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Abstract

Hurricanes have proven to be one of nature's deadliest forces, and they can cause irreplaceable damage to entire communities, infrastructure, and people's livelihood. As a hurricane approaches, it generates an immediate need for information. The affected communities, emergency responders, and general public seek hurricane risk information from a variety of sources. Traditional media plays a significant role in information management; however, engaging in web communication is becoming more popular for its mix of news reporting and personal accounts.

An analysis of weather blogs reveals the topics discussed by bloggers and their readers before Hurricane Ike and what message components from the EPPM may or may not be present. From a sample of 105 blog posts, the messages included all four components of the EPPM (perceived susceptibility, perceived severity, response efficacy, and self-efficacy) only 13% of the time. As time approached the day of hurricane landfall, the occurrence dropped to 8%. The findings for blog comments were abysmal. From a sample of 849 blog comments, messages included all four components of the EPPM only 3% of the time. As time approached the day of hurricane landfall, the occurrence dropped to 2%. These findings suggest that blog posts and readers' comments may be failing to motivate protective behavior, for which threat and efficacy appeals must be present. Overall, perceived severity appeared most frequently in blog posts; however,

response efficacy was present more in blog readers' comments. When analyzed for messages components across the three days prior to hurricane landfall, self-efficacy was missing 92% of the time the day before hurricane landfall. For blog readers' comments, self-efficacy was missing 84% of the time for the same time period. The disproportion of threat and efficacy suggest that posts and comments are likely falling short of motivating protective behaviors, which could have a more profound effect when one considers the timing of the messages.

Finally, the study exposes what, if any, channel beliefs readers may hold about blogs. By examining the content reader's convey in their comments, the study concluded that readers do find weather blogs about Hurricane Ike as fairly credible. Moreover, the study found that readers expressed stronger credibility statements about local weather blogs than national weather blogs; however, the finding is non-significant.

Limitations of the investigation include difficulty with statistical procedures, which were a result of coding problems. Also, the imbalance of local and national weather blogs may have contributed to the insignificant findings of readers' channel beliefs. Future studies should address these limitations and continue to apply the EPPM and RISP to hurricane events. Research also benefits when the audience's perspectives are incorporated. The blogosphere provides an excellent opportunity for such exploration.

CHAPTER 1

Introduction

On May 22, 2008, the National Oceanic and Atmospheric Administration (NOAA) predicted near normal or above normal Atlantic hurricane activity for the hurricane season, which commenced on June 1, 2008. The prediction included a 25% probability of a near normal season and a 65% probability of an above normal season, bringing a 90% chance of near or above normal activity (NOAA, June 2008). As hurricane season continued through the month of November, scientists, media, and the lay public face uncertainty of what was to come. “Living in a coastal state means having a plan for each and every hurricane season,” says retired Navy Vice Adm. Conrad C. Lautenbacher, Ph.D., Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator (NOAA, June 2008).

Despite the fact that the eye of Hurricane Rita did not make direct landfall over the Houston/Galveston region in 2005, people did have a plan. Just weeks before, residents of the greater Houston area witnessed the consequences of Hurricane Katrina, which displaced thousands of Gulf Coast residents. The images and reports from news media sent the nation into a frenzy as families, pets, and livestock scrambling for shelter. As Hurricane Rita approached the Texas/Louisiana border on September 24, 2005, residents in greater Houston heeded mandatory and voluntary evacuation warnings. Nearly half of

metropolitan Houston (approximately 2.5 million people) sought higher ground. Although they were prepared to leave their homes and communities, it was soon discovered there was not an adequate system to support the mass evacuation. Evacuees were met with unheard of conditions. The evacuation orders were complicated by residents who prematurely or unnecessarily evacuated their area and created roadway congestion. In addition to unimaginable gridlock, evacuees suffered from scorching triple-digit temperatures, overheated cars, empty gas tanks (forcing families to become stranded on highways and exacerbating traffic congestion), fuel shortages at service stations preventing motorists from refueling, cramped conditions (families traveled with and their children, pets, and individuals with special needs), and depleting food and water resources. Many people succumbed to these factors, and 110 died en route according to a report by the *Houston Chronicle* (Berger, 2008). Of the people who evacuated, it's estimated that "just over half completed their trips – to another destination or back home – in less than ten hours. But 21% spent twenty hours or more on the road" (Mack, 2005).

The United States government and multiple agencies have recognized the prospective benefits of hurricane risk programs and services. NOAA, The National Weather Service, The National Hurricane Center, and a plethora of meteorological societies work in tandem to develop sophisticated weather models and forecasts to aid the public with hurricane preparations and evacuation

planning. In addition, organizations such as the Federal Emergency Management Agency (FEMA), the American Red Cross, and Citizen Corps aid in disaster recovery and help improve systems for emergency management and response efforts. Finally, groups such as the Center for Risk and Crisis Management, Risk + Crisis Communication Project, and the Center for Risk Communication complement these efforts by investigating the various communal and behavioral dimensions of risks before, during, and after they strike.

These efforts have profound ramifications and are further crystallized when one considers that, unfortunately, “risk-assessment techniques have not necessarily resulted in decreasing the uncertainties we face as we resolve issues and questions” (Scherer and Juanillo, 2003, p. 221). Response to disasters requires coordination and interdependency among several agencies, community groups, and emergency response personnel. Kendra and Wachtendorf (2003) report with regard to the destruction of the New York City Emergency Operations Center during the attack on September 11, 2001, “although the emergency operations center was destroyed, the emergency management organization was not” (p. 99). The instrumental roles each actor plays should not be understated. The primary tenet of effective risk and crisis management is a stable unyielding infrastructure.

As we have witnessed in recent history, the impact of a hurricane is not limited to an individual. In fact, entire communities often experience a collective

loss. Perhaps this encompassing nature of hurricanes is why a significant segment of hurricane research often centers on communication with and within vulnerable communities. This alternative conceptualization of hurricane risks has transformed a once primarily scientific concern into one that attracts the attention of several disciplines and interest groups. Thus, more hurricane risk research is warranted from a communal perspective.

Hurricanes are media events, which create a whirlwind of information seeking activity as people search for up-to-the minute news. Traditional news sources serve as a conduit for mass broadcasts of storm updates, safety information, and school and business closures. E-mail, instant messaging, and texting complement traditional news sources by offering direct and instantaneous personal communication exchanges. Another means for managing information comes via blogs (web logs). A blog is an online journal where an author filters news and self-publishes information on a website. Blog users are able to read and post comments, questions, photos, videos, and links within a chronological and archival format. Because anyone (media outlets, weather experts, or concerned citizens) can create a blog in the blogosphere, the rapid popularity of blogging is unique for its blend of traditional media and web communication.

Despite the interest in blogging, relatively little is known about the messages that blogs are communicating. Even less is understood about the relationship between blogs and traditional media. For instance, do blog users rely

on multiple news sources? Do blog users have opinions about the credibility of other news sources? At worst, hurricane blogs may undermine reports from weather experts, city officials, and government agencies. At best, hurricane blogs may serve to counterbalance national news reports with first-hand accounts, identify and inform vulnerable communities, and educate the public.

This investigation examines the trend of hurricane blogs. A content analysis was used to determine what messages hurricane blogs are communicating to blog users and what, if any, perceptions of credibility blog users may have about other news sources.

CHAPTER 2

Review of Literature

Blog Overview

According to The American Heritage Dictionary, a “weblog”, commonly shortened to “blog”, is a “website that displays in chronological order the postings by one or more individuals and usually has links to comments on specific postings” (Weblog, n.d.). The blog is maintained by a blogger, who writes entries and updates information sometimes with links to other websites, pictures, and even video. Blog users are individuals who read and follow the online diary, and who may posts their comments in response to the blogger’s posts. Virtually any person can create and author a blog. Internet access and fundamental knowledge of web applications may be all that is required since free blog hosts and software are available on the internet. Blogs are often easy to find as added features to existing websites or via online blog directories which can be browsed by names, categories, or locations.

Growth

The origins of blogs have been traced to the early 1990s; however, the first blog to have appeared in today’s format materialized in 1996 (Festa, 2003). Software Developer, David Winer, recalls chronicling information on a webpage in reverse order. The term “blogging” wasn’t actually used at the time, but it was soon introduced into the digital age vocabulary in 1997. “Fifteen years ago it

wasn't even a word much less a phenomenon, but today it is the most exploding source of information in society” (Blogs, 2007). In fact, eMarketer claims that there were 94.1 million blog readers in 2007—nearly half of Internet users (Verna, 2008).

The National Institute for Technology and Liberal Education (NITLE) began an active blog census in 2003. NITLE (2009) has indexed more than 2.8 million blogs, and nearly 1.9 million are estimated to be active. A vast majority of blogs, more than 1.9 million, are in English, followed by Catalan, French, Spanish, and Portuguese which account for a combined total of nearly 360,000 blogs (NITLE, 2009). Geographically, NITLE (2009) estimates blogs exist primarily in the United States and throughout Europe, although blogs are scattered in Asia and have been scantily traced in South America, East Africa, and Australia. Technorati (n.d.) reports 133 million blog records indexed since 2002 and estimates an amazing 900,000 blogs posted in a 24-hour period. U.S. bloggers are predominately male, age thirty-five or older, college graduates, and experience an average blogging tenure of 35 months (Technorati, n.d.). In addition, Lee Rainie of The Pew Internet & American Life Project claim that blog creators are Internet veterans (have been online for six years or more) and live in households earning more than \$50,000 (Rainie, 2005). Despite the lack of agreement on blog estimates, it's certain that blogs are a key element of Internet culture.

Mixed Media and Media Convergence

Blogs have added yet another revolutionary twist to public discourse with mass audiences via the Internet. First, the blogosphere is an informal and convenient source for information. Second, the blog is a vehicle for bloggers to communicate their attitudes and viewpoints. Finally, not only can website operators count the number of times a blog has been visited, they can read the responses of blog users who post comments; thus, giving explicit feedback about the readers interests and the popularity of the blog. These are tremendous advantages as blogs are being regarded as a democratic communication channel in competition with traditional forms of media (Smith, 2006).

Herring, Scheidt, Wright, and Bonus (2005), state that blogs hold a “new position in the Internet genre ecology... a de facto bridge between multimedia HTML documents and text-based computer-mediated communication” (p. 143). Most bloggers are not independent news gatherers; rather bloggers rely heavily on searching, filtering, and posting information from traditional media and will frequently post links to the original sources (Johnson & Kaye, 2004; Seipp, 2002). An example of this is the convergence of text, video, and commentary which appears on blogs. Uploading video clips of televised programs is a practice permitted under fair use and provides richer coverage of an event than reading the newspaper. “In a world of micro-content delivered to niche audiences, more and

more of the small tidbits of news that we encounter each day are being conveyed through personal media—chiefly weblogs” (Lasica, 2003, p. 71).

Media and Risk Communication

Dissemination of information is a well-known challenge for risk communicators. Understanding who, what, when, where, and why about a situation is imperative for efficient and appropriate response. Failure of complete, accurate, and prompt delivery of communication can compound an already distressing emergency situation. In some cases, some warning systems are able to alert attention but are unable to successfully communicate adequate information about the situation. Warning systems that are descriptive, and which support information verification, are recommended (Perry, 1988). Even the best of systems and the quality of the warnings people receive, however, only partly account for how people may eventually respond. Other matters, such as personal disabilities, previous experience with and knowledge of the hazards, social class, ethnicity, race, and proximity and other available physical clues to the hazard, have important effects on how people define situations in which they find themselves negotiating their actions (Aguirre, 2004). “Crises that precipitate a surge in personal communication as well as heightened consumption of mass media sources ranging from radio and TV to news websites and blogs has been described global crisis communication” (Thelwall & Stuart, 2007, p. 189; see also Bucher, 2002).

