

EXPLORING THE CONCEPT AND APPLICATION OF CRISIS-INDUCED UNCERTAINTY  
IN ORGANIZATIONAL CRISES

by

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## ABSTRACT

This dissertation was designed to investigate stakeholders' feelings of uncertainty during an organizational crisis and how such feelings influence stakeholders' relationship with the organization and change their information-seeking behaviors. Through reviewing current theories about uncertainty in risk communication and interpersonal communication, this dissertation created a term, crisis-induced uncertainty, and conceptualized the construct. The researcher designed two studies to measure and test the construct separately.

Study 1 aimed to develop a multidimensional scale to capture crisis-induced uncertainty. Two samples were collected to validate the scale ( $n_1 = 341$ ;  $n_2 = 294$ ). Through the comprehensive assessment of content validity, construct validity, discriminant validity, convergent validity, and reliability, this study yielded a three-dimension scale with 11 measurement items. Crisis-induced uncertainty contained three dimensions: protection uncertainty, process uncertainty, and relationship uncertainty.

Using a survey ( $n_3 = 324$ ), Study 2 attempted to discover the relationship between crisis-induced uncertainty and organization-public relationships, and the relationship between crisis-induced uncertainty and information-seeking behaviors. The survey revealed that crisis-induced uncertainty significantly predicts satisfaction, trust, and commitment. It also indicated that crisis-induced uncertainty does not change people's information-seeking behaviors during a crisis. This dissertation greatly contributes to the understanding of uncertainty during a crisis and paves the way for future uncertainty research in the crisis context.

## DEDICATION

To my two late grandmas who always encouraged me to receive education and work hard, I wish you could be here to see my achievement.

## LIST OF ABBREVIATIONS AND SYMBOLS

$\alpha$	Cronbach's alpha
$\beta$	Standardized multiple regression coefficient
df	Degree of freedom
M	Mean
n	Sample size
p	Probability value
R <sup>2</sup>	Coefficient of determination
SD	Standard deviation
SE	Standard error
$\chi^2$	Chi-square
AMOS	A software program used to fit structural equation modeling
AVE	Average variance extracted
BP	British Petroleum
CFA	Confirmatory factor analysis

CFI	Comparative fit index
CR	Composite reliability
CRV	Content validity ratio
EFA	Exploratory factor analysis
ICM	Integrated crisis mapping
IRB	Institutional review board
IRT	Image repair theory
KMO	Kaiser-Meyer-Olkin test
MSA	Individual Measures of Sampling Adequacy
MTurk	Amazon Mechanical Turk
OPR	Organization-public relationships
PIT	Problematic integration theory
RMSEA	The root mean square error of approximation
SCCT	Situational crisis communication theory
SEM	Structural equation modeling
SMCC	Social-mediated crisis communication model
SPSS	Statistical Package for Social Sciences
SRMR	Standardized root mean square residual

UMT            Uncertainty management theory

URT            Uncertainty reduction theory

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## CHAPTER 1: INTRODUCTION

Organizational crises frequently occur in our daily life that one does not have to search his/her memory to raise examples of notorious crises that impact societies around the world. From the Volkswagen emissions scandal to the Facebook's breach of user data, and from the Samsung Galaxy battery explosion to the BP gulf coast oil spill, each of these crises influenced millions or even billions of people. Once a crisis occurs, it quickly grabs media attention. There is no shortage of news articles, TV breaking news, social media postings, user-generated videos that cover organizational crises. For the public, these crises disrupt their normal life as a Facebook user, a driver of a Beetle, or an ordinary person who sends text messages every day. For the companies involved, the crises disorder their normal operations. Although not all minor incidents finally turn into a severe crisis automatically, reports suggest the conversion rate is increasing. The average number of headlines signaling corporate reputation risk has doubled from 570 between 2000-2009 to 1030 between 2010-2016 (Kalavar & Mysore, 2017).

Crises are costly from an organization's perspective. Every organization spends substantial financial and human resources fixing wrongdoings. More seriously, crises further discourage consumers from using its products or services. Samsung lost nearly 17 billion dollars in sales after recalling its problematic cellphones (Lee, 2016). By September 2017, Volkswagen emissions scandal had cost the car manufacturer 30 billion dollars to buy back cars and pay fines (Riley, 2017). BP had paid 61.6 billion dollars in total by 2016 to rectify its misconduct in 2010 (Bomey, 2016). Beyond the direct cost to restore to normal operation, probably the more pressing issue is how to heal the wound on the public's mind. Organizations have realized the

importance of a good reputation, and scholars have widely studied the significant outcomes of a positive reputation. For example, a favorable reputation can bring benefits to marketing (Lewis & Booms, 1983), recruitment (Turban & Cable, 2003), and customer behavioral intentions (Keh & Xie, 2009). A crisis usually threatens how the public sees an organization and its reputation. Thus, it becomes imperative to explore effective strategies an organization could take to maintain, protect, and repair its public image. Crisis communication features this line of research.

The discussion of crisis communication and management started in the 1980s when management journals published several landmark studies (e.g., Mitroff, 1988; Mitroff, Shrivastava, & Udwadia, 1987; Weick, 1988). Since then, crisis communication and management became one of the most heavily researched areas in public relations (Sallot, Lyon, Acosta-Alzuru, & Jones, 2003). Public relations scholars have established various theories and frameworks, such as corporate apologia (Ware & Linkugel, 1973), image repair theory (IRT) (Benoit, 1997), situational crisis communication theory (SCCT) (Coombs, 2007), integrated crisis mapping model (ICM) (Jin, Pang, & Cameron, 2007), and social-mediated crisis communication model (SMCC) (Austin, Liu, & Jin, 2012), just to name a few, to explain crises. Each theory has unique features and concentrates on a specific area in crisis communication. For example, IRT analyzes available crisis response strategies people and organizations utilize to respond to a crisis. SCCT seeks to understand people's attribution of crisis responsibility and how to use crisis response strategies to shift the attribution and protect reputation. ICM examines how people emotionally respond to a crisis. SMCC discusses how messages and channels influence people's perceptions of a crisis.

Although being heavily researched, crisis does not have a universal definition. It has been defined from various perspectives. Heath and Miller (2004) reviewed more than 20 definitions of crisis in the literature and found each highlights different characteristics. For example, some emphasize the suddenness of a crisis (Fink, 1986; Paschall, 1992). Others focus on the negative impact a crisis brings to an organization (Fearn-Banks, 1996; Lerbinger, 1997). Among these definitions, Ulmer, Seeger, and Sellnow (2011) defined crisis as “a specific, unexpected, and nonroutine event or series of events that create high levels of uncertainty and simultaneously present an organization with both opportunities for and threats to its high-priority goals” (p. 7). This definition is unique in two ways. First, a crisis is not always detrimental but could potentially bring opportunities for growth to an organization. Second, crisis is defined in terms of uncertainty. A crisis could disrupt the normal operation of an organization and pose a vast amount of uncertainty to both organizations and stakeholders. However, they did not provide a theoretical definition to uncertainty. Liu, Bartz, and Duke (2016) reinforced the importance of uncertainty in crisis communication research, pointing out there is a lack of accurate definitions and advocating for more empirical research on this concept. As crisis communication theories progress, an increasing number of studies advocate ethical communication during a crisis (Coombs, 2007, 2015; Millar & Heath, 2003; Ulmer, Seeger, & Sellnow, 2011). Stakeholders should be the priority of any crisis communication plans. The study of uncertainty management could help stakeholders alleviate their negative feelings and help post-crisis image repair.

Although stakeholders’ uncertainty appears in the crisis scholarship ordinarily (e.g., Holladay, 2009; Ray, 1999; Reynolds & Seeger, 2006; Seeger, 2006; Stephen, Malone, & Bailey, 2005), it has never been explicated in crisis communication research. Crisis communication theories have moved from organization-oriented research to audience-oriented

research (Coombs, 2010), and SCCT and ICM feature audience-oriented research by investigating people's attribution of responsibility and emotional responses respectively. Stakeholders are continually observing a crisis as it evolves, and they are making judgments at the same time. Uncertainty, as a rarely researched concept in crisis communication, is an essential characteristic of stakeholders that deserves further investigation. It could potentially add a new perspective to audience-oriented frameworks. Many questions remain unclear about this variable, such as "What does uncertainty mean?", "When stakeholders feel uncertain, what are they uncertain about?", "How does uncertainty influence people's perceptions and behaviors during a crisis?"

This dissertation aims to explore the concept and application of stakeholders' uncertainty within the organizational crisis context. Specifically, drawing from risk communication and interpersonal communication, the current study attempts to define crisis-induced uncertainty and propose dimensions under the construct. As mentioned previously, though uncertainty frequently appears in the crisis literature, it is not extensively discussed and examined, not to mention an accurate definition. Multiple disciplines have created unique definitions for uncertainty that fits specific contexts so there should be no exception in the crisis context. Through a thorough review of the literature, this dissertation seeks to delineate the layers of uncertainty and different aspects an organization should consider in the face of a crisis. The new definition and dimensions could bring researchers to the same page when they discuss crisis-induced uncertainty.

Second, adapting from previous measurements in risk and interpersonal communication, this study will propose a multidimensional scale to measure crisis-induced uncertainty. Research cannot progress without proper measurements. However, methodologists have not reached a

consensus on the standard procedure of scale development. Different textbooks have provided diverse recommendations on the best practices. This study will primarily follow Churchill's (1979) eight-step procedure in scale development while realizing the theoretical and methodological contributions by later studies (DeVellis, 2012; Netemeyer, Bearden, & Sharma, 2003).

Third, employing the newly created scale, the dissertation attempts to establish links between uncertainty and organization-public relationships (OPR), and between uncertainty and information-seeking behaviors. It is generally accepted that the goal of crisis communication is to improve the image or reputation of an organization (Benoit, 1995; Coombs, 2007; Sturges, 1994). Establishing the relationship between crisis-induced uncertainty and OPR is a significant step to show evidence to scholars and practitioners that they should seriously treat stakeholders' uncertainty. In the field of public relations, cultivating a long-term relationship is more important than building a short-term image. Stakeholders' feelings of uncertainty are an evolving concept that changes as a crisis progresses. Therefore, this dissertation aims to investigate if crisis-induced uncertainty influences OPR. Besides, this study will establish the relationship between uncertainty and information-seeking behaviors in the organizational crisis context. Understanding how people seek information during a crisis helps organizations better prepare targeted messages.

### **Significance of the Dissertation and Expected Contribution**

This study is expected to contribute to the crisis communication literature in three ways. First, to the best of the author's knowledge, this dissertation will be the first study to articulate uncertainty in the organizational crisis context. As mentioned previously, crises create a unique situation that poses tremendous uncertainty to both organizations and stakeholders (Ulmer,

Seeger, & Sellnow, 2011). Although scholars generally discuss uncertainty, it bears different connotations for organizations and stakeholders. For organizations, they worry more about a feasible solution and how to protect their reputation. For the public, they feel uncertain how an incident will evolve and if that will seriously impact their life. It is critical to distinguish the meaning of uncertainty in different situations. Without an accurate definition, the discussion of uncertainty is ambivalent, and it hinders the further exploration of the concept. Therefore, this study aims to open a door for a scholarly discussion regarding uncertainty.

Second, a developed uncertainty scale enables quantitative testing on uncertainty. Due to a lack of common understanding, uncertainty has long been briefly explained but never gone through robust testing. Any arguments made in the previous studies have not been empirically supported. With the new scale, scholars could provide evidence to these arguments. Additionally, the connotation of uncertainty can be different in different crisis situations. Scholars could use the dimensions proposed in this study as a starting point to map out potential layers of uncertainty across situations.

Third, as an underexplored variable, uncertainty has the potential to become the next battleground for crisis communication research as the importance of the construct has been frequently stressed in scholarships. Shoemaker, Tankard, and Lasorsa (2004) demonstrated that theory building could start with a hypothesis. They argued, “a creative thinker begins the idea generation process by forcing a relationship between two or more ideas that would normally not be related” (Shoemaker et al., 2004, p. 75). This study tentatively tests the relationship between uncertainty and OPR, and the relationship between uncertainty and information seeking. If such relationships are established, more discussions on the construct will ensue, which might put uncertainty to the frontline of theory building in crisis communication.

## CHAPTER 2: LITERATURE REVIEW

### **Crisis and Crisis Communication**

The word “crisis” appears commonly in our daily conversation. If someone is in trouble and has no idea how to deal with it, we can describe the situation as a crisis, such as a midlife crisis. In organizational settings, a company might regard a sudden transition of the management team, an economic downturn, or a voluntary product recall as a major crisis. Indeed, crisis can refer to many different objects across situations and this inconsistency influences how scholars understand an organizational crisis.

Scholars have defined the term, crisis, in various ways. In an early attempt, Allen and Caillouet (1994) described that “crises occurred when an event or series of events threaten a corporate actor’s legitimacy and therefore, ultimately, its survival” (p. 46). Lerbinger (1997) defined crisis as “an event that brings, or has the potential for bringing, an organization into disrepute and imperils its future profitability” (p. 4). The first two definitions emphasized the negative impacts crises bring to organizations. Coombs (2007), in his article introducing SCCT, explained crisis from a stakeholder’s perspectives, arguing crisis is “the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organization’s performance and generate negative outcomes” (p. 2-3). He stressed that whether an event is a crisis should be determined by stakeholders. Ulmer, Seeger, and Sellnow (2011) denoted crisis by “a specific, unexpected, and nonroutine event or series of events that create high levels of uncertainty and simultaneously present an organization with both

opportunities for and threats to its high-priority goals” (p. 7). This definition showcased that crises are not inherently negative.

Although a universally accepted definition does not exist, some common elements emerge in the discussion. First, a crisis is an adverse event or some events that occur(s) suddenly. While it is difficult to predict when exactly a crisis will occur, it is not impossible to expect one. Coombs (2010) compared a crisis with an earthquake in California. People know an earthquake will occur in Southern California in the future, but they do not know when and where it will occur. Due to its suddenness, a crisis disrupts the normal operation of an organization and requires much effort to fix it. Second, a crisis almost always brings negative outcomes to an organization as well as its stakeholders. For stakeholders, their life might be threatened by environmental damage, unsafe products, and offensive words or opinions. For organizations, they will face a loss of consumers, a high cost to fix the problem, and long-term reputation damage. Third, a crisis is a perception, and it does not need to be physical damage. Benoit (1997) argued perceptions are more important than reality in crisis communication. If the stakeholders of an organization believe there is a crisis, the organization must respond to it (Seeger, 2006).

Crisis communication is a broad term that describes an organization’s activities in the face of a crisis. Sturges (1994) described crisis communication as the communication practices of an organization during an organizational crisis. Fearn-Banks (2002) depicted crisis communication as the interaction between an organization and its stakeholders using verbal, visual, and written tools before, during, and after a crisis. When compared with risk communication, Reynold and Seeger (2005) argued crisis communication is primarily a public relations practice. It derives from the need to strategically defend an organization’s position when being exposed to criticism, attack, threat, and uncertainty caused by a crisis. Coombs

(2010) defined crisis communication as the collection, processing, and dissemination of information and regarded it as the essence of crisis management. Overall, crisis communication aims to explain the event through designing and disseminating specific messages. Ultimately, it helps protect stakeholders and an organization's reputation.

### **Crisis Communication Theories**

Crisis communication research could be dated back to 1986 when Steve Fink published the seminal book, *Crisis Management: Planning for the Inevitable* (Coombs, 2010). Early landmark crisis studies more often appeared in management journals rather than communication journals (Mitroff, 1994; Smith, 1990; Weick, 1988). However, as crisis research progresses, researchers gradually realized the role of communication in crisis management. Coombs (2010) contended that communication plays a vital role in every phase of a crisis from pre-crisis to post-crisis. An increasing number of studies that investigate organizational crises appeared in communication journals. Along with this trend, a growing number of theories and frameworks emerged in communication journals.

#### **Corporate apologia**

The theory of corporate apologia originated from rhetorical studies. It aimed to use communication for self-defense when one's characters are attacked; therefore, it was initially worded as the speech of self-defense (Ware & Linkugel, 1973). Ware and Linkugel (1973) introduced four strategies when critics attack: denial, bolstering, differentiation, and transcendence. Denial attempts to deny any alleged facts and refute the validity of the attack. Bolstering associates the speaker with something people feel positive about. Differentiation prevents the audience from making judgments instantly until more evidence is shown. Transcendence psychologically pushes the audience to look at more abstract and general

characters of the speaker rather than focusing on the current attack (Ware & Linkugel, 1973). Coombs, Frandsen, Holladay, and Johansen (2010) demonstrated that corporate apologia is a perfect fit to crisis communication though it was designed to explain the individual-level communication. Similar to a person's traits, an organization also has its traits (reputation). In the face of an attack, the organization needs to defend its character (reputation) (Coombs et al., 2010).

Corporate apologia was widely applied to early crisis communication research. Each of the four strategies were scrutinized in different case studies, such as the General Motors incendiary device crisis (Hearit, 1996), the Johnson Control's fetal protection policy crisis (Hearit, 1997), the Intel Pentium processor crisis (Hearit, 1999), the Audi 5000 crisis (Hearit & Courtright, 2003), and the Merrill Lynch fraud crisis (Hearit & Brown, 2004). As an early rhetorical theory applied to crisis communication, it helps researchers identify and categorize available crisis response strategies by organizations. It also lays the foundation of future empirical testing of crisis response strategies.

### **Image repair theory**

Image repair theory (IRT) is a comprehensive framework to understand the goal of crisis communication as well as available strategies one can employ to respond to a crisis. It was initially framed as Image Restoration Theory (Benoit, 1997). Receiving critiques from Burns and Bruners (2000) that an image can hardly be fully restored but can only be repaired, Benoit and Pang (2008) started to use image repair theory, and the term became the formal name of the theory thereafter. The basic idea of IRT is that a person or an organization sometimes faces accusations from another person or organization for wrongdoings. When attacked, the accused party uses communication strategies to repair its image.

There are two underlying assumptions of IRT (Benoit, 2014). First, communication is a goal-oriented activity. Second, maintaining a positive image is a crucial goal of communication. Besides communication, IRT also considers the nature of accusations. Benoit (2014) argued that communication is only necessary when an incident is undesirable, and the accused party is responsible for the incident. When the two conditions are met concurrently, an organization must respond to the accusation. Benoit (1997, 2014) provided five primary communication strategies for consideration: denial, evasion of responsibility, reducing offensiveness, corrective action, and mortification. The five general strategies can be further divided into 14 specific types. Table 1 provides the 14 image repair strategies.

