3.282 ± 1.389) than of those with low issue involvement (2.199 ± 1.194), $t = -5.953$, $p < 0.001$.

With respect to rebuttal acceptance, participants' belief in a rebuttal was significantly higher among participants with high issue involvement (3.710 ± 1.045) than those with low issue involvement (2.959 ± 1.199), $t = -4.618$, $p < 0.001$. Likewise, intention to share a rebuttal was significantly higher among participants with high issue involvement (3.615 ± 1.207) than those with low issue involvement (2.419 ± 1.266), $t = -6.819$, $p < 0.001$. Table 4.10 summarizes the descriptive statistics of all the constructs for the low and high issue involvement groups.

Table 4.10: Differences between low issue involvement and high issue involvement groups.

Constructs	Low issue involvement (M ± SD)	High issue involvement (M ± SD)	t(df)
Attitudinal predisposition	3.024 ± 0.993	3.437 ± 1.077	-2.771 (203)**
Issue involvement	2.313 ± 0.609	4.640 ± 0.272	-32.485 (102.731)***
Belief in rumor	2.358 ± 1.207	2.816 ± 1.259	-2.594 (203)*
Intention to share rumor	2.199 ± 1.194	3.282 ± 1.389	-5.776 (203)***
Belief in rebuttal	2.959 ± 1.199	3.710 ± 1.045	-4.618 (157.067)***
Intention to share rebuttal	2.419 ± 1.266	3.615 ± 1.207	-6.819 (203)***
Perceived argument quality	3.016 ± 0.995	3.612 ± 0.921	-4.397 (203)***
Perceived source credibility	3.378 ± 1.183	4.046 ± 1.032	-4.166 (157.181)***
Perceived utilitarian value	3.215 ± 0.961	3.851 ± 0.917	-4.771 (203)***
Perceived hedonic value	3.024 ± 0.823	3.493 ± 0.958	-3.739 (190.389)***

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.
Sample size for low issue involvement = 82.
Sample size for high issue involvement = 123.

PLS multi-group analysis for issue involvement. A PLS multi-group analysis was employed to examine the extent to which participants' issue involvement could moderate the underlying relationships between perceived message properties and rebuttal acceptance. The group comparison method was applied to identify if the path coefficients for the two groups of participants differed significantly (Banerjee & Chua, 2019; Keil et al., 2000; Zhang, Cheung, & Lee, 2014). Age group, gender, educational qualification, exposure sequence, attitudinal predisposition, belief in rumor, and intention to share rumor were included as control variables.

After accounting for the control variables as shown in Appendix F (Table F4), the path coefficients and standard errors for the two groups are reported in Table 4.11. The group comparison method showed significant differences in the underlying relationships for the two groups. Compared with participants who had high issue involvement, those

who had low issue involvement showed stronger relations between (1) perceived argument quality and perceived utilitarian value ($t = 29.5, p < 0.001$), and (2) perceived utilitarian value and users' belief in a rebuttal ($t = 6, p < 0.001$).

Compared with participants who had low issue involvement, those who had high issue involvement showed stronger relations between (1) perceived argument quality and perceived hedonic value ($t = -31.6, p < 0.001$), (2) perceived source credibility and perceived utilitarian value ($t = -24.118, p < 0.001$), (3) perceived utilitarian value and intention to share a rebuttal ($t = -7.643, p < 0.001$), (4) perceived hedonic value and users' belief in a rebuttal ($t = -12.6, p < 0.001$), and (5) perceived hedonic value and intention to share a rebuttal ($t = -20.143, p < 0.001$).

Another set of PLS multi-group analysis was conducted by dividing the sample using a median split. The results of this analysis are reported in Table G2 of Appendix G.

Table 4.11: PLS multi-group results for issue involvement.

	Low issue involvement		High issue involvement		t-stat
	β	Std. Error	β	Std. Error	
Perceived argument quality → Perceived utilitarian value	0.618***	0.112	0.205*	0.091	29.5***
Perceived argument quality → Perceived hedonic value	0.279***	0.084	0.595***	0.056	-31.6***
Perceived source credibility → Perceived utilitarian value	0.130	0.131	0.540***	0.113	-24.118***
Perceived utilitarian value → Belief in rebuttal	0.535***	0.092	0.451***	0.109	6***
Perceived utilitarian value → Intention to share rebuttal	0.280**	0.091	0.387***	0.101	-7.643***
Perceived hedonic value → Belief in rebuttal	0.135	0.082	0.324**	0.120	-12.6***
Perceived hedonic value → Intention to share rebuttal	0.041	0.085	0.323**	0.106	-20.143***
<i>R² Value</i>					
Perceived utilitarian value		51.8%		49.1%	
Perceived hedonic value		7.8%		35.4%	
Belief in rebuttal		52.4%		46.5%	
Intention to share rebuttal		51.3%		52.6%	

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.

Sample size for low issue involvement = 82.

Sample size for high issue involvement = 123.

Control variables: Age group, gender, educational qualification, exposure sequence, attitudinal predisposition towards the brand, belief in rumor, and intention to share rumor.

4.4. Results of the Qualitative Analysis

As highlighted earlier in Section 3.4.2, the qualitative analysis involved an inductive coding approach to analyze the participants' open-ended responses to the rebuttal (Black et al., 2016; Drouin et al., 2016). The purpose was to glean nuanced insights into participants' perceptions of the rebuttal as a way to debunk the rumor on the Internet. To achieve the purpose, the researcher and another coder, who were trained in qualitative research methods, were involved to develop a set of codes from the data. These eventually helped develop a coding schema.

Among the 305 participants, 147 participants gave nonsensical responses (e.g., dots and random characters) and the remaining 158 open-ended responses were admitted for the inductive coding. Each participant's response was treated as unit of analysis.

The coders jointly read the responses a few times to establish emergent codes and to develop an overall understanding of the receivers' perceptions of the rebuttal. The researcher and the coder conferred to identify relations among the initial codes. Similar codes (e.g., looking for evidence and seeking information) were merged to develop a concise and robust coding scheme (Stemler, 2001). Through this process, identification of codes continued until new observations did not add new categories (Sanderson, 2013).

After a few iterations of checking between the data and the emergent codes, the following eight mutually exclusive categories of responses were found: Explanation for refutation, reliance on source credibility, commendation, likelihood of sharing rebuttal, seeking information, expression of doubt, expression of brand loyalty, and perils of fake news.

Responses were coded as (1) *Explanation for refutation* if they touched on the justification provided in the rebuttal; (2) *Reliance on source credibility* if they evaluated the origin of the rebuttal; (3) *Commendation* if they appreciated the effort of others who shared the rebuttal; (4) *Likelihood of sharing rebuttal* if they intended to share the rebuttal with others; (5) *Seeking information* if they tried to obtain further evidence to rely on the rebuttal; (6) *Expression of doubt* if they conveyed uncertainty about the veracity of the rebuttal; (7) *Expression of brand loyalty* if they reflected individuals' favorable attitude towards the brand; and (8) *Perils of fake news* if they expressed concern about online false information.

To establish inter-coder reliability, the coders independently coded all the open-ended responses using the coding scheme. They were free to discuss any newly emergent codes if arrived during the coding process. However, no other new codes were emerged. A Cohen's Kappa score of 0.70 was used as a threshold for the inter-coder agreement, which is considered as substantial (Landis & Koch, 1977). The specific Cohen's Kappa scores are as follows: Explanation for refutation (1.00), reliance on source credibility (0.99), commendation (0.83), likelihood of sharing (0.89), seeking information (0.77), expression of doubt (0.74), expression of brand loyalty (0.96), and perils of fake news (0.72). Thereafter, the coders conferred to resolve disagreements. Table 4.12 summarizes the results in terms of the content categories, descriptions, and representative responses.

Explanation for refutation. Responses with this code touched on the justification provided in the rebuttal. The rebuttal shown in the experiment included an independent DNA test result—as an alternative explanation to debunk the rumor—to confirm that the rodent-shaped meat was indeed chicken and not rat. Participants' responses such as “DNA

test confirm it was chicken” (Participant 133), and *“Independent investigation confirm this is rumor”* (Participant 129) mentioned about the confirmation from the DNA test result that the rumor was false. These responses suggest that receivers of rebuttals tap on the strength of arguments in the message when attempting to refute online rumors.

Reliance on source credibility. Responses with this code evaluated the origin of the rebuttal. The rebuttal in the experiment appeared as a mimic of a social media feed from the BBC News outlet. Several participants mentioned their perception about the source of the rebuttal in their responses such as *“It is more reliable than the first message because it is posted by BBC News”* (Participant 127), *“Trustworthy, because it is from the official account.”* (Participant 281), and *“Resource is from BBC and seems convinced to me”* (Participant 44). These show that receivers of rebuttals perceive official accounts of news outlets as credible sources in the context of online rumor refutation.

Commendation. Responses with this code appreciated the efforts of others who shared the rebuttal. Examples include *“thanks for sharing the truth”* (Participant 278), and *“Thanks for the right information... i will eat again in KFC”* (Participant 131). These responses show that receivers of rebuttals appreciate the altruistic efforts of others who spread the truth.

Likelihood of sharing rebuttal. Responses with this code intended to share the rebuttal with others. These include the likes of *“I would like to share this message for others so that they don’t believe the rumor”* (Participant 61), *“I like to share it in my social networks”* (Participant 74), and *“I will share to prevent my friends from being deceived by the rumor”* (Participant 274). Clearly, when a rebuttal passes muster, the online community seems quite open to the idea of sharing it with others.