An ample body of literature clearly positions the media as playing an integral role in the delivery of hurricane risk messages, as well as the development of safety behaviors. Mass media news sources fulfill informational needs for the public at each stage of a hurricane. When a hurricane approaches, people need to know what to do, how to evacuate, and how much time they have. After a hurricane makes landfall, residents and the general public want to learn about the extent of the hurricane's damage or how to locate family members in the affected area. Even when there is no hurricane activity present, news media play a key role in keeping the public vigilant and informed. Unfortunately, the ability to communicate to hurricane victims who need the information may be severely limited due to power outages or technology breakdowns/overloads. Disaster-related myths may further impede the progress of news reporting. Before, during, and after Hurricane Alicia in 1986, Wenger and Friedman (1986) revealed local and national print media propagated myths about panic, looting, mass evacuation, increased crime, disaster shock, and mass sheltering.

Communicating hurricane risk is a dynamic and difficult task. Hurricane Katrina, for example, was every bit a communication disaster as it was a natural disaster. "Communication gaps, missed signals, information technology failures, administrative buffering, turf battles, and deliberate and unintentional misinterpretations delayed and handicapped both the recognition of the crisis that Katrina posed and the response to its devastation" (Garnett & Kouzmin, 2007, p.

171). A significant weather event, such as a hurricane, generates a high level of public interest and an immediate communication need for information relevant to the hurricane's development, track, potential damage, and safety of loved ones. Various communication channels are necessary to disseminate these types of messages, and communication technologies are important as they increase the opportunity for gaining multi-channel information.

Beaudoin (2007) states that "people's dependency on the media and the effects of such dependency escalate during times of social change and conflict" (p. 696; see also Ball-Rokeach & DeFleur, 1976). For example, Bucher (2002) found television to be the primary source of information following the terrorist attacks on September 11, 2001 followed by radio, Internet, and talking with other people. More interesting, may be reasons people used the Internet to search for information on the terrorist attacks. Among the top three reasons, users noted they can (1) get more detailed information, (2) obtain information not available via other sources, and (3) get up-to-date information. This appears to be in contrast to the following three reasons noted about the Internet (to get information while at work, quicker to use than other sources, and more convenient), which perhaps demonstrates a preference for quality of information over convenience. Thelwall and Stuart (2007) attributes the interrelationship between technology and communication to the unique set of circumstances of news reporting during a

crisis, where technology affords easier access to real time development of an event and promotes more event-driven news and embedded journalism.

Risk Research

Risk communication research occurs across a vast landscape. When research focuses on one's actions before an imminent threat, it seeks to explain self-protective behavior (see Lee & Rodriguez, 2008; Mileti & Sorensen, 1987; Norris, 1997) or preparedness (see Faupel, Kelley, & Petee, 1992; Fink, 1986; Heath & Abel, 1996). Examples of self-protective behaviors before a hurricane strikes include evacuation boarding windows of a home/business or even acquiring personal protection, such as a firearm. An issue for researchers in this area is identifying the critical point at which individuals engage in protective behaviors. Studies reveal minority communities are more vulnerable than others before and after hurricane disasters (Baker, 1991; Elder, Xirasagar, Miller, et al., 2007), as well as the elderly (Baker, 1991; Bourque, Siegel, Kano, & Wood, 2006). Moreover, barriers related to culture, language, literacy, and trust continue to contribute to a lack of protective action (Andrulis, Siddiqui, & Gantner, 2007). Preparedness refers to the state of readiness for responding to a hurricane. On a micro level, preparedness might describe the conditions at which individuals experience vigilance and organization (or lack of); whereas on a macro level, investigations often focus on preparedness from the perspectives of emergency responders, government agencies, and community organizations (see Bea, 2005).

The study of risk perception aims to discover what people understand to be a risk, predict how people might respond to hazards and risk management strategies, and improve the communication of risk messages (Slovic, Fischhoff, & Lichtenstein, 1982; see also Dow & Cutter, 2000; Lazo, Morss, & Demuth, submitted). Cole and Withey (1981) further this explanation by clarifying two distinctions in risk perception research: the level of risk that an individual is willing to accept for him/herself in the course of daily activities and the level of risk that the collectivity is willing to accept (tacitly or explicitly) as one of the several costs associated with the generation of a public benefit. Risk perception inquiry can be coupled with research related to information seeking (see Griffin, Dunwoody, & Neuwirth, 1999; Griffin, Yang, ter Huurne, Boerner, Ortiz, & Dunwoody, 2008) and information processing (see Broad, Leiserowitz, Weinkle, and Steketee, 2007; Kahlor, Dunwoody, & Griffin, 2002). While the body of literature is extensive on information seeking and processing before the onset of a hurricane disaster, few studies present a comprehensive and longitudinal perspective of the practices before, during, and after the event.

Since hurricanes are a continuous threat to the United States' coastal communities, it is vital that science and academia focus on these aspects of hurricane disasters. Sometimes, however, the best-intended educational efforts are not enough to encourage protective or precautionary behaviors. For example, practical instructions for hurricane preparedness appear to be clear and sensible,

yet many people may disregard the information because it may appear too trivial or unnecessary. Scientific information focuses on risks and physical mechanisms of disasters; however, the information can be construed as overly technical or not intended for the lay audience. Educational models reduce information into a simplistic format but are often directed to only a specific audience (i.e. children, as with the use of animated or cartoon-like characters delivering a message). Persuasive communications attempt to alter beliefs and behavior. In doing so, it sometimes requires a personal sacrifice such as money or time. Modeling can often be a way to reach people with whom the public identifies, but it can only be assumed that individuals will imitate the actions performed by the role model. Attribute portrayal “seeks to sell an audience about a feature of a desired practice” (Sorensen & Mileti, 1987, p. 221); however this appeal is only a partial representation of a more involved commitment. Fear arousal is a commonly used strategy in conjunction with others, and it’s been used as emotional stimuli in compliance gaining. Such a technique has the potential to induce fear to the extent that it creates distress and psychological harm, which cannot be avoided or reversed. Prompts promote repeated exposure to certain messages; however, they’re brief and less explanatory nature may be ineffective in encouraging one’s behavior. Finally, some programs aim for people to learn through participation (see Morss & Zhang, 2008). This approach provides an educational opportunity; however, such programs can be challenging to assemble and reach a mass

audience. Given that these strategies only partially influence people's hurricane preparation behaviors, there is more to understand about publics' perceptions.

Prior to the events of Hurricanes Katrina and Rita, a prevailing view of hurricane risks emphasized the presence/absence of property damage and loss of life. Such a position is limited by the dichotomy of being "safe" and "unsafe." More contemporary views of hurricanes take account of social, psychological, and symbolic dimensions. The National Hurricane Center, for example, urges visitors to their website to "prepare family disaster plans" (<http://www.nhc.noaa.gov/HAW2/english/intro.shtml>) during Hurricane Preparedness Week—the seven day period prior to the official start of hurricane season. The Galveston County Office of Emergency Management also reminds the public of specific aspects of hurricane preparedness for families, business owners/operators, animals, and individuals who may need special needs assistance. According to its website, "the Substance Abuse and Mental Health Services Administration (SAMHSA), an agency of the U.S. Department of Health and Human Services (HHS), was created to develop and focus attention on programs and funding for improving the lives of people with or at risk for mental and substance abuse disorders" (<http://mentalhealth.samhsa.gov/disasterrelief/>). The SAMHSA promotes mental wellness through a collection of publications and a series of related topics and links. Their mission of building community resilience and facilitating recovery has also helped produce a Hurricane Mental

Health Awareness Campaign, which contains a set of public service announcements for adults, parents/caregivers, and even first responders.

Although hurricane risk assessment has always been a necessary obligation, the study of risk communication having a distinct function is relatively new to the communication discipline. “Prior to 1986, there were only a few essays in the scholarly and policy literature with ‘risk communication’ in the title” (Krimsky & Plough, 1988, p. 2). Today, risk communication spans science and social science disciplines, and hurricane studies appear in various publishing outlets, along with conferences, special interest meetings, and sponsored workshops (see Covello, 1988).

Theorizing Risk

With an active hurricane season for hurricane-prone areas, understanding each dimension of risk is a serious matter. Theorizing about risk communication has contributed considerably in research areas of hurricane preparedness and hurricane response. Theory is important for explaining what motivates people to perform protective behaviors, such as evacuating before a hurricane makes landfall. Given the disparities among Hurricane Katrina, Rita, and Ike evacuations, risk communication theory can help understand the forces that are at play.

One of the strongest motivators for attitude and behavioral change is the sense of fear. *Fear* is defined as “an internal emotional reaction composed of

psychological and physiological dimensions that may be aroused when a serious and personally relevant threat is perceived” (Witte, Meyer, & Martell, 2000, p. 20). Studies of risk have frequently focused on the perception of fear as a key factor in motivating one’s behavior.

Fear-as-Acquired Drive Model

Janis (1967) argues that fear arousal is the most effective means of persuasive communication. More specifically, the fear-as-acquired drive model (Janis, 1967) suggests that some fear is necessary for successful persuasive messages, while too little fear does not arouse any reaction. For example, research suggests awareness of personal risks was heightened when people viewed graphic images of automobile crashes and mortuaries (Sutton & Hallett, 1989) and pictures of the effects of cigarette smoking to the body (Sutton & Hallett, 1988). Since people are more likely to remember pictures than words (see Nelson, 1979; Paivio & Csapo, 1973), which can induce an emotional response (Pfau, Haigh, Fifrick et al., 2006), memories of other hurricanes and the magnitude of the destruction they caused can increase their motivation to prepare for such an event.

The fear-as-acquired model (Janis, 1967) also suggests that too much fear leads to maladaptive effects. LaRose, Rifon, and Enbody (2008) set out to learn how they could encourage Internet users to protect themselves from online threats (i.e. viruses, hackers, spyware, and security compromises). They found that some individuals who visited the *Consumer Reports’* “Online Safety is Everyone’s

Job!” web page reported increases in online safety prevent (i.e. reading privacy policies) than their counterparts who visited the web page “Online Safety isn’t My Job!” which claimed that online protection is somebody else’s responsibility and not that of the reader. Despite this finding, there was very little difference in respondents’ reports of safety maintenance behaviors (i.e. updating virus and anti-spyware protection) for those who exhibit low involvement or interest in safety issues and who also present low self-efficacy or lack the confidence to protect themselves. LaRose et al. (2008) believe strategies emphasizing user’s personal responsibility can boomerang when directed to these individuals.

Janis’ (1967) fear-as-acquired model does not, however, account for the unique phenomenon of the “crying wolf” hypothesis. According to Burnside, Miller, and Rivera (2007), “the ‘crying wolf’ hypothesis has continually surfaced as a reason why many citizens in high risk areas do not evacuate” (p. 731). Researchers suggest individuals begin to dismiss the legitimacy of disaster warnings after repeated experience with predictions, which do not become reality (see Atwood & Major, 1998; Breznitz, 1984; and Dow & Cutter, 1998). The hypothesis is also believed to contribute to a growing disaster subculture. “This subculture includes citizens who may be cognizant of the perceived threat but refuse to evacuate” (Burnside et al., 2007, p. 731). It is believed that a disaster subculture exists in high risk communities, such as the lower 9th Ward in New Orleans, Louisiana (Wolshon, 2002). “If mass numbers of people are required to

evacuate for a storm that never strikes, it is likely that they will be much less eager to evacuate early the next time” (Wolshon, 2002, p. 49).