Table 1: Image Repair Strategies (Benoit, 2014)

Denial	Simple denial	Deny the wrongful action
	Shift blame	Blame someone for the wrongful action
Evade responsibility	Provocation	The wrongful action is in response to another wrongful action
	Defeasibility	Claim a lack of control over the situation
	Accident	Make an excuse based on accidents
	Good intentions	Intend to something good
Reduce offensiveness	Bolstering	Remind of the past good actions
	Minimization	Minimize the amount of negative effects
	Differentiation	Differentiate the action from a more negative one
	Transcendence	Placing the action in a different context
	Attack accuser	Reduce the credibility of the accuser
	Compensation	Offer to remunerate the victim
Corrective action		Fix the problem
Mortification		Apologize to who is offended

Since its inception, IRT has been applied to case studies in the corporate field (e.g., Benoit, 1995; Blaney, Benoit, & Brazeal, 2002; Brinson & Benoit, 1994, 1999; Muralidharan, Dillistone, & Shin, 2011), the political field (e.g., Benoit, 2006; Benoit & Henson, 2009; Blaney & Benoit, 2001; Kennedy & Benoit, 1997), and the sports and entertainment field (e.g., Benoit &

Hanczor, 1994; Brazeal, 2008; Bruce & Tini, 2008). These studies focused on an individual crisis and analyzed what strategies the accused parties employed in that specific situation. Besides case studies, researchers further used the experiment method to test the effectiveness of the proposed strategies (Brown, 2016; Brown, Billings, Mastro, and Brown-Devlin, 2015; Dardis & Haigh, 2008).

Along with corporate apologia, IRT is an organization-oriented theory that considers how to respond to accusations. It primarily discusses the communication strategies used by organizations without considering the reactions of stakeholders. However, stakeholders are a primary component of crisis communication because a goal of crisis communication is to make stakeholders form a better image of an organization. As stated by Benoit, “Persuasion is all about trying to change the audience’s attitudes; in image repair, the goal of persuasive messages is to change the audience’s attitudes concerning accusations or suspicions about the target of attack” (Benoit, 2014, p.31). Therefore, crisis communication theories should not only present available strategies to organizations, but they should also help organizations understand how people perceive a crisis and crisis response strategies.

### **Situational crisis communication theory**

Through the years of theory development, crisis communication mainly went through two stages (Lee, 2004). In the first stage, researchers analyzed crisis response strategies in each crisis. In the second stage, researchers gradually paid more attention to the audience. They attempted to understand how the audience understands crises and their reactions to different response strategies. Arguably, the second stage has become the dominant trend in crisis communication, and situational crisis communication theory (SCCT) represents this line of research (Avery, Lariscy, Kim, & Hocke, 2010).

Coombs commenced the discussion of SCCT after the publication of his seminal study in 1995. Simply put, SCCT claims that crises are negative events and stakeholders attempt to find the responsible party. How much responsibility an organization takes determines its reputation in the eyes of stakeholders (Coombs, 1995, 2007, 2010). SCCT originates from a psychology theory, attribution theory, which explains how people make sense of events. When an event occurs, especially a negative one, people want to know why it occurs and make attributions of responsibility (Weiner, 1986). Following the same logic, Coombs (1995) argued crises are negative events, and people will make similar attributions of responsibility during a crisis. As people's attribution of crisis responsibility increases, their perceptions of the reputation of the organization decrease.

SCCT proposes a two-step procedure to evaluate a crisis. First, an organization needs to determine the crisis type. Based on the amount of crisis responsibility, Coombs (2004) divided all crisis types into three categories: the victim crisis, the accidental crisis, and the preventable crisis. The victim crisis draws the least responsibility, and the preventable crisis draws the most responsibility where the accidental crisis is in between of the two. Specifically, the victim cluster includes crises like natural disasters, rumors, product tampering, and workplace violence. The accidental cluster contains crises such as challenges, technical error accidents, and technical error recalls. The preventable cluster comprises crises like human error accidents, human error recalls, and organizational misdeeds (Coombs, 2004). Table 2 provides the definition of each crisis. Second, after identifying the crisis type, the organization should detect if intensifiers exist. Two types of intensifiers are within discussion, crisis history and prior reputation (Coombs, 2007; Coombs & Holladay, 2001). If a similar crisis occurred before, people usually attribute more

responsibility to the organization. If the organization has a bad reputation, people again attribute more responsibility to the organization.

Table 2: Crisis Type Definitions (Coombs, 2007)

Victim	<b>Natural disaster:</b> Acts of nature that damage an organization such as an earthquake. Some environmental/weather event impacts the organization.
	<b>Rumors:</b> False and damaging information about an organization is being circulated. Evidence that the information is false.
	<b>Workplace violence:</b> Current or former employee attacks current employees onsite. An employee or former employee injures or attempts to injure current employees.
	<b>Product tampering/malevolence:</b> External agent causes damage to an organization. Some actor outside of the organization has altered the product to make it dangerous.
Accidental	<b>Challenges:</b> Stakeholders claim an organization is operating in an inappropriate manner. There is a public challenge based on moral or ethical, not legal, grounds.
	<b>Technical error accidents:</b> A technology or equipment failure causes an industrial accident. The cause of the accident is equipment/technology related.
	<b>Technical error recalls:</b> A technology or equipment failure causes a product to be recalled. A product is deemed harmful to stakeholders. The cause of the recall is equipment or technology related.
Preventable	<b>Human error accidents:</b> Human error causes an industrial accident. The cause of the accident is a person or people not performing job properly.
	<b>Human error recalls:</b> Human error causes a product to be recalled. A product is deemed harmful to stakeholders. The cause of the recall is a person or people not performing job properly.
	<b>Organizational misdeed:</b> Laws or regulations are violated by management or stakeholders are placed at risk by management. Members of management knowingly violate laws/regulations or offer a product or service they know could injure stakeholders.

After fully understanding the situation, the organization, like the argument in IRT, should use appropriate communication strategies to respond to the crisis. Coombs (1998) initially synthesized Benoit's (1995) strategies and Allen and Caillouet's (1994) strategies into seven categories: attack the accuser, denial, excuse, justification, ingratiation, corrective action, and full apology. Later he collapsed all response strategies into three primary strategies: deny,

diminish, and deal/rebuild (Coombs, 2006, 2007). The deny cluster contains attack the accuser, denial, and scapegoat. The diminish cluster contains excuse and justification. The deal/rebuild cluster contains compensation and apology (Coombs, 2006). Coombs (2007, 2015) recommended that organizations should use more accommodative strategies such as apology if they take more responsibility for a crisis. In contrast, when organizations bear no responsibility, they can use strategies like denial or attack the accuser. For example, in a rumor or challenge crisis, the denial strategy is appropriate. The diminish strategy is ideal for an accidental crisis when an organization bears little responsibility. For a preventable crisis, the best strategy to take is the rebuild strategy. Besides traditional crisis response strategies, Coombs (2007, 2015) also emphasized two types of information: adjusting and instructing information. Adjusting information refers to messages that psychologically alleviate stakeholders' stress. Instructing information denotes messages that tell stakeholders what they should do to protect themselves (Coombs, 2007, 2015). Based on ethical consideration, the goal of the types of information is to protect stakeholders rather than image repair.

Ever since the introduction of SCCT, it quickly became a mainstream theory in crisis communication research. Different from corporate apologia and IRT, SCCT enables quantitative research. Researchers could use the experiment method to test which strategy works the best in certain situations and provide empirical evidence to support or refute suggestions provided by the theory. Scholars have tested different crisis response strategies across different crisis types (e.g. Brown & White, 2010; Claeys, Cauberghe, & Vyncke, 2010; Dutta & Pulling, 2011; Ki & Brown, 2013; Sisco, 2012; van Zoonen & van der Meer, 2015). Interestingly, these studies revealed inconsistent best practices and most of them did not comply with Coombs' recommendations. Ma and Zhan's (2016) meta-analysis indicated that matched crisis response

strategies do not automatically generate a better reputation. Kim and Sung (2014) made a similar argument that crisis response strategies do not always exert influence on crisis responsibility and organizational reputation at the same time. People might believe an organization is responsible for a crisis but appreciate its acceptance of responsibility. In the end, the crisis response strategy might increase responsibility and reputation at the same time. As discussed by Benoit (1997) and Coombs (2007), the ultimate goal of crisis communication is to protect the organization's reputation. If certain strategies could influence reputation without incurring the attribution mechanism, then crisis responsibility would not always be the center of crisis communication research.

### **Integrated crisis mapping**

Crisis emotions were initially created to be a variable embedded in the SCCT model. Coombs and Holladay (2005) contended "The attributions stakeholders make about a crisis will generate emotions about the organization and these emotions will affect their future interactions with the organization" (p. 265). In SCCT, emotions operate parallelly with organizational reputation, both being influenced by crisis responsibility and influencing behavioral intentions (Coombs, 2007). However, Coombs and Holladay (2005) did not definitively operationalize the variable but only broadly listed three types of emotions frequently experienced by stakeholders: sympathy, anger, schadenfreude (taking joy from the pain of the organization). They found that crisis responsibility was positively related to anger and schadenfreude, but negatively related to sympathy. Victim crises draw the highest level of sympathy while preventable crises generate the highest level of anger (Coombs & Holladay, 2005).

While recognizing the importance of crisis emotions in the SCCT model and its connection with crisis responsibility and reputation, some scholars created a new framework,

integrated crisis mapping (ICM), and regarded crisis emotions as the center of crisis communication (Jin, et al., 2007, 2012). Jin, et al. (2007) argued that crisis managers could draft crisis response strategies from an emotional perspective. Different from the view of SCCT that crisis response strategies should influence crisis responsibility, ICM focuses on how response strategies relieve stakeholders' emotions.

In ICM, emotions are defined as “organized cognitive-motivational-relational configurations whose status changes with changes in the person-environment relationship as this is perceived and evaluated (appraisal)” (Lazarus, 1991, p. 38). It reflects stakeholders' interpretations of the change and evolvement of a crisis. ICM primarily concerns about the primary audience who are directly affected by a crisis, such as victims, employees, and news media. Drawing from Lazarus' study (1991), four current crisis emotions are raised: anger, fright, anxiety, and sadness. To categorize the emotions, Jin, et al. (2007, 2012) introduced two dimensions: the public's coping strategy and the level of organizational engagement. Coping strategies refer to the choice of the public to deal with a crisis, which ranges from cognitive coping to conative coping. Cognitive coping represents how the public thinks about and makes sense of a crisis while conative coping stands for the actions the public takes to sustain a positive relationship with an organization in crisis. The level of organization engagement is operationalized as “a combination of the relevance between what had happened in the crisis and the organizational goal in operational and reputational success” (Jin, et al., 2012, p. 272). A crisis with a high organizational engagement is usually intense, asking for more resources from the organization to deal with it, such as natural disasters and economic downturns. On the contrary, a low organizational engagement requires less effort from the organization to resolve the issue, such as human resource problems. Based on the two dimensions, Jin, et al. (2007) formed four

crisis situation quadrants: (1) high engagement/conative coping, (2) high engagement/cognitive coping, (3) low engagement/cognitive coping, and (4) low engagement/conative coping.

However, empirical evidence does not fully support this argument. Conative coping is somewhat dominant during a crisis. Regardless of quadrants, cognitive coping never surpasses conative copying (Jin, et al., 2012).

Besides the landmark exploration by Jin, Pang, and Cameron (2007, 2012), a series of studies have been conducted to test and extend the scope of ICM. Jin (2010) examined the influence of crisis predictability and crisis control on crisis emotions, coping strategies of stakeholders, and the effectiveness of crisis response strategies. A crisis with high predictability and control is likely to generate more anger and sadness. To the contrary, a crisis with low predictability and control generates more fright of the public. Jin (2014) investigated two emotions, sympathy and anger, at different levels of intensity. More intense sympathetic feelings lead to conative coping and less intense sympathetic feelings lead to cognitive coping. Jin, Fraustino, and Liu (2016) posited that anger and anxiety significantly predict the information-seeking behaviors of stakeholders after a crisis. Jin, Liu, Anagondahalli, and Austin (2014) developed a scale to measure common emotions experienced during a crisis. They categorized various emotions appeared in previous studies into three clusters: the attribution-independent crisis emotions (anxiety, fear, apprehension, and sympathy), the internal-attribution-dependent crisis emotions (guilt, embarrassment, and shame), and the external-attribution-dependent crisis emotions (disgust, contempt, anger, and sadness) (Jin, et al., 2014).

Like SCCT, ICM is another audience-oriented theory that explains how people perceive and understand a crisis and adds a new perspective to analyze stakeholders. To the best of the author's knowledge, SCCT and ICM are the only two theories in crisis communication that focus

on the public. As stated by Benoit (1995), perceptions are more important than facts in crisis communication. Defined as “groups without whose support the organization would cease to exist” (Freeman & Reed, 1983), stakeholders, including consumers, media, community, and employees, should be the center of crisis communication research. During a crisis, stakeholders continuously make judgments about a crisis and their stances change when they receive different information. Different factors can influence the judgment-making process, such as the way they attribute responsibility and negative emotions incurred in a crisis. The feeling of uncertainty is also a personal characteristic that might change people’s attitude. Many scholars advocate the consideration of stakeholders’ uncertainty in crisis communication research (Liu et al., 2016). Therefore, as a potential characteristic of stakeholders that might influence their perceptions about a crisis, uncertainty needs a full specification. Further, public relations scholars emphasize ethical communication (Coombs, 2007, 2015; Kent & Taylor, 2002). The research on stakeholders’ uncertainty management could tell organizations what to do to protect them. But before that, researchers need to investigate the meaning of uncertainty during a crisis.

## **The Concepts of Uncertainty**

### **Crisis and risk communication**

Some crisis communication scholars have introduced the concept of uncertainty, but the concept has never been thoroughly defined and empirically investigated. Ray (1999) argued that the higher the uncertainty about solving a crisis, the more severe the crisis is. Stephen, Malone, and Bailey (2005) proposed that the management of uncertainty is the key element of using crisis response strategies. Reynolds and Seeger (2005) postulated that timely communication is necessary to help the audience who are directly affected by a crisis as well as the public. For people who are directly influenced, such as victims, potential victims, and family members of the

victims, the primary purpose is to contain harm. For the public, immediate communication aims to reduce uncertainty, inform the public about what just happened, and tell them how to react appropriately. Seeger (2006) claimed that a crisis itself is a high-uncertainty event, in which it is hard to get immediate information. Organizations should acknowledge uncertainty and try to avoid over-assuring messages. In explaining adjusting and instructing information in SCCT, Holladay (2009) maintained that the aim of offering the two strategies is to reduce uncertainty and reassure stakeholders. Ulmer, Seeger, and Sellnow (2011) even defined crisis as “a specific, unexpected, and nonroutine event or series of events that create high levels of uncertainty and simultaneously present an organization with both opportunities for and threats to its high-priority goals” (p. 7). Liu et al. (2016) emphasized that terrorist attacks and emergency vaccinations are two areas in crisis communication that involve a high level of uncertainty. They also mentioned that uncertainty is closely associated with trust, fear, and information seeking.

Despite the frequent appearance of uncertainty in studies defining crises, describing crisis response strategies, and proposing best practices, uncertainty has never become the center of crisis communication research. As Liu et al. (2016) put, “Uncertainty is central in crisis definitions, but it is not central in existing crisis communication research and theory development” (p. 484). Until now, there is no widely accepted definition of uncertainty in the crisis context. Only one study briefly defined uncertainty as “an inherently uncomfortable state” (Lachlan, Spence, & Nelson, 2010). Crisis communication researchers advocate effective uncertainty management but never explicitly explain how organizations could use crisis response strategies to deal with it, not to mention providing empirical evidence to support the arguments. Another major unanswered question is what stakeholders feel uncertain about when uncertainty

arises. To follow this line of research, an accurate definition of uncertainty is necessary as well as a comprehensive framework to conceptualize uncertainty in crisis communication.

Although the concept of uncertainty does not generate enough explanation in crisis communication, its meaning is frequently discussed in risk communication, a similar but independent field to crisis communication. Heath and Gay (1997) argued that risk is entwined with uncertainty. The discussion of risk is related to probabilistic predictions of positive, neutral, and negative outcomes, and the likelihood that the outcomes are tolerable or not. Risk communication does not create its definition of uncertainty; instead, it borrows the concept from other disciplines. In organizational communication, uncertainty is believed to be the gap between the total information needed for a task and the information that already possessed. Driskill and Goldstein (1986) defined uncertainty as “the perceived lack of information, knowledge, beliefs, and feelings, whatever is necessary for accomplishing the organizational task” (p. 45). They argued that uncertainty means one does not have enough knowledge, but simply rendering information cannot solve the issue. If the information could not change one’s attitude or belief, uncertainty will remain (Driskill & Goldstein, 1986). Heath, Seshadri, and Lee (1998) claimed “uncertainty is a measure of confidence regarding (a) the ability to estimate risk and its consequences and (b) to communicate knowledgeably” (p. 43). Heath (1990) also associated uncertainty with information, urging risk managers to see information-seeking behaviors of the public as a cause of the desire to reduce uncertainty.

Generally, risk communication regards uncertainty as a void of knowledge, information, and beliefs. The void further impacts one’s confidence to accurately predict a future event. Risk communication commonly discusses people’s uncertainty about new and unfamiliar technology. Melber, Nealey, Hammersla, Rankin (1977) found that people fear nuclear plants because they

are uncertain about the potential harm it brings to residents. Besides risk communication, uncertainty is an equally important concept in interpersonal communication theories, such as uncertainty reduction theory, problematic integration theory, and uncertainty management theory.

### **Uncertainty reduction theory**

Berger and Calabrese (1975) first proposed uncertainty reduction to explain interpersonal communication process. Before uncertainty reduction theory (URT), most interpersonal communication theories borrowed from social psychology theories. Feeling unsatisfied with the current theories that focus on psychological factors, Berger and Calabrese (1975) created an interpersonal theory that emphasizes the communication process. URT focuses on the interaction between two individuals, especially two strangers. The primary assumption of URT is that it is human nature to reduce uncertainty or increase predictability about the behavior of themselves and others when strangers meet (Berger, 1979, 1987; Berger & Bradec, 1982; Berger & Calabrese, 1975). Uncertainty was initially defined as the number of possible alternative predictions. As the number of alternative explanations goes up, the level of uncertainty increases accordingly (Berger & Bradec, 1982; Berger & Calabrese, 1975). Knobloch and Solomon (1999) defined uncertainty as “a lack of confidence about how an interpersonal encounter will proceed; it involves the inability to describe, explain, and predict within interaction” (p. 262). Baxter and Montgomery (1996) stated uncertainty exists when situations are unpredictable and incomprehensible. As such, uncertainty is believed to be a cognitive process in which people analyze possibilities and increase predictability.

To state the theory, Berger and Calabrese (1975) utilized seven axioms and 21 theorems. Axiom 1 presents as verbal communication increases, the uncertainty level of both interactants

decreases. The lowered uncertainty further boosts the verbal communication. Verbal communication means the number of words exchanged between two interactants. Axiom 2 claims as nonverbal affiliative expressiveness increases, the uncertainty level of both interactants decreases. The lowered uncertainty encourages nonverbal affiliative expressiveness. Nonverbal affiliative expressiveness refers to a specific nonverbal communication that people show positive feelings toward the other. Axiom 3 contends a high level of uncertainty drives information-seeking behaviors. Axiom 4 states increased uncertainty decreases the intimacy of communication contents. The intimacy of communication contents represents how likely one is willing to reveal personal information such as feelings, attitudes, and opinions. Axiom 5 posits a higher level of uncertainty causes a higher rate of reciprocity. The rate of reciprocity means an equal sharing of information between people. Axiom 6 shows the similarities between two people decrease uncertainty while dissimilarities increase uncertainty. Axiom 7 posits the increase in uncertainty causes a decrease in liking. Based on Park and Adelman's (1983) study, Berger and Gudykunst (1991) added an eighth axiom that a shared communication network decreases uncertainty. A shared communication network indicates interactants have common friends or family members. Table 3 provides the eight axioms.