Seeking information. Responses with this code tried to obtain further evidence to rely on the rebuttal. This is evident from responses such as “*Who and when is the test being conducted*” (Participant 245), “*BBC seems legit but will wait for Sg and other press to confirm first as there is no point rushing for conclusion*” (Participant 236), and “*I still need to gather more evidence to be able to take action about the message*” (Participant 292). These suggest that receivers of rebuttals might seek further information before being convinced by the debunking messages.

Expression of doubt. Responses with this code conveyed uncertainty about the veracity of the rebuttal. Responses such as “*It is much more convincing than the last message, but still doubtful*” (Participant 88), and “*I still have doubt whether it was chicken!!!*” (Participant 271) show that receivers might express skepticism about the rebuttal.

Expression of brand loyalty. Responses with this code reflected individuals’ favorable attitude towards the brand as in “*For an established fast food chain, I doubt that I would be quick to believe rumors about it*” (Participant 205), and “*Kfc my favorite*” (Participant 267). It seems that individuals with favorable brand attitude might not believe a disparaging rumor about their favorite brand, and could easily accept the rebuttal.

Perils of fake news. Responses with this code expressed concerns about the menace of online false information. These concerns are echoed in responses such as “*People are easily deceived by rumors*” (Participant 286), and “*Fake news causing real harm*” (Participant 178). The online population is evidently anxious about the growing problem of online falsehoods.

Table 4.12: Categories of responses stem from the qualitative analysis.

Categories	Descriptions	Occurrence (%)	Representative responses
Explanation for refutation	Responses were coded as ‘explanation for refutation’ when they touched on the justification provided in the rebuttal.	24 (15.19%)	<i>“DNA test confirm it was chicken”</i> (Participant 133)
Reliance on source credibility	Responses were coded as ‘reliance on source credibility’ when they evaluated the origin of the rebuttal.	48 (30.38%)	<i>“Trustworthy, because it is from the official account.”</i> (Participant 281)
Commendation	Responses were coded as ‘commendation’ when they appreciated the effort of others who shared the rebuttal.	6 (3.80%)	<i>“thanks for sharing the truth”</i> (Participant 278)
Likelihood of sharing rebuttal	Responses were coded as ‘likelihood of sharing rebuttal’ when they showed users’ intention to share the rebuttal.	21 (13.29%)	<i>“I would like to share this message for others so that they don’t believe the rumor”</i> (Participant 61)
Seeking information	Responses were coded as ‘seeking information’ when they tried to obtain further evidence to rely on the rebuttal.	17 (10.76%)	<i>“I still need to gather more evidence to be able to take action about the message.”</i> (Participant 292)
Expression of doubt	Responses were coded as ‘expression of doubt’ when they conveyed uncertainty about the veracity of the rebuttal	16 (10.13%)	<i>“I still have doubt whether it was chicken!!!”</i> (Participant 271)
Expression of brand loyalty	Responses were coded as ‘expression of brand loyalty’ when they reflected individuals’ favorable attitude towards the brand.	15 (9.49%)	<i>“For an established fast food chain, I doubt that I would be quick to believe rumors about it”</i> (Participant 205)
Perils of fake news	Responses were coded as ‘perils of fake news’ when they expressed concern about online false information.	11 (6.96%)	<i>“People are easily deceived by rumors”</i> (Participant 286)

The emergent themes obtained from the qualitative responses not only complement the quantitative findings but also extend the understanding of users' perceptions of rebuttals. In terms of complementing the quantitative findings, the qualitative analysis reveals that participants tapped on the strength of arguments in the message when attempting to refute online rumors. This was evident from the responses such as "*DNA test confirm it was chicken*" (Participant 133), and "*Independent investigation confirm this is rumor*" (Participant 129). Therefore, the qualitative findings reinforce the support for hypotheses H1 and H2.

The qualitative analysis reveals that participants tapped on the source of the rebuttal. Several participants mentioned their perception about the source of the rebuttal in their responses such as "*It is more reliable than the first message because it is posted by BBC News*" (Participant 127), and "*Trustworthy, because it is from the official account*" (Participant 281). Participants perceived official accounts of news outlets as credible sources in the context of online rumor refutation. This further lends support to H3.

Furthermore, the qualitative analysis reveals that participants expressed their likelihood of sharing. This was evident from the responses such as "*I would like to share this message for others so that they don't believe the rumor*" (Participant 61), "*I like to share it in my social networks*" (Participant 74). When a rebuttal passes muster, the online community seems quite open to the idea of sharing it with others. This also supports the hypotheses H5 and H7, which are associated with users' intention to share rebuttals.

The qualitative analysis extends the quantitative findings on the following three fronts: First, it reveals that users can seek further information when they receive rebuttals. This was evident from responses such as "*Who and when is the test being conducted*"

(Participant 245), and “*I still need to gather more evidence to be able to take action about the message*” (Participant 292). This suggests that the use of rebuttals may require a follow-up that authorities could use to gain public trust and address related concerns. Following up on a rebuttal could thus help improve acceptance of the rebuttal.

Second, the qualitative analysis reveals that receivers of rebuttals could express doubts about the veracity of the rebuttal. Responses such as “*It is much more convincing than the last message, but still doubtful*” (Participant 88), and “*I still have doubt whether it was chicken!!!*” (Participant 271) showed that receivers might express skepticism about the rebuttal. This could hinder the acceptance of rebuttals. As suggested by prior works (Berinsky, 2017; Lewandowsky et al., 2012), refuting a rumor is not an easy task. It requires an adequate understanding of the underlying mechanism of rebuttal acceptance so that the refutation strategy can be placed in appropriate manner. As stated earlier, a follow-up could be useful to clarify the doubts and to address related concerns.

Third, the qualitative analysis reveals that brand loyalty helps increase the likelihood of rebuttal acceptance. Responses reflected individuals’ favorable attitude towards the brand as in “*For an established fast food chain, I doubt that I would be quick to believe rumors about it*” (Participant 205), and “*Kfc my favorite*” (Participant 267). These participants who were loyal to KFC were found willing to reject the rumor and accept the rebuttal.

Appendix E presents quotations from the participants related to the emergent themes obtained from the qualitative data.

4.5. Summary of the Research Findings

This chapter has presented the research findings. It started by providing the descriptive statistics of the dataset. Thereafter, it validated the conceptual model of this research by testing the proposed hypotheses. The results suggest that perceived messages properties were significantly associated with perceived values, which in turn determined rebuttal acceptance. Table 4.13 summarizes the hypotheses testing results for RO 1.

Table 4.13: Summary of the hypotheses testing results for RO 1.

Hypotheses	Supported?
H1: Perceived argument quality → Perceived utilitarian value	Yes
H2: Perceived argument quality → Perceived hedonic value	Yes
H3: Perceived source credibility → Perceived utilitarian value	Yes
H4: Perceived utilitarian value → Belief in rebuttal	Yes
H5: Perceived utilitarian value → Intention to share rebuttal	Yes
H6: Perceived hedonic value → Belief in rebuttal	Yes
H7: Perceived hedonic value → Intention to share rebuttal	Yes

Thereafter, this chapter presented the moderation testing results pertaining to the role of exposure sequence, attitudinal predisposition, and issue involvement. The results show how each of the three moderating variables moderates the underlying mechanism of rebuttal acceptance. Table 4.14 summarizes the hypotheses testing results for RO 2.

Next, this chapter presented the results of the qualitative analysis. Specifically, to gain richer insights, participants' open-ended responses to the rebuttal were analyzed inductively. The analysis revealed eight categories of responses including explanation for

refutation, reliance on source credibility, commendation, seeking information, expression of doubt, expression of brand loyalty, and perils of fake news.

Having presented the results, this chapter paves the way to discuss the findings in light of the extant literature. The next chapter serves this purpose.

Table 4.14: Summary of the hypotheses testing results for RO 2.

(a) Exposure sequence				(b) Attitudinal predisposition			(c) Issue involvement		
Path coefficients			Comparison (t-stat)	Path coefficients		Comparison (t-stat)	Path coefficients		Comparison (t-stat)
	Rumor- before- rebuttal	Rebuttal- before- rumor		Pro- attitude	Anti- attitude		Low involvement	High involvement	
H8: Perceived argument quality → Perceived utilitarian value	0.376	0.372	0.308	0.311	0.437	-7.875***	0.618	0.205	29.5***
H9: Perceived argument quality → Perceived hedonic value	0.444	0.458	-1.556	0.558	0.366	17.455***	0.279	0.595	-31.6***
H10: Perceived source credibility → Perceived utilitarian value	0.335	0.438	-7.357***	0.395	0.323	3.789***	0.130	0.540	-24.118***
H11: Perceived utilitarian value → Belief in rebuttal	0.401	0.517	-9.667***	0.374	0.632	-19.846***	0.535	0.451	6***
H12: Perceived utilitarian value → Intention to share rebuttal	0.345	0.331	1.273	0.232	0.574	-26.308***	0.280	0.387	-7.643***
H13: Perceived hedonic value → Belief in rebuttal	0.361	0.108	23***	0.337	0.038	23***	0.135	0.324	-12.6***
H14: Perceived hedonic value → Intention to share rebuttal	0.202	0.179	2.091*	0.380	-0.057	33.615***	0.041	0.323	-20.143***

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.

CHAPTER FIVE

DISCUSSION

The preceding four chapters have provided a concise description of the problem statement, laid out the research goal, reviewed the related literature, presented the research methods, and shown the empirical results. Specifically, the previous chapter was devoted to the results of the empirical validation and testing of the proposed conceptual model. Seeking to draw connections between the results and the literature, this chapter discusses the key findings of the research.

The chapter is organized into three sections. Section 5.1 explains the underlying mechanism of rebuttal acceptance. Specifically, it discusses the relationships between perceived message properties and perceived values, as well as those between perceived values and rebuttal acceptance.