Related to the “crying wolf” hypothesis is the boomerang effect LaRose et al. (2008) observed in people’s Internet safety behaviors. That is, personal responsibility messages of Internet safety can boomerang when people are highly confident in recovering from Internet threats, yet are not involved enough to perform safety precautions (LaRose et al., 2008). In other words, people may be fearful of certain risks but positive that they are informed and capable of handling the consequences; thus, they engage less in behaviors such as updating protection software. Another limitation of the fear-as-acquired model is that it does not suggest means for coping with fear—only that a magical amount of fear can influence an adaptive reaction. The literature clearly demonstrates that responses to fear require a more complicated understanding of how individuals process threat and motivation.

Protection Motivation Theory

Protection Motivation Theory (PMT) states that individuals cope with a perceived risk; thus, stressing cognitive organization. PMT (Rogers, 1975, 1983) suggests people appraise the severity and likelihood of being exposed to an event, evaluate their ability to cope with the event, and alter their attitudes accordingly. Moreover, Rogers (1983) argues people can be motivated to engage in desirable behaviors not only to avoid risks but also to avoid social or interpersonal risks.

The engagement in a particular behavior is often prompted by a fear appeal. PMT is more defined than the fear-as-acquired model in that it specifies four persuasive message components (often a fear appeal) and “demonstrating the conditions under which fear appeals work” (Kim, 2004). First, PMT asserts that the perceived severity (magnitude) of a threat initiates cognitive mediational processes (e.g. A category five hurricane will produce a storm surge over eighteen feet, wind speeds in excess of 155 miles per hour, and catastrophic building failures). Second, the theory suggests that perceived susceptibility (the probability of the occurrence) of the threat prompts reasoning (e.g. Living in coastal regions increases the risk of sustaining hurricane damage). Third, perceived response efficacy (e.g. Having an evacuation plan can be effective during a hurricane) forces people to think about their own abilities. Fourth, perceived self-efficacy will help mediate the danger of the threat (e.g. I am confident I can protect my property and family from some hurricane damage). In sum, a “one size fits all” approach, which adheres to the PMT framework and emphasizes threat appraisal, can be effective in reaching a large majority of individuals independent of any individual differences; however, “many studies involving PMT only provide evidence that a manipulation affected the intended variables—it is difficult to find patterns of explanation for unintended effects (McMath & Prentice-Dunn, 2005, p. 638). In light of this limitation, more comprehensive theoretical support is necessary to adequately explain risk behaviors.

Extended Parallel Processing Model

Assessing our exposure to risk creates a compelling desire for understanding the cognitive processes that occur when a threat is present. People are motivated to perform protective behaviors when they fear a significant threat *and* when they perceive a response that would avert the threat (Witte, 1992). In contrast to the reduction of fear, in which people attempt to avoid an emotional state of fear, the extended parallel processing model (EPPM) draws from the previous frameworks by offering justifications to fear control processes (Kim, 2004), whereas others focused on danger control processes (Leventhal, 1970).

The EPPM's applicability has been demonstrated in a significant breadth of health topics, including safer sex practices (see Cho & Witte, 2005) and smoking cessation (see Wright, French, Weinman, & Marteau, 2006). In one study, Gore and Bracken (2005) asked individuals to report their responses about meningitis vaccinations. The study focused on college students as previous research noted college students living in on-campus dormitories may be more susceptible to the virus. The EPPM successfully predicted that a high-efficacy/no-threat health message persuaded individuals from fear control to move toward danger control, and a high-threat/no-efficacy health message persuaded individuals from fear control to higher fear control processes regarding meningitis vaccinations. The study also found that exposure to a high-threat/no-efficacy health message persuaded individuals from danger control to fear control

processes. These findings underscore the EPPM's key propositions of the relationship between threat and efficacy. "The critical point occurs when perceptions of threat begin to outweigh perceptions of efficacy, causing individuals to shift from danger control responses to fear control responses" (Gore & Bracken, 2005, p. 37; see also Witte, 1992).

The EPPM also helped LaVela, Smith, & Weaver (2007) to assess whether danger or fear control processes are dominating in veterans' responses to an influenza threat. The findings suggest that most veterans perceived efficacy to be stronger than the threat of the virus. That is, the individuals are more likely to engage in a danger control response (e.g. receive an influenza vaccination). However, this did not significantly differ from the control group. One explanation given was the variety of health campaigns to increase influenza vaccinations, which have been ongoing for a number of years, may be responsible for an overall high rate of compliance to vaccination recommendations. Similar to past research, LaVela et al. (2007) express that health campaigns must contain appropriate efficacy messages, in addition to threat messages, in order to promote behavioral change.

The strength of the EPPM has allowed researchers to apply the model in efforts to prevent the risk of occupational and safety hazards as well. Murray-Johnson, Witte, Patel, Orrego, Zuckerman, Maxfield, and Thimons (2004) evaluated the EPPM dimensions in addition to subjective norms and channel

preferences of coal miners' regarding hearing loss and hearing protection. Among the findings, it was not surprising that all participants agreed hearing loss was harmful, serious, and affecting quality of life. Self-efficacy, however, was weaker than response efficacy due to comfort, hygiene, and cost concerns. Murray-Johnson et al. (2004) also reveal that fear appeals and "nagging" from family members and spouses to prevent hearing loss is not effective. Many miners used humor and joked that they were not "a bunch of scared men" (Murray-Johnson et al., 2004, p. 750). Witte, Peterson, Vallabhan, Stephenson, Plugge, Givens, et al. (1993), also report unexpected perceptions of preventing tractor-related injuries and deaths. While tractor operators recognize the severity of farm equipment accidents, they do not particularly feel vulnerable. Witte et al. (1993) advocate for subsequent safety messages to target fear control processes, which will increase one's susceptibility and perceived efficacy, in order to challenge the operators' lax attitude towards exposure to tractor safety risks.

In another study, attendees of hunter safety classes were exposed to a video-based intervention about gun safety practices. The EPPM suggests that individuals recognize a level of threat, which is created by perceived susceptibility and severity to a risk. Furthermore, if strong enough, the level of threat should motivate individuals to take action which assumes a high level of efficacy (Roberto, Meyer, Johnson, & Atkin, 2000). Thus, Roberto et al. (2000) hypothesized that individuals who watched the gun safety video would (1) recall

significantly more recommended gun safety practices, (2) perceive their susceptibility to gun injuries as being significantly greater, (3) perceive gun injuries as significantly more severe, and (4) perceive significantly more response efficacy than individuals who were in the control group. After conducting a survey of 175 hunter safety class attendees, the findings were significant for hypotheses 1-3, where the experimental group reported more of the six recommended gun safety practices, they were more likely to believe that they or their gun might be involved in an accidental shooting, and they were more likely to believe that gun injuries result in greater suffering. The finding for hypothesis four, that individuals felt each gun safety practice was effective in preventing injuries, was in the direction predicted; however, it did not reach significance. While the investigation provides clues of individuals' fear control responses, actual behavior change can only be presumed. Notwithstanding this, "the evidence suggests that the strong intention—behavior relationship is generalizable to gun safety" (Roberto et al., 2000, p. 171).

The EPPM has even been extended to explore the perception of risk messages to an unknown risk. McMahan, Witte, and Meyer (1998) examined perceptions of risk related to electromagnetic fields (EMFs) and observed the effectiveness of different risk messages (low vs. high threat) in motivating adaptive response behaviors. Participants in the study received either a low-threat or high-threat risk message about EMFs which was followed by a questionnaire.

“Consistent with the EPPM predictions, threat motivated stronger or weaker attitudes, but efficacy determined whether the attitudes were positive or negative” (McMahan et al., 1998, p. 254-255). Those with high-efficacy perceptions and who received high-threat messages had the strongest attitudes toward EMF control processes. With regard to intentions, the pattern was also consistent in that high-threat/high-efficacy had the strongest intentions to engage in safety behaviors. Low efficacy group, regardless of threat level, reported the weakest intentions. In addition, low-efficacy groups also reported weaker safety behaviors, most likely to engage in defensive avoidance, higher levels of message minimization (denial of the importance of the EMF risk messages), and stronger perceptions of perceived manipulation (reactance against EMF risk messages). The authors conclude that “when messages promote high perceived threat or fear at the expense of increases in response or self-efficacy, they run the risk of producing maladaptive fear-control outcomes,” (McMahan et al., 1998, p. 258). This is consistent in other research in which “the EPPM suggests that when the efficacy level exceeds the threat level, an individual should express an intent to enact the recommended behavior(s), but when the threat level exceeds the efficacy level, an individual will express denial or avoidance,” Roberto et al. (2000, p. 170).

As the previous sections demonstrate, the EPPM is a strong theoretical framework for understanding hurricane risk. Like PMT, the theory emphasizes the

process of cognition. That is, rather than reflexive responses to instinctive events, engaging in a deliberate behavior to manage one's fear involves a sustained process. Second, the EPPM underscores that one is coping with an event rather than escaping from an unpleasant emotional state. The model focuses on an individual's perceived self-efficacy – do I believe I have some control over hurricane risks; response efficacy – how can I reduce the risk of a hurricane; susceptibility – how vulnerable am I to hurricanes; and severity – to what extent could I be affected by hurricanes. Thus, Research Questions 1-3 ask:

RQ1: What percentage of hurricane blog posts contains all four components of the EPPM (perceived susceptibility, perceived severity, response efficacy, and self-efficacy)?

RQ2: What percentage of hurricane blog posts is missing one or more threat component (perceived susceptibility and perceived severity)?

RQ3: What percentage of hurricane blog posts is missing one or more efficacy component (response efficacy and self-efficacy)?

Choi and Lin (2008) used the EPPM to analyze newspaper coverage of three major hurricanes in 2005 during a one-week period before the storms actually occurred. Researchers were able to create categories based on the four EPPM message components of response efficacy (“actions to take to prevent risk”), self-efficacy (“expected outcomes of taking actions”), susceptibility

(“anticipated outcomes”), and severity (“the intensity of the hurricane”). The researchers report the most frequent type of message was “actions to take to prevent the risk” ($n = 936$ or 62%), followed by “anticipated damages” ($n = 286$ or 19%), “the intensity of the hurricane” ($n = 282$ or 19%), and “expected outcomes of taking actions” ($n = 3$ or 0.02%). Moreover, Choi and Lin (2008) found stories emphasized preventative actions with appeals such as “Take the storm seriously,” “Follow directions,” and “Remain calm.” Another interesting finding is that the study reveals that newspapers rarely mention what are the expected outcomes of the recommended actions. As supported by previous research (see LaVela et al., 2007), stating the expected outcomes of a recommended preventative action (prompting self- and response efficacy) was noted as being an integral criterion for performing the action. News coverage relied heavily on delivering key hurricane risk information; thus, heightening the public’s emotional response to fear. Choi and Lin (2008) add that emotional frames may help people better understand a potential risk. This notion is supported by Lerner & Keltner, 2001, who claim appraisal tendencies mediate the causal affects of fear upon optimism. The current study aims to partially replicate Choi and Lin’s (2008) work by applying the same EPPM derived categories to evaluate blogs by hypothesizing:

H1: Overall, hurricane blog posts will most frequently convey messages associated with actions to take to prevent risk (response efficacy).