Table 3: Uncertainty Reduction Theory Axioms (Berger & Bradac, 1982; Berger & Gudykunst, 1991)

Axiom 1: As verbal communication increases, the level of uncertainty of both parties decreases.
Axiom 2: As nonverbal affiliative expressiveness increases, the level of uncertainty of both parties decreases.
Axiom 3: As the level of uncertainty increases, information-seeking behaviors increases.
Axiom 4: High levels of uncertainty decreases the intimacy level of communication content.
Axiom 5: High levels of uncertainty increases reciprocity.

Axiom 6: Similarities between the two parties decrease uncertainty while dissimilarities increase uncertainty.
Axiom 7: As the level of uncertainty increases, the liking between two parties decreases.
Axiom 8: A shared communication network decreases uncertainty.

The scope of URT was narrow when it was first proposed because it only aimed to explain the initial interactions between strangers. Since its inception, researchers explored the applicability of the theory to more relationships such as romantic relationships (Parks & Adelman, 1983), ongoing relationships (Planalp & Honeycutt, 1985; Knobloch & Solomon, 2002), cross-cultural communication (Gudykunst, 1983; Gudykunst, 1985; Gudykunst, Yang, & Nishida, 1985), organizational communication (Kramer, 1999), and health communication (Brashers, 2007).

Berger and Bradec (1982) deemed that uncertainty comes from three sources: partner uncertainty, self uncertainty, and relationship uncertainty. Partner uncertainty refers to the inability to predict the feelings, attitudes, and behaviors of a person. For example, if a student is in the first class of a new semester and never met the professor before, the student might feel uncertain about the professor. What will be the professor’s style? Is the professor a tough grader? Is the professor more formal or laid-back? Partner uncertainty primarily concerns the uncertainty related to the person an individual is going to interact with (Berger & Bradec, 1982; Berger & Calabrese, 1975).

Self uncertainty represents a person’s inability to describe, explain, and predict how he/she should behave in a context (Berger & Bradec, 1982; Berger & Calabrese, 1975). For example, as a Christian, an individual is invited to visit a Muslim family. However, the individual knows very little about the Muslim culture. In this situation, he/she may feel uncertain

about how to behave and what to say at the Muslim family and want to know if there are any taboos he/she should not discuss.

Relational uncertainty is the third source of uncertainty. It mainly concerns with a lack of confidence to predict and explain issues about a given relationship (Berger & Bradec, 1982; Berger & Calabrese, 1975). One who feels relationally uncertain does not know where the relationship is going. In a romantic relationship, if an individual's boyfriend or girlfriend fails to answer his/her call multiple times. The individual may want to know what happened and feel uncertain where the relationship is going.

Redmond (2015) concluded four guiding principles of URT. First, people's willingness to reduce uncertainty depends on the likelihood of future interactions. An employee wants to increase the predictability of his/her boss's thoughts and behaviors because he/she needs to interact with the boss regularly. However, the employee is less willing to take effort to reduce uncertainty toward a passenger next to him/her on a flight because no further interaction will happen in the future. Second, in an initial interaction, uncertainty increases if one party violates social norms. For example, when someone talks to a new friend, he/she will be more likely to talk about the weather, sports, job, etc. It is not a social norm to reveal more personal information such as family issues and romantic relationship problems. However, if someone keeps talking about these issues, the interactant might feel weird and wonder about the personality of this new friend. Third, uncertainty increases when people violate the expectations we have formed about him/her. For example, an individual's friend is always an optimistic and forward-looking person but one day he/she keeps talking about everything is doomed. The individual will feel there is something wrong with the friend and uncertainty increases accordingly. Last, uncertainty can be reduced through information acquisition. If an individual

does not understand what his/her interactant means, simply asking the meaning of the words or behaviors could remove uncertainty (Redmond, 2015).

### **Problematic integration theory**

Realizing the limitations in URT, Babrow (1992, 1995, 2001, 2007) developed problematic integration theory (PIT) to explain people's reactions in the face of uncertain situations and how communication affects uncertainty. The fundamental argument of PIT is that human beings form two orientations: probabilistic orientation and evaluative orientation (Babrow, 2007). Probabilistic orientations denote "an expectation that associates some object of thought with another object of thought" (Babrow, 2007, p.183). Afifi and Matsunaga (2008) explained the term as one's belief about what the world is or will be. One might ask the question "How likely it will rain tomorrow?" "What is my chance of passing the exam?" "What seems to have caused this?" These questions originate from people's probabilistic orientations. Besides probabilistic orientations, PIT posits that human beings also form evaluative orientations to the world and it is human nature to evaluate whether an issue is good or bad (Babrow, 2007). Evaluative orientations answer the question: "Is this event or outcome good or bad?" Afifi and Matsunaga (2008) compared probabilistic orientations to the hot component of the theory, whereas evaluative orientations to the cold component. Babrow (1992, 1995, 2001, 2007) has argued that both probabilistic orientations and evaluative orientations derive from human nature and arise at the same time. However, they are not merely separate phenomena.

The second proposition of PIT is that probabilistic and evaluative orientations are integrated into human experience. Moreover, the two orientations are interdependent and integrated in a sophisticated way. Probabilistic orientations significantly influence evaluative orientations and vice versa (Babrow, 2007). The third primary claim of PIT is that the integration

process is not smooth but often causes problems. Babrow (1992), in his pioneering study, discussed four types of problem integrations: divergence, ambiguity, ambivalence, and impossibility. Divergence indicates the situations that probabilities and values diverge. For example, sometimes a negative event (evaluative orientations) is likely to happen (probabilistic orientations) to you while a good event is less likely to happen to you, both of which are negative to an individual. When these situations occur, people usually experience negative emotions such as anger, frustration, and disappointment (Babrow, 1992). The second type is ambiguity, which refers to the situation that the probability of something to happen is vague (Babrow, 1992). Ambivalence concerns with the complexity of evaluative orientations. In certain situations, people don't know how to evaluate an event because it involves both potential positive and negative outcomes (Babrow, 1992). The last form of problematic integration is impossibility, which means something is certainly not going to happen. However, the fact of certainty is hard to consume because the entity is valued (Babrow, 1992).

In the later applications, Babrow (2007) noticed the limitations of the four types when explaining uncertainty related to health and illness. He argued uncertainty comes in more different forms than initially conceptualized. Uncertainty is not only about quantitative probability. Sometimes, a probability can be predicted. For example, there is a way to compute the chance of rain tomorrow. However, in many situations, one hopes to know the probability of an event, but there is no way to predict the probability. For example, a high school student wants to know the probability of being accepted by his/her dream college, but there is no way to get an accurate prediction. Moreover, uncertainty, sometimes, cannot be described in the sense of quantitative probability judgment.

Later studies indicated uncertainty has both ontological and epistemological meanings (Babrow, 2001; Babrow, Kasch, & Ford, 1998; Babrow, Hines, & Kasch, 2000). Ontological uncertainty discusses uncertainty related to the nature of the world. Perceived indeterminacy is a representation of ontological uncertainty, which refers to a relationship that the cause of an event cannot be resolved (Babrow, 2001). In contrast, epistemological uncertainty comes with different forms. Babrow (2001) deliberated four variants of epistemological uncertainty: qualities and uses of information, the nature of the association, information processing, and the nature of knowing. Clearly, philosophers have different opinions about the definition of uncertainty and individual differences also exist. Despite the difficulty to find an accurate definition of uncertainty, PIT challenged URT in a variety of ways. First, by listing many different connotations of uncertainty, PIT claims that uncertainty does not have a single and homogeneous meaning. It is not merely an accumulation of probability. Second, unlike URT, PIT holds that uncertainty is not inherently a positive or negative concept. Third, uncertainty is a state which is not caused by a lack of information. Instead, it originates from the problematic integration process. Fourth, since the cause of uncertainty is not a lack of information, the main response to deal with uncertainty is not information seeking. Fifth, since uncertainty is not inherently good or bad, the aim of dealing with it is not to reduce it. Sixth, certainty is not possible; instead, uncertainty is embedded in human nature (Babrow, 2007).

### **Uncertainty management theory**

The idea of uncertainty management emerges from PIT, and the connotation of uncertainty in uncertainty management theory (UMT) is similar to that of PIT. UMT also suggests that uncertainty is a complex concept that does not possess a universal definition. Brashers (2001) argued, “uncertainty is a self-perception about one’s own cognitions or ability to

derive meanings” (p. 478). The argument refutes the traditional wisdom that uncertainty and communication are inseparable. A person is uncertain as long as he believes him to be uncertain even if he has enough information available. Suppose a person has enough information at hand but the information contradicts one another. The more information he/she gets, the more uncertain he/she feels (Brashers, 2001).

UMT is new and unique in the following three ways: First, UMT focuses on the meaning and experience of uncertainty. Second, UMT emphasizes how people emotionally appraise and respond to uncertainty. Third, UMT discusses various communicative and psychological strategies to manage uncertainty (Afifi & Matsunaga, 2008). Since Brashers centers the theory on the experience of HIV patients, UMT significantly contributes to health communication research.

Following the idea of PIT, the fundamental argument of UMT is that uncertainty by itself could be either good or bad. It does not automatically cause anxiety; rather, people will first appraise an uncertain situation. Brashers (2001, 2007) argued that the appraisals of uncertainty mainly focus on three issues: relevancy, congruency, and coping skills. People will first ask the question “Is the event relevant to me?” If the answer is yes, they will continue to ask, “Is the event congruent or incongruent with my goal?” If the answer is still positive, they will keep asking, “What resources are available for coping with the event?” If a person believes the event is relevant and congruent to his/her goal, he/she might form a positive appraisal of uncertainty. If a person thinks the event is relevant and incongruent to his goal, he/she might hold a negative appraisal of uncertainty (Brashers, 2001, 2007). Different appraisals of uncertainty cause different emotions. If a person holds a negative appraisal, negative emotions will occur like anxiety or fear. If a person holds a positive appraisal, positive emotions will occur like hope and

optimism. It is also possible that people show neutral emotions in the face of uncertainty. For example, if a person believes the occurrence of an event is irrelevant to them, they will show neutral emotions, such as indifference (Brashers, 2001, 2007).

When facing different types of uncertainty and emotions, people use different tactics to deal with the feelings. If a person experiences uncertainty in a negative way and feels anxiety, he will take actions to reduce it, which is in line with URT. Information seeking now will be a typical behavior (Brashers, 2007). In the situation where uncertainty is evaluated positively, people want to maintain it. For example, you want to hold some uncertainty about the girl you are dating with if your friends tell you something negative about her. It is common that you may want to intentionally avoid such information (Brashers, 2007). There is another situation that you want to increase uncertainty. Suppose that you have some preliminary symptoms of HIV and you are afraid it is true. You do not like the feeling of certainty that you do have HIV, so you engage in information-seeking behaviors to reduce certainty. In other words, you want to hold some uncertainty to give yourself hope (Brashers, 2007).

### **The Synthesis of Crisis-Induced Uncertainty**

As discussed previous, uncertainty bears different meanings in different theories and disciplines. As such, it is difficult to form a universally accepted definition. Just like crisis communication theories that discuss both organizational strategies and audience, organizational crises normally involve two parties: an organization and its audience. Both parties will generate tremendous amounts of uncertainty during a crisis. An organization might feel uncertain about its stakeholders' reactions and available solving strategies. The stakeholders might feel uncertain about the overall situation and their own safety. This dissertation focuses on uncertainty experienced by an audience, while the discussion of uncertainty associated within organizations

is out of the scope. This study proposes a concept “crisis-induced uncertainty” to refer to uncertainty experienced by stakeholders during a crisis. Drawing from definitions in risk and interpersonal communication, crisis-induced uncertainty in this study is defined as stakeholders’ lack of confidence that their personal well-being and interactions with the organization will be positive in both a short and long term.

In URT, Berger & Bradac (1982) proposed three types of uncertainty: self uncertainty, partner uncertainty, and relationship uncertainty. This dissertation brings this categorization into the crisis context. Self uncertainty here refers to stakeholders’ lack of confidence of how to protect themselves from the harm inflicted by the crisis. No matter the crisis is about food poisoning or data breach, the first reaction of stakeholders is to protect themselves. They are not confident about what they should do to protect themselves from potential harms. This study names this dimension as *protection uncertainty*. This study denotes partner uncertainty as stakeholders’ lack of confidence that the organization is able to properly handle the crisis. During a large-scale crisis like the BP oil spill, stakeholders concern about how the organization involved will address the problem, how long it will take to solve the problem, and to what degree the organization will actively communicate with stakeholders, etc. Generally, stakeholders observe how the crisis evolves and what the organization will do. This study names this dimension as *process uncertainty*. Relational uncertainty represents stakeholders’ lack of confidence that their interaction with the organization can continue. Freeman’s (1984) stakeholder theory explained the role of stakeholders in an organization’s operation. A stakeholder is an important component of public relations practices (Grunig and Repper, 1992). During a crisis, stakeholders might cast doubt on their relationship with the organization, question the ability of the organization to deliver quality services or products, continue making

profits, be a responsible corporate citizen, etc. This study names this dimension as *relationship uncertainty* in crisis communication.

In this definition of crisis-induced uncertainty, there are two features that contradict with traditional wisdom. First, following the discussion of uncertainty in PIT and UMT, this definition does not regard uncertainty as an inherently negative state. This assumption is against the argument in risk communication. As argued by Brashers (2001), uncertainty is a state of human being that cannot be avoided. Therefore, it is unnecessary to reduce uncertainty in every situation. In the crisis context, organizations are required to bring stakeholders' uncertainty back to its pre-crisis level. In most circumstances, this process involves uncertainty reduction because a crisis usually increases uncertainty among stakeholders. Second, simply rendering more information does not guarantee the sound management of uncertainty. This argument complies with Babrow's (2007) idea in PIT. In a complex crisis which is described by technological terms that ordinary people don't understand (e.g. the Boeing 737 Max crisis), more information will only confuse stakeholders even more, especially when the messages are not highly consistent with each other.

This dissertation consulted uncertainty measurement in URT to propose the initial pool of items. The earliest measurement of uncertainty for URT was Uncertainty Evaluation Scale developed by Clatterbuck (1979) which contains seven items. Clatterbuck (1979) defined uncertainty as people's lack of confidence in predicting a partner's attitudes and behaviors. Table 4 provides the scale. Parks and Adelman (1983) proposed an alternative scale to measure uncertainty in romantic relationships but did not change the definition of uncertainty. Table 5 provides the scale.

Table 4: Clatterbuck (1979) Uncertainty Evaluation Scale

How confident are you of your general ability to predict how he/she will behave?
How certain are you that he/she likes you?
How accurate are you at predicting the values he/she holds?
How accurate are you at predicting his/her attitudes?
How well can you predict his/her feelings and emotions?
How much can you empathize with the way he/she feels about himself/herself?
How well do you know him/her?

Table 5: Parks and Adelman's (1983) Uncertainty Scale

I do not know my dating partner very well.
I am confident of my ability to accurately predict my dating partner's behavior.
My dating partner often does or says things which surprise me.
I have a very good idea of what my dating partner's values and preferences are
I often have trouble understanding why my dating partner does what he/she does
I can accurately predict what my dating partner's attitudes are.
I can usually tell what my dating partner is feeling inside.
I can accurately predict how my dating partner will respond to me in most situations.

Knobloch and Solomon (1999) criticized that the previous scales are mainly measuring partner uncertainty while generally neglecting self uncertainty and relational uncertainty dimensions. They developed a comprehensive scale measuring all three dimensions. Self and partner uncertainty each have three components: desire subscale, evaluation subscale, and goals subscale. The two subscales are the same except that the wording is changed to indicate how uncertain you think that your partner feels. Relational uncertainty is further divided into four categories: behavioral norms subscale, mutuality subscale, definition subscale, and future subscale. Table 6 provides the dimensions and items. In testing URT in an online environment, Antheunis, Valkenburg, & Peter (2010) synthesized Clatterbuck's (1979) scale and Kellerman and Reynolds' (1990) scale, proposing a five-item measurement: (1) I can predict very well how this person will behave. (2) I can predict very well the things this person finds important. (3) I

can predict very well this person's attitudes. (4) I can predict very well this person's feelings and emotions. (5) I understand this person well.

Table 6: Knobloch and Solomon's Uncertainty Scale

<b>Self-Uncertainty/Partner Uncertainty Scale</b>
<ul style="list-style-type: none"> <li>• Desire subscale <ul style="list-style-type: none"> <li>○ How certain are you about how committed you are to the relationship?</li> <li>○ How certain are you about your feelings for your partner?</li> <li>○ How certain are you about how much you like your partner?</li> <li>○ How certain are you about how much you want this relationship right now?</li> <li>○ How certain are you about the relationship?</li> <li>○ How certain are you about how much you want to pursue this relationship?</li> <li>○ How certain are you about whether or not you are ready to commit to your partner?</li> <li>○ How certain are you about whether you want a romantic relationship with your partner or to be just friends?</li> </ul> </li> <li>• Evaluation Subscale <ul style="list-style-type: none"> <li>○ How certain are you about how important this relationship is to you?</li> <li>○ How much are you romantically interested in your partner?</li> <li>○ How certain are you about how ready you are to get involved with your partner?</li> <li>○ How certain are you about whether or not you want to maintain your relationship?</li> <li>○ How certain are you about your view of this relationship?</li> </ul> </li> <li>• Goals Subscale <ul style="list-style-type: none"> <li>○ How certain are you about whether or not you want this relationship to work out in the long run?</li> <li>○ How certain are you about whether or not you want this relationship to last?</li> <li>○ How certain are you about whether or not you will want to be with your partner in the long run?</li> <li>○ How certain are you about your goals for the future of the relationship?</li> <li>○ How certain are you about whether or not you want to stay in a relationship with your partner?</li> <li>○ How certain are you about where you want this relationship to go?</li> </ul> </li> </ul>
<b>Relational Uncertainty Scale</b>
<ul style="list-style-type: none"> <li>• Behavioral Norms Subscale <ul style="list-style-type: none"> <li>○ How certain are you about what you can or cannot say to each other in this relationship?</li> <li>○ How certain are you about the boundaries for appropriate and/or inappropriate behavior in this relationship?</li> <li>○ How certain are you about the norms for this relationship?</li> <li>○ How certain are you about how you can or cannot behave around your partner?</li> </ul> </li> <li>• Mutuality Subscale</li> </ul>

○ How certain are you about whether or not you and your partner feel the same way about each other?
○ How certain are you about how you can your partner view this relationship?
○ How certain are you about whether or not your partner likes you as much as you like him or her?
○ How certain are you about the current status of this relationship?
● Definition Subscale
○ How certain are you about the definition of this relationship?
○ How certain are you about how you and your partner would describe this relationship?
○ How certain are you about the state of the relationship at this time?
○ How certain are you about whether or not this is a romantic or platonic relationship?
● Future Subscale
○ Whether or not you and your partner will stay together?
○ How certain are you about the future of the relationship?
○ How certain are you about whether or not this relationship will end soon?
○ How certain are you about where this relationship is going?