Section 5.2 provides a discussion on the moderating effects in the conceptual model of rebuttal acceptance. The three moderating variables include exposure sequence, attitudinal predisposition, and issue involvement.

Finally, Section 5.3 concludes the chapter with a summary of this research.

5.1. The Underlying Mechanism of Rebuttal Acceptance

This research explains the underlying mechanism of rebuttal acceptance, which has been conceptualized as users' belief in the debunking messages coupled with their

intention to share the messages on the Internet. Perceived message properties of rebuttals are significantly associated with perceived utilitarian and hedonic values, which in turn are significantly related to rebuttal acceptance. These findings are discussed below.

5.1.1. Relationships between Perceived Message Properties and Perceived Values

As reported earlier in Table 4.6 (Section 4.2.2), perceived message properties of rebuttals are significantly associated with perceived utilitarian and hedonic values. The relationships between perceived message properties and perceived values are discussed below in light of the related literature. The qualitative analysis further provides evidence that perceived messages properties of the rebuttal play a crucial role in debunking rumors online.

Perceived argument quality and perceived utilitarian value. Perceived argument quality was positively associated with perceived utilitarian value ($\beta = 0.380$, $t = 3.354$, $p < 0.001$). Given the role of arguments in reflecting the merits of a message, perceived argument quality often determines the extent to which information can influence receivers' perception in a given context. This research finds that individuals tend to evaluate the strength of arguments embedded in rebuttals in deciding their usefulness. The finding contributes to the information adoption model (Sussman & Siegal, 2003) by extending its contextual application to rebuttals. Moreover, by following the S-O-R framework (Kim & Johnson, 2016; Mehrabian & Russell, 1974), this research helps explain the Stimulus-Organism mechanism in individuals' processing of rebuttals. Perceived argument quality generates thought-based information processing in which receivers perceive rebuttals as useful to abandon the rumor belief. This is evident from

participants' open-ended responses that touched on the justification provided in the rebuttals as in "*the rumor was false. DNA test shows it was chicken meat*" (Participant 111), "*Independent investigation confirm this is rumor*" (Participant 129), and "*DNA results prove that the rumor was false*" (Participant 296). Therefore, this research shows that rebuttal as a stimulus has the potential to influence individuals' cognitive state of processing in refuting online rumors.

Perceived argument quality and perceived hedonic value. Perceived argument quality was positively associated with perceived hedonic value ($\beta = 0.470$, $t = 6.307$, $p < 0.001$). Despite the factual nature of rebuttals as suggested in previous works (Ecker et al., 2020; Garrett & Weeks, 2013), this research highlights the possibility for rebuttals' argument quality to elicit affective responses upon receiving the truth about the rumors. With persuasive arguments, rebuttals can evoke a sense of satisfaction among receivers. Hedonic perceptions of rebuttals are echoed in participants' open-ended responses such as "*wow... it's a relief. I simply love kfc food*" (Participant 273) and "*I am happy to see my favorite brand KFC did not sell rat*" (Participant 253). Therefore, by adopting the S-O-R framework (Kim & Johnson, 2016; Mehrabian & Russell, 1974), this research shows that rebuttal as a stimulus has the potential to influence individuals' affective state of processing.

Perceived source credibility and perceived utilitarian value. Perceived source credibility yielded a significant positive association with perceived utilitarian value of rebuttals ($\beta = 0.392$, $t = 3.127$, $p < 0.01$). Credibility of online information sources is important to consider, especially when people are skeptical about the veracity of information (Lewandowsky et al., 2012). Amid the uncertainty, they become highly

reliant on what official sources say about a rumor (Andrews et al., 2016; Visentin et al. 2019; Vraga & Bode, 2018; Reinhard & Sporer, 2010). Therefore, knowing that the rebuttal in the experiment came from BBC News—an authoritative news outlet—might have had a significant impact on users’ credibility assessments. The more Internet users perceive the source of rebuttals as credible, the more likely they would perceive rebuttals as useful. The online community is likely to accept rebuttals as the truth. This lends support to previous works on the information adoption model (Bhattacharjee & Sanford, 2006; Cheung et al., 2008) by highlighting the role of source credibility of a rebuttal in establishing its informational utility. Participants’ reliance on source credibility is reflected in open-ended responses such as “*Trustworthy, because it is from the official account*” (Participant 281), “*i will trust BBC in claiming that the fried rat was actually chicken since it is a reliable source*” (Participant 142), and “*BBC serves as a more reliable source of news. I will trust the news more than the last one*” (Participant 84). Therefore, providing an authoritative source to substantiate rebuttals would be effective to debunk online rumors.

5.1.2. Relationships between Perceived Values and Rebuttal Acceptance

As reported earlier in Table 4.5 (Section 4.2.2), perceived utilitarian and hedonic values are significantly associated with rebuttal acceptance. The relationships have been discussed below in light of the related literature. The qualitative analysis further provides evidence that perceived values lead to rebuttal acceptance.

Perceived utilitarian value and belief in rebuttal. Perceived utilitarian value was significantly associated with users’ belief in a rebuttal ($\beta = 0.461$, $t = 4.479$, $p < 0.001$).

Refutation of a rumor create a coherence gap in receivers' mental models of unfolding events (Johnson-Laird, 2012). The resulting gap perhaps engages people in thought-based information processing since it plays a crucial role in assessing the truth of a claim (Johnson-Laird, 2012; Lewandowsky et al., 2012). They evaluate rebuttals by looking at the alternative explanation to get confirmation that the rumor was false. When people see rebuttals with plausible explanations to debunk the rumor, they tend to perceive the debunking messages as useful by filling the coherence gap left behind by refutation (Johnson-Laird, 2012; Lewandowsky et al., 2012). This in turn prompts them to believe rebuttals. Therefore, this finding extends the information adoption model (Cheung et al., 2008; Sussman & Siegal, 2003) in the context of online rebuttal literature by uncovering the relationships between information usefulness and its adoption. Participants' open-ended responses such as "...it is from a reliable source... I trust it" (Participant 104), "since the test is independent, I believe it. (Participant 161), and "This message seems to be from a credible news agency BBC News. So, I believe that it should contain legitimate information and can be trusted" (Participant 92) showed that they ended up believing the rebuttal.

Perceived utilitarian value and intention to share rebuttal. Perceived utilitarian value was significantly associated with users' intention to share the rebuttal ($\beta = 0.342$, $t = 3.599$, $p < 0.001$). When receivers perceive that the content of a rebuttal is helpful in making a decision to refute the rumor, perceived utilitarian value triggers their likelihood to share the debunking message in the online community. People perhaps see sharing rebuttals as a pro-social behavior for the welfare of the entire online community (Zhao et al., 2016). Given that the Internet users are facing adverse consequences caused by rumors

on social media, they feel a sense of responsibility to share rebuttals as a way to spread the truth on the Internet (Zhao et al., 2016). They could think that sharing rebuttals would coax members of the online community to check facts (Andrews et al., 2016). Contrary to the view that social media may degenerate into a rumor mill (Oh et al., 2013; Tanaka et al., 2013), this research suggests that social media users' likelihood to share rebuttals can be harnessed to fight rumors. In light of the S-O-R framework (Kim & Johnson, 2016; Mehrabian & Russell, 1974), the finding helps explain the Organism-Response mechanism by showing how individuals' cognitive state processing leads to trigger favorable response on rebuttal acceptance. Participants' open-ended responses such as "*I will share it to spread the truth*" (Participant 24), "*wow. I love to share it.*" (Participant 114), "*I would share it to the people who shared the previous message to me*" (Participant 86), "*I will share the message if it appears on my feed*" (Participant 302) shows their likelihood to share rebuttals in the community.

Perceived hedonic value and belief in rebuttal. Perceived hedonic value was positively associated with users' belief in a rebuttal ($\beta = 0.221$, $t = 2.208$, $p < 0.05$). Using convincing and persuasive arguments in rebuttals, individuals' affective state can be influenced to foster hedonic perceptions. This finding can be explained in light of consumption emotions in consumer research (Ladhari, 2007; Phillips & Baumgartner, 2002; Westbrook & Oliver, 1991). Perhaps, rebuttals activate consumption emotions in which individuals feel pleasure and less disquiet upon receiving the truth about a rumor. This in turn elicited a favorable response towards believing rebuttals. Although the qualitative analysis did not uncover specific responses illustrating this relationship, participants' open-ended responses such as "*wow... it's a relief. I simply love kfc food*"

(Participant 273) and “*I am happy to see my favorite brand KFC did not sell rat*” (Participant 253) offer some confidence in terms of their likelihood to believe the rebuttal.

Perceived hedonic value and intention to share rebuttal. Perceived hedonic value was positively associated with intention share rebuttal ($\beta = 0.187$, $t = 2.002$, $p < 0.05$). Besides cognitive involvement, information sharing behavior has an emotional element too (Dobele et al., 2007; Stieglitz & Dang-Xuan, 2013; Wang et al., 2017). Perhaps, the exposure to rebuttal elicited emotional appeal and/or a measure of individuals’ engagement with the process of refutation. Previous studies have acknowledged that perceived hedonic value acts as a determinant in social interactions (Cambria, 2016; Choi & Toma, 2014; Wang et al., 2017; Wang et al., 2019). This is echoed in participants’ open-ended responses as in “*wow. I love to share it*” (Participant 114). Therefore, this research explains the Organism-Response mechanism in the S-O-R framework (Kim & Johnson, 2016; Mehrabian & Russell, 1974; Wang et al., 2019) by showing how rebuttals can influence individuals’ affective state of psychological processing, which motivates information sharing behavior on social media. Moreover, this finding extends the previous literature on the relationship between hedonic perception and information propagation in the context of rebutting rumors online (Alhabash et al., 2013; Botha & Reyneke, 2013; Stieglitz & Dang-Xuan, 2013).