Finally, the EPPM can be applied to forms of managing risk where no fear is aroused (e.g. pre- or post-hurricane season) yet one engages in protective activity (e.g. preparing a household emergency kit). Past research has demonstrated the change in news media involvement during a hurricane event; yet, less is known regarding the fear control and danger control processes rooted in the messages. In their investigation, Barnes, Hanson, Novilla, Meacham, McIntyre, and Erickson (2008) found the focus of national and local newspaper coverage of Hurricane Katrina changed dramatically before, during and after the hurricane. On average, newspapers published 2.5 articles per day before the storm hit, twenty-eight articles during the storm, and fifty-eight articles after the hurricane made landfall. Significant differences were found among articles, which focused on public health disaster management practices for preparation, mitigation, response, and recovery during pre-hurricane, hurricane on land, and post-hurricane times (Barnes et al, 2008). Given the topical shift in newspaper coverage, it may be reasonable to assume that hurricane blogs may follow a similar pattern. To advance the findings of Barnes et al. (2008), the current study proposes to understand fear control and danger control processes by examining

how perceptions of threat and risk in hurricane blog messages may change over time. Thus, Research Question 4 asks:

RQ4: Is there a difference in percentages of the EPPM components in hurricane blog posts as time approaches hurricane landfall?

The fact that readers have the opportunity to respond to blog posts creates a unique on-line exchange. Larson (2007) argues that their significant interactive components are what separate weather blogs from more traditional media.

Therefore, the investigation also seeks to answer the following research questions as they related to blog readers' comments:

RQ5: What percentage of hurricane blog comments contains all four components of the EPPM (perceived susceptibility, perceived severity, response efficacy, and self-efficacy)?

RQ6: What percentage of hurricane blog comments is missing one or more threat component (perceived susceptibility and perceived severity)?

RQ7: What percentage of hurricane blog comments is missing one or more efficacy component (response efficacy and self-efficacy)?

RQ8: What EPPM component do blog comments most frequently convey?

RQ9: Is there a difference in percentages of the EPPM components in hurricane blog comments as time approaches hurricane landfall?

Risk Information Seeking Processing Model

Information seeking and processing are fundamental activities when managing a hurricane threat. People seek information to gain knowledge in order to learn what to do and to know the status and effects of the hurricane. As Griffin, Neuwirth, Dunwoody, and Giese (2004) explain, current risk communication research of information seeking focuses on the source and content of messages, rather than striving for an audience-based approach. Understanding patterns for the ways in which audiences seek information is augmented by observing perceptions of information sufficiency and information gathering capacity. Griffin, Dunwoody, and Neuwirth (1999) advance the risk information seeking and processing model (RISP), which suggests information sufficiency is a potential predictor of information seeking behaviors. This is evident from Eagly and Chaiken's (1993) work on the heuristic-systematic model (HSM) for information processing. The HSM model explains that individuals process risk information with more or less effort depending on their desire for information. From this standpoint, it is further argued that the size of the gap between information held and information needed affects the initiation of heuristic or systematic information processes (Griffin et al., 1999, 2004).

The RISP also depicts the relevance of people's everyday beliefs about risk information channels. The model illustrates how views about the presence of bias in information channels are associated with information seeking and

processing. Biased information can be presented by focusing on trivial aspects of important news events, fragmenting (distorting) the news, and relying on too many of the same types of information sources (Bennett, 1988). Rouner, Slater, and Buddenbaum (1999) found people perceived the media as generally biased. “Beliefs about channels of risk information, including their trustworthiness and usefulness, have the potential to influence information seeking and processing strategies” (Griffin et al., 2002, p. 714). Despite the belief that media may distort or exaggerate news, television and radio are still heavily relied upon as one’s primary information sources during a crisis (Bucher, 2002). Information channel preferences can be guided by the importance and credibility individuals’ place on the source. “Although newspapers, newsmagazines, and television network news often carry science stories, it is likely that individuals with an interest in science and technology make special efforts to seek out additional science information either from specialized outlets” (Elliott & Rosenberg, 1987, p. 185).

Channels for seeking information include face-to-face encounters (e.g. personal conversations) and mediated communication (e.g. television and web communications) (Brashers et al., 2002). It is common for individuals to experience contextual challenges with regard to the availability of channels for information seeking during a hurricane event. Specifically, Brashers et al. (2002) argue that information seekers may become overwhelmed when confronted with messages from multiple channels. Griffin et al. (1999) refer to this as information

gathering capacity. Griffin, Neuwirth, Giese, and Dunwoody (2002) posit that systematic processing depends on one's information gathering capacity and the perceived ability to obtain relevant information (Eagly & Chaiken, 1993).

Griffin et al. (2002) examined the link between the HSM (Eagly & Chaiken, 1993) and depth of processing risk information about environmental hazards. The researchers found that greater systematic information processing is positively related to the number of strongly held behavioral beliefs, strength of evaluation associated with behavioral beliefs, and strength of cognitive structure (indirect attitude) toward the behavior. Despite the suggested relationship between capacity and processing, Griffin et al. (2002) report low reliabilities of the measure and a curvilinear relationship between information gathering capacity and two dependent variables. The low reliability is likely a result of a two-item measure. Future research could develop the variable's conceptualization; thus, adding more items for determining information gathering capacity. Griffin et al. (2002) also explains that a "person's perception of information gathering capacity may hinge not only on assessment about the quality and nature of the information environment but also turn on questions of a person's perceived ability to handle such information" (p. 723).

Information management of hurricane risks differs from many other large-scale threats such as organizational crises, epidemics, bioterrorism, or global warming. This is primarily due to the level of (un)certainty associated with the

threat of a hurricane. Climatologists, for instance, have been able to identify a time frame for potential hurricane activity (e.g. hurricane season), which has aided investigations of people's actions to gain more knowledge. The predictability, albeit limited, of hurricane development allows researchers to pinpoint target populations and include actual hurricane events in the research. In other cases, those aforementioned, sometimes only hypothetical scenarios can be employed. Furthermore, many studies aim to understand individuals' intent to perform information seeking behaviors. The current investigation seeks to assess the role of blog credibility by examining beliefs about it as a communication information channel. This strategy of assessing channels beliefs is necessary due to limitations in identifying, contacting, and surveying blog readers who have submitted comments in response to a blog post. While blog authors are relatively accessible, accessing blog readers is problematic since they do not ordinarily provide contact information such as email addresses or links to personal web pages. Thus, Research Question 10 asks:

RQ10: What do blog readers' comments convey regarding their beliefs about the blog?

Blogging During Crises

Thus far, there have been no limits to the explosion of blogging activity. Experts and lay people blog about personal, social, and political issues. Thelwall and Stuart (2007) compared blogging communication technologies during three

major crises in 2005: the suicide bombing attacks on London's public transportation system, Hurricane Katrina, and the Pakistan-Kashmir earthquake. The researchers concluded that bloggers relied on a variety of communication technologies, including national and regional mass media and personal communication (Thelwall & Stuart, 2007). The same study also reveals that bloggers prefer different communication technologies depending on the crisis. For instance, during Hurricane Katrina, local news media was a significant information source for bloggers; however, this was not the case for the London attacks, during which bloggers relied on Wikipedia and Wiki news. The findings do not suggest a preferred communication technology for bloggers writing about the Pakistan-Kashmir earthquake. Thelwall and Stuart's (2007) work not only highlight information sources for bloggers, but it was able to capture the increase in blogging activity during a crisis by employing processing software to monitor blogs and extract frequently used crisis-related words.

Blogs even play a role during an organizational crisis. Sweetser and Metzgar (2007) analyzed individuals' perceptions of an actual crisis. Participants were assigned to either read a personal blog of the event, the organization's blog of the event, or placed in a control group. The findings indicate that people who read the blogs (personal or organizational) perceived a lower level of a crisis for the organization than those who were not exposed to a blog, and those exposed to the organizational blog reported the lowest score for the crisis among the groups

(Sweetser & Metzgar, 2007). The implications of the findings suggest that the type of blog may have an influence on people's perceptions of the magnitude of a crisis; thus, "they may have great promise as an organizational crisis management tool" (Sweetser & Metzgar, 2007, p. 342). Moreover, the study provides clues as to people's perceptions of credibility of blogs.

Publics have long relied on different information sources (i.e. local news, national news, scientific experts, social networks, or neighbors) during hurricane events. The findings of Thelwall and Stuart (2007) as well as Sweetser and Metzgar (2007) emphasize that individuals' beliefs during a crisis are not only influenced by the communication channel (e.g. blogs) by which a message travels but also the executor of the message. Lindell, Lu, and Prater (2005) surveyed risk area residents about hurricane evacuations in response to Hurricane Lili, which traveled toward the central Texas coast before ultimately making landfall on the south central coast of Louisiana in 2005. The researchers found that residents reported they relied most on local media as opposed to national media and more on local authorities than peers. In addition, those residents closer to the coast, rivers, or lakes, were more likely to rely on local authorities. The potential to predict message credibility based on the information source leads to Hypothesis 2 and states:

H2: Blog readers' comments will reveal greater credibility of local weather blogs than national weather blogs.

CHAPTER 3

Method

Definitions

For the purpose of this study, a *blog* is an interactive website which a *blogger* displays messages about a particular topic—usually in reverse chronicle order—and to which online *users* can view and respond to such messages. The blogger's messages are called *posts*, whereas the users' responses are referred to as *comments*.

Sampling Procedure

The researcher performed a content analysis on national and local weather blogs about Hurricane Ike. Each element within each weather blog (i.e. post and comment) was examined. Posts were analyzed for blogger and user activity (i.e. providing links, quotes, pictures, etc.) and message content (i.e. perceived susceptibility, perceived severity, response efficacy, and self-efficacy). Users' comments were analyzed for user activity (i.e. providing links, quotes, pictures, etc.), message content (i.e. perceived susceptibility, perceived severity, response efficacy, and self-efficacy), as well as perceptions of channel beliefs.

Blog sites active during the three days preceding Hurricane Ike's landfall were included in the sample. The official report, issued by the National Hurricane Center, indicated the storm's landfall was September 13, 2008. Three to seven days prior to hurricane land fall has been used as an acceptable period during

which much communication is generated about active hurricanes (see Choi & Lin, 2008; Wenger & Friedman, 1986). Thus, the sampling time frame begins 12:01AM, September 10, 2008 and ends on 11:59PM, September 12, 2008.

Blog Site Identification and Selection

The analysis focuses on the most popular and recognized weather-related blogs. This is determined by a cross check of science blogs that were recognized during the 2008 Weblog Awards for “Best Science Blog” and the “Top 10 Weather and Climate Blogs” list featured on Blogs.com. One blog, *Real Climate*, appeared on both lists. This yielded nineteen blog sites. The “Top 10 Weather and Climate Blogs” is contributed by Doyle Rice of *USA Today* and blogger of *The Weather Guys*; therefore, the decision was made to include *The Weather Guys* blog. In all, twenty national blogs were identified. From the twenty blog sites, nine of them were excluded for one or more reasons including: no available archive or no hurricane-specific content for the sample time frame, even when the blog was active. This resulted in a sample ($n = 11$) of national blogs: *60-Second Science*, *Capital Weather Gang*, *Dot Earth*, *Greg Laden*, *Jeff Master’s WunderBlog*, *Meteorological Madness*, *NASA Watch*, *Philly Weather.net*, *WeatherBug Backyard Club*, *Weather.com Blog*, and *WGN Weather Blog*.

To test Hypothesis 2, weather blogs featured on the websites of local news media (television and newspaper) serving the Houston-Galveston region were identified. Blogs were carefully examined for hurricane-specific content within

the sample time frame, as exercised during the national blog identification process. Local weather blogs ($n = 4$) in the analysis include: *11 Weather Blog* (CBS affiliate, KHOU), *Weatherblog.abc13* (ABC affiliate, KTRK), *Sci Guy* (The Houston Chronicle), and *Weather Watch* (The Galveston County Daily News). In total, fifteen ($n = 15$) national and local weather blogs are represented.