Based on the uncertainty measurements from URT above, this dissertation proposed an initial pool of items to measure crisis-induced uncertainty. These items imitated previous measures that are feasible to capture people’s uncertainty toward an organization. Previous measures that could not reflect an organizational aspect were dropped, such as “Whether or not you and your partner will stay together.” As discussed previously, crisis-induced uncertainty is further divided into protection uncertainty, process uncertainty, and relationship uncertainty. Table 7 provides the initial items. The following research question is proposed.

RQ1: What is a reliable and valid scale for crisis-induced uncertainty?

Table 7: Initial Measurement Items for Crisis-Induced Uncertainty

Protection Uncertainty	I will not be affected by the incident.
	I know the way to avoid harm.
	I know the way to protect myself.
	My family will not suffer from the incident.
	I can help myself during the incident.
	The incident will not influence my life.
Process Uncertainty	( ) can fix the problem.

	( ) will handle the incident properly.
	( ) will not make the situation worse.
	( ) has the ability to solve the crisis.
	( ) will do whatever they can to make it right.
	( ) will treat people involved in the incident appropriately.
Relationship Uncertainty	( ) can keep providing quality services/products.
	( ) is a responsible company.
	The brand is a trustworthy name to me.
	( ) has strong leadership.
	I want to use the ( ) product/service in the future.
	I want to maintain a relationship with ( ).

*\*Participants will evaluate these statements on a 7-point Likert scale ranging from 1 (Extremely Uncertain) to 7 (Extremely Certain)*

*\*The company name will appear in the parenthesis in the statement.*

### **Scale Development Procedure**

Without a valid and reliable measure, communication concepts are difficult to investigate, thus making it difficult for theories to progress. Netemeyer, Bearden, and Sharma (2003) put “measurement is at the heart of virtually all scientific endeavors” (p. 1). Despite its importance, no consensus has been reached on the best practices of scaling procedures. Numerous scholars have attempted to propose a standard procedure, but it still varies across textbooks and disciplines (Churchill, 1979; Costello & Osborne, 2005; DeVellis, 2012; Gerbing & Anderson, 1988; Worthington & Whittaker, 2006).

Churchill’s study (1979) is one of the earliest attempts to provide a guideline for scale development. He proposed an eight-step procedure including specify the domain of the construct, generate a sample of items, collect data, purify measure, collect data, assess reliability, assess validity, and develop norms. Gerbing and Anderson (1988) updated Churchill’s paradigm by introducing more rigorous statistical tests. They argued exploratory factor analysis (EFA) and item-total correlations should be used as preliminary steps to modify the scale, and then

confirmatory factor analysis (CFA) must be applied after to assess unidimensionality. Reliability test is the last step to confirm the scale (Gerbing & Anderson, 1988). Netemeyer, Bearden, and Sharma (2003) provided an alternative solution which condenses the process into four steps. First, it is necessary to thoroughly review the literature and come up with a definition of a construct. The second step involves generating measurement items and giving them an initial assessment to confirm face and content validity. The third step asks researchers to test the psychometric properties of a scale, including pilot testing and initial item analyses via EFA and internal consistency. The last step is to finalize the scale through multiple samples. This step also requires empirical tests including EFA, CFA, and internal consistency estimates. DeVellis (2012) introduced a similar eight-step procedure: determine the concept, generate an item pool, determine the format for measurement, let experts revise the item pool, include validation items, administer items to a sample, evaluate the items, and optimize scale length.

This study primarily followed Churchill's (1979) guide while adopting additional recommendations from other best practices articles. The Churchill's guideline was selected because it has been widely cited by landmark scale development studies in public relations (e.g. Huang, 2001; Meng & Berger, 2013). First, a theoretical definition of crisis-induced uncertainty will be proposed based on a thorough review of the literature. Second, the study will generate a pool of items which are adapted from previous studies. The items will be reviewed by experts twice to ensure face and content validity. Third, the study will implement the first round of data collection. Fourth, exploratory factor analysis (EFA) will be applied in this step to purify measures. Fifth, the second round of data will be collected. Sixth, the study will use confirmatory factor analysis (CFA) to check the internal structure of the scale. Reliability will be also examined in this step. Seventh, the study will use the second dataset to evaluate discriminant and

convergent validity. Eighth, the study will have a full discussion of the new scale and provide its implication for future research.

### **Organization-Public Relationships**

The idea that relationship management should be the center of public relations practices and research was first raised by Ferguson (1984). Since then, organization-public relationships (OPR) became a focal concept in public relations literature and gradually formed a theory. Several trend analyses documented that the number of studies focusing on OPR is constantly increasing (Heath, 2001; Ki & Shin, 2006; Pasadeos, Berger, & Renfro, 2010). Sallot et al. (2003) found OPR is the second most examined theory, after excellence theory, in public relations research. The creation of OPR changed how people understand the field because public relations practices were traditionally regarded as communication activities. In the framework of OPR, communication becomes a strategic tool to reach the goal of relationship management (Ledingham & Bruning, 1998).

Despite its popularity, Ki and Shin (2015) acknowledged the lack of a universally accepted definition in research. Scholars broadly discuss and test OPR but there is no consensus on its definition. Huang (1997) defined OPR as “the degree that the organization and its publics trust one another, agree on one has rightful power to influence, experience satisfaction with each other, and commit oneself to one another” (p. 61). Ledingham and Bruning (1998) tentatively defined OPR as “the state which exists between an organization and its key publics in which the actions of either entity impact the economic, social, political and/or cultural well-being of the other entity” (p. 62). Ki and Shin (2015) demonstrated that OPR had been studied from different perspectives such as antecedents, dimensions, and outcomes. When studied as antecedents, scholars attempt to prove that OPR influences consumer-related concepts such as consumer

satisfaction (Bruning & Ledingham, 1998), brand attitude (Kim & Chan-Olmsted, 2005), donor support (O'Neil, 2007), organizational reputation (Yang, 2005), and attitude and behavioral intentions (Ki & Hon, 2007a).

Exploring the dimensions of OPR is another major line of research. Since OPR does not have a commonly accepted definition, its measurements vary according to scholars' perspectives. Ledingham and Bruning (1998) proposed five dimensions including trust, openness, involvement, investment, and commitment. Hon and Grunig (1999) displayed six dimensions: control mutuality, trust, satisfaction, commitment, exchange relationship, and communal relationship. Drawing from eastern culture, Huang (2001) enriched the list and presented five dimensions: control mutuality, trust, relational satisfaction, relational commitment, and favor and face. Ki and Hon (2007b) developed a scale containing four dimensions: control mutuality, satisfaction, trust, and commitment. Besides the measurement for general OPR, scholars have applied the measurements to specific contexts such as manufacturer-retailer relationships (Jo, 2006) and university relationships (Jo, Hon, & Brunner, 2005). Last, OPR has been studied as an outcome. Scholars raised and tested communication strategies to cultivate OPR (Grunig & Huang, 2000; Hon & Grunig, 1999; Ki & Hon, 2008; Seltzer & Zhang, 2010).

Crisis communication has been studied using an OPR perspective (Brown & White, 2010; Haigh & Dardis, 2012; Huang, 2008; Ki & Brown, 2013). From an organization's aspect, OPR aims to build and cultivate a favorable relationship with its key publics and hopes such relationship will further change publics' attitudes and behaviors (Ki & Hon, 2007a). A crisis, as a negative event, hurts such relationship and changes the public's views of the organization. When explaining SCCT, Coombs and Holladay (2001) mentioned that relationship history influences how publics see an organization during a crisis. This dissertation attempts to establish the

relationship between crisis-induced uncertainty and OPR based on two beliefs. First, OPR has a strong connection with interpersonal communication (Ledingham, 2003; Ledingham & Bruning, 1998; Toth, 2000). Crisis-induced uncertainty, as just conceptualized above, originates from interpersonal communication. Second, as found in URT research, reduced uncertainty usually draws more intimate communication content (Berger & Calabrese, 1975). In romantic relationships, people who experienced less uncertainty about their partners received more support from the relationship and communicated more often with their partners. These positive relational outcomes in interpersonal communication can be compared with OPR at an organizational level.

The concept of OPR overall has been examined in the crisis literature. In testing SCCT, Brown and White (2010) found that crisis responsibility has a negative relationship with post-crisis OPR. Further, people with a positive relationship with an organization attribute less crisis responsibility to the organization compared to people having a negative relationship with the organization. To test OPR, this study considers the dimension proposed by Ki and Hon (2007b): control mutuality, satisfaction, trust, and commitment.

### **Control mutuality**

Control mutuality refers to “the degree to which parties agree on who has the rightful power to influence one another” (Ki & Hon, 2007b, p. 422). Ki and Brown (2013) revealed that control mutuality is positively related with crisis responsibility. In other words, the more people blame an organization, the more they believe the organization and themselves could influence each other. The finding failed to support the hypothesis and was counterintuitive. The authors explained that the finding is caused by the setting of the experiment. The crisis scenario was a university crisis and participants are college students. College students may blame a single

university crisis but are more likely to have a positive relationship with the school (Ki & Brown, 2013).

### **Satisfaction**

Satisfaction denotes “the extent to which each party feels favorably toward the other because positive expectations about the relationship are reinforced” (Ki & Hon, 2007b, p. 422). Relational satisfaction has been studied both as an antecedent and an outcome of crisis communication. Kim (2014) evidenced that a prior satisfactory relationship causes a less negative violation valence. Ki and Brown (2013) indicated that increased crisis responsibility causes higher satisfaction during a crisis. In an attempt to articulate the self-mocking strategy in crisis communication, Kim, Zhang, and Zhang (2016) discovered that the self-mocking strategy significantly increases customers’ satisfaction in an Alibaba crisis.

### **Trust**

Trust is conceptualized as “one party’s level of confidence in and willingness to open oneself to the other party” (Ki & Hon, 2007b, p. 422). Huang (2008) investigated the influence of crisis communicative strategies (CCS) and the form of CCS on people’s perceptions of trust. The results showed that individual CCS does not influence people’s feelings; rather, the form of communication, such as timeliness and consistent tones, significantly predicts trust. Scholars explored how the five image repair strategies in IRT impacts people’s perception of OPR. They found that the reduce offensiveness strategy is more effective than the denial strategy in maintaining people’s trust (Haigh & Brubaker, 2010; Haigh & Dardis, 2012). Ki and Brown (2013) demonstrated that there is a positive relationship between crisis responsibility and trust.

### **Commitment**

Commitment means “the extent to which each party believes and feels that the relationship is worth spending energy to maintain and promote” (Ki & Hon, 2007b, p. 423). Huang (2008) observed that the form of communication is more effective in maintaining people’s commitment than crisis response strategies. Haigh and Brubaker (2010) found that people who read the reduce offensiveness statement show higher commitment compared to those who read the evade responsibility statement. The same finding was evidenced by Haigh and Dardis (2012). Ki and Brown (2013) discovered the positive relationship between crisis responsibility and commitment.

As mentioned previously, since uncertainty changes relationships in interpersonal communication research, it makes sense to hypothesize such relationship exists at an organizational level, which was hinted in one study. In routine business settings, Ni and Wang (2011) showed that increased employee uncertainty decreases the degree of control mutuality but does not influence satisfaction. To the best of the researcher’s knowledge, no study has yet investigated how uncertainty alters the relationship between an organization and its publics during a crisis. Although the interpersonal communication literature indicates a negative relationship between uncertainty and relational outcomes, it is premature to conclude such relationship is applicable to crisis communication. Therefore, the following research questions are proposed.

RQ2: What is the association, if any, between stakeholders’ crisis-induced uncertainty and control mutuality during an organizational crisis?

RQ3: What is the association, if any, between stakeholders’ crisis-induced uncertainty and satisfaction during an organizational crisis?

RQ4: What is the association, if any, between stakeholders' crisis-induced uncertainty and trust during an organizational crisis?

RQ5: What is the association, if any, between stakeholders' crisis-induced uncertainty and commitment during an organizational crisis?

### **Information-Seeking Behaviors**

Information seeking is a common human practice due to a lack of information. It begins when someone feels his/her current knowledge is unable to solve a current problem and ends when he/she no longer feels this way (Krikelas, 1983). Myers and Knox (2001) defined information seeking as “the process by which individuals proactively acquire feedback through the use of overt and monitoring strategies to understand, predict, and control their environments; increase task mastery; and reduce role ambiguity” (p. 343). Krikelas (1983) proposed a four-step model to understand the procedure of information seeking: (1) perceive a need, (2) search for information, (3) find the information, and (4) use the information. Early information seeking research explored the behaviors among scholars, and it did not start to investigate common people until the 1980s (Weiler, 2004).

In the interpersonal communication domain, information-seeking behaviors have been studied as an uncertainty reduction strategy. URT presents that increased uncertainty drives information-seeking behaviors. It proposes three types of information-seeking strategies: passive strategies, active strategies, and interactive strategies (Berger & Bradac, 1982; Berger & Kellermann, 1994). Passive strategies refer to observing the interactant from a distance. Active strategies represent that an individual actively obtains information without directly interacting with the target person. One example might be an individual asks the target person's friend for

information. Interactive strategies mean that an individual directly talks with the target person to acquire more information. Health communication visits information seeking as well. Rutten, Squiers, and Hesse (2006) maintain that information-seeking behaviors are critical to cope with cancer disease, reduce stress, and build social support. Brasher, Goldsmith, and Hsieh (2002) demonstrated that information seeking and avoiding can be used to increase or decrease health-related uncertainty.

In crisis communication, information seeking is studied as a behavior after the outbreak of a crisis (Avery, 2010; Kim, 2016; Kim & Niederdeppe, 2013). In line with Krikelas' (1983) argument that information-seeking behaviors arise when knowledge is not enough to solve a problem, a crisis creates a unique situation that stakeholders have a difficult time to interpret the incident. Therefore, stakeholders actively seek information to understand the situation. Austin, et al. (2012) found that social media use increases after a crisis, and people tend to seek more information online when they heard about the crisis online. Similar to URT, crisis communication also connects information-seeking behaviors with uncertainty. Spence, Lachlan, and Burke (2007) proposed that individuals feel a high level of uncertainty after a crisis and the feeling further motivates them to seek information. People attempt to update their knowledge to understand the situation. Kim (2016) contended that communicative behaviors (information seeking and sharing) via social media help people reduce uncertainty, maintain support, and achieve expressive communication goals during a crisis. In a personal interview study, Vigsø and Odén (2016) concluded that people usually ask a question after a crisis: Is this or is this not dangerous? Uncertainty about the potential danger drives their motivation for information seeking. Although various arguments about the relationship between uncertainty and information seeking exist in the crisis literature, there is no empirical evidence so far to facilitate these

opinions. This study, specifically, looks at people's willingness to seek information about a crisis. In order to empirically investigate the relationship between uncertainty and information seeking, the following hypothesis is proposed.

H1: During a crisis, as stakeholders' crisis-induced uncertainty increases, their information-seeking behaviors increase accordingly.

## CHAPTER 3: METHOD

### **Study 1**

Study 1 answered the first research question which explores a valid and reliable measurement for crisis-induced uncertainty. The scale development process generally followed Churchill's (1979) guideline while adding new statistical tests suggested by later statistics papers. Since the construct had already been defined and the initial items had been proposed, the following steps were followed: item evaluations, EFA, CFA, and validity and reliability assessment. As shown in Table 7, the initial crisis-induced uncertainty contained three dimensions and 18 items. Research participants were asked to evaluate the items based on a 7-point Likert scale ranging from 1 (Extremely Uncertain) to 7 (Extremely Certain).

#### **Face and content validity**

After the first step of proposing items, the next step was to evaluate wording clarity, wording redundancy, choice of response format, as well as face and content validity. Netemeyer, et al. (2003) argued that the achievement of good face and content validity not only relies on how accurately a construct is defined, but also how much experts agree on the dimensions and measurement items. They further listed several threats to content validity: (a) items representing dimensions that are not discussed in the construct, (b) items reflecting dimensions outside the construct, and (c) the items are difficult for the target audience. Churchill (1979) stated that organizing a focus group is a tool to evaluate initial items. Using a specific situation or case, researchers could discuss the items with a group of people. Netemeyer et al. (2003)

recommended asking five or more experts to thoroughly evaluate whether items represent the construct.

In study 1, the researcher decided to adopt a two-step procedure to assess the initial dimensions and items. First, a focus group was conducted among five doctoral students with expertise in mass communication. The main purpose was to assess the readability and clarity of the items. Items that did not reflect the dimensions that they were intended to capture were removed, and items that had clarity issues were reworded. Second, the scale was sent to 10 crisis communication scholars and researchers who are familiar with the concept of uncertainty. Using Lawshe's (1975) content validity ratio (CVR) method, experts were first asked to evaluate the necessity of the three dimensions and if the three proposed dimensions reflect the meaning of crisis-induced uncertainty based on three standards, essential, useful but not essential, and not necessary. The ratio was computed by the following formula.  $n$  represents the number of experts indicating that an item (dimension) is essential.  $N$  stands for the number of experts in the panel (Lawshe, 1975). Since 10 experts were invited, the ratio must pass the cutoff of .62 (Lawshe, 1975). Some items did not pass the cutoff and more detailed information will be provided in the result section. The scale was further revised based on the focus group discussion and expert evaluation. Appendix 1 provides the CRV questionnaire.

$$CVR = \frac{n - \frac{N}{2}}{\frac{N}{2}}$$

## **Procedure**

After reaching ideal face and content validity, the study continued to collect data and apply more rigorous statistical analyses to evaluate validity. Two crisis scenarios were adopted to

stimulate research participants: the Facebook data breach in 2018 and the United Airlines passenger removal incident in 2017. The two crises were well-known to the public.

In 2018, it was revealed that Cambridge Analytica, a British political consulting company, had harvested 87 million Facebook profiles around the world. Facebook noticed the company's misconduct back in 2015 but failed to warn its users. Among the 87 million breached data, 70 million users were from the US. Cambridge Analytica used the data to build a program to predict and influence voters. In 2017, several passengers on a United Airlines flight recorded an incident and posted on social media. In the video, a man was dragged down the aisle by security officers and removed from the flight. Later, it was found that United asked passengers to voluntarily give up their seats for compensation in order to make room for four crew members. They randomly removed four passengers when no one volunteered. Three passengers left the flight while one passenger refused to do so, making him forcibly dragged out of the plane.

An online survey was set up via Qualtrics and distributed through Amazon Mechanical Turk (MTurk) after IRB approval. It took participants around 10-15 minutes to finish the survey. Once getting their informed consent, the first question was displayed to the participants, "Which of the following incident are you more familiar with?" Two options were available to them, the Facebook data breach and the United Airlines passenger removal incident. They were directed to a short paragraph describing the Facebook case if they chose the first option. When they chose the second option, the United Airlines story was shown to them. Appendix 2 provides the two statements.

The purpose of setting up two scenarios has two folds. First, participants' familiarity with the crisis should be controlled. A participant who was familiar to the Facebook case might show a different feeling of uncertainty compared to a participant who knew nothing about the crisis.

The researcher asked participants to select the case they knew better in order to make people in that group have relatively similar familiarity. Second, the scale couldn't be generalizable if it was only applied to one scenario. The researcher hoped to validate the scale in two different types of crises and companies. After reading the scenario, all participants were asked to evaluate how uncertain they feel about crisis-induced uncertainty items based on a 7-point Likert scale, ranging from 1 (Strongly Uncertain) to 7 (Strongly Certain).