With regard to the strength of the associations, perceived utilitarian value ($\beta = 0.461$, $p < 0.001$) was a stronger predictor than perceived hedonic value ($\beta = 0.221$, $p < 0.05$) for belief. Likewise, perceived utilitarian value ($\beta = 0.342$, $p < 0.001$) was a stronger predictor than perceived hedonic value ($\beta = 0.187$, $p < 0.05$) for intention to share. In

summary, rebuttal acceptance was better predicted by perceived utilitarian value than perceived hedonic value in the full sample.

5.2. Discussion of the Moderating Variables

This research examines the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. As reported earlier in Section 4.3, a series of PLS multi-group analysis were conducted to examine the moderating effects. The findings for the three moderators are discussed below.

5.2.1. Exposure Sequence

This research conceptualizes exposure sequence as the order in which individuals are exposed to the two antithetical messages—rumor and its rebuttal—in the online setting (Huang, 2017; Purnawirawan et al., 2012). Although rebuttals are issued after the wake of rumor outbreaks, users could be exposed to a rebuttal either before or after they receive the rumor. As reported earlier in Table 4.14, this research shows that exposure sequence significantly moderates the underlying mechanism of rebuttal acceptance. This could be explained in light of the anchoring effect as individuals' decision-making often depends on the first piece of information obtained (Kwak et al., 2018; Mussweiler et al., 2000; Tversky & Kahneman, 1974).

Perceived message properties and perceived values. Perceived source credibility triggers a greater perceived utilitarian value when rebuttals precede rumors than the other way round ($t = -7.357, p < 0.001$). Prior works suggest that when people are exposed to

rebuttals after rumors, they tend to assess the former by paying extra attention to its source (Henkel & Mattson, 2011; Johnson et al., 1993). This research augments the previous finding in the literature by demonstrating that perceived source credibility elicits perceived utilitarian value when people are exposed to rebuttals before rumors. The relation is in fact relatively weaker when rebuttals come after rumors.

Perceived values and rebuttal acceptance. Perceived hedonic value triggers a higher belief in rebuttals when rumors precede rebuttals than the other way round ($t = 23$, $p < 0.001$). However, perceived utilitarian value triggers a higher belief in rebuttals when rebuttals precede rumors than the other way round ($t = -9.667$, $p < 0.001$). In other words, users' belief in rebuttals is better predicted by perceived hedonic value in the rumor-before-rebuttal condition, but by perceived utilitarian value in the rebuttal-before-rumor condition.

In the rumor-before-rebuttal condition, perceived hedonic value is crucial perhaps because rebuttal acceptance is often contingent on individuals' level of belief and anxiety associated with rumors that the rebuttals attempt to debunk (Bordia et al., 2005; Chan et al., 2017). Thus, upon receiving the rebuttals, individuals perhaps feel less anxious about the rumors. Works such as Ecker et al. (2020) suggest that the impact of refutation seems especially strong when receivers are previously exposed to the rumor. This research extends these previous works by showing a positive association between perceived hedonic value and users' belief in rebuttals when rumors precede rebuttals.

In the rebuttal-before-rumor condition, perceived utilitarian value is crucial because individuals perhaps perceive rebuttals as pre-emptive warnings to rumors that have become viral on social media (Ozturk et al., 2015). By processing rebuttals prior to

rumors, individuals probably manage to keep the hedonic aspect of anxiety associated with the rumors at arm's length. The rumor-congruent inferential reasoning does not interfere with the ways in which the rebuttals are processed.

5.2.2. Attitudinal Predisposition

This research conceptualizes attitudinal predisposition as individuals' prior attitude towards the brand (Mafael et al., 2016; Visentin et al., 2019). As reported earlier in Table 4.14, it shows that individuals' attitudinal predisposition significantly moderates the underlying mechanism of rebuttal acceptance.

Perceived message properties and perceived values. Perceived argument quality elicits greater perceived hedonic value for individuals with pro-attitudinal predisposition than those with anti-attitudinal predisposition about the brand ($t = 17.455$, $p < 0.001$). This suggests that rebuttals elicit hedonic perceptions from their arguments for individuals having a favorable brand attitude. This could be vestige of individuals' emotional brand attachment (Chang, & Wu, 2014; Batra, Ahuvia, & Bagozzi, 2012; Park & Young, 1986).

In contrast, perceived argument quality elicits greater perceived utilitarian value for individuals with anti-attitudinal predisposition than those with pro-attitudinal predisposition about the brand ($t = -7.875$, $p < 0.001$). It seems that individuals with anti-attitudinal predisposition towards the brand tend to process rebuttals in a relatively more rational way. Instead of being swayed by emotions, they seem to focus on the arguments in a rebuttal and look at its utilitarian value to be convinced (Huang, 2017). One would expect that individuals with favorable brand attitudes would be convinced about the rebuttal more readily compared with those having unfavorable attitudes towards a brand.

Still, this research shows that rebuttals with persuasive arguments can convince those with unfavorable attitudes towards a brand. This offers confidence in the use of rebuttals as a strategy to combat online rumors.

Furthermore, perceived source credibility triggers greater perceived utilitarian value for individuals with pro-attitudinal predisposition than those with anti-attitudinal predisposition about the brand ($t = 3.789$, $p < 0.001$). When the former perceives that the source of a rebuttal is credible, they tend to evaluate the rebuttal as useful. Thus, this research augments previous works on rebuttals' source credibility (Andrews et al., 2016; Visentin et al. 2019; Vraga & Bode, 2018) by showing that the credibility of the source of rebuttals is more salient for individuals with pro-attitudinal predisposition compared with those having anti-attitudinal predisposition towards brands. On the other hand, individuals with anti-attitudinal predisposition perhaps consider a credible source to be necessary but not sufficient to correct misconceptions. Although human brains are likely to rely on information originated from a credible source (Gunawan & Huarng, 2015; Liu et al., 2019; Zhang et al., 2014), this might not always be evident in the context of rumor refutation specifically when receivers of rebuttals are overwhelmingly partisan.

Perceived values and rebuttal acceptance. This research reveals a conundrum, a possible way to resolve which is highlighted later as part of the future research directions (Section 6.4). It shows that perceived hedonic value triggers a higher belief ($t = 23$, $p < 0.001$) and intention to share rebuttals ($t = 33.615$, $p < 0.001$) for the individuals with pro-attitudinal predisposition than those with anti-attitudinal predisposition about the brand. On the other hand, perceived utilitarian value triggers a higher belief ($t = -19.846$, $p < 0.001$) and intention to share rebuttals ($t = -26.308$, $p < 0.001$) for the individuals with

anti-attitudinal predisposition than those with pro-attitudinal predisposition about the brand. In other words, rebuttal acceptance is better predicted by perceived hedonic value for the individuals with pro-attitudinal predisposition, but by perceived utilitarian value for those with anti-attitudinal predisposition.

For the individuals with pro-attitudinal predisposition, perceived hedonic value is crucial perhaps because receivers perceive emotional attachment when they see a rebuttal attempting to debunk a rumor associated with their favorite brand. They could find themselves morally obligated to refute false claims associated with their favorite brands (Zhao et al., 2016). Previous works suggest perceived hedonic value drives individuals' information-sharing behavior on social media (Kim & Johnson, 2016; Sukhu et al., 2015; Wang et al., 2019). This research augments the literature by showing that perceived hedonic value triggers higher intentions to believe and share rebuttals for individuals with pro-attitudinal predisposition than those with anti-attitudinal predisposition about a brand.

Despite the concern that participants with anti-attitudinal predisposition towards the brand might not provide a favorable response for rebuttal acceptance, they can be persuaded to accept rebuttals by eliciting greater perceived utilitarian value. This suggests that rebuttals have the potential to influence individuals' cognitive state of information-processing even when the messages are attitude-discrepant.

5.2.3. Issue Involvement

This research conceptualizes issue involvement as the extent to which individuals perceive an issue to be personally important or relevant (Angst & Agarwal, 2009; Seiders et al., 2005), which determines individuals' likelihood of elaboration in information-

processing behavior. As reported earlier in Table 4.14, this research shows that issue involvement significantly moderates the underlying mechanism of rebuttal acceptance. The findings can be explained in light of the elaboration likelihood model (Petty & Cacioppo, 1986).

Perceived message properties and perceived values. Perceived argument quality triggers greater perceived utilitarian value for individuals with low issue involvement than those with high issue involvement ($t = 29.5, p < 0.001$). However, it triggers greater perceived hedonic value for individuals with high issue involvement than those with low issue involvement ($t = -31.6, p < 0.001$).

These findings suggest that low involvement individuals process rebuttals in a more rational way, while those with high involvement do so in a more emotional way. This contradicts the literature on the elaboration likelihood model (Petty & Cacioppo, 1986), which suggests that high involvement individuals evaluate messages with greater deliberation compared with low involvement individuals (Angst & Agarwal, 2009).

One way to understand the contradiction with the elaboration likelihood model lies in differentiating situational involvement and enduring involvement. As opposed to enduring involvement, which refers to individuals' long-term orientations/connections with a brand, situational involvement refers to individuals' temporary feelings with an issue related to the brand (Chun & Lee, 2016; Mathews-Lefebvre & Valette-Florence, 2014; Richins et al., 1992). Conceivably, the KFC fried rat case is akin more to situational involvement than enduring involvement. For low involvement individuals, rebuttals seem influential in increasing situational involvement, which elicits a greater perceived utilitarian value than hedonic value. For high involvement individuals, however, rebuttals

are perhaps influential in increasing enduring involvement, which elicits a greater perceived hedonic value than utilitarian value. Individuals with high issue involvement probably possess a strong sense of brand attachment as observed in enduring involvement (Mathews-Lefebvre & Valette-Florence, 2014; Warrington & Shim, 2000).