Blog Post Selection

The unit of analysis is each individual post appearing in the fifteen blog sites and within the sampling time frame. Posts ($n = 105$) were included in the analysis if they (1) are specific to Hurricane Ike, and (2) fall within the three days prior to the hurricane's landfall as reported by the National Hurricane Center (September 13, 2008). Thus, the three days prior to hurricane landfall are represented by Time 1 (September 10, 2008), Time 2 (September 11, 2008), and Time 3 (September 12, 2008). Posts dated after hurricane landfall were excluded as the perceived risks associated with hurricane threats (as well as information seeking behaviors) change once the storm comes ashore. Risks associated with hurricanes after landfall often include mosquito infestation, debris hazards, chainsaw accidents, carbon monoxide poisoning from generators, and concerns of looting; none of which are within the scope of the current study. In addition, the analysis focused only on the text of the posts. The content of any videos, pictures, graphics, or links provided within a post were not analyzed.

Blog Comment Selection

In a subsequent analysis, users' comments, which appear in response to the blog posts, were examined. The unit of analysis, hence, is each individual comment appearing in response to the post. The sample was generated using the identical sampling procedure outlined above for the blog post selection.

Comments were included in the analysis if they (1) are specific to Hurricane Ike, and (2) fall within the three days prior to the hurricane's landfall as reported by the National Hurricane Center. Comments dated after hurricane landfall were excluded in order to maintain a consistent sampling time frame utilized for blog posts. In concert with the blog post selection procedures, only the text of the comments were analyzed. The content of any videos, pictures, graphics, or links provided within a comment were not included in the analysis.

As what frequently happens in the blogosphere, a blog remains open for users to read and submit comments days (sometimes months) after the original post. This would result in a blog containing hundreds or thousands of comments. One blog, in particular, received over 4800 comments! Therefore, an additional consideration for comment selection was volume. The current study limited comment selection to the first twenty-five chronological comments submitted per blog post per day. For example, a blog post may have over 100 total comments, but only sixteen of them fall within the sample time frame. In this case, only the sixteen comments would be analyzed. In addition, it is not uncommon for blog

authors to create multiple posts in a given day. Thus, the first twenty-five comments submitted for each of the posts were included in the analysis.

Finally, one particular blog site experienced technical difficulty related to the site's capacity to manage the volume of activity. Occasionally, the blog displayed a blank comment where the user's text was lost in the submission. Thus, the decision was made to omit the submission in the selection process and include the following chronological comment. As a result, these steps produced a sample of 849 comments.

Coding and Scale Development

A codebook was created to identify messages in blogs based on the four components of the EPPM (Witte, 1992): perceived susceptibility, perceived severity, response efficacy, and self-efficacy, as well as the channel beliefs component of the RISP (Griffin et al., 2004). Descriptions and examples of the EPPM and RISP are found in Appendix A and B, respectively.

Threat and Efficacy

To satisfy Research Questions 1-9 and Hypothesis 1, message content was coded based on previous research (see Choi & Lin, 2008) using four topic categories derived from the EPPM (Witte, 1992). Blog messages related to perceived susceptibility or perceived severity fall under the realm of fear control processes and signify threat components. These consist of the categories, "anticipated outcomes or damages" and "the intensity of the hurricane." Examples

of messages, which reflect these categories include, “The category five hurricane will cause catastrophic building failures” (perceived susceptibility) and “The hurricane will produce a storm surge over eighteen feet, and wind speeds in excess of 155 miles per hour” (perceived severity). Blog messages related to response efficacy and self-efficacy elicit danger control processes and signify efficacy components. These consist of the categories, “actions to take to prevent risks” and “expected outcomes of taking preventive actions.” Examples of messages, which reflect these categories include, “Residents are advised to remove furniture, plants, and loose objects from outdoor spaces” (response efficacy) and “By staying away from windows and exterior walls you will be safer” (self-efficacy). Examples of coding sheets for blog posts and comments are found in Appendix C and D, respectively.

Channel Beliefs

To address Research Question 10 and Hypothesis 2, audiences’ channel beliefs of the blog were coded using an adaptation of the news credibility scale (Gaziano & McGrath, 1986). The seven-point Likert-type scale contains 12-item indicators and focuses on traditional credibility components, which reflect beliefs and perceptions of information channels, and include trustworthiness, currency, bias, fairness, completeness, objectivity, honesty, up-to-date, believability, balance, accuracy, and timeliness. The scale has performed well in a diversity of media studies. Abdulla, Garrison, Salwen, Driscoll, and Casey (2002; see also

Johnson & Kaye, 1998) report credibility was highest for online news at 7.01 ($SD = 5.14$, $n = 145$) while individuals rated television credibility at 4.85 ($SD = 5.85$, $n = 447$) and newspaper credibility at 4.26 ($SD = 5.44$, $n = 399$). Johnson, Kaye, Bichard, and Wong (2008) generated a credibility index of four of the traditional credibility components (believability, fairness, accuracy, and depth of information) in their investigation of political blogs. Blogs were rated as moderately credible ($M = 2.6$); however, Johnson et al. (2008) hypothesized the moderate score given that their investigation focused on political blogs where bloggers frequently voice their opinions. Anderson, Bielling, Bissell, Burke, Chambers, Davis, et al. (2006) employed the full version of the news credibility scale (Gaziano & McGrath, 1986) to measure credibility of military blogs. The researchers report military blogs are somewhat credibility at 3.96 ($\alpha = .87$), which is very close to the scale's midpoint.

Next, rating scales were developed for content analysis of blog comments in the data corpus. In keeping with past research (see Johnson & Kaye, 2004; Johnson et al., 1998; and Rubin et al., 1994), the news credibility scale (Gaziano & McGrath, 1986) was adapted from a seven-point to a five-point Likert-type scale. Although Johnson et al. (2008) achieved moderate credibility ratings using an adaptation of the news credibility scale the study was not compromised by the conversion to a five-point Likert-type scale, but rather the possible selection of four of the twelve credibility components. A second modification to the scale is

the inclusion of zero to mark an absence of a component. This results in an adapted scale which ranges from 0 to 5, and where 0 = absence, 1 = strongly disagree, 3 = neutral, and 5 = strongly agree. The study also employed the full version of the scale to assess each of the distinct components (e.g. trustworthiness, currency, bias, fairness, completeness, objectivity, honesty, up-to-date, believability, balance, accuracy, and timeliness). The scales' values were defined with summaries of each component, as well as examples of particular ratings. For example, to assess timeliness of a blog, the time stamp of a blog comment was not rated; rather, the blog comment, "Whatever, that information is irrelevant now!" was be rated as low on the timeliness scale. This indicates that the blog reader perceives the blog as untimely. In contrast, a blog reader who comments, "Glad I read this blog before I evacuated!" may obtain a high rating on the timeliness scale. Finally, a reader who comments, "Be safe everyone" would receive a rating of zero, as the message does not reflect the reader's opinion regarding timeliness. Examples of ratings scales and summaries are provided in the Appendix E. Blog posts were not coded since Research Question 10 and Hypothesis 2 seeks to understand blog readers' perceptions. Scale reliability for the news credibility scale in this study was .931.

Inter-coder Reliability

The present study employed two coders, which included the researcher and an undergraduate student assistant. The assistant was first introduced to the research topic and given a general overview of the data collection procedures. Next, the assistant was trained in the theoretical concepts of the EPPM, RISP, as well as the rating scales for the news credibility scale. A session was also conducted by the researcher, where coders visited blogs sites, unrelated to the present study, to explore blog features. Training materials were then provided to the assistant, of which included detailed explanations of the scales and examples. Data generated from blog sites outside of the study's sample were used for practice sets (nineteen posts and thirty comments). A subsequent meeting occurred the following week where the coders discussed disagreements in their ratings until a mutual understanding was met.

After completion of the practice sets, the coders independent coded approximately 10% ($n = 95$) of the final sample. Cohen's κ (Cohen, 1960) was used to test the validity of the coding scheme. Reliability for each variable ranged from .34 to .49. Coders discussed disagreements of the variables. A second training session was conducted to review changes in the codebook and coding worksheets, which were made for clarity and to remove redundant items. Coders independently coded a second subsample, and a second inter-coder reliability test using Cohen's κ was performed. This time, reliability ranged from .62 to .80.

Acceptable reliability figures in the .80 and .90 range are most desirable; however, Rifee, Lacy, and Fico (1998) argue content research “that is breaking new ground with concepts that are rich in analytical value may go forward with reliability levels somewhat below that range” (p. 131). The ratings were retained based on their relevance to the study.

Data Analysis

The study used multiple methods to analyze the data. To answer Research Questions 1-9 and Hypothesis 1, frequencies were generated to describe the presence or absence of the EPPM message components (perceived susceptibility, perceived severity, response efficacy, and self-efficacy) in blog posts and blog comments.

Next, chi-square tests were performed to determine whether there were significant differences of the EPPM components and the time at which blog posts (or comments) occur for Research Questions 4 and 9. Statistical significance was set at $p < .05$.

To assess Research Question 10, what do blog readers’ comments convey regarding their beliefs about the blog, the study examined the overall mean of the news credibility measure. First, scale reliability was performed on all twelve credibility components ($\alpha = .931$). Next, a new variable was recoded for cases which included particular news credibility ratings. For example, comments may have communicated a reader’s belief of trustworthiness, but not timeliness. The

items were collapsed into a single item measure of credibility. Means and *SD* were calculated for credibility of local and national blogs.

Furthermore, Hypothesis 2 posited that blog readers' comments will reveal greater credibility of local weather blogs than national weather blogs. A one-way analysis of variance (ANOVA) was performed to determine whether there was a significant difference. The level of significance was set at the .05 level. All tests were performed using SPSS Statistics 17.0.

CHAPTER 4

Results

This investigation featured a content analysis of national and local weather blogs about Hurricane Ike. Specifically, the analysis aims to describe the content of the blogs' posts and comments in terms of the message components of the EPPM including perceived susceptibility, perceived severity, response efficacy, and self-efficacy. In addition, correlations between threat/efficacy messages and the time at which blog messages are posted were examined. Finally, credibility of national and local weather blogs about Hurricane Ike were assessed.

Research Question 1 and Hypothesis 1

The first research question asked what percentage of hurricane blog posts contains all four components of the EPPM (perceived susceptibility, perceived severity, response efficacy, and self-efficacy). Table 1 illustrates frequencies of each EPPM component found overall in blog posts. Only 13% of the blog posts ($n = 14$) included both threat and efficacy messages. This was observed in blog posts at each time, as well as in both local and national blogs.

Table 1

Blog Posts and EPPM Components

	Overall	Time 1	Time 2	Time 3
Containing All Four EPPM Components	13% (<i>n</i> = 14)	21% (<i>n</i> = 6)	14% (<i>n</i> = 4)	8% (<i>n</i> = 4)
Missing All Four EPPM Components	10% (<i>n</i> = 10)	7% (<i>n</i> = 2)	7% (<i>n</i> = 2)	13% (<i>n</i> = 6)

When analyzed according to when the blog messages were posted—Time 1 (September 10, 2008), Time 2 (September 11, 2008) and Time 3 (September 12, 2008)—the percentage of blog posts that included all four EPPM components was similarly low across groups (see Table 1). Among blog posts from Time 1, 21% contained all four components; however, as blog posts approached the date of hurricane landfall fewer posts (14%) contained all four components as seen at Time 2. Finally, the day before hurricane landfall, Time 3, only 8% of blog posts contained all four EPPM message components.