### **Use of Amazon Mechanical Turk data**

This study used MTurk for data collection in order to get more representative samples because it is believed that MTurk data could be regarded as a representation of US Internet users (Mason & Suri, 2012). Although the use of MTurk data has received some critiques (Goodman, Cryder, & Cheema, 2013), Buhrmester, Kwang, and Gosling (2011) revealed that Mtruk participants are slightly more diverse than other Internet samples and significantly more diverse than student samples. Thus, MTurk can be used to gather high-quality data. In the communication domain, Kees, Berry, Burton, and Sheehan (2017) compared MTurk data with professional panel samples and student samples in an advertising experiment. They found the quality of MTurk data is better than the two sets of professional panel data and as reliable as the two sets of student data (Kees et al., 2017). With all the studies supporting the use of MTurk, the dissertation regards MTurk as a reliable source of high-quality data.

### **Sample 1**

The study implemented data collections twice on MTurk and produced two datasets. For the first rounds of data collection, the study used the scale with 18 items. The researcher applied

EFA to the first sample. The second rounds of data collection repeated the same procedure of the first data collection except that several items were removed in EFA.

Following Kee et al.'s (2017) suggestion, the collection of sample 1 was finished in three days to diversify participants. Each participant was rewarded 50 cents for their work. A total number of 367 participants finished the questionnaire. An attention check question, "In order to prove you are paying attention, please select number 16," was asked at the end of the questionnaire. Nineteen participants failed to pass the attention check question and seven participants did not finish the questionnaire. Therefore, the final sample size was 341 after the removal of the 26 invalid responses. Since the initial scale contained 18 items, the first dataset had a sample-to-item ratio of 18.9. In the sample, the majority of the participants selected the Facebook case ( $n = 265$ ) while 76 participants were more familiar with the United Airlines case. Gender were balanced with male occupying 50.4% ( $n = 172$ ) while 48.4% were female ( $n = 165$ ). The dataset contained 4 missing values and another one participant prefer not to answer the question. The mean age was 31.89 ranging from 18 to 71.

In terms of racial makeup, the majority of participants were Caucasian (42.2%,  $n = 144$ ) and Asian/Pacific Islander (41.6%,  $n = 142$ ), followed by African American (7.6%,  $n = 26$ ), Hispanic/Latino (6.5%,  $n = 22$ ), Native American (1.8%,  $n = 6$ ), and Others (2.6%,  $n = 9$ ). In terms of education, more than half of the participants held a bachelor's degree (59.4%,  $n = 203$ ), followed by a high school diploma (18.7%,  $n = 64$ ), a master's degree (18.4%,  $n = 63$ ), others (1.2%,  $n = 4$ ), a doctorate (.9%,  $n = 3$ ), and less than a high school diploma (.3%,  $n = 1$ ). Regarding income level, 23.7% had an annual household income less than \$25,000 ( $n = 81$ ), followed by \$25,000-\$34,999 (19%,  $n = 65$ ), \$35,000-\$49,999 (18.7%,  $n = 64$ ), \$50,000-\$74,999

(17.3%,  $n = 59$ ), \$75,000-\$99,999 (12.3%,  $n = 42$ ), \$100,000-\$149,999 (5.6%,  $n = 19$ ), and \$150,000 and more (2.3%,  $n = 8$ ).

## **Sample 2**

The second data collection was also finished in three days as well. A total number of 303 participants completed the questionnaire. Six participants failed to pass the attention check question and three more participants did not finish the questionnaire. Therefore, the total valid sample size was 294, and it had a sample-to-item ratio of 24.5. In this sample, 246 participants selected the Facebook case, while only 48 participants selected the United Airlines case. Male occupied 57.5% ( $n = 169$ ) of the sample, while 42.4% were female ( $n = 124$ ). One participant did not reveal the gender information. The mean age was 31.38 years old, ranging from 18 to 70. The majority of participants were Asian/Pacific Islander (46.3%,  $n = 138$ ), followed by Caucasian (38.1%,  $n = 112$ ), African American (7.8%,  $n = 23$ ), Latino/Hispanic (5.4%,  $n = 16$ ), Native American (3.7%,  $n = 11$ ), and Others (5.1%,  $n = 15$ ).

Regarding education, 67% participants held a bachelor's degree ( $n = 197$ ), followed by a master's degree (15%,  $n = 44$ ), a high school diploma (15%,  $n = 44$ ), others (1.7%,  $n = 5$ ), doctorate (1%,  $n = 3$ ), and less than a high school diploma (.3%,  $n = 1$ ). In terms of income level, 26.5% had an annual household between \$50,000 and \$74,999 ( $n = 78$ ), followed by \$25,000-\$34,999 (19.7%,  $n = 58$ ), less than \$25,000 (19%,  $n = 56$ ), \$35,000-\$49,999 (16.3%,  $n = 48$ ), \$75,000-\$99,999 (11.2%,  $n = 33$ ), \$100,000-\$149,999 (5.4%,  $n = 16$ ), and \$150,000 and more (1.7%,  $n = 5$ ).

## **Statistical analysis**

To validate the proposed scale, the researcher performed several statistical analyses, including descriptive statistics, reliability analysis, EFA, and CFA. CFA was executed using AMOS 24, and all other analyses were performed on SPSS 21.

## **Study 2**

The second data collection was performed using a survey to answer RQ2, RQ3, RQ4, RQ5 and test H1 as iterated below. These research questions and hypothesis were analyzed through two research models. Figure 1 and 2 visualize the proposed models.

RQ2: What is the association, if any, between stakeholders' crisis-induced uncertainty and control mutuality during an organizational crisis?

RQ3: What is the association, if any, between stakeholders' crisis-induced uncertainty and satisfaction during an organizational crisis?

RQ4: What is the association, if any, between stakeholders' crisis-induced uncertainty and trust during an organizational crisis?

RQ5: What is the association, if any, between stakeholders' crisis-induced uncertainty and commitment during an organizational crisis?

H1: During a crisis, as stakeholders' crisis-induced uncertainty increases, their information-seeking behaviors increase accordingly.

Figure 1: Research Model 1

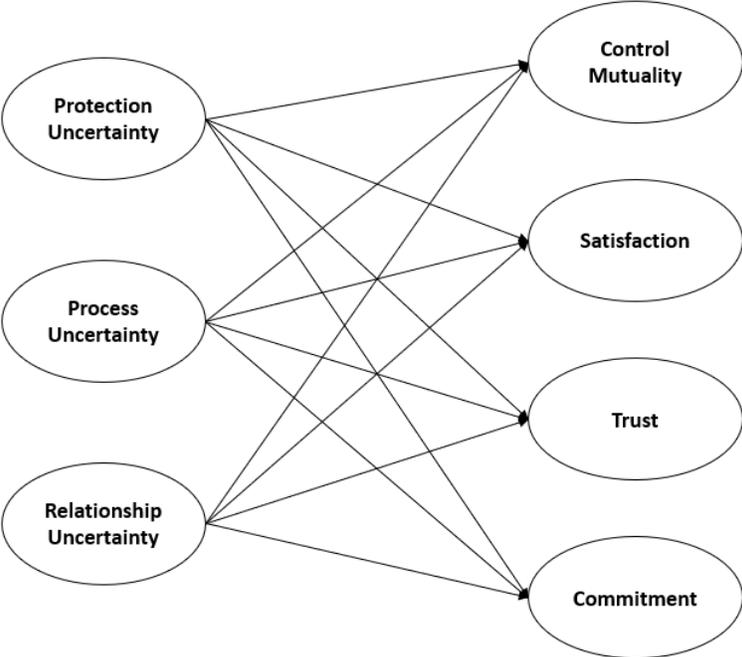
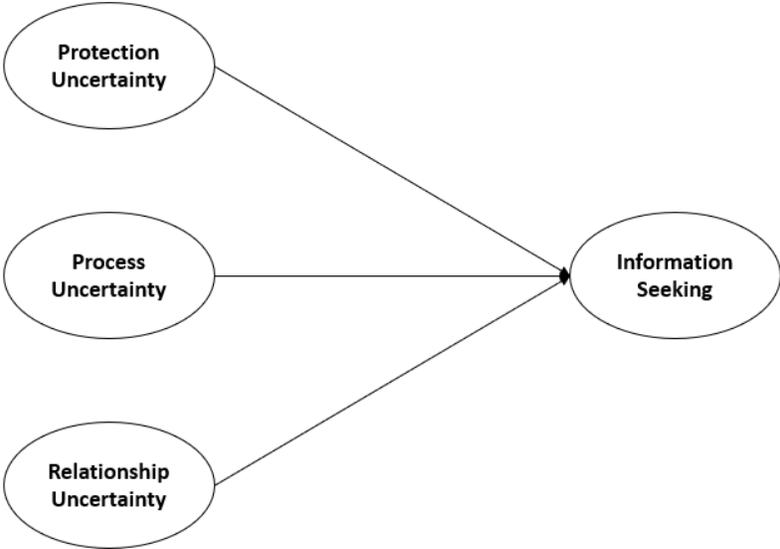


Figure 2: Research Model 2



## **Procedure**

The researcher wrote a news article describing a food poisoning crisis in Georgia. Fifteen people who dined at a local Nothing But Beef restaurant were infected with E. coli virus. All victims were hospitalized and in stable condition. The CDC reported that it is still unclear what caused the E. coli outbreak. Nothing But Beef stated that it is cooperating with the local public health officials to identify the source. Appendix 3 provides the news article. All information appeared in the news article were fictitious, including the crisis, the restaurant, the spokesman's name, and the CEO's name.

The study selected a fictitious crisis and company to exclude subjects' prior knowledge and perceptions about the business. Participants would hold a certain attitude if the study used a real company and crisis. In that situation, the relationship found between crisis-induced uncertainty and organization-public relationships (OPR) would be contaminated by a pre-existing attitude. Right after getting participants' informed consent, they were asked to read the news article. After reading the article, the participants were asked to evaluate their crisis-induced uncertainty based on a 7-point Likert scale, ranging from 1 (Strongly Uncertain) to 7 (Strongly Certain), and OPR and information-seeking behaviors also based on a 7-point Likert scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

## **Sample**

Study 2 recruited a total number of 352 participants from MTurk. Four participants' responses were removed because they failed to pass the attention check question. An additional 24 responses were deleted because their answers were not complete. A number of 324 responses were left for further analysis. In the sample, there were 188 males (58%) and 131 females

(40.4%). Another three participants did not disclose their gender information. The mean age was 37.06 years old, ranging from 18 to 73. Caucasian was the dominant ethnicity (71.9%,  $n = 233$ ), followed by African American (9.6%,  $n = 31$ ), Hispanic/Latino (9.3%,  $n = 30$ ), Asian/Pacific Islander (6.2%,  $n = 20$ ), Native American (4.6%,  $n = 15$ ) and others (.9%,  $n = 3$ ).

About half of the participants had a bachelor's degree (48.8%,  $n = 158$ ), followed by a high school diploma (18.2%,  $n = 59$ ), an associate degree (13.9%,  $n = 45$ ), a master's degree (13.6%,  $n = 44$ ), a doctoral degree (4.3%,  $n = 14$ ), and others (.9%,  $n = 3$ ). One participant did not reveal his/her education information. Regarding the annual household income, about one quarter participants received \$35,000-\$49,000 (23.5%,  $n = 76$ ), followed by \$50,000-\$74,999 (21.6%,  $n = 70$ ), \$25,000-\$34,999 (14.8%,  $n = 48$ ), \$75,000-\$99,999 (14.5%,  $n = 47$ ), less than \$25,000 (13.9%,  $n = 45$ ), \$100,000-\$149,999 (7.7%,  $n = 25$ ), \$150,000 or more (3.7%,  $n = 12$ ).

## **Measurement**

### ***Crisis-induced uncertainty***

Crisis-induced uncertainty was measured by the newly developed scale. Crisis-induced uncertainty was operationalized as people's feeling of uncertainty about the current situation and future relationship with the company. The scale included items, such as "I will not be affected by the incident," and "I want to maintain a relationship with Nothing But Beef." All items were reversely coded after the data collection. A higher score on an item indicated a higher level of uncertainty. EFA and reliability analysis were applied to evaluate the validity and reliability of the scale. For the protection uncertainty subscale, the principal axis factoring extraction method with no rotation was used. Three items loaded on a single factor with factor loadings of .87, .93, and .84, indicating good construct validity. The subscale also reached ideal reliability ( $M = 5.16$ ,

$SD = 1.51, \alpha = .91$ ). For the process uncertainty subscale, the above steps were repeated. Five items loaded on a single factor with factor loadings of .80, .84, .88, .79, and .67, showing good construct validity. The reliability test also proved a good measure ( $M = 4.85, SD = 1.24, \alpha = .90$ ). For the relationship uncertainty subscale, three items loaded on one factor with factor loadings of .73, .93, and .94. The subscale also showed good reliability ( $M = 3.63, SD = 1.59, \alpha = .90$ ).

### **OPR**

The measurement of the four dimensions of OPR was adapted from the scale created by Ki and Hon (2007b). Control mutuality, satisfaction, trust, and commitment were operationalized as people's agreement on the OPR scale. The control mutuality scale contained seven items, such as "The company believes the opinions of members are legitimate." The satisfaction scale contained seven items, such as "Both the company and member benefit from their relationship." The trust scale contained seven items, such as "The company treats members fairly and justly." The commitment scale contained five items, such as "The company is trying to maintain a long-term commitment to members." Table 8 provides the OPR scale. All items were measured on a 7-point Likert scale ranging from "strongly disagree" to "strongly agree."

EFA and reliability analysis were applied to each subscale. For control mutuality, the seven items loaded on two factors. In detail, Item 2, 3, 5 loaded on one factor while the rest four items loaded on the other factor. The researcher conducted EFA on two groups of items and they loaded on only one factor separately. A further examination of factor loadings illustrated that the group with three items had higher factors loadings compared to the other group (.82, .80, .87). Therefore, the researcher decided to remove the four items in the other group. A further reliability analysis showed ideal outcomes ( $M = 4.32, SD = 1.37, \alpha = .87$ ).

For the satisfaction dimension, eight items again loaded on two factors. Four items loaded on one factor and four items loaded on the other factor. Two EFA were applied to the two groups of items and the group with item 1, 3, 5, 7 showed better factor loadings (.70, .83, .81, .81), therefore, item 2, 4, 6, 8 were deleted. The 4-item subscale demonstrated good reliability ( $M = 4.39, SD = 1.21, \alpha = .87$ ).

For the trust subscale, seven items loaded on one factor and only one item loaded on the other factor. Reliability analysis indicated Cronbach's alpha greatly increased if the one item was removed. Therefore, the item was deleted. EFA results showed good factor loadings (.77, .75, .84, .79, .78, .80). The subscale also showed ideal reliability ( $M = 4.56, SD = 1.13, \alpha = .91$ ).

For the last dimension of OPR, the five items loaded on two factors. Two items loaded on the first factor while the rest three loaded on the second factor. For the purpose of reliability, the researcher decided to keep the three-item scale. EFA was applied and factor loadings were ideal (.74, .87, .84). Reliability result was also acceptable ( $M = 4.34, SD = 1.24, \alpha = .85$ ).

Nearly half of the OPR items were deleted to increase validity and reliability. One possible reason was that a lot of items were reversely asked so that participants got confused. After measure purification, the OPR scale had a total number of 16 items (control mutuality: 3; satisfaction: 4; trust: 6; commitment: 3).

Table 8: Organization-Public Relationship Scale

Control Mutuality	( ) believes the opinions of members are legitimate.
	( ) neglects members. I
	When dealing with members, ( ) has a tendency to throw its weight around. I
	( ) really listens to what members have to say.

	( ) seems to ignore members' opinions in the decisions that affect members. I
	When members interact with ( ), member feel that they have some sense of control.
	( ) cooperates with members.
Satisfaction	Both ( ) and member benefit from their relationship.
	Members are dissatisfied with their interaction with ( ). I
	Members are happy with ( ).
	Generally speaking, members are unhappy with the relationship ( ) has established with them.
	Members enjoy dealing with ( ).
	( ) fails to satisfy members' needs. I
	Members feel they are important to the company.
	In general, nothing of value has been accomplished by ( ) for members. I
Trust	( ) treats members fairly and justly.
	Whenever the company makes an important decision, members know ( ) will consider the decision's impact on members.
	( ) can be relied on to keep its promises to members.
	( ) takes the opinions of members into account when making decisions.
	Members feel very confident about ( ) abilities.
	Sound principles guide ( ) behaviors.
	( ) misleads members. I
Commitment	( ) is trying to maintain a long-term commitment to members.
	( ) wants to maintain a positive relationship with members.
	Compared to other companies, members value their relationship with ( ) the most.
	Members would rather work with ( ) than without it.
	Members feel a sense of loyalty to ( ).

*\*The parentheses are replaced with the company name in the statement.*

### ***Information-seeking behaviors***

Information-seeking behaviors scale was adapted from information seeking scale proposed by Kim (2016). The variable was operationalized as people's willingness to find information through different channels. A sample item was displayed here "I am willing to talk to people to see how to protect myself." Table 9 provides the five adapted items. All items were measured based on a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." To ensure validity and reliability of the measure, EFA and reliability analysis were employed.

The five items loaded on a single factor with factor loadings of .65, .82, .85, .76, and .76.

Although the first item had a slightly small loading compared to the standard of .70, it was close to the standard. Therefore, the researcher decided to keep the item. The five-item scale also demonstrated good reliability ( $M = 4.95$ ,  $SD = 1.24$ ,  $\alpha = .88$ ).

Table 9: Information Seeking-Behavior Scale

I am willing to talk to people to see how to protect myself.
I am willing to visit websites relevant to this crisis.
I am willing to check to see if there is any new information about this crisis on the Internet.
I would request information about this crisis.
I actively search for information on this topic.

### **Statistical analysis**

Using AMOS 24, the study employed Structural Equation Modeling (SEM) to test the proposed models. This study followed Anderson and Gerbing's (1988) two-step modeling for model identification. The first step was to respecify the research model as a CFA measurement model. This step aimed to find an adequate measurement model. After achieving an acceptable measurement model, the second step was to test the structural model and compare the model with alternative models. This step would confirm the final model.

## CHAPTER 4: RESULTS

### Study 1

#### Face and content validity

A focus group was conducted among five doctoral students and lasted around 30 minutes. Items that did not reflect the dimensions were removed, and items that had clarity issues were reworded. For example, the fourth item of process uncertainty “( ) puts my interest first” was replaced by “( ) has the ability to solve the crisis.” The fifth item of relationship uncertainty “I want to buy the ( )’s products/services in the future” was reworded as “I want to use ( )’s products/services in the future.”

The researcher sent the revised scale to 10 crisis communication scholars. All scholars indicated that the three proposed dimensions were essential to crisis-induced uncertainty so that the ratio equaled one. Therefore, the three dimensions were confirmed by scholars. Then, experts were further asked to assess if the items under each dimension reflected the dimension that they were intended to measure. In the protection uncertainty dimension, three items did not pass the cutoff, “I know the way to avoid harm,” “I know the way to protect myself,” “I can help myself during the incident.” One of the experts mentioned that “I know” and “I can do” are two different things. Another expert recommended adding statements about how an organization could help protect stakeholders. Therefore, the three statements were reworded as “( ) will provide information to help me avoid harm,” “( ) will help me protect myself,” and “( ) will tell me what to do.” For the process uncertainty dimension, the statement “( ) will not make the

situation worse” did not pass the cutoff. Several experts pointed out this statement is double negative. Therefore, the statement was reworded as “( ) can make the situation better.”