In addition, perceived source credibility triggers a greater perceived utilitarian value for individuals with high issue involvement than those with low issue involvement ($t = -24.118$, $p < 0.001$). This finding extends the literature on elaboration likelihood model (Bordia et al., 2005; Li, 2013) by demonstrating that individuals who have high elaboration likelihood tend to pay more attention to the source of rebuttals, which in turn contributes to utilitarian value.

Perceived values and rebuttal acceptance. Perceived hedonic value triggers a higher belief in rebuttals for individuals with high issue involvement than those with low issue involvement ($t = -12.6$, $p < 0.001$). Both perceived utilitarian ($t = -7.643$, $p < 0.001$) and hedonic ($t = -20.143$, $p < 0.001$) values trigger a higher intention to share rebuttals for individuals with high issue involvement than those with low issue involvement.

It seems that rebuttal acceptance is generally higher among high issue involvement individuals than that among low issue involvement. As discussed earlier, this is perhaps because individuals with high issue involvement possess a strong sense of brand attachment (Mathews-Lefebvre & Valette-Florence, 2014; Warrington & Shim, 2000). Therefore, they are more likely to believe and share rebuttals than others with low issue involvement.

5.3. Summary of the Discussion

This chapter discusses the key findings of the research. Specifically, it began by explaining the underlying mechanism of rebuttal acceptance. This research extends the applicability of the S-O-R framework and the information adoption model in the context of rumor rebuttals. It shows that perceived message properties are significantly associated with perceived values, which in turn determine rebuttal acceptance.

Furthermore, this research explains the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. These three moderators are rooted in the theoretical perspectives of the theory of anchoring effect, the theory of partisan motivated reasoning, and the elaboration likelihood model respectively. The moderating role of exposure sequence demonstrates that individuals process rumors and rebuttals differently depending on the anchor. The moderating role of attitudinal predisposition extends the understanding of the theory of partisan motivated reasoning by highlighting that even individuals with anti-attitudinal predisposition can be convinced by rebuttals. The moderating role of issue involvement deepens the understanding of the elaboration likelihood model by suggesting that rebuttals can even engage low involvement individuals.

Having discussed the findings of this research, this chapter has laid the foundation to highlight the contributions of this research. This is the purpose of the next chapter, which brings the thesis to a close.

CHAPTER SIX

CONCLUSION

So far, what has been achieved in the thesis can be summarized as follows: The first two chapters laid the foundation of the conceptual model of rebuttal acceptance that was needed to be empirically validated. The third chapter has described the between-participants experiment employed in this research followed by the methods of analysis using partial least squares structural equation modeling (PLS-SEM) and inductive content analysis. The fourth chapter has presented the results while the fifth chapter discussed them in light of the literature.

Finally, this chapter brings the thesis to a close, and is organized into four sections. Section 6.1 provides a summary of the research. It revisits the two research objectives and summarizes the key research findings.

Section 6.2 highlights the contributions of this research. Specifically, it includes two theoretical contributions in the emerging area of using rebuttals to combat online rumors. Thereafter, two practical contributions are put forward for practitioners and the lay online populace.

Section 6.3 acknowledges the four limitations of this research. Readers are advised to interpret the findings of this research in light of these limitations.

Section 6.4 offers directions for future research. Specifically, it highlights three major directions that interested scholars can pursue to tackle the problem caused by online rumors.

6.1. Summary of the Research

This research focuses on the use of rebuttals to debunk rumors on the Internet. As described earlier in Section 1.2, the goal was to investigate the underlying mechanism of rebuttal acceptance, which has been conceptualized as users' intentions to believe and share the debunking messages on the Internet. To achieve the goal, two ROs were formulated. Each of them had two subordinate RQs.

RO 1: To develop and empirically validate a conceptual model of rebuttal acceptance.

RQ 1.1: How are perceived message properties of rebuttals related to perceived utilitarian and hedonic values?

RQ 1.2: How are perceived utilitarian and hedonic values related to rebuttal acceptance?

As shown earlier in Figure 2.2, a conceptual model is developed to explain the underlying mechanism of rebuttal acceptance. It hypothesizes the relationships between perceived message properties and perceived values of rebuttals, as well as perceived values and rebuttal acceptance. Specifically, perceived message properties comprise of the argument quality and the source credibility dimensions of rebuttals. Perceived values include both utilitarian and hedonic components. Rebuttal acceptance is captured through users' intentions to believe and share rebuttals. As summarized earlier in Table 2.5, this research posits seven hypotheses to address RO 1 (H1-H7). These were empirically validated by PLS-SEM analysis. Results of the hypotheses testing for RQ 1.1 found that perceived message properties of rebuttals were significantly associated with perceived

utilitarian and hedonic values. Results of the hypotheses testing for RQ 1.2 showed that perceived utilitarian and hedonic values of rebuttals were significantly associated with rebuttal acceptance. The hypotheses testing results for RO 1 have been summarized earlier in Table 4.13.

RO 2: To examine the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance.

RQ 2.1: How are the relationships between rebuttals' perceived message properties and perceived values moderated by exposure sequence, attitudinal predisposition, and issue involvement?

RQ 2.2: How are the relationships between rebuttals' perceived values and rebuttal acceptance moderated by exposure sequence, attitudinal predisposition, and issue involvement?

This research further examines the moderating roles of exposure sequence, attitudinal predisposition, and issue involvement in the conceptual model of rebuttal acceptance. As summarized earlier in Table 2.6, this research posits seven hypotheses to address RO 2 (H8-H14), examining the three moderators (a) exposure sequence, (b) attitudinal predisposition, and (c) issue involvement. By using PLS multi-group analysis, group-comparisons were done to identify the significant differences in the underlying relationships of the conceptual model of rebuttal acceptance for the three moderators. The hypotheses testing results for RO 2 have been summarized earlier in Table 4.14.

6.2. Contributions

6.2.1. Theoretical Contributions

The research has two theoretical contributions. First, it shifts the scholarly focus from the dominant area of research on online rumors to the emerging area of rebuttals. The literature abounds with works on the spread of rumors (Han et al., 2015; Zhao et al., 2012), users' perception of rumors (Qi et al., 2017; Yang & Chung, 2014), and detection of rumors (Qazvinian et al., 2011; Zhang, Zhang, Dong et al. 2015). However, the growing Internet accessibility and proliferation of social media applications not only make rumors viral easily but also provide an avenue to tackle them. An emerging body of research has started to investigate how rumors can be effectively countered on the Internet (Aditya, 2014; Ozturk et al., 2015).

As a way to extend it, this research focuses on the use of rebuttals that debunk rumors on the Internet. Specifically, it explicates the concept of rebuttal acceptance and theorizes its underlying mechanism. Rebuttal acceptance is conceptualized as a non-atomic construct that encompasses users' belief in rebuttals and intention to share the debunking messages. Both are necessary to combat online rumors. Believing rebuttals helps correct individuals' misconceptions about the rumors while sharing the debunking messages spreads the truth to the online community. While most prior works have looked into either belief (e.g., Bordia et al., 2005) or intention to share (e.g., Pal et al., 2019), this research investigates both in conjunction.

Furthermore, this research theorizes the underlying mechanism of rebuttal acceptance. Theorizing is long recognized as a significant scholarly undertaking as it facilitates a systematic accumulation of knowledge (Eisenhardt, 1989; Gregor, 2006). The

few previous works (e.g., Ozturk et al., 2015; Tanaka et al., 2013) do little to offer a holistic theoretically-informed understanding of how Internet users process and decide whether to accept rebuttals. To fill this void, this research integrates five theoretical lenses to shed light on the underlying mechanism of rebuttal acceptance. In particular, the three theoretical lenses—the S-O-R framework, the information adoption model, and the elaboration likelihood model—were used to develop the overarching structure of the conceptual model by associating the three interlaced concepts including perceived message properties of rebuttals, perceived values, and rebuttal acceptance. The other two lenses—the theory of anchoring effect, and the theory of partisan motivated reasoning—were used to explore the micro-level dynamics in terms of exposure sequence, individuals’ attitudinal predisposition and issue involvement associated with rumor refutation. Through the empirical validation, the research helps advance scholarly knowledge by showing how perceived message properties of rebuttals are significantly associated with perceived utilitarian and hedonic values, which in turn determine rebuttal acceptance. Moreover, the micro-level dynamics—exposure sequence, attitudinal predisposition and issue involvement—are found to significantly moderate the underlying mechanism of rebuttal acceptance.

The second theoretical contribution of this research stems from challenging an implicit assumption in the literature. Prior works seem to assume that rumors always precede rebuttals. This research extends the literature by taking into account the possibility for users to be exposed to a rebuttal before they encounter the rumor. This was necessary because one cannot rule out the possibility for the Internet users to be exposed to the rebuttal before they encounter the rumor that is being debunked. Therefore, this

research contributes to the literature by empirically investigating the role played by exposure sequence of the two antithetical messages—a rumor and its rebuttal. For this purpose, it drew on the literature on the anchoring effect (Kwak et al., 2018; Wu & Cheng, 2011), and manipulated exposure sequence in the experiment. The anchor manipulation offers a new understanding of how exposure sequence of a rumor and its rebuttal could influence the underlying mechanism of rebuttal acceptance. Specifically, this research shows that users' belief in rebuttals was better predicted by perceived hedonic value in the rumor-before-rebuttal condition, but by perceived utilitarian value in the rebuttal-before-rumor condition. However, no significant difference was observed in users' intention to share rebuttals for the two conditions.