An example of a blog post with all four EPPM components is illustrated in the following national blog post (#18-10-1, dated September 10, 2008 7:40AM):

As of 4:00AM CDT Wednesday, Category ‘1’ Hurricane ‘Ike’ was located near 23.5 degrees North, 84.9 degrees West. This is about 125 miles North

of the Western tip of Cuba, or 465 miles Southeast of the mouth of the Mississippi River [*perceived susceptibility*]. ‘Ike’ is traveling West-Northwest at 8 mph with maximum-sustained winds of 85 mph [*perceived severity*]. The central pressure as reported by ‘Hurricane Hunter’ reconnaissance aircraft has dropped to 959 MB, or 28.32 inches of mercury. Hurricane-force winds extend 35 miles outward from ‘Ike’s’ center [*perceived severity*]. Tropical storm-force winds extend outward up to 175 miles...[*perceived susceptibility*] Hurricane ‘Ike’ is still being steered by a strong upper-level high-pressure ridge that extends across the Northern Gulf of Mexico and the Deep South of the United States... Conditions are favorable for intensification over the next couple of days as water temperatures along ‘Ike’s’ projected track are at least 82 degrees and upper-level wind shear remains weak [*perceived severity*]. ‘Ike’ is expected to intensify to a Category ‘2’ hurricane later today or tonight [*perceived severity*]. But it’s also believed given the favorable conditions, ‘Ike’ could develop into a major hurricane, possibly Category ‘3’ status, later on Thursday or Thursday night...[*perceived severity*] Stay tuned here for new info on these tropical storms [*response efficacy*]. Please don’t forget that when these tropical systems form – whether they remain a tropical depression or develop into a named tropical storm or Category ‘1’ through ‘5’ hurricane, each of these systems will **ALWAYS BE A RAIN**

EVENT! [*perceived severity and perceived susceptibility*] When the term ‘hurricane’ is written or spoken, it’s human nature to think only of the wind speeds they contain [*self-efficacy*] but don’t overlook the fact that there is always torrential rainfall associated with any type of tropical system! [*response-efficacy*] If you’d like to have a 2008 Atlantic Basin Hurricane Tracking Chart, click on the link below to open it up and print it out [*response and self-efficacy*].

A second exemplar of a blog post containing all four EPPM components is found in a local blog at Time 2 (#24-11-3, posted on September 11, 2008 at 4:00PM):

...By late Friday night into Saturday morning, conditions will be what can only be described as terrible [*perceived severity*]. Sustained winds of 64 to 85-mph will down power lines, trees, and signs while ripping at roofs and other vulnerable portions of many structures [*perceived severity and perceived susceptibility*]. Tides will increase to the predicted heights of 12-16 feet on the [Galveston] Island and 12-20 feet around the Bay, inundating many parts of the County [*perceived severity and perceived susceptibility*]. Hopefully, anyone who has ignored the evacuation order will have found refuge in a place with an elevation enough to avoid the devastating tidal surge [*self-efficacy and response efficacy*]. I know this scenario may sounds very gloomy to some readers, but I think that it is a

fairly accurate description of what we may well face over the next 36-hours [*perceived susceptibility*]. Please take care! [*response efficacy*]

The analysis also revealed a number of cases ($n = 10$, or 10%) in which blog posts were missing all four message components (see Table 1). Interestingly, the percentage of posts missing all components remained the same at Time 1 and Time 2 (7%); yet, nearly doubled at Time 3. Clear examples of when this occurred were when blog posts contained a link, video clip, or graphic but no text. Since the analysis evaluated message content, an absence of all EPPM components was subsequently reported. Occasionally, a blog post containing content was also found to be missing all EPPM components such as when the content used Hurricane Ike as a focal point for climate-hurricane debate. One national blog post in particular (#3-10-3, posted on September 10, 2008 at 11:00AM) states:

This hurricane season has been a destructive one for the United States, with five consecutive tropical cyclones making landfall so far, while a sixth storm – Ike – now threatens the Gulf Coast. If the recent past is any guide, adding such a remarkable string of tempests to the volatile atmosphere of an election year should result in a high profile debate on global climate change and severe storms... with Hurricane Ike approaching and more than two months left in hurricane season, it's perhaps inevitable that another hurricanes and global warming debate will

flare up this year. But who will start that conversation, and where it will lead, are unclear.

Although the post refers to Hurricane Ike, it was found to be missing all four EPPM components because there was no specific mention of the intensity of the hurricane (perceived severity), anticipated outcomes or damages (perceived susceptibility), actions to take to prevent risks (response efficacy) or expected outcomes of taking preventative actions (self-efficacy).

Table 2
Presence/Absence of the EPPM Components in Blog Posts

	Frequency	Percent
Perceived Susceptibility		
Yes	79	75.2
No	26	24.8
Total	105	100
Perceived Severity		
Yes	86	81.9
No	19	18.1
Total	105	100
Response Efficacy		
Yes	46	43.8
No	59	56.2
Total	105	100
Self-Efficacy		
Yes	15	14.3
No	90	85.7
Total	105	100

Hypothesis one stated that hurricane blogs will most frequently convey messages associated with actions to take to prevent risk (response efficacy). The hypothesis was not supported. Frequencies illustrated in Table 2 reveal that blog posts communicated messages associated with the severity of the hurricane (perceived severity) most frequently, or 82% of the time. Examples of posts containing messages identified as perceived severity include one from a local blogger posted two days before hurricane landfall (#22-11-1, dated September 11, 2008, time not given):

Based on the current forecast track, here's what you can expect in some of our local communities. For Galveston Island: Sustained winds 100-120 mph with higher gusts, 15-17' storm surge flooding most of the island, more than 8" of rain, and isolated tornados... [*perceived severity*]

Hurricane Ike could be the strongest hurricane to hit the north Texas coast since Hurricane Carla in 1961 and could be stronger than Hurricane Alicia in 1983 [*perceived severity*]. Based on the predicted path and strength of Hurricane Ike, our cost analysis program shows this area could have \$75 billion dollars in total economic losses [*perceived susceptibility*]. Of course, this is just an estimate and it includes such things as the cost of shutting down local businesses, loss of income and property damage [*perceived susceptibility*].

Messages associated with anticipated outcomes or damages (perceived susceptibility) appeared in blog posts 75% of the time. Examples of posts containing messages identified as perceived susceptibility include one from a national blog posted at Time 3, or the day before the hurricane made landfall (#9-12-2, dated September 12, 2008 at 9:12PM):

Extensive flooding of low lying towns outside the New Orleans levee system is occurring. Surge overtopped a St. Mary Parish levee near the town of Gordy, and a six-foot-wide breach was reported in a non-federal parish levee near the towns of Caernarvon, Scarsdale, White Ditch and Braithwaite...[*perceived susceptibility*] We can expect Ike to cause the largest and longest-lived power outage in Texas history, with power knocked out along a 200-mile wide swath in eastern Texas and extreme western Louisiana extending 300 miles inland on I-20 [*perceived susceptibility*]. Dallas will be at the fringe of the region of widespread outages, and should not suffer major power failures [*perceived susceptibility*].

Messages associated with actions to prevent risks (response efficacy) appeared in blog posts 44% of the time. An example of response efficacy in a blog post is found in a one local blog (#23-12-7, dated September 12, 2008 11:39PM):

...About 40% of the city's 58,000 residents ignored calls to evacuate [*response efficacy*]. And now they're planning for help and getting this response, "We can't help you." I fear it's going to be quite grim [*perceived susceptibility*]. City Manager Steve LeBlanc went so far as to ask the media not to photograph "certain things" in the aftermath, referring to the possibility of dead bodies... [*response efficacy*] I noted on Wednesday night that I couldn't believe that the Galveston mayor hadn't yet called for an evacuation, and she finally did Thursday morning [*response efficacy*]. Still, I feel the emergency planners weren't sufficiently firm in their warnings, leaving that job to the National Weather Service. Sensing the danger, the weather service was left to writing messages such as, "Persons not heeding evacuation orders in single family one or two story homes will face certain death." [*response efficacy*] Unfortunately, this may now come to pass on an island where more than 20,000 people remain to ride out a monster hurricane [*response efficacy*].

Finally, the least frequent EPPM message component in blog posts were those which focused on expected outcomes of taking preventative actions (self-efficacy), which appeared only 14% of the time. An example of self-efficacy is illustrated in the following national blog post (#5-12-1, dated September 12, 2008 1:37 PM):

The storm surge simulations for Hurricane Ike provide an extraordinary wakeup call, and an illustration of how science increasingly is providing a clear view of disaster risks. It's up to citizens to respond, not only by fleeing when prompted, but also by considering carefully where to live and how to build [*self-efficacy*].

Research Question 2

The second research question asked what percentage of hurricane blog posts is missing one or more threat component (perceived susceptibility and perceived severity). As seen in Table 3, 16% of the overall blog posts were missing only one threat component (either perceived susceptibility or perceived severity). The frequency of missing both threat components was 11% of the total blog posts. A closer analysis reveals the blog posts were missing perceived susceptibility and perceived severity messages 25% and 18% of the time, respectively.

According to time, blog posts appear to lack only one threat component more often, rather than both threat components. Also, at Time 1 and Time 2, blog posts were missing perceived susceptibility messages more often than perceived severity messages; although, this was not the case at Time 3 when more blog posts appeared to include these messages more.

Table 3

Absence of Threat Messages in Blog Posts

	Overall	Time 1	Time 2	Time 3	χ^2
Missing only one threat component	16% (<i>n</i> = 17)	11% (<i>n</i> = 3)	24% (<i>n</i> = 7)	15% (<i>n</i> = 7)	
Missing both threat components	11% (<i>n</i> = 12)	11% (<i>n</i> = 3)	10% (<i>n</i> = 3)	13% (<i>n</i> = 6)	
Missing Perceived Susceptibility	25% (<i>n</i> = 26)	21% (<i>n</i> = 6)	24% (<i>n</i> = 7)	19% (<i>n</i> = 13)	.312, <i>p</i> = .856
Missing Perceived Severity	18% (<i>n</i> = 19)	11% (<i>n</i> = 3)	21% (<i>n</i> = 6)	21% (<i>n</i> = 10)	1.404, <i>p</i> = .496

Research Question 3

The third research question asked what percentage of hurricane blog posts is missing one or more efficacy component (response efficacy and self-efficacy). Table 4 illustrates blogs posts, which are missing efficacy messages. Overall, 30% of the all blog posts were missing only one efficacy component (either response efficacy or self-efficacy). The frequency of missing both efficacy components was 56% of the total blog posts. A closer analysis reveals the blog posts were missing response efficacy and self-efficacy messages 56% and 86% of the time, respectively. According to time, blog posts appear to lack both efficacy

components more frequently, rather than only one efficacy component. In fact, as time progressed from Time 1 (43%), Time 2 (52%), and Time 3 (67%), there was an increase in missing both efficacy components in blog posts. More specifically, blog posts missing response efficacy increased across the groups over time (43%, 52%, and 67%, respectively). The trend continued for missing self-efficacy messages at Time 1 (79%), Time 2 (83%), and Time 3 (92%).

Table 4
Absence of Efficacy Messages in Blog Posts

	Overall	Time 1	Time 2	Time 3	χ^2
Missing only one efficacy component	30% (<i>n</i> = 31)	36% (<i>n</i> = 10)	31% (<i>n</i> = 9)	25% (<i>n</i> = 12)	
Missing both efficacy components	56% (<i>n</i> = 59)	43% (<i>n</i> = 12)	52% (<i>n</i> = 15)	67% (<i>n</i> = 32)	
Missing Response Efficacy	56% (<i>n</i> = 59)	43% (<i>n</i> = 12)	52% (<i>n</i> = 15)	67% (<i>n</i> = 32)	4.397, <i>p</i> = .111
Missing Self-Efficacy	86% (<i>n</i> = 90)	79% (<i>n</i> = 22)	83% (<i>n</i> = 24)	92% (<i>n</i> = 44)	2.762, <i>p</i> = .251

Research Question 4

The fourth research question asked whether there is a difference in percentages of the EPPM components in hurricane blog posts as time approaches

hurricane landfall. Tables 3 and 4 (see last column) illustrate the results of chi-square tests of the EPPM components across all groups. To understand how perceived susceptibility, perceived severity, response efficacy and self-efficacy independently operated, Pearson's chi-square (χ^2) statistic was calculated for each EPPM component to determine if there were significant differences between Time 1, Time 2, and Time 3. The results indicate that there is no statistically significant difference between time and perceived susceptibility ($\chi^2 (2) = .312, p = .856$), perceived severity ($\chi^2 (2) = 1.404, p = .496$), response efficacy ($\chi^2 (2) = 4.397, p = .111$), or self-efficacy ($\chi^2 (2) = 2.762, p = .251$).