The dimension, relationship uncertainty, reached the least agreement. Four items did not pass the cutoff. Most of the experts questioned if the items really measure relationships. Therefore, the statement “( ) can keep providing quality services/products” was replaced by “I expect the ( ) to keep providing quality services/products.” “( ) is a responsible company” was reworded as “( ) is a responsible company that I can trust.” “The brand is a trustworthy name to me” was substituted by “( ) is a trustworthy brand to build a relationship with.” “( ) has strong leadership” was changed to “I still value my relationship with ( ).” Table 10 provides the scale items after the face and content validity assessment.

Table 10: Measurement Items for Crisis-Induced Uncertainty after Expert Evaluation

Protection Uncertainty	I will not be affected by the incident.
	( ) will provide information to help me avoid harm.
	( ) will help me protect myself.
	My family will not suffer from the incident.
	( ) will tell me what to do.
	The incident will not influence my life.
Process Uncertainty	( ) can fix the problem.
	( ) will handle the incident properly.
	( ) will make the situation better.
	( ) has the ability to solve the crisis.
	( ) will do whatever they can to make it right.
	( ) will treat people involved in the incident appropriately.
Relationship Uncertainty	I expect ( ) to keep providing quality services/products.
	( ) is a responsible company that I can trust.
	( ) is a trustworthy brand to build a relationship with.
	I still value my relationship with ( ).
	I want to use the ( ) products/services in the future.
	I want to maintain a relationship with ( ).

*\*Participants will evaluate these statements on a 7-point Likert scale ranging from 1 (Extremely Uncertain) to 7 (Extremely Certain)*

*\*The company name will appear in the parenthesis in the statement.*

## **Assessing the correlation matrix**

Before running EFA, the factorability of the correlation matrix was first assessed via three tests: (1) Bartlett's Test of Sphericity, (2) Kaiser-Meyer-Olkin (KMO) Test, and (3) Individual Measures of Sampling Adequacy (MSA). EFA would ensue if the Facebook, the United Airlines, and the combined datasets passed the tests.

Bartlett's Test of Sphericity tests the null hypothesis that the correlation matrix is an identity matrix. A larger value indicates a bigger chance that the matrix is not an identity matrix, which rejects the null hypothesis (Bartlett, 1950). For the Facebook case, Bartlett's Test of Sphericity was 4593.96 with a  $p$ -value of .00. For the United Airlines case, Bartlett's Test of Sphericity was 1495.87 with a  $p$ -value of .00. When the two datasets were combined, the overall Bartlett's Test of Sphericity was 6077.31 with a  $p$ -value of .00. Therefore, the scale passed the first test.

KMO test evaluates if a dataset can be used for factor analysis. A value above .8 can be regarded as meritorious and a value above .90 is marvelous (Kaiser, 1974). The Facebook case had a KMO value of .95 and the United Airlines case was .90, indicating a good factorability. When the two datasets were combined, KMO was .96.

MSA represents how strongly an individual item is correlated with other items in a matrix. A value above .70 normally indicates a good factorability (Dziuban & Shirkey, 1974). The MSA ranged from .90 to .97 in the Facebook case, and from .84 to .93 in the United Airlines case. The MSA ranged from .90 to .97 when the two datasets were combined. Therefore, the two cases were ideal for further factor analysis.

## **Exploratory factor analysis**

The first step in conducting EFA is to determine the factor extraction method. Principal component analysis (PCA) and common factor analysis are two popular factor extraction methods. Kline (1994) categorized three sources of variance among items: common variance, specific variance, and error variance during EFA. PCA considers all three variances and assumes all components are orthogonal which means they are not correlated with each other. Common factor analysis differentiates common variance from specific and error variance and assumes factors are correlated with each other (Kline, 1994). This study assumed three types of uncertainty are correlated with each other, thus, this study selected the Principal Axis Factoring (PAF) extraction method, a type of common factor analysis.

The second step is to determine the number of factors to retain. This study considered the following standards to make the decision: (1) eigenvalues larger than 1, (2) scree plot, and (3) scree plot with a parallel analysis (Netemeyer, et al., 2003). For the Facebook dataset, two factors were extracted based on the rule of eigenvalues larger than 1. The first factor accounted for 61.97% of total variance. The second factor accounted for 5.68% of total variance. For the United Airlines dataset, three factors were extracted. The first factor accounted for 61.94% of total variance, the second accounted for 9.15%, and the third accounted for 6.06%. The combined dataset indicated a two-factor solution based on this standard. The first factor accounted for 63.09% of total variance and the second accounted for 8.62%. Nevertheless, this standard received some critiques for its accuracy. Kaiser (1960) suggested this rule applies to PCA, and strictly, not to common factor analysis. Cliff (1988) showed the rule of eigenvalues larger than 1 should be best used as a guide rather than an absolute criterion. Therefore, the scree plots were examined. For the Facebook case, two factors should be retained based on the scree plot. For the United Airlines case, three factors should be retained. The combined dataset

illuminated a two-factor solution as well. However, the interpretation of the scree plots deserves further consideration. The scree plot method is particularly designed for PCA. For common factor analysis, two or more factors near the elbow should be further investigated (Netemeyer, et al., 2003). Thus, the third criterion, scree plot with a parallel analysis were applied. The Facebook data suggested three factors should be retained because the raw data eigenvalues of the first three factors were larger than the random data eigenvalues (O’Connors, 2000). The United Airlines data suggested two factors should be retained. The combined data suggested a four-factor solution based on a parallel analysis. Based on the previous results, the author decided to retain three factors for further interpretation. Table 11 provides the parallel analysis results.

Table 11: Parallel Analysis Results

	Facebook		United Airlines		Combined	
	Raw	Random	Raw	Random	Raw	Random
Factor 1	11.17	.68	10.90	1.41	11.10	.57
Factor 2	.99	.54	1.41	1.18	1.14	.46
Factor 3	.50	.44	.89	.98	.49	.38
Factor 4	.35	.38	.58	.83	.41	.32

The third step in EFA is to decide the factor rotation method. In order to make factors more interpretable and each item has a major loading on only one factor, factors are often rotated after extraction (Netemeyer et al., 2003). Two types of rotation methods are frequently applied: orthogonal and oblique. While orthogonal rotations assume no correlation among factors, oblique rotations assume there is some correlation among two or more factors being rotated. In this study, the three dimensions of uncertainty were related, thus, the oblique rotation method, specifically, Promax, was applied. Regarding item deletion and retention criteria, many scholars recommend different cutoffs (Costello & Osborne, 2005; Hair, Black, Babin, & Anderson, 2010; Netemeyer et al., 2003). However, these criteria are based more on experience than theory. For

example, Netemeyer et al. (2003) advocated keeping items that have loadings greater than .40 but less than .90. Hair et al. (2010) regarded item loadings less than .30 as weak loadings. To encourage parsimony, this study decided to retain items based on three criteria: (1) The item must have a loading of .40 or above on the primary factor. (2) The item must have a loading less than .40 on the secondary factor. (3) the difference in the loadings between the primary factor and the secondary factor must be at least .40. Items that loaded on multiple factors or had small loadings were removed from the scale.

Three rounds of EFA were performed using the Facebook data, the United Airlines data, and the combined data. Item 2, 3, 5 under protection uncertainty dimension produced mixed loadings that are hard to interpret. Item 1, 2, 3 under relationship uncertainty dimension seriously loaded on multiple factors. Therefore, the six items were deleted. Table 12 provides the factor loadings across the three datasets.

Table 12: Principal Axis Factoring with Promax Rotation Factor Loadings

	Facebook			United Airlines			Combined		
	1	2	3	1	2	3	1	2	3
I will not be affected by the incident.	.02	-.12	<b>.70</b>	.01	-.02	<b>.90</b>	.04	-.09	<b>.72</b>
( ) will provide information to help me avoid harm.	.43	.17	.33	.09	<b>.80</b>	.06	.56	.15	.23
( ) will help me protect myself.	.45	.20	.31	-.01	<b>.97</b>	-.05	.61	.17	.23
My family will not suffer from the incident.	-.08	.09	<b>.84</b>	.02	.06	<b>.71</b>	-.00	.06	<b>.80</b>
( ) will tell me what to do.	.49	.11	.27	-.10	<b>.82</b>	-.02	<b>.63</b>	.05	.14
The incident will not influence my life.	.00	.02	<b>.72</b>	-.08	-.03	<b>.97</b>	-.02	.05	<b>.78</b>
( ) can fix the problem.	<b>.93</b>	-.17	.11	.29	.39	.10	<b>.93</b>	-.16	.06
( ) will handle the incident properly.	<b>.85</b>	-.02	.06	.11	<b>.80</b>	.02	<b>.91</b>	-.03	.00
( ) will make the situation better.	<b>.74</b>	.13	.07	.30	<b>.65</b>	-.01	<b>.82</b>	.10	.01

( ) has the ability to solve the crisis.	<b>.72</b>	-.02	-.03	<b>.51</b>	.09	-.07	<b>.61</b>	-.01	.04
( ) will do whatever they can to make it right.	<b>.82</b>	.13	-.09	<b>.68</b>	.19	.05	<b>.76</b>	.20	-.09
( ) will treat people involved in the incident appropriately.	<b>.83</b>	.16	-.12	<b>.70</b>	.19	-.01	<b>.73</b>	.26	-.11
I expect ( ) to keep providing quality services/products.	.52	.47	-.15	<b>.87</b>	-.12	.07	.44	.47	-.07
( ) is a responsible company that I can trust.	.51	.46	-.05	<b>.92</b>	-.03	.08	.47	.49	-.03
( ) is a trustworthy brand to build a relationship with.	.43	.51	-.02	<b>.87</b>	.05	.03	.40	.55	-.02
I still value my relationship with ( ).	.23	<b>.66</b>	-.00	<b>.73</b>	.16	.09	.24	<b>.64</b>	.06
I want to use the ( ) products/services in the future.	-.09	<b>.97</b>	-.01	<b>.99</b>	-.07	-.08	-.09	<b>.98</b>	.00
I want to maintain a relationship with ( ).	-.09	<b>.91</b>	.07	<b>.91</b>	.00	-.12	.07	<b>.95</b>	.03

The researcher conducted EFA one more time using the combined dataset after excluding the six items. The factor structure greatly improved this time. All items had a high loading on only one factor except item 4 in relationship uncertainty, “I still value my relationship with ( ).” Although the loading met the first two item retention standards, the loading on the primary factor larger than .40 and on the secondary factor smaller than .40, it failed to meet the third standard which indicates the difference between the two must be larger than .40. Pett, Lackey, and Sullivan (2003) suggested researchers should not only consider factor loadings when they decide which item to delete. Problematic items should be closely examined to see their relevance to the overall construct. If researchers feel the problematic items significantly contribute to the measure of the construct, these items could be retained for further analysis (Pett, et al., 2003). Despite a potential cross-loading issue, the researcher decided to keep this item. If CFA indicated a similar

problem, this item would be further analyzed. The 12-item scale was used for the second round of data collection. Table 13 provides the final factor loadings for the 12-item scale.

Table 13: Final EFA Loadings Using the Combined Dataset

	1	2	3
I will not be affected by the incident.	.04	-.09	<b>.72</b>
My family will not suffer from the incident.	.01	.05	<b>.78</b>
The incident will not influence my life.	-.02	.06	<b>.80</b>
( ) can fix the problem.	<b>.91</b>	-.18	.11
( ) will handle the incident properly.	<b>.81</b>	.05	.04
( ) will make the situation better.	<b>.80</b>	.10	.04
( ) has the ability to solve the crisis.	<b>.66</b>	.01	-.01
( ) will do whatever they can to make it right.	<b>.79</b>	.15	-.06
( ) will treat people involved in the incident appropriately.	<b>.75</b>	.21	-.08
I still value my relationship with ( ).	.35	<b>.53</b>	.07
I want to use the ( ) products/services in the future.	.01	<b>.93</b>	-.02
I want to maintain a relationship with ( ).	.00	<b>.92</b>	.01

### Confirmatory factor analysis

The factor structure yielded from EFA further went through more rigorous CFA. The second dataset with 294 participants was employed to complete CFA. Unlike EFA, the researcher decided to conduct CFA only based on the combined dataset and the Facebook dataset because the sample size of the United Airlines dataset was too small ( $n = 48$ ) to perform CFA.

Many different fit indices were reported in previous scale development studies in crisis communication research, including chi-square, RMSEA, SRMR, GFI, IFI, CFI, NNFI, AIC, and BIC (Brown & Ki, 2013; Jin, et al., 2014; Zhou, Ki, & Brown, 2019). The model fit depends on the evaluation of multiple indices rather than only one or two fit statistics. Kline (2015) suggested that researchers should report at least four statistics: (a) Chi-square with its degrees of freedom and  $p$ -value, (b) RMSEA and its 90% confidence interval, (c) CFI, and (d) SRMR.

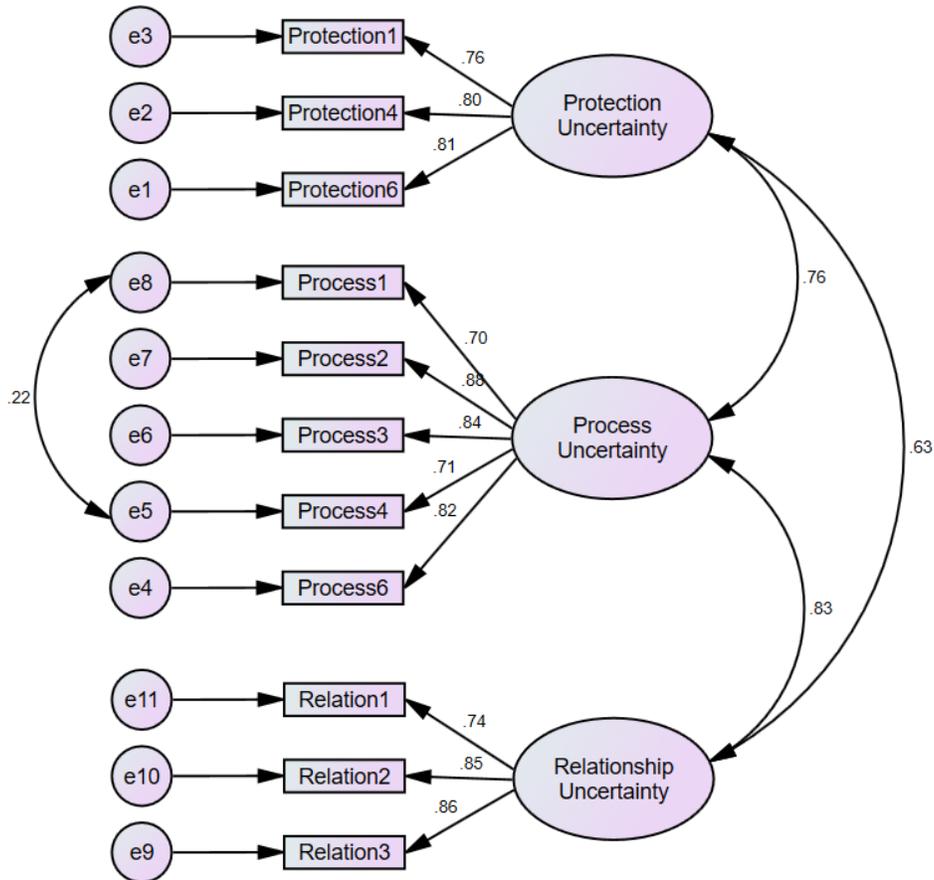
Scholars proposed different standards for the goodness of fit. Hu and Bentler (1999)

recommended that the values of TLI, CFI, and NFI should be approximately .95. SRMR should be lower than .08, and RMSEA should be lower than .06. MacCallum, Browne, and Sugawara (1996) used .01, .05, and .08 RMSEA to represent an excellent, good, and mediocre fit. Model chi-square is sensitive to sample size. A larger sample size normally induces a sample  $p$ -value. Thus, Wheaton, Muthen, Alwin, & Summers (1977) proposed reporting chi-square/ $df$  rather than only chi-square. This study reported Chi-square with degrees of freedom and  $p$ -value, Chi-square/ $df$ , RMSEA with 90% confidence interval, CFI, and SRMR. The goodness of fit followed these standards: Chi-square/ $df$  lower than 5, RMSEA lower than .06, SRMR lower than .08, and CFI greater than .95.

The first round of CFA was conducted on the combined dataset. The initial three-factor correlated model did not show an ideal model,  $\chi^2 = 119.251$ ,  $df = 51$ ,  $p < .05$ ,  $\chi^2/df = 2.338$ ; RMSEA = .068 [90%CI = .052, .083]; SRMR = .040; CFI = .970. A further investigation of the modification indices ( $< 10$ ) and standardized residual covariances ( $< 2.58$ ) revealed a large covariance among the error terms related to the fifth item under process uncertainty (Byrne, 2001). Modification indices also suggested a covariance between the error terms of two items under relationship uncertainty. Therefore, the researcher decided to remove the second item under process uncertainty and let the two error terms covary. Although the use of modification indices and standardized residual covariances are questioned by some researchers, they are frequently used in the crisis communication scholarship to increase fit statistics (e.g. Brown & Ki, 2013; Jin et al., 2010). Bentler (2010) maintained that modification indices are useful, if not necessary, to indicate in which way the model can be improved. The model was re-estimated after a revision. The re-estimated model reached a better and ideal fit,  $\chi^2 = 75.356$ ,  $df = 40$ ,  $p < .05$ ,  $\chi^2/df = 1.884$ ; RMSEA = .055 [90%CI = .035, .074]; SRMR = .034; CFI = .982. Although

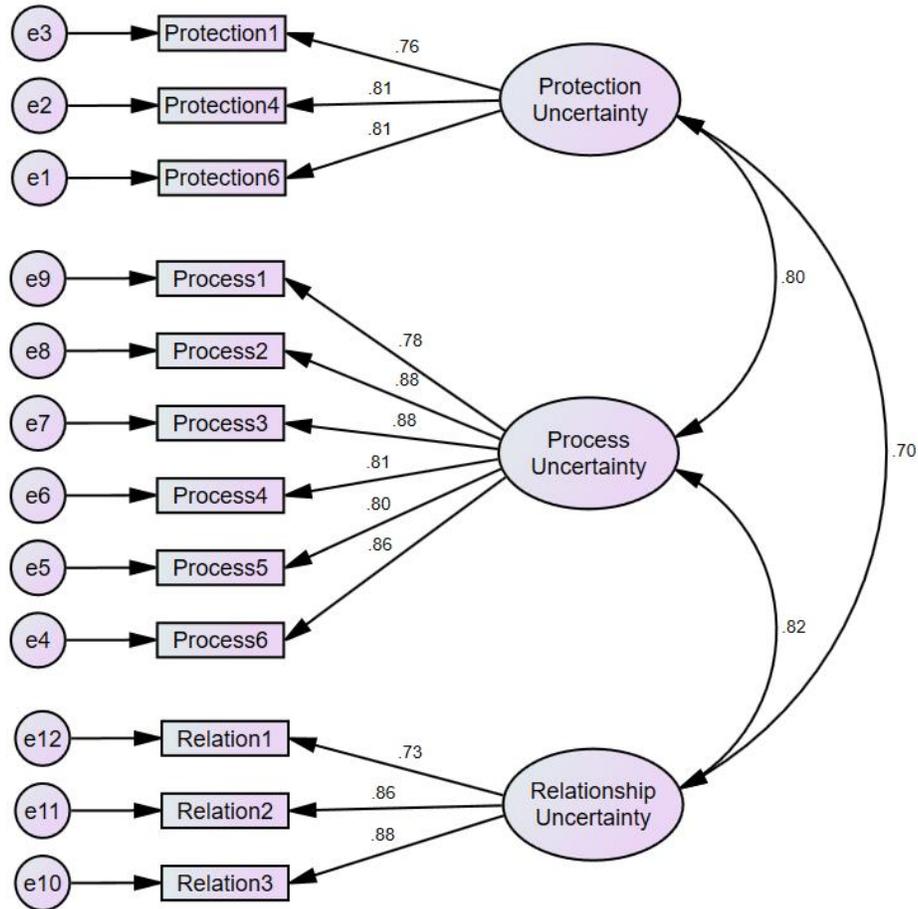
the upper bound of RMSEA was still slightly larger than the cutoff, considering other fit statistics, this model fitted the data. The first round of CFA produced a three-factor model with 11 measurement items. Figure 3 provides the CFA model based on the combined dataset.