6.2.2. Practical Contributions

The research has two practical contributions. First, whilst most brands and companies are concerned by the problem of online rumors, this research provides confidence to social media brand managers and public relations practitioners on the use of rebuttals as a strategy to debunk rumors. This research recommends brands' social media managers and public relations practitioners to watch out for the stories about their brands online. If any incorrect information is identified, they should be corrected as soon as possible through rebuttals. This research offers insights into how rebuttals should be crafted by such practitioners to promote users' rebuttal acceptance on the Internet. After all, a well-crafted rebuttal is essential to promote people's likelihood of believing and sharing it.

The findings suggest to practitioners the characteristics of ideal rebuttals: These messages should contain adequate evidence from appropriate authoritative sources. Emphasis must be given to rebuttals' argument quality and source credibility. In terms of argument quality, rebuttals must offer convincing alternative explanations. Moreover, the source of a rebuttal should be credible enough to rebut a false claim. Brands' social media managers are recommended to highlight credible sources in their rebuttals. They could also work with the credible sources (e.g., news outlets) to jointly develop press releases to further widen the reach and the impact of the rebuttals.

Second, this research hopes to elevate Internet users' digital information literacy in general, and awareness of the perils of rumors in particular. This is important because rumors will never completely disappear. In this vein, it is worth noting that individuals regardless of their prior attitude towards brands can be persuaded to refute rumors by virtue of exposure to rebuttals on social media. This research shows how individuals' attitudinal predisposition about a brand influences their perceptions and processing of rebuttals that debunk disparaging rumors about the brand. It is promising that both individuals with a favorable attitude and those with an unfavorable can accept rebuttals. The same was also true for individuals who were highly involved with the rumor topic and those who were relatively nonchalant. Through digital information literacy campaigns, the public should be made aware of this optimistic finding. This may instill in them a greater eagerness and willingness to take online information with a pinch of salt. Social media companies can also play a part by launching information literacy development programmes that will make netizens more immune to online rumors. For example, Facebook's Digital Literacy Library to help the youth use the Internet

responsibly is a step in the right direction (Lee, 2018), but should be augmented to enhance awareness about rumors.

Furthermore, this research reveals that individuals with low issue involvement process rebuttals in a more rational way, while those with high issue involvement do so in a more emotional way. Both utilitarian and hedonic values triggered a higher intention to share rebuttals for individuals with high issue involvement than those with low issue involvement. Authorities can try to harness social media affordances to reach users who are not highly interested in the issue via the exuberance of other users. By sharing rebuttals on social media, individuals with high issue involvement increase the likelihood that less interested individuals get accidentally exposed to the rebuttals, and thus give a call to arms to refute rumors and strengthen refutation. This is indeed one of the cornerstones of the digital strategy of political campaign often used when activists manage to reach non-activists in the environments of political participation (Vaccari and Valeriani, 2015). Thus, this research gives insights on how refutation can be effective, given how difficult it is to correct misconceptions in individuals' worldview (Nyhan & Reifler, 2010).

Drawing from the findings from the qualitative analysis, this research reveals that users can seek further information when they receive rebuttals. Therefore, just disseminating the rebuttals should not be seen as the end of the refutation process. Social media managers and other related authorities should take a step further to follow up on users' queries to rebuttals on social media. Following up on a rebuttal could help gain public trust that could further reinforce rebuttal acceptance.

6.3. Research Limitations

This research should be viewed in light of the following limitations. First, the research did not involve random sampling. Non-probability sampling was used because it was difficult to select participants randomly from the entire population of Internet users. This research, therefore, recruited participants based on eligibility criteria. Such an approach has been followed in several related works (Benson et al., 2015; Smith et al., 2013). Still, the recruited participants may not be representative of the entire online population.

Second, this research addressed its objectives by choosing a rumor related to the fast-food brand KFC as a test case for investigation. The choice of a real brand-related case was deliberate because this research intended to examine the underlying mechanism of rebuttal acceptance for a real brand. Controlling for participants' predisposition by choosing a fictitious brand was hence not an option. Choosing multiple brands from several industries was also not viable as it could have introduced numerous unforeseeable confounding factors. It would also have been logistically difficult. Therefore, the research chose a rumor related to the fast-food brand KFC and included variables like attitudinal predisposition towards the brand and issue involvement in the conceptual model.

Since participants were unaware of this rumor, the findings may be generalizable to any brand-related disparaging rumor with the boundary condition that individuals must not have seen it beforehand. Nonetheless, further work needs to be done in the field to confirm the generalizability of the findings. The current research may also be replicated in the contexts of health rumors and political rumors.

Third, in this research, the rebuttal was displayed as a social media feed. Hence, the degree to which the findings would be consistent if the rebuttals are placed at the top of a webpage remains unknown. Nonetheless, such variations that could have been tested as part of this research were numerous, and were logistically infeasible to incorporate.

6.4. Future Research Directions

The research identifies directions for further inquiry on conceptual, contextual and methodological fronts. At the conceptual level, future research could extend the proposed conceptual model of rebuttal acceptance by adding new variables, particularly, individual differences such as altruism, and moral obligation. Altruism refers to an “other-oriented” motivational state with the primary goal of benefiting other people’s well-being (Burks et al., 2012; Park & Gabbard, 2018). While altruism has been empirically examined as an intrinsic motivation in online information sharing (Marett & Joshi, 2009), helping others by sharing rebuttals is a pro-social behavior. Adding it to the present conceptual model may enhance its predictive power.

Moral obligation refers to individuals’ feelings regarding the duty to engage or to refuse to engage in a particular behavior (Ajzen 1991). Users who appreciate the adverse consequences of rumors will most likely take the responsibility to combat rumors (Tanaka et al., 2013; Zhao, Yin, & Song, 2016). If so, their willingness to accept rebuttals is expected to be high.

Moreover, future work can examine individuals’ likelihood to share rebuttals based on their information-sharing behavior on social media. Some social media users (known as lurkers) behave as observers instead of actively participating through sharing

messages on the platforms while others (known as posters) are likely to share messages (Amichai-Hamburger et al., 2016; Yang, Li, & Huang, 2017). As such, it is worth exploring how the conceptual model of rebuttal acceptance would work differently between lurkers and posters.

In addition, the conceptual model can be investigated by exploring the effectiveness of information literacy on users' responses to rumors and rebuttals. Through an intervention, social media users can be directed to refute rumors voluntarily and to spread only those messages that are verified to be accurate. The extent to which such interventions will curb the spread of rumors needs to be understood.

Future efforts also need to clarify the conundrum (as indicated earlier in Section 5.2.2) that this research revealed. In this vein, the theory of rational and emotional message appeal could be leveraged (Rosselli, Skelly, & Mackie, 1995; Zhang, Sun et al., 2014). The differential effects of message appeal can further help to explain cognitive and affective functioning in the context of rumor refutation. Moreover, rebuttals can be manipulated in terms of dimensions such as gain versus loss frames, text-only versus pictorial, and brief versus detailed. How such traits of rebuttals influence users' rebuttal acceptance would further enrich the literature on users' rebuttal-processing behavior (Borah & Xiao, 2018; Yan et al., 2012).

At the contextual level, future research direction could involve replication of the current work under different settings. The importance of replication is widely acknowledged in the scholarly community (Evanschitzky & Armstrong, 2013; Jiao et al., 2006). The experiment conducted in this research could be replicated by changing the settings in terms of choosing different domains (e.g., politics, health), and different target

samples (e.g., adolescents, elderly). Moreover, future research could investigate how Internet users perceive and process rebuttals when issued by the authorities (such as brands) that involved in the accusation of the rumors. The delimitations of the current research as identified earlier in Section 1.6 also need to be addressed. Scholars interested in the area of online rumors could investigate the impact of rebuttals in other media formats that include YouTube videos and TikTok memes.

At the methodological level, future research is encouraged to employ more qualitative methods. While interviews and focus-groups can be used to provide a rich qualitative description, other data collection approaches such as screencast videography could be employed to capture individuals' behavior in response to rumors and rebuttals in real-time (Kawaf, 2019).

APPENDIX A RUMOR & REBUTTAL MESSAGE

Figure A1: Rumor message.

Note. The picture was taken from
<https://www.telegraph.co.uk/foodanddrink/foodanddrinknews/11695506/KFC-confirm-deep-fried-rat-is-actually-just-chicken.html>

Figure A2: Rebuttal message.

APPENDIX B NTU IRB APPROVAL

IRB-2018-10-031

14 November 2018

Associate Professor Alton Chua Yeow Kuan
Wee Kim Wee School of Communication and Information

NTU INSTITUTIONAL REVIEW BOARD APPROVAL Project Title: Rumor Denial: A Strategy to Combat Online Rumors

I refer to your application for ethics approval with respect to the above project.

The Board has considered your application and noted from your application that your research involves collecting behavioral data from participants through survey.

You have also confirmed that informed consent will be obtained from the participants and you have guaranteed the confidentiality of your participants' biodata obtained from them.

The documents reviewed are:

- a) NTU IRB application form dated **15 October 2018**
- b) Participant information sheet and consent form: version 1 dated **15 October 2018**
- c) Data collection form: version 1 dated **15 October 2018**

The Board is therefore satisfied with the bioethical consideration for the project and approves the ethics application under **Expedited** review. The approval period is from **14 November 2018** to **31 December 2019**. The NTU IRB reference number for this study is **IRB-2018-10-031**. Please use this reference number for all future correspondence.

The following protocol and compliances are to be observed upon NTU IRB approval

1. Any research involving subjects less than 21 years old would require IRB approved written Parental Consent and consent from the participant before any research protocols can be administered unless waiver of consent is given by IRB. Minimal risk refers to an anticipated level of harm and discomfort that is no greater than that ordinarily encountered in daily life, or during the performance of routine educational, physical, or psychological examination.
2. Only the approved Participants Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.
3. Consent forms are important documents therefore they should be stored in the strictest arrangement. Loss of consent form would result in disciplinary action.
4. No deviation from, or changes of, the protocol should be initiated without prior written NTU IRB approval of an appropriate amendment.