Research Question 5

The fifth research question asked what percentage of hurricane blog comments contains all four components of the EPPM (perceived susceptibility, perceived severity, response efficacy, and self-efficacy). Table 5 illustrates frequencies for each EPPM component found in all blog comments. A meager 3% ($n = 22$) included both threat and efficacy messages. In direct contrast, the check also revealed a number of cases (27%, or $n = 232$) in which blog comments were missing all four message components.

Table 5

Blog Comments and EPPM Components

	Overall	Time 1	Time 2	Time 3
Containing All Four EPPM Components	3% (n = 22)	5% (n = 12)	1% (n = 3)	2% (n = 7)
Missing All Four EPPM Components	27% (n = 232)	7% (n = 58)	30% (n = 82)	26% (n = 92)

When analyzed according to when the blog comments occurred—Time 1 (September 10, 2008), Time 2 (September 11, 2008) and Time 3 (September 12, 2008)—the percentage of blog comments that included all four EPPM components was very low across the groups (see Table 5). Among blog comments from Time 1, 5% contained all four components; however, as blog comments approached the date of hurricane landfall fewer comments (1%) contained all four components as seen at Time 2. Finally, the day before hurricane landfall, Time 3, a slight increase (2%) of blog comments contained all four EPPM message components.

An example of a blog comment with all four EPPM components is illustrated in the following response to a national blog (Comment ID #2 from Blog ID #3-10-1, dated September 10, 2008 9:47PM ET):

Ike is likely to be an extremely dangerous major hurricane at landfall, and will likely do \$10-\$30 billion in damage [*perceived susceptibility and perceived severity*]. The chances of hundreds of people being killed in this storm are high if people do not heed evacuation orders [*response efficacy and self-efficacy*]. It is possible that Ike will make a direct hit on Galveston as a Category 4 hurricane with 145 mph winds [*perceived severity*].

The analysis also revealed a number of cases ($n = 232$, or 27%) in which blog comments were missing all four message components (see Table 5). Unexpectedly, the percentage of blog comments that were found to be missing all four EPPM components jumped dramatically from Time 1 (7%) to Time 2 (30%), then tapered slightly at Time 3 (26%). Obvious examples of when this occurred were when comments contained a link, video clip, or graphic but no text. Since the analysis evaluated message content, an absence of all EPPM components was subsequently reported for these cases. More often, a comment containing content was found to be missing all EPPM components when the commentator made personal remarks, such as praise to the blogger. One commentator on a local blog (Comment ID: #25 from Blog ID #23-11-1, posted on September 11, 2008 at 8:12AM CDT) writes, “WOW, Eric! Do you realize your blog is the headline on Drudge Report!” Another comment (Comment ID: #16) showing support to the same blog post writes, “I want a SciGuy T-Shirt. Where do I place my order?”

Although the comments are reactions to a post about Hurricane Ike, they were found to be missing all four EPPM components because there was no specific mention of the intensity of the hurricane (perceived severity), anticipated outcomes or damages (perceived susceptibility), actions to take to prevent risks (response efficacy) or expected outcomes of taking preventative actions (self-efficacy).

Research Question 6

The sixth research question asked what percentage of hurricane blog comments is missing one or more threat component (perceived susceptibility and perceived severity). As seen in Table 6, 39% of the all blog posts were missing only one threat component (either perceived susceptibility or perceived severity). The frequency of missing both threat components was 51% of the total blog posts. A closer analysis reveals blog posts missing perceived susceptibility and perceived severity messages were virtually the same (68% of the time). According to time, blog posts were missing both threat components more frequently than only missing one threat component. Another notable finding was that blog comments were consistently missing both threat components over time (52%, 51%, and 49% for Time 1, 2, and 3 respectively).

Table 6

Absence of Threat Messages in Blog Comments

	Overall	Time 1	Time 2	Time 3	χ^2
Missing only one threat component	39% (<i>n</i> = 333)	32% (<i>n</i> = 72)	42% (<i>n</i> = 115)	41% (<i>n</i> = 146)	
Missing both threat components	51% (<i>n</i> = 432)	52% (<i>n</i> = 117)	51% (<i>n</i> = 141)	49% (<i>n</i> = 174)	
Missing Perceived Susceptibility	68% (<i>n</i> = 580)	67% (<i>n</i> = 151)	73% (<i>n</i> = 202)	64% (<i>n</i> = 227)	6.305, <i>p</i> = .043*
Missing Perceived Severity	68% (<i>n</i> = 577)	69% (<i>n</i> = 155)	70% (<i>n</i> = 195)	76% (<i>n</i> = 267)	3.364, <i>p</i> = .186

Note *Statistical significance was set at $p < .05$.

Research Question 7

The seventh research question asked what percentage of hurricane blog comments is missing one or more efficacy component (response efficacy and self-efficacy). Table 7 illustrates the blog comments, which are missing efficacy messages. Overall, 23% of the all blog comments were missing only one efficacy component (either response efficacy or self-efficacy). The frequency of missing both efficacy components was 61% of the total blog comments. A closer analysis reveals the blog comments were missing response efficacy and self-efficacy

messages 61% and 82% of the time, respectively. According to time, blog comments are missing both efficacy components more frequently than missing only one efficacy component. More specifically, blog comments missing response efficacy varied over time (57%, 65%, and 58% for Time 1, 2, and 3 respectively). Some variation continued for missing self-efficacy messages at Time 1 (75%), Time 2 (84%), and Time 3 (84%) although frequencies of the missing content remained high (75% or above).

Table 7

Absence of Efficacy Messages in Blog Comments

	Overall	Time 1	Time 2	Time 3	χ^2
Missing only one efficacy component	23% (n = 191)	19% (n = 43)	20% (n = 55)	26% (n = 93)	
Missing both efficacy components	61% (n = 515)	57% (n = 129)	65% (n = 180)	58% (n = 206)	
Missing Response Efficacy	61% (n = 522)	59% (n = 132)	66% (n = 182)	59% (n = 208)	3.812, p = .149
Missing Self-Efficacy	82% (n = 699)	75% (n = 169)	84% (n = 233)	84% (n = 297)	9.105, p = .011*

Note *Statistical significance was set at p < .05.

Research Question 8

The eighth research question asked what EPPM component was most frequently conveyed in blog comments. Frequencies illustrated in Table 8 reveal that blog comments communicated messages associated with actions to prevent risks (response efficacy) most frequently. Messages associated with anticipated outcomes or damages (perceived susceptibility) were next, followed by messages associated with the severity of the hurricane (perceived severity) and messages associated with expected outcomes of taking preventative actions (self-efficacy), respectively.

Table 8

Presence/Absence of the EPPM Components in Blog Comments

	Frequency	Percent
Perceived Susceptibility		
Yes	269	31
No	580	68
Total	849	100
Perceived Severity		
Yes	272	32
No	577	68
Total	849	100
Response Efficacy		
Yes	327	39
No	522	61
Total	849	100
Self-Efficacy		
Yes	150	18
No	699	82
Total	849	100

Research Question 9

The ninth research question asked whether there is a difference in percentages of the EPPM components in hurricane blog comments as time approaches hurricane landfall. Tables 7 and 8 (see last column) illustrate the results of chi-square tests of the EPPM components across all groups. To understand how perceived susceptibility, perceived severity, response efficacy and self-efficacy independently operated, Pearson's chi-square (χ^2) statistic was

calculated for each EPPM component to determine if there were significant differences between Time 1, Time 2, and Time 3. The results indicate that there is a statistically significant difference between time and perceived susceptibility ($\chi^2 (2) = 6.305, p = .043$) as well as time and self-efficacy ($\chi^2 (2) = 9.105, p = .011$). No statistical difference were found between time and perceived severity ($\chi^2 (2) = 3.364, p = .186$) or time and response efficacy ($\chi^2 (2) = 3.812, p = .149$).

Research Question 10 and Hypothesis 2

The tenth research question asked what do blog readers’ comments convey regarding their beliefs about the blog. That is, did the readers find the blog credible? To assess this, the study examined the overall mean of the news credibility measure (see Table 9). Using the five-point Likert-type scale, with a midpoint of 3.0, the overall credibility of the blogs was $M = 3.63, SD = 1.2 (n = 216)$.

Table 9
Local and National Credibility

Type	Mean	N	Std. Deviation
Local	3.6916	151	1.01832
National	3.4800	65	1.50620
Total	3.6279	216	1.18670

Hypothesis two stated that blog readers’ comments will reveal greater credibility of local weather blogs than their counterparts. Blog readers’ credibility

was higher for local weather blogs ($M = 3.7, SD = 1.0, n = 151$) than national weather blogs ($M = 3.48, SD = 1.5, n = 65$). A one-way analysis of variance (ANOVA) was calculated on credibility ratings of local and national blogs, and the analysis was not significant $F(1, 214) = 1.4, p = .230$ (see Table 10). Subsequently, Eta-square was calculated, where $\eta = .0067$. That is, the type of blog only accounts for .67% of readers' credibility.

Table 10
ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.035	1	2.035	1.448	.230
Within Groups	300.739	214	1.405		
Total	302.774	215			

CHAPTER 5

Discussion

The purpose of this investigation was to apply the EPPM to weather blogs about Hurricane Ike to determine whether the posts and comments contain messages to stimulate threat and efficacy appraisals. A second goal was to apply the RISP to learn what readers convey in their comments about their channel beliefs of the blogs. Since the blogosphere has gained enormous popularity for its convenience, interactivity, and efficiency, it is critical to understand the role of blogs and how they may shape perceptions of hurricane risks. In this final section, the research questions and hypotheses are interpreted, salient limitations are addressed, and key directions for future research are posed.

Past scholars have argued that “two-way interaction between the public and the organization, where the public is given the opportunity to respond, is a giving interactive communication a promising future” (Taylor & Perry, 2005, p. 216); yet they fall short of studying a specific modality, such as blogging. Studies have also attempted to evaluate the use of the internet at various times during crisis, but the findings provide little evidence related to a specific event and do not include the perspective of the audience (see Perry, Taylor, & Doerfel, 2003). Herring et al. (2005) describe blogging as the “bridging genre” (p. 143) for its potential to be interlinked, interactive, and oriented towards external events. Whether blogs reflect forms of self-expression or collectivistic views, they

represent a breadth of issues about health, politics, celebrity gossip, and a host of other categories. Basically, there is something for everyone.

This study accomplished several goals. First, it answered the call to focus on two-way interactions by evaluating the content of blog posts and readers' responses (e.g. comments). Second, the study analyzed a specific event (Hurricane Ike) and looked at the frequencies and significant differences of threat and efficacy messages at various times of the crisis. Third, the study integrates the perspective of the audience by analyzing what channel beliefs they may convey about the blog.

Blog Posts

The first set of research questions and Hypothesis One addressed the presence or absence of the EPPM components in blog posts. The results of the content analysis of weather blogs indicate that the significant portion of the posts are likely failing to motivate behaviors to circumvent or reduce the effects of hurricane risks. They simply do not contain the threat and efficacy components. Only 13% of the weather blogs contain all four EPPM components. Equally concerning, the results indicate a steady decline of the four components as time approaches hurricane landfall (from 21% to 8%)—despite that the number of blog posts increase over time. Witte (1992) argues, “Cognitions about threat and efficacy cause attitude, intention, or behavior changes (i.e. adaptive responses)” (p. 340). The lack of both threat and efficacy appeals in the days prior to

hurricane landfall is a missed opportunity for bloggers. This is a critical point when individuals will decide whether response and self-efficacy are still manageable. Not only does the number of blogs containing all four EPPM components decline, but the number of blogs missing the four components rises (from 7% to 13%). If fewer posts contain all message components, it may influence the likelihood that readers engage in maladaptive responses, such as denying the threat of the hurricane, rejecting the hurricane message in the post, or reacting against the message or even the blogger.

The results also show that the most frequently conveyed message component in the blogs was perceived severity followed by perceived susceptibility; thus, Hypothesis One was not supported. This contrasts Choi & Lin's (2008) investigation of newspaper coverage of three major hurricanes, who found response efficacy (actions to take to prevent risk) to be most predominant. Moreover, the researchers did not find either of the threat components as prevalent. The implications of the current findings on hurricane risk information seeking can be significant. Given that the blogs in the current study communicate threat more frequently than not, as well as more often than both efficacy components, jeopardizes the efforts of the blog post if the threat is not accompanied by an efficacy appeal.

When blog posts were missing threat (perceived susceptibility and perceived severity), 11% of the posts were missing both threat components while

16% were missing only one. “The EPPM proposes that threat initiates and motivates message processing” (Witte, 1992, p. 339). Essentially, if weather blogs about Hurricane Ike are missing one or more threat component, readers may lack a sufficient level of threat and are therefore unlikely to evaluate efficacy components. The findings suggest that readers may not reach the efficacy appraisal process because the blog post was missing one or both threat components, but these percentages may be misleading. The EPPM also proposes that if weather blogs do not contain threat components, but the reader detects threat, the reader may continue with the evaluation of efficacy components. The frequencies represent the content of the written text of each post. It does not reflect the threat content, which may be contained in video clips, pictorials, hyperlinks, or sidebar features which were outside the scope of the study. Notwithstanding this, when blog posts do not communicate the anticipated outcomes or damages or the intensity of the hurricane, the audience may be less likely to perform adaptive behaviors including buying supplies, securing loose outdoor items, or evacuating.

The EPPM suggests that if blog posts do contain efficacy components, and the reader perceives a sufficient level of efficacy, then the reader is more likely to comply with the recommended behavior. When blog posts were missing efficacy (response efficacy and self-efficacy), 56% of the posts were missing both efficacy components while 30% were missing only one. A closer look reveals posts which

were missing response efficacy climbed over time. Most alarming, was that the posts were missing self-efficacy 86% overall. As time progressed towards hurricane landfall, self-efficacy was missing in blog posts at an increasing rate—as high as 92% at Time 3. Witte (1992) argues that missing even one of the efficacy components, the reader may be left with the perception of threat, as well as the feeling that nothing can be done to resolve it. These absences in efficacy exacerbate a dire state for which threat has already been detected.

Chi-square tests revealed the key times for missing EPPM components in blog posts, such as the one, two, or three days prior to hurricane landfall. Although no significant differences were found across the three times for blog posts, the trends support the notion that as time approaches hurricane landfall the perceptions of susceptibility and severity of the threat increases; thus, blog posts may be more likely to include threat messages over efficacy messages.

Blog Comments

The EPPM

The second set of research questions and Hypothesis Two addressed the presence or absence of the EPPM components, as well as channel beliefs, in blog comments. The results of the analysis indicate that a staggering portion of the comments are not motivating threat and efficacy appraisals. Overall, only 3% of 849 readers' comments contained all four components. At best, Time 1, comments contained all components 5% of the time. At Time 2, all four

components were nearly non-existent accounting for only 1%, and at Time 3, a mere 2%. Despite that blog readers may not represent a meteorological or official emergency response opinion, research has shown that online participants do see themselves as do-it-yourself reporters. The Pew Internet & American Life Project (Horrigan & Morris, 2005) concludes that “approximately 72 million Americans used the Internet to get news and information about Hurricanes Katrina and Rita” (Horrigan & Morris, 2005, p. 3). They noted that a number of Americans use the Internet to move beyond traditional means, where 17% of the online news audience read blogs for details regarding the impact of the hurricanes. The report also described “4% of Internet users (or 5.6 million people) went online to post their own materials such as comments, links, and pictures related to the hurricane on blogs, bulletin boards, or chat rooms” (Horrigan & Morris, 2005, p.1). This indication of blog usage, redefines the importance of the EPPM content in readers’ comments. Not only do the comments provide feedback to the blogger, but they may also serve as a credible source for information seekers. Currently, no other study has focused on unsolicited blog comments.

The results of the investigation show that when readers’ comments were missing threat (perceived susceptibility and perceived severity), 50% of the comments were missing both threat components while 39% were missing only one. Returning to Witte’s (1992) claim, that threat initiates and motivates message processing, it would appear that a large portion of reader’s comments fail to

prompt other readers to evaluate efficacy messages. When comments lack even one threat component, readers may lack a sufficient level of threat; however the findings for readers' comments may be misleading. Like blog posts, the frequencies represent the content of the written text of each comment. It does not reflect the threat content, which may be contained in video clips, pictorials, hyperlinks, or sidebar features which were outside the scope of the study. The findings are still meaningful, despite this, as the EPPM suggest that individuals need only to detect threat.

An alternative interpretation for the missing threat components may be that the EPPM content of comments reflects the EPPM content in the blog post. If a blog post focuses only on perceived severity (e.g. the intensity of the hurricane), it's conceivable that the readers' submit comments to support, reject, or seek clarification on the topic; thus, they do not attempt to shift the topic of the blog. And because readers may not view themselves as actual journalists or meteorologists, they may feel less responsible for safeguarding others.

When it comes to efficacy, more than half of readers' comments, 60% or 511, were missing both response efficacy and self-efficacy. As explained earlier, commentators EPPM content may mirror that of the blogger. If the blog post does not contain both forms of efficacy, the reader may only respond to the content s/he has detected. The finding may also suggest that readers do not feel

responsible for communicating actions to prevent the risk or the expected outcomes of taking the preventative action.

The frequency of efficacy components over time either leveled or dropped off as time approached hurricane landfall. Between the two types of efficacy, self-efficacy was missing from readers' comments the most, as high as 84% of the time. This contradicts previous research, which finds that "blogs are used more frequently to share emotional support and personal stories" (Kim & Chung, 2007, p. 449). One likely explanation points to the sample characteristics of Kim and Chung (2007), whose blog participants were cancer patients, family or friends of cancer patients, or health care providers. Personal narratives and experiences communicated in blogs may help patients cope with their illness (see also Oransky, 2005); however, this may not hold true for blog readers days away from a major hurricane who may either experience the storm directly (they live or work in the path of the storm) or indirectly (experiencing the hurricane vicariously via the media or friends/family who will be directly affected).

Regarding the most frequently conveyed EPPM component in blog comments, the results show the greatest number of comments contained response efficacy, although the presence of response efficacy was an unfavorable 39%. Some commentators addressed the blogger directly with their specific questions regarding whether mandatory evacuations had been issued or whether generators were still available at stores, for example. Other commentators, however,

appeared to engage with each other. Many responded to each other's questions, gave advice as to how to prepare, and even sent well-wishes and prayers to each other. It was common for blogs to attract readers from all around the country and even a few international readers. Most of the sentiments in their comments dealt with response efficacy, perhaps because they had experienced hurricanes in the past. One particular blog reader was unique, in that he introduced himself as a claims adjuster for a major insurance agency. He provided his contact information, and urged others to contact him with any questions. This introduction was not well-received. Nonetheless, the comment represented a presence of response efficacy.

Chi-square tests revealed the key times for missing EPPM components in blog comments, such as the one, two, or three days prior to hurricane landfall. Significant differences were found for blog comments and two of the EPPM components (perceived susceptibility and self-efficacy). There is evidence that as time approaches hurricane landfall, messages associated with perceived susceptibility and self-efficacy are more likely to be absent from blog comments. Overall, (67%, or $n = 570$) of the total sample of blog comments were missing a perceived susceptibility message, compared to 67% ($n = 151$) at Time 1, 73% ($n = 202$) at Time 2, and 64% ($n = 227$) at Time 3. Overall, (82%, or $n = 692$) of the total sample of blog comments were missing a self-efficacy message, compared to 75% ($n = 169$) at Time 1, 84% ($n = 233$) at Time 2, and 84% ($n = 297$) at Time 3.

An apparent explanation for the absence of perceived susceptibility could be that blog readers already accept their susceptibility to the hurricane threat, and therefore are unlikely to write about it when submitting a comment. Moreover, by reading and submitting comments to a blog post, readers may be acknowledging their susceptibility and are utilizing the blog to fill other needs. With regard to comments missing self-efficacy messages, one might conclude that as time progressed toward hurricane landfall, individuals believed there was no opportunity to perform any preventative actions. Comments gradually shifted to topics other than self-efficacy. For example, many of the comments were brief updates of the early effects of Hurricane Ike (i.e. street flooding, power outages, or wind gusts).

The RISP Model

The last research question and hypothesis addressed readers' channel beliefs by assessing their expressed comments regarding credibility. Various analyses using the RISP model have rendered two major beliefs about media: the belief that distorts reality and the belief that the media provide useful cues for processing information (Griffin et al., 2004 and 2008). Using the news credibility scale (Gaziano & McGrath, 1986), the findings suggest that weather blogs communicate a moderately credible message. Credibility ratings were achieved above the scale's midpoint. Specifically, readers stated the blog posts and/or blogger were trustworthy, accurate, reports the whole story, and up-to-date.

Furthermore, the results suggest that local blogs are found to be slightly more credible than national blogs, though the analysis was non-significant. This adds power to the RISP model as an explanatory framework for information seeking and processing.

Limitations and Future Directions

Despite the partial confirmation of the EPPM and RISP Model, there were various limitations in this study. One concern focuses on the limitations of the chi-square and ANOVA data analyses. When assessing the EPPM message content for blog posts and comments, as well as the comparison of credibility means for local and national blogs, the data did not meet the assumptions for the analysis (that the observations must be independent). This error was realized after the data had been collected, coded, and entered into SPSS. Removing repeated measures would have resulted in a significant loss of data. Future investigations should ensure appropriate coding procedures to prevent the loss of explanatory power in the findings. Nonparametric statistical procedures, such as logistic regression, could be a possible solution for future analysis; however, this would require coding the data according to blogger or blog reader.

In addition, the expected cell size for some chi-square tests was violated with fewer than five cases. This, however, did not impact the results of the tests as they were found to be non-significant. One remedy in future studies may be to calculate Fisher's exact test to confirm significance. Fisher's exact test has been

more accurate than the chi-square when the values are small. Even so, there is some support that chi-square tests can be remarkably robust under these conditions (see Roscoe & Byars, 1971).

It should also be noted, that frequencies related to Hypothesis 1 and Research Question 8 included posts/comments which were previously found to be missing all four EPPM components. Naturally, these cases would affect the individual threat and efficacy frequencies. The decision was made not to remove these cases, however, in order to gain a broad understand of the overall posts/comments.

A second limitation involves the role of faith as response efficacy. During data analysis, it was discovered that one of coders viewed expressions of faith as a response to avert a threat; thus coding messages as containing response efficacy. This poses an interesting question for researchers to consider prayer or well-wishing as response efficacy