Figure 3: CFA Model Based on The Combined Dataset



The researcher continued to run CFA based on the Facebook dataset. The preliminary three-factor model showed acceptable fit statistics,  $\chi^2 = 79.764$ ,  $df = 51$ ,  $p < .05$ ,  $\chi^2/df = 1.564$ ; RMSEA = .048 [90%CI = .026, .068]; SRMR = .036; CFI = .987. There were no surprising large modification indices and standard residual covariances did not show any large values as well. Thus, the second round of CFA produced a 12-item scale. Figure 4 provides the CFA model based on the Facebook dataset.

Figure 4: CFA Model Based on The Facebook Dataset



After CFA, parameter estimates were evaluated to further confirm the structure.

Parameters that did not load significantly on their intended factors should be removed. Bagozzi and Yi (1998) proposed that there should be no loadings too small ( $< .5$ ) or too large ( $> .95$ ). An extremely high loading usually indicates item wording redundancy. The loadings of both models ranged from .70 to .90. To encourage parsimony, the researcher selected the model achieved based on the combined dataset with 11-items.

### Convergent and discriminant validity

This study continued to assess the convergent and discriminant validity based on the combined dataset after achieving the ideal factor structure. To achieve good convergent validity, Fornell and Larcker (1981) suggested the average variance extracted (AVE) should be .50 or above. Through calculation, the scores of AVE passed the cutoff, indicating good convergent validity. To assess discriminant validity, Fornell and Larcker (1981) recommended that the AVE of each dimension should be larger than the squared inter-dimension correlations. The results showed the AVE of each dimension was larger than the squared inter-dimension correlation, demonstrating ideal discriminant validity. Table 14 provides the comparison.

Table 14: AVE and Shared Variance Estimates

	Protection Uncertainty	Process Uncertainty	Relationship Uncertainty
Protection Uncertainty	.62	.42	.30
Process Uncertainty	.65	.63	.56
Relationship Uncertainty	.54	.75	.67

*Note: Correlations are below the diagonal, squared correlations are above the diagonal, and AVEs are on the diagonal.*

### **Reliability**

The study calculated Cronbach’s alpha and composite reliability to evaluate the reliability of the scale. To achieve good reliability, Fornell and Larcker (1981) suggested the composite reliability should be at least .70. Nunnally (1978) recommended the Cronbach’s alpha should also be at least .70. The results showed the scale passed both tests, indicating good reliability. Table 15 provides descriptive statistics, Cronbach’s alpha, and composite reliability. Therefore, through rigorous testing, this study confirmed a three-dimension scale with 11 items to measure crisis-induced uncertainty. Table 16 provides the final scale.

Table 15: Descriptive Statistics, Cronbach’s Alpha, and Composite Reliability

	<i>M</i>	<i>SD</i>	<i>α</i>	<i>CR</i>
Protection Uncertainty	4.67	1.37	.83	.83
Process Uncertainty	4.57	1.38	.90	.89
Relationship Uncertainty	4.59	1.43	.85	.86

Table 16: The Final Scale

Protection Uncertainty	I will not be affected by the incident.
	My family will not suffer from the incident.
	The incident will not influence my life.
Process Uncertainty	( ) can fix the problem.
	( ) will handle the incident properly.
	( ) will make the situation better.
	( ) has the ability to solve the crisis.
	( ) will treat people involved in the incident appropriately.
Relationship Uncertainty	I still value my relationship with ( ).
	I want to use the ( ) products/services in the future.
	I want to maintain a relationship with ( ).

## Study 2

### Model 1

The study employed SEM to test the two proposed models. Before testing the structural model, the study first evaluated the fit of the measurement model. CFA was first conducted based on a seven-factor model (Uncertainty: three factors; OPR: four factors) with all 27 items. The fit of this model was a little problematic ( $RMSEA > .06$ ;  $CFI < .95$ ). A further examination of modification indices and standardized residual covariances indicated that the error covariance between item 1 and item 4 and between item 1 and item 5 under process uncertainty should be allowed. The researcher also allowed item 2 and item 4 under trust to covary. The first item under satisfaction caused large modification indices ( $< 10$ ) so that this item was removed. CFA

was conducted on the revised model, which showed a slight improvement and generally could be regarded as a good measurement model.

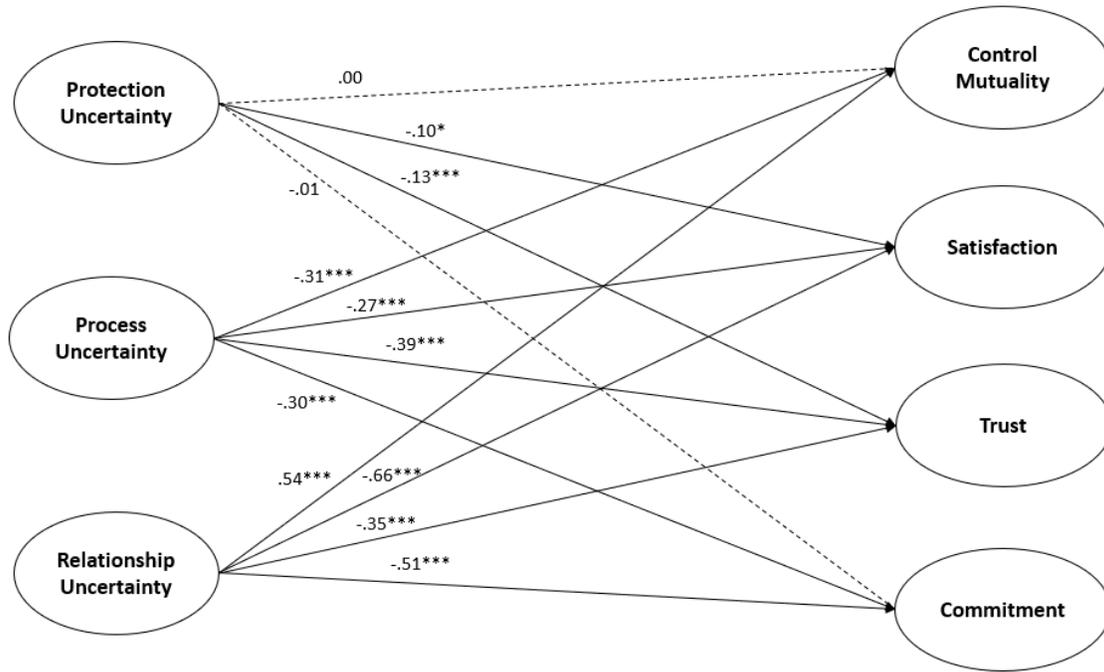
Table 17: Fit Statistics of The Measurement Model 1

Model	$\chi^2$	<i>df</i>	<i>p</i>	$\chi^2/df$	RMSEA	SRMR	CFI
Seven Factor	710.396	303	.000	2.345	.065	.054	.937
Seven Factor (R)	591.123	275	.000	2.150	.060	.049	.949

A SEM analysis was applied to evaluate the structural model. The results reached ideal fit indices,  $\chi^2 = 591.123$ ,  $df = 275$ ,  $p < .05$ ,  $\chi^2/df = 2.150$ ; RMSEA = .060 [90%CI = .053, .066]; SRMR = .049; CFI = .949. Figure 5 provides the estimated standardized effects from the three uncertainty factors to the four OPR factors. RQ2 to RQ5 questioned if crisis-induced uncertainty influences the four dimensions of OPR. The structural model indicated that there was a significant negative relationship between protection uncertainty and satisfaction ( $b = -.10$ ; SE = .04; CR = -2.25;  $p < .05$ ), and between protection uncertainty and trust ( $b = -.13$ ; SE = .03; CR = -3.97;  $p < .001$ ). Protection did not significantly influence control mutuality and commitment. Process uncertainty had a significant negative influence on every dimension of OPR (Control Mutuality:  $b = -.31$ ; SE = .08; CR = -3.91;  $p < .001$ ; Satisfaction:  $b = -.27$ ; SE = .06; CR = -4.31;  $p < .001$ ; Trust:  $b = -.39$ ; SE = .05; CR = -7.74;  $p < .001$ ; Commitment:  $b = -.30$ ; SE = .06; CR = -5.18,  $p < .001$ ). Relationship uncertainty had a significant negative impact on satisfaction ( $b = -.66$ ; SE = .07; CR = -9.45,  $p < .001$ ), trust ( $b = -.35$ ; SE = .05; CR = -7.39,  $p < .001$ ), and commitment ( $b = -.51$ ; SE = .06; CR = -8.13,  $p < .001$ ). Interestingly, relationship uncertainty produced a significant positive effect on control mutuality ( $b = .54$ ; SE = .08; CR = 6.75,  $p < .001$ ). The square multiple correlations demonstrated crisis-induced uncertainty explained 20%

variance in control mutuality, 58% variance in satisfaction, 63% variance in trust, and 52% variance in commitment.

Figure 5: The Standardized Coefficients for Model 1



Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; Solid lines indicate significant effects; Dotted lines indicate non-significant effects.

## Model 2

After confirming the first model, the study continued to test the measurement model of the second model. CFA was executed on a four-factor model with 16 items (Uncertainty: three factors; Information Seeking: one factor). The initial model did not fit the data (RMSEA  $> .06$ ; CFI  $< .95$ ). Based on modification indices and standardized residual covariances, the researcher let the error terms of item 1 and 4 under process uncertainty covary. The fourth item under

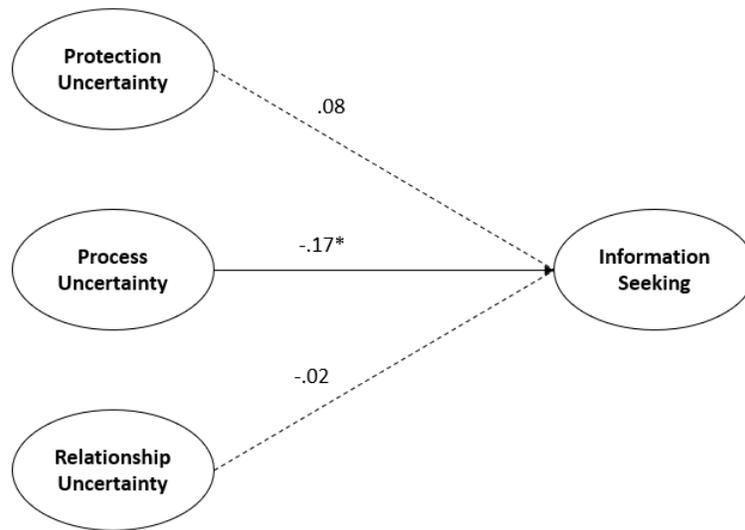
information-seeking behaviors caused surprisingly large residual covariances (< 2.58), thus, the item was removed. CFA was applied to the new measurement model, and the model showed better fit statistics. Although RMSEA was still slightly larger than the cutoff, considering other reported parameters, the measurement model was generally acceptable.

Table 18: Fit Statistics of The Measurement Model 2

Model	$\chi^2$	<i>df</i>	<i>p</i>	$\chi^2/df$	RMSEA	SRMR	CFI
Four Factors	330.745	98	.000	3.375	.086	.061	.931
Four Factors (R)	221.696	83	.000	2.671	.072	.055	.955

After achieving an adequate measurement model, an SEM analysis was conducted based on the structural model. The fit statistics indicated the model was acceptable,  $\chi^2 = 221.696$ , *df* = 83, *p* < .05,  $\chi^2/df = 2.671$ ; RMSEA = .072 [90%<sub>CI</sub> = .061, .072]; SRMR = .055; CFI = .955. Though RMSEA was a little large again, considering overall fit statistics, the structural model was acceptable. Figure 6 provides the estimated standardized effects from the three uncertainty factors to information-seeking behaviors. H1 predicted that crisis-induced uncertainty influences people’s information-seeking behaviors. In this analysis, only process uncertainty exerted a significant influence on information-seeking behaviors (*b* = -.17; SE = .08; CR = -2.01, *p* < .05). The other two dimensions of crisis-induced uncertainty did not influence information-seeking behaviors during the crisis. Therefore, **H1 was not supported**. The multiple squared correlations illustrated that crisis-induced uncertainty explained 3% of the variance in information-seeking behaviors.

Figure 6: The Standardized Coefficients for Model 2



*Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; Solid lines indicate significant effects; Dotted lines indicate non-significant effects.*

## CHAPTER 5: DISCUSSION

The dissertation fulfilled three general purposes. First, it conceptualized crisis-induced uncertainty. Second, based on the definition, it created a valid and reliable instrument to measure the construct. Third, using the new construct, it tested the relationship between crisis-induced uncertainty and organization-public relationships (OPR), and between crisis-induced uncertainty and information-seeking behaviors. The dissertation was meaningful because it is the first study to define uncertainty and operationalize the construct in the crisis context. Although uncertainty was a frequently discussed variable in the crisis communication literature, its empirical examination was scarce. The dissertation found a link between crisis-induced uncertainty and OPR, demonstrating the value of uncertainty in crisis communication.

The discussion chapter is divided into four parts. The first part will discuss the results yielded from Study 1 and Study 2. The second part includes the discussion about theoretical and practical implications. In the third section, some limitations will be pointed out along with future research directions. This chapter ends with a short conclusion that iterates the importance of this study.

### **Summary of Results**

RQ1 inquired what a valid and reliable scale was to measure crisis-induced uncertainty. Following Churchill's (1979) scale development steps, the study proposed three dimensions:

protection uncertainty, process uncertainty, and relationship uncertainty. The scale was first reviewed and discussed by a group of doctoral students in the field of communication and then reviewed by some crisis communication experts to check face and content validity. The initial scale was revised at this stage. The polished scale was further validated quantitatively using EFA and CFA and achieved ideal construct validity. In the end, convergent validity, discriminant validity, and reliability were assessed to confirm the final scale. The validation procedure yielded a three-dimensional scale with 11 items.

The researcher proposed three dimensions to measure crisis-induced uncertainty. The multiple steps of analyses confirmed the three underlying dimensions—protection uncertainty, process uncertainty, relationship uncertainty—as a reliable and valid measure of crisis-induced uncertainty as proposed. With three measurement items, the first dimension, protection uncertainty, deals with stakeholders' lack of confidence that they can protect themselves from the crisis. Measured with five items, the second dimension, process uncertainty, explains stakeholders' lack of confidence that the organization can properly handle the crisis. The last dimensions, relationship uncertainty, denotes stakeholders' lack of confidence that they still hope to maintain a relationship with the organization and was measured by three items. The three dimensions imitated Knobloch and Solomon's (1999) scale to measure uncertainty in URT and clarified the question “when people feel uncertain, what do they feel uncertain about?”

RQ2 investigated if crisis-induced uncertainty affects control mutuality during a crisis. Control mutuality is the most interesting OPR variable because protection uncertainty did not influence control mutuality while relationship uncertainty had a positive impact on control mutuality. In other words, as people feel more uncertain about their relationship with an organization, they believe both parties have more rightful power to influence each other. This is

clearly inconsistent with other OPR dimensions and it is common to witness such inconsistency. For example, when exploring how a crisis changes OPR, Ki and Brown (2013) demonstrated that there is a significant difference in every dimension of OPR before and after a crisis except control mutuality. That is, control mutuality seems to be more stable during the time of crisis compared to the other three relationship dimensions, satisfaction, trust, and commitment. One possible explanation is that the four OPR dimensions are not on the same level and simply parallel. It is possible that control mutuality mediates or moderates the relationship between crisis-induced uncertainty and other three OPR dimensions. Ki and Hon (2007a) discussed and tested the hierarchy among the four dimensions of OPR. They argued the four dimensions are not solely parallel and some factors might be the antecedents of other factors. Thus, control mutuality deserves further examination by OPR researchers to see if it truly fits in the framework.

RQ3 examined the influence of crisis-induced uncertainty on satisfaction. All three dimensions of crisis-induced uncertainty exerted a significant negative influence on satisfaction. In detail, as people feel more uncertain about their self-protection, the organization's ability to handle the crisis, and whether they want to maintain a relationship with the organization, they feel less satisfaction toward an organization. The three dimensions of crisis-induced uncertainty together explained 58% variance in satisfaction. This finding is lined with the ones at an interpersonal level. For example, Neuliep & Grohskopf (2000) revealed that uncertainty significantly and negatively influences communication satisfaction. In the context of friendship, Forsythe and Ledbetter (2015) discovered that relationship uncertainty significantly reduces communication satisfaction between friends. This study recommended that organizations should use uncertainty reduction strategies to maintain stakeholders' satisfaction during a crisis.

RQ4 scrutinized if crisis-induced uncertainty impacts on trust. Similar to the relationship between crisis-induced uncertainty and satisfaction, all dimensions of crisis-induced uncertainty had a significant negative influence on trust. Precisely, when people feel uncertain about protecting themselves, an organization's ability to solve the crisis, and maintaining the relationship with the organization, they are less willing to open themselves to the organization. The three factors together explained 63% variance in trust. This finding resembles what has been uncovered in interpersonal communication. Dainton and Aylor (2001) explored the role of uncertainty in long-distance relationships and found that relational uncertainty is negatively correlated with trust. Liu et al. (2016) argued uncertainty and trust intertwine in two ways. One is that publics' trust in the communicator influences publics' acceptance of uncertainty. The other lies in the communicator's acceptance of uncertainty influences publics' trust in the communicator. Either way, uncertainty and trust have a strong association.