Research Integrity and Ethics Office, NTU Institutional Review Board

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5. The Principal Investigator should report promptly to NTU IRB regarding:
 - a. Deviation from, or changes to the protocol.
 - b. Changes increasing the risk to the subjects and/or affecting significantly the conduct of the trial
 - c. All serious adverse events (SAEs) which are both serious and unexpected.
 - d. New information that may affect adversely the safety of the subjects of the conduct of the trial.
 - e. Completion of the study.
6. Continuing Review Request/ Notice of Study completion form should be submitted to NTU IRB for the following:
 - a. Annual review: Status of the study should be reported to the NTU IRB at least annually using the Continuing Review Request/ Notice of Study completion form.
 - b. Study completion or termination: Continuing Review Request/ Notice of Study completion form is to be submitted within 4 to 6 weeks of study completion or termination.
7. All Principal Investigators should comply with existing legislation that would have an impact on the domain of their research.
8. Advertisements/ Notices for recruitment of subjects must meet the following requirements:
 - a. Advertisements must clearly state that volunteers are being recruited to participate in an NTU research project with proper research title and NTU logo.
 - b. Name and contact details of Principal Investigator (usually a faculty member), and NTU-IRB contact details (Tel: 6592 2495; Email: IRB@ntu.edu.sg) should be provided.
 - c. The NTU-IRB project reference number should be stated.
 - d. Advertisements should include eligibility criteria.
 - e. Advertisements recruiting Minors must explicitly state that parental consent is required for participation (unless NTU-IRB has granted approval for a waiver of parental consent).

Advertisements/ Notices should NOT contain the following:

- a. State or imply a certainty of favourable outcome or other benefits beyond what is outlined in the informed consent form and the application/protocol.
- b. Make claims, either explicitly or implicitly, that a procedure or intervention is safe or effective or superior to other standard procedures or interventions.
- c. Use catchy words like "free" or "exciting."
- d. Advertisements may state that participants will be paid, but should not emphasize the payment or the amount to be paid (e.g. by such means of larger or bold type)

Professor Lionel Lee
Chair, NTU Institutional Review Board
encl.

Take Part in a Paid Study

We are recruiting participants for a study that investigates users' perceptions of online messages.

WHO:

- ✓ Participants are required to be social media users.
- ✓ Participants must be **between 21 and 60 years old**.

WHAT: This study requires you to complete online questionnaire. It should not take more than 20 to 25 minutes of your time.

RISK: There are no known risks for participating in this study.

INCENTIVE: You will receive SGD 8 as a token of appreciation for participation.

CONTACT: Mr. Anjan Pal
anjan001@ntu.edu.sg

NOTE: This study is approved by the NTU-Institutional Review Board (IRB-2018-10-031). If you have any questions, feel free to contact a representative of the IRB (irb@ntu.edu.sg, or +65 65922495).

APPENDIX D ITEM LOADINGS AND CROSS LOADINGS MATRIX

Table D1: Item loadings and cross loadings.

	Constructs									
Items	(1) ATT	(2) INV	(3) BIRU	(4) ITSRU	(5) BIRE	(6) ITSRE	(7) PAQ	(8) PSC	(9) PUV	(10) PHV
ATT1	0.875	0.206	-0.093	-0.041	0.090	0.009	0.031	-0.006	0.076	0.280
ATT2	0.948	0.174	0.081	-0.016	0.130	0.152	0.105	0.139	0.226	0.326
ATT3	0.831	0.212	0.136	-0.083	0.061	0.005	0.006	-0.004	0.086	0.279
ATT4	0.916	0.127	0.066	-0.035	0.121	0.078	0.120	0.131	0.148	0.303
INV1	0.150	0.900	0.153	0.289	0.265	0.305	0.213	0.177	0.231	0.183
INV2	0.171	0.859	0.146	0.263	0.199	0.274	0.201	0.169	0.250	0.176
INV3	0.174	0.903	0.172	0.317	0.245	0.335	0.186	0.237	0.226	0.205
BIRU1	-0.058	0.200	0.935	0.666	0.311	0.339	0.204	0.232	0.239	-0.012
BIRU2	-0.093	0.173	0.936	0.651	0.225	0.200	0.166	0.176	0.184	-0.057
BIRU3	-0.124	0.104	0.939	0.650	0.205	0.207	0.170	0.157	0.139	-0.049
ITSRU1	-0.017	0.325	0.665	0.962	0.235	0.486	0.278	0.198	0.206	0.063
ITSRU2	-0.060	0.311	0.687	0.968	0.264	0.533	0.298	0.241	0.239	0.092
ITSRU3	-0.024	0.314	0.680	0.967	0.213	0.480	0.294	0.225	0.225	0.067
BIRE1	0.129	0.310	0.312	0.285	0.935	0.698	0.593	0.616	0.580	0.440
BIRE2	0.115	0.222	0.235	0.200	0.966	0.591	0.604	0.585	0.587	0.418
BIRE3	0.111	0.234	0.238	0.220	0.961	0.614	0.170	0.532	0.592	0.431
ITSRE1	0.101	0.347	0.263	0.488	0.618	0.968	0.596	0.478	0.516	0.369
ITSRE2	0.051	0.327	0.283	0.510	0.617	0.973	0.607	0.517	0.515	0.410
ITSRE3	0.135	0.329	0.268	0.508	0.606	0.964	0.589	0.492	0.517	0.429
PAQ1	0.096	0.151	0.178	0.264	0.609	0.570	0.904	0.681	0.623	0.435
PAQ2	0.043	0.214	0.189	0.288	0.518	0.541	0.896	0.592	0.539	0.417
PAQ3	0.113	0.243	0.161	0.257	0.561	0.548	0.889	0.627	0.600	0.412
PSC1	0.119	0.199	0.199	0.219	0.547	0.447	0.661	0.926	0.596	0.388
PSC2	0.093	0.201	0.199	0.215	0.621	0.511	0.671	0.969	0.647	0.427
PSC3	0.095	0.231	0.200	0.225	0.616	0.508	0.697	0.971	0.648	0.452
PUV1	0.190	0.228	0.183	0.189	0.591	0.493	0.604	0.616	0.948	0.419
PUV2	0.187	0.255	0.207	0.257	0.544	0.526	0.644	0.608	0.929	0.419
PUV3	0.122	0.258	0.197	0.204	0.593	0.478	0.597	0.631	0.931	0.433
PHV1	0.338	0.209	-0.058	0.045	0.417	0.373	0.426	0.412	0.423	0.946
PHV2	0.290	0.215	0.003	0.095	0.451	0.403	0.465	0.425	0.439	0.918
PHV3	0.313	0.169	-0.053	0.074	0.391	0.389	0.423	0.403	0.403	0.938

Note. The bolded values indicate the loading of each item to a construct in the respective columns. The other values indicate the cross loadings.

ATT: Attitudinal predisposition, INV: Issue involvement, BIRU: Belief in rumor, ITSRU: Intention to share rumor, BIRE: Belief in rebuttal, ITSRE: Intention to share rebuttal, PAQ: Perceived argument quality, PSC: Perceived source credibility, PUV: Perceived utilitarian value, PHV: Perceived hedonic value.

APPENDIX E PARTICIPANTS' QUOTATIONS

Table E1: Categories of responses stem from the qualitative data.

Categories	Responses
Explanation for refutation	<p><i>"DNA test confirm it was chicken"</i> (Participant 133)</p> <p><i>"the rumor was false. DNA test shows it was chicken meat"</i> (Participant 111)</p> <p><i>"Independent test prove that the kfc meal was chicken"</i> (Participant 123)</p> <p><i>"DNA test reveal the truth"</i> (Participant 294)</p>
Reliance on source credibility	<p><i>"Trustworthy, because it is from the official account."</i> (Participant 281)</p> <p><i>"BBC Confirm the rumor"</i> (Participant 134)</p> <p><i>"This message seems to be from a credible news agency BBC News. So, I believe that it should contain legitimate information and can be trusted. However, I still consider doing a background check to be important in this situation to avoid any chances of making a decision based on personal bias."</i> (Participant 92)</p> <p><i>"i will trust BBC in claiming that the fried rat was actually chicken since it is a reliable source."</i> (Participant 178)</p>
Commendation	<p><i>"thanks for sharing the truth"</i> (Participant 278)</p> <p><i>"thanks for let us know about the rumor"</i> (Participant 254)</p> <p><i>"Thanks for informing the truth"</i> (Participant 280)</p> <p><i>"Be aware, thanks for spreading the truth"</i> (Participant 282)</p>
Likelihood of sharing rebuttal	<p><i>"I would like to share this message for others so that they don't believe the rumor"</i> (Participant 61)</p> <p><i>"I like to share it in my social networks."</i> (Participant 74)</p> <p><i>"manytimes we share rumors unknowingly... so we should share the truth as well as a responsible citizen"</i> (Participant 63)</p> <p><i>"I would share it to the people who shared the previous message to me."</i> (Participant 86)</p>

Categories	Responses
Seeking information	<p><i>“which kfc store it is?”</i> (Participant 66)</p> <p><i>“I still need to gather more evidence to be able to take action about the message.”</i> (Participant 292)</p> <p><i>“SO REALLY??”</i> (Participant 69)</p> <p><i>“Who and when is the test being conducted?”</i> (Participant 245)</p>
Expression of doubt	<p><i>“I still have doubt whether it was chicken!!!”</i> (Participant 271)</p> <p><i>“Too many unreliable sources thus might not be sure if this news is real”</i> (Participant 164)</p> <p><i>“It's a false news unless it's proven right by various scientific reports and many trusted media reports.”</i> (Participant 279)</p> <p><i>“who knows what is true”</i> (Participant 293)</p>
Expression of brand loyalty	<p><i>“kfc has its reputation, why they ruin reputaion by seeling rat”</i> (Participant 35)</p> <p><i>“For an established fast food chain, I doubt that I would be quick to believe rumors about it”</i> (Participant 205)</p> <p><i>“kfc food is simply delicious. I don’t believe they serve rat”</i> (Participant 21)</p> <p><i>“I am happy to see my favorite brand KFC did not sell rat :)”</i> (Participant 253)</p>
Perils of fake news	<p><i>“Fake news causing real harm”</i> (Participant 177)</p> <p><i>“Most social media usage is a waste of time for fake news”</i> (Participant 171)</p> <p><i>“Rumor are time wasting”</i> (Participant 290)</p> <p><i>“People are easily deceived by rumors”</i> (Participant 286)</p>

APPENDIX F RESULTS FOR CONTROL VARIABLES

Table F1: Results for control variables.