RQ5 analyzed the influence of crisis-induced uncertainty on the last dimension of OPR, commitment. While no relationship was found between protection uncertainty and commitment, the other two dimension of crisis-induced uncertainty, process uncertainty and relationship uncertainty, significantly predicted commitment. In detail, as people feel more uncertain about an organization's ability to solve the problem and maintaining a relationship with the organization, they are less likely to sustain a long-term the relationship with the organization. This finding is also consistent with the tenets in URT. In exploring on-again/off-again (on-off) relationships, Dailey, Hampel, and Roberts (2010) found that uncertainty between partners in a romantic relationship had a significant negative effect on commitment. A similar finding was reported in a later study that commitment mediates the relationship between relational

uncertainty and relationship quality in a romantic relationship (Weigel, Brown, & O’Riordan, 2011).

H1 predicted that crisis-induced uncertainty positively influences information-seeking behaviors. This hypothesis was not supported because protection uncertainty and relationship uncertainty did not significantly affect information-seeking behaviors. Although the influence of process uncertainty on information-seeking behaviors was significant, process uncertainty, counterintuitively, negatively affected information seeking. That is, as people feel more uncertain about an organization’s ability to solve the problem, their information seeking decreases. The finding refutes what has been revealed in the interpersonal communication literature. One possible explanation is that participants’ involvement moderates the relationship between crisis-induced uncertainty and information-seeking behaviors. Crisis scholars have emphasized the importance of involvement in crisis management. Claeys and Cauberghe (2014) noted that participants’ involvement could change the effectiveness of crisis response strategies. It moderated the relationship between crisis response strategies and post-crisis attitude toward the company. McDonald, Sparks, and Glendon (2010) pointed out that crisis involvement is a strong predictor of people’s emotions such as anger, fear, and sympathy. The non-significant effect of uncertainty could be caused by involvement. This study used a fictitious restaurant and a fictitious crisis to stimulate participants, and it might make them feel this crisis is irrelevant and show indifference. A different pattern might be uncovered if a real crisis that significantly impacts them was used. Another possible explanation is that the two concepts were measured at different levels. Information seeking explains an individual’s behaviors while crisis-induced uncertainty concerns the interaction between stakeholders and an organization.

### **Theoretical and Practical Implications**

## **Enrichment to ethical communication**

This study corresponds to the advocacy of ethical communication in public relations. Ethics has long been regarded as an important issue, if not the most important issue, in public relations education. Through surveying more than 200 public relations professors, Erzikova (2010) stressed ethics education is an essential part to prepare future public relations practitioners. Most teachers regard developing socially responsible professionals as the highest goal of ethics education. In research, public relations theorists also add the ethical element to current theories. For example, Kent and Taylor (2002) argued that dialogue is one of the most ethical forms of communication so that practitioners should engage the public in dialogue in practice. Grunig (2000) claimed that ethics and social responsibility are two critical components of public relations practices.

As one of the most heavily researched areas in public relations, crisis communication also maintains a high ethical standard and requires practitioners to ethically communicate. Despite its importance, current crisis communication theories do not reflect this important component. Early theories such as corporate apologia and IRT only consider crisis response strategies without discussing ethical issues. Although SCCT states that response messages should be provided based on ethical consideration, claiming adjusting and instructing information should be provided at the beginning of crisis communication, it does not explicate how the two types of information are ethical. More importantly, the entire theory builds on attribution theory so it does not center around the protection of stakeholders. The core of the theory lies in responsibility avoidance and reputation maintenance, which does not echo ethical communication. Practitioners who consult the theory still don't know how to integrate ethics into crisis communication and what messages could be regarded as ethical information.

This study provides a direction for researchers and practitioners in ethical communication. It focuses on stakeholders' feeling of uncertainty during a crisis and advocates that crisis managers must address uncertainty to psychologically protect their audience. If a message has the function of sustaining good reputation but fails to resolve any of stakeholders' uncertainty, the message or the strategic communication plan could not be regarded as ethical communication. This study provides a new angle to look at crisis communication research by shifting attention from responsibility to uncertainty and from an organization orientation to a stakeholder orientation. The goal of crisis communication could be broader than simply avoiding responsibility and maintaining reputation. This study claims that the goal of crisis communication is to build a long-term relationship with stakeholders. Stakeholder protection and reputation maintenance are two instruments to evaluate the goal achievement. Therefore, stakeholder protection is as important as reputation protection. An effective crisis communication plan must meet the two goals at the same time to cultivate a long-term relationship.

### **Application of the new scale**

To the best of the researcher's knowledge, this study is the first one to propose and test a multidimensional scale to measure uncertainty in the crisis context. It advances our understanding and measurement of crisis-induced uncertainty. As argued by many crisis communication researchers, uncertainty is an essential construct to consider in crisis management (Liu, et al., 2016; Seeger, 2006). By providing the measurement, this study paves the way for researchers who want to follow up this line of research. This study also provides evidence on the relationship between crisis-induced uncertainty and OPR. While more questions remain unanswered, a newly developed scale can facilitate scholars to test the relationship

between crisis-induced uncertainty and other important variables in crisis communication. For example, though this study examined the impact of crisis-induced uncertainty on OPR, it did not navigate the sources of uncertainty. In other words, the study failed to identify factors that influence uncertainty. Liu et al. (2016) discussed the influence of information channels on people's uncertainty during health-related crises. They argued that the outlets of information impact people's trust and further change their uncertainty but failed not provide empirical evidence on how channels function. Applying this scale, future research could look at how disseminating the same message from different media outlets changes crisis-induced uncertainty.

Another important factor that might influence uncertainty is media frames. Framing theory states that how news is presented influences how people make sense of an event and process information (Entman, 1993). Framing theory has already been applied to crisis communication research. For example, Cho and Gower (2006) revealed that the human-interest frame significantly influences people's emotions and attribution of crisis responsibility. Kim and Cameron (2011) concluded that emotional news frames affect people's emotions and further alter their evaluations of the company. Since previous studies have provided evidence on the effect of news frame in crisis communication, future research could look at if different news frames change people's feeling of uncertainty during a crisis.

Perceived crisis severity, an important concept of SCCT, could also contribute to crisis-induced uncertainty. In discussing ambiguous product-harm crises, Laufer, Gillespie, McBride, and Gonzalez (2005) predicted that organizations could not benefit from doubts when consumers perceive a crisis to be more severe. In reverse, they will benefit from doubts if people believe the crisis is less severe. Unfortunately, they did not provide empirical evidence on the influence of

severity. Future research could investigate if and how perceived crisis severity impacts uncertainty.

With the reconceptualization of uncertainty and the new scale, crisis-induced uncertainty could generate more discussion and become a new battleground for crisis communication research. Generally, researchers could regard crisis-induced uncertainty as an antecedent or an outcome, identifying what contributes to the feeling of uncertainty and exploring what could be changed when people feel uncertain during a crisis.

### **Rethinking OPR management during crises**

OPR has become a mainstream theory in public relations research for more than 20 years. According to Ki and Shin (2015), OPR research has generated more than a hundred empirical journal articles, some of which discussed OPR in the crisis context. However, most of investigation was carried out within the framework of SCCT. Some studies focused on testing what crisis response strategies are effective to maintain OPR (Haigh & Brubaker, 2010; Haigh & Dardis, 2012; Kim, Zhang, & Zhang, 2016). Other studies examined the relationship between crisis responsibility and OPR (Ki & Brown, 2013). One major missing link in the literature is neglecting the enduring effect of relationships. Organizations need to spend resources building and maintaining a relationship with their stakeholders. It is unlikely that organizations could nurture satisfaction or trust in one or two public relations programs. In the same vein, it is also unlikely that a well-established relationship could be destroyed by only one or two messages. When researching OPR during crises, it is more important to look at how psychological factors of stakeholders change their relationship with an organization rather than the influence of one or two pieces of information.

The current study evidenced that crisis-induced uncertainty is a strong predictor of OPR. Protection uncertainty, process uncertainty, and relationship uncertainty together explained between 50% and 60% variance in satisfaction, trust, and commitment. Cohen (1988) defined an effect size  $f^2$  which is calculated through  $R^2$ . He provided a standard to define small, medium, and large effect sizes: .02, .15, .35. According to this formula,  $f^2$  for satisfaction, trust, and commitment are larger than 1, which show large effect sizes. Hair et al. (2010) suggested  $R^2$  of .25, .50, .75 representing weak, moderate, and substantial effect sizes. Overall, it could be argued that crisis-induced uncertainty has a strong relationship with OPR.

$$f^2 = \frac{R^2}{1 - R^2}$$

Since the study demonstrated that there is a strong association between uncertainty and OPR, crisis-induced uncertainty might mediate the relationship between crisis response strategies and OPR. Thus, from an organization's perspective, it is critical to understand how to manage stakeholders' uncertainty during a crisis. However, it is beyond the scope of this study to propose effective strategies. Crisis communication research has offered a rich pool of crisis response strategies, such as apology, minimization, differentiation, denial, just to name a few. The effectiveness of these strategies also has been studied from different perspectives, such as shifting responsibility (Brown & White, 2010), maintaining OPR (Huang, 2008), and affecting general company evaluation (Kim & Sung, 2014). Future research could test if any of the existing crisis response strategies are effective in increasing or reducing crisis-induced uncertainty and also explore unique communication strategies or management plans to reduce crisis-induced uncertainty.

### **Practical implications**

Besides opening up a new window for crisis communication researchers, this study also provides some practical recommendations for practitioners when managing a crisis. According to Claeys and Opgenhaffen (2016), practitioners tend to ignore theories and rely on gut feelings when managing a crisis. They have a general crisis communication plan and customize the plan in each situation. This study recommends that practitioners should think about how much uncertainty a crisis has imposed on stakeholders when crafting messages. Even if they cannot conduct a large scale of survey to measure people's uncertainty level, practitioners should examine a small number of publics' level of uncertainty regarding the situation the organization is facing. In addition, before they issue a position statement or post messages on social media regarding a crisis, practitioners should ask the following questions, "Does this message raise or lower people's level of uncertainty?" "After reading the message, do people know what to do to protect themselves?" "Is the message showing that we are in control and we have the ability to solve the problem?" "After reading the message, do people feel we value the relationship with them?" If the crisis response message could answer the previous questions, it is able to resolve crisis-induced uncertainty.

The other practical implication lies in stakeholders' information-seeking behaviors. Although this study did not discover the relationship between crisis-induced uncertainty and information-seeking behaviors, it does not prove there is no such relationship. As discussed previously, the relationship might be moderated by crisis involvement. Highly involved people in the crisis are more likely to engage in information seeking than those with low involvement. From an organization's perspective, practitioners should think about what information must be provided when stakeholders start to do so. For example, in late 2018, Marriott International revealed that the information of more than 500 million customers on their database was accessed

by hackers. The information included the customers' names, addresses, phone numbers, passport numbers, etc. Right after the crisis, Marriott designed an independent website to release details about the crisis. On the website, they left a large frequently asked questions (FAQ) section to tell whoever visit the website the current situation and what they could do to avoid harm. The current study suggests that crisis managers should follow this method to keep stakeholders posted. When people start engaging in information seeking, organizations should ensure the information is accurate and provided by themselves.

### **Limitations and Future Research**

Although this study greatly contributes to the understanding of people's feeling of uncertainty during organizational crises, it bears several limitations. First, Study 1 only used two crisis scenarios, the Facebook case and the United Airlines case, to validate the scale and improve generalizability. Although the researcher attempted to diversify the crisis situations to make the scale generalizable, it is far from enough to conclude that the scale could be applied to every crisis. Therefore, future researchers are encouraged to use the newly developed crisis-induced uncertainty scale across different crises.

Second, the study selected two real crises which have died down. Participants' reported uncertainty may not be the same as their feeling during the crises or at the early stage of the crises because many details have been released and participants already knew how the two organizations handled the crises respectively. In addition, since the real scenarios were used, participants' uncertainty may be contaminated by other preexisting factors such as prior reputation.

Third, this study aims to define and measure stakeholders' uncertainty. However, it is worth noting that an organization normally has multiple stakeholders including media, consumers, employees, investors, suppliers, just to name a few (Rawlins, 2006). During a crisis, each stakeholder is likely to feel uncertain about different issues. What an employee feels uncertain about will be different from those of the public. Therefore, the proposed three dimensions of crisis-induced uncertainty may not be able to capture all stakeholders' uncertainty.

Despite the limitations, this study sheds light on this significant yet rarely explored area in crisis communication. More importantly, it paves the way for uncertainty study in crisis communication research. The first job that future research should consider is to solidify the scale, that is, apply the new scale to diverse crisis situations. If the current scale is proved to be reliable in different situations, the three dimensions could be further confirmed. Researchers in the future could also consider applying the concept to different stakeholders. As discussed previously, employees might experience different types of uncertainty compared to customers. Researchers could explore and compare the uncertainty experienced by different stakeholders. Another interesting research area lies in the antecedents of uncertainty. Besides the crisis itself, what are some factors that influence people's feeling of uncertainty?

## **Conclusion**

Crisis communication has been a major topic in public relations for more than 20 years. However, there is still a big gap between practices and research. We need more perspectives to understand crisis dynamics and more criteria to evaluate the effectiveness of crisis response strategies. Uncertainty, a major underdeveloped research line, has the potential to become a new battleground for crisis communication research. Although this study showed some evidence to support the argument, it is only exploratory in nature. This study opens a new door for crisis

communication by shifting its focus onto uncertainty and stakeholders. Hopefully, more scholars will join to move this research forward.

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## APPENDIX A: CONTENT VALIDITY RATIO FORM

### Panel Survey

The purpose of this survey is to determine the content validity of the Crisis-Induced Severity Scale quantitatively. Perceived crisis severity is defined as “stakeholders’ lack of confidence that their personal well-being and interactions with the organization will be positive in both a short and long term.” The construct contains three dimensions: protection uncertainty, process uncertainty, and relationship uncertainty. They are defined separately below.

Protection uncertainty: stakeholders’ lack of confidence of how to protect themselves from the harm inflicted by the crisis.

Process uncertainty: stakeholders’ lack of confidence that the organization can handle the crisis properly.

Relationship uncertainty: stakeholders’ lack of confidence that their interaction with the organization can continue.

Instruction: For each dimension, please indicate whether it is essential, useful but not essential, or not necessary to measure crisis-induced uncertainty.

	Essential	Useful but not Essential	Not Necessary
Protection Uncertainty			
Process Uncertainty			
Relationship Uncertainty			

Instruction: For each item, please indicate whether it is essential, useful but not essential, or not necessary to measure the proposed dimensions. **The items will be evaluated by research participants based on a 7-point scale ranging from 1 (Extremely Uncertain) to 7 (Extremely Certain)**

	Essential	Useful but not Essential	Not Necessary
<b>Protection Uncertainty</b>			
I will not be affected by the incident?			
I know the way to avoid harm?			
I know the way to protect myself?			

My family will not suffer from the incident?			
I can help myself during the incident?			
The incident will not influence my life?			
<b>Process Uncertainty</b>			
The organization can fix the problem.			
The organization will handle the incident properly.			
The organization will not make the situation worse.			
The organization has the ability to solve the crisis.			
The organization will do whatever they can to make it right.			
The organization will treat people involved in the incident appropriately.			
<b>Relationship Uncertainty</b>			
The organization can keep providing quality service or product.			
The organization is a responsible organization.			
The brand is a trustworthy name to me.			
The organization has a strong leadership.			
I want to use the organization's product/service.			
I want to maintain a relationship with the organization.			

## APPENDIX B: THE TWO REAL CRISIS SCENARIOS

### **Facebook Data Breach Crisis**

Cambridge Analytica, a British political consulting firm, began collecting Facebook user data from 2014. So far, it is reported that 87 million (70.6 million in the US) Facebook users' identifiable personal information has been stolen. The data was used to attempt to influence voter opinions on behalf of politicians who hired Cambridge Analytica.

A few years ago, a researcher created a personality quiz on Facebook and asked participants to download an app. When Facebook users downloaded the app, they gave the researcher access to their friends' data. Initially, 270,000 Facebook users agreed and later it caused 87 million people's information being scraped. The researcher later gave all the information to Cambridge Analytica, and the company used the information to serve its clients in political research.

Facebook published a post saying it has suspended Cambridge Analytica from its platform on March 16, 2018. It insisted there was no data breach, but the data was used in an unauthorized manner. The linked information includes people's public profiles, age, gender, friends, and where they live.

### **United Airlines Passenger Removal Crisis**

A passenger was forcibly dragged out of a plane operated by United Airlines on April 9, 2017. Aviation security officers were called by flight attendants to remove the passenger. One of the passengers on the plane video recorded the incident and posted the video on YouTube, which soon went viral on social media.

Prior to the confrontation, the manager offered vouchers to passengers to voluntarily take the next flight and make room for four United Airlines employees, however, none passengers took the offer. United Airlines then randomly removed four passengers, and three passengers involuntarily followed the order. David Dao, the fourth passenger, then was forcibly removed from the plane.

United Airlines CEO Oscar Munoz issued a public statement next morning, justifying the action of removing the passenger. He also sent an internal email to all United Airlines employees, commending crew members action and criticizing the passenger. Criticized by media and the public, Oscar Munoz issued a second statement two day after, apologizing and promising such an incident would never happen again.

## APPENDIX C: THE FICTITIOUS CRISIS SCENARIO

Fifteen cases of E. coli infection have been traced to a Nothing But Beef restaurant in Georgia. According to Jonathan Modie, the Georgia Department of Public Health spokesman, between Feb. 8-11, 15 people in Swansea, GA, reported gastrointestinal problems, including nausea, diarrhea, and fever after dining at a local restaurant, Nothing But Beef. Swansea is a typical college town in Georgia, and the business is located on campus. All 15 people are students at Swansea Community College.

All victims have been hospitalized, and they are in stable condition. “Many people affected with Shiga toxin E. coli have not sought medical care, so the number of people who are showing symptoms may be higher,” Modie said in a statement. “Health officials want people who have dined at Nothing But Beef restaurants nationwide in January and February, and became ill, to see their health-care provider.” E. coli usually strikes around three or four days after being ingested, but people can start showing symptoms from two to eight days after ingestion. Usually, there’s light fever, gastrointestinal issues and diarrhea lasting five to seven days.

It is not clear what caused the outbreak. “CDC (Centers for Disease Control and Prevention) officials are working very hard to identify the source, but it’s still too early to confirm what caused the outbreak. It normally takes about two weeks to finish the investigation” said Modie. “The CDC is also advising that consumers not dine at the Nothing But Beef restaurants in Swansea, GA.”

Nothing But Beef is a fast food chain that has over 200 restaurants in 32 states. Tony Sanders, the company’s CEO, released a statement today: “Food safety is our priority. We are closely monitoring this situation and cooperating with state and federal public health authorities as they further investigate the illnesses.”

## APPENDIX D: IRB CERTIFICATE



November 20, 2018

Ziyuan Zhou  
Advertising & Public Relations  
CCIS  
Box 870172

Re: IRB#: 18-OR-424 "Exploring the Concept and Application of Crisis-Induced Uncertainty in Organizational Crises"

Dear Ziyuan Zhou:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

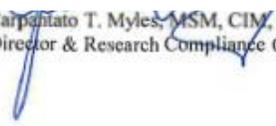
Your application will expire on October 31, 2019. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the IRB Request for Study Closure Form.

Please use reproductions of the IRB approved stamped consent form to provide to your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,

  
Caroll T. Myles, MSM, CIM, CIP  
Director & Research Compliance Officer