	β	Std. Error
Age group → Belief in rebuttal	-0.013	0.092
Gender → Belief in rebuttal	-0.027	0.076
Educational qualification → Belief in rebuttal	-0.012	0.082
Exposure sequence → Belief in rebuttal	-0.162	0.089
Attitudinal predisposition → Belief in rebuttal	-0.033	0.094
Issue involvement → Belief in rebuttal	0.072	0.091
Belief in rumor → Belief in rebuttal	0.184	0.123
Intention to share rumor → Belief in rebuttal	-0.084	0.121
Age group → Intention to share rebuttal	-0.001	0.083
Gender → Intention to share rebuttal	-0.052	0.074
Educational Qualification → Intention to share rebuttal	0.079	0.079
Exposure sequence → Intention to share rebuttal	-0.112	0.083
Attitudinal predisposition → Intention to share rebuttal	-0.030	0.108
Issue involvement → Intention to share rebuttal	0.084	0.079
Belief in rumor → Intention to share rebuttal	-0.170	0.113
Intention to share rumor → Intention to share rebuttal	0.476***	0.120

Note. *** $p < 0.001$.
Sample size = 305.

Table F2: Results for control variables of the analysis of exposure sequence.

	The rumor-before-rebuttal condition		The rebuttal-before-rumor condition	
	β	Std. Error	β	Std. Error
Age group → Belief in rebuttal	-0.071	0.111	0.078	0.078
Gender → Belief in rebuttal	0.008	0.076	-0.059	0.078
Educational qualification → Belief in rebuttal	-0.085	0.073	0.019	0.091
Attitudinal predisposition → Belief in rebuttal	-0.005	0.107	-0.044	0.094
Issue involvement → Belief in rebuttal	-0.053	0.095	0.181	0.099
Belief in rumor → Belief in rebuttal	0.204	0.121	0.274*	0.128
Intention to share rumor → Belief in rebuttal	-0.049	0.116	-0.159	0.123
Age group → Intention to share rebuttal	-0.080	0.071	0.076	0.094
Gender → Intention to share rebuttal	-0.001	0.066	-0.118	0.082
Educational qualification → Intention to share rebuttal	0.049	0.077	0.077	0.091
Attitudinal predisposition → Intention to share rebuttal	0.030	0.093	-0.070	0.133
Issue involvement → Intention to share rebuttal	-0.041	0.072	0.221*	0.089
Belief in rumor → Intention to share rebuttal	-0.143	0.109	-0.112	0.135
Intention to share rumor → Intention to share rebuttal	0.588***	0.107	0.352**	0.131

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample size for the rumor-before-rebuttal condition = 150.

Sample size for the rebuttal-before-rumor condition = 155.

Table F3: Results for control variables of the analysis of attitudinal predisposition.

	Pro-attitudinal predisposition		Anti-attitudinal predisposition	
	β	Std. Error	β	Std. Error
Age group → Belief in rebuttal	0.111	0.082	0.020	0.081
Gender → Belief in rebuttal	-0.047	0.080	-0.016	0.075
Educational qualification → Belief in rebuttal	-0.029	0.073	-0.153	0.093
Exposure sequence → Belief in rebuttal	-0.187*	0.078	-0.178	0.118
Issue involvement → Belief in rebuttal	0.052	0.098	0.083	0.079
Belief in rumor → Belief in rebuttal	0.280	0.180	-0.089	0.168
Intention to share rumor → Belief in rebuttal	-0.169	0.123	0.110	0.169
Age group → Intention to share rebuttal	0.144	0.077	-0.013	0.074
Gender → Intention to share rebuttal	-0.113	0.071	-0.099	0.079
Educational qualification → Intention to share rebuttal	-0.014	0.074	0.007	0.092
Exposure sequence → Intention to share rebuttal	-0.149	0.080	-0.254*	0.119
Issue involvement → Intention to share rebuttal	0.176*	0.086	0.083	0.070
Belief in rumor → Intention to share rebuttal	0.074	0.144	-0.402*	0.186
Intention to share rumor → Intention to share rebuttal	0.284**	0.098	0.421*	0.194

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Sample size for pro-attitudinal predisposition = 113.
Sample size for anti-attitudinal predisposition = 88.

Table F4: Results for control variables of the analysis of issue involvement.

	Low issue involvement		High issue involvement	
	β	Std. Error	β	Std. Error
Age group → Belief in rebuttal	-0.012	0.091	-0.060	0.091
Gender → Belief in rebuttal	-0.215	0.079	0.086	0.076
Educational qualification → Belief in rebuttal	-0.061	0.094	-0.064	0.074
Exposure sequence → Belief in rebuttal	-0.331**	0.090	0.031	0.101
Attitudinal predisposition → Belief in rebuttal	-0.083	0.093	-0.002	0.094
Belief in rumor → Belief in rebuttal	0.151	0.140	0.176	0.157
Intention to share rumor → Belief in rebuttal	-0.204	0.119	0.041	0.121
Age group → Intention to share rebuttal	0.008	0.058	0.009	0.094
Gender → Intention to share rebuttal	-0.060	0.072	-0.109	0.070
Educational qualification → Intention to share rebuttal	-0.003	0.080	0.025	0.079
Exposure sequence → Intention to share rebuttal	-0.237**	0.082	0.068	0.099
Attitudinal predisposition → Intention to share rebuttal	-0.053	0.088	-0.050	0.105
Belief in rumor → Intention to share rebuttal	0.006	0.150	-0.295	0.156
Intention to share rumor → Intention to share rebuttal	0.427**	0.132	0.516***	0.120

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Sample size for low issue involvement = 82.
Sample size for high issue involvement = 123.

APPENDIX G PLS MULTI-GROUP ANALYSIS USING MEDIAN SPLIT

Table G1: PLS multi-group results for attitudinal predisposition (using median split).

	Pro-attitudinal predisposition		Anti-attitudinal predisposition		t-stat
	β	Std. Error	β	Std. Error	
Perceived argument quality → Perceived utilitarian value	0.365***	0.105	0.399***	0.112	-2.615**
Perceived argument quality → Perceived hedonic value	0.538***	0.076	0.389***	0.077	16.555***
Perceived source credibility → Perceived utilitarian value	0.386**	0.126	0.391**	0.121	0.357
Perceived utilitarian value → Belief in rebuttal	0.402***	0.097	0.510***	0.096	-9.818***
Perceived utilitarian value → Intention to share rebuttal	0.280***	0.082	0.391***	0.116	-10.091***
Perceived hedonic value → Belief in rebuttal	0.297**	0.095	0.076	0.093	20.091***
Perceived hedonic value → Intention to share rebuttal	0.311***	0.084	-0.016	0.086	32.7***
<i>R² Value</i>					
Perceived utilitarian value	47.5%		54%		
Perceived hedonic value	28.9%		15.1%		
Belief in rebuttal	53%		45.5%		
Intention to share rebuttal	62.2%		46.5%		

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample size for pro-attitudinal predisposition = 159.

Sample size for anti-attitudinal predisposition = 146.

Control variables: Age group, gender, educational qualification, exposure sequence, issue involvement, belief in rumor, and intention to share rumor.

Table G2: PLS multi-group results for issue involvement (using median split).

	Low issue involvement		High issue involvement		t-stat
	β	Std. Error	β	Std. Error	
Perceived argument quality → Perceived utilitarian value	0.504***	0.101	0.260*	0.108	20.333***
Perceived argument quality → Perceived hedonic value	0.292***	0.086	0.554***	0.064	-32.75***
Perceived source credibility → Perceived utilitarian value	0.244*	0.122	0.505***	0.119	-18.643***
Perceived utilitarian value → Belief in rebuttal	0.484***	0.093	0.460***	0.108	2.000*
Perceived utilitarian value → Intention to share rebuttal	0.311***	0.094	0.335**	0.101	-2.000*
Perceived hedonic value → Belief in rebuttal	0.179*	0.084	0.270*	0.115	-7.583***
Perceived hedonic value → Intention to share rebuttal	0.076	0.078	0.271*	0.107	-17.73***
<i>R² Value</i>					
Perceived utilitarian value	47.6%		51.3%		
Perceived hedonic value	8.5%		30.7%		
Belief in rebuttal	46.9%		48.1%		
Intention to share rebuttal	52.2%		50.5%		

Note. * p < 0.05, ** p < 0.01, *** p < 0.001.

Sample size for low issue involvement = 125.

Sample size for high issue involvement = 180.

Control variables: Age group, gender, educational qualification, exposure sequence, attitudinal predisposition towards the brand, belief in rumor, and intention to share rumor.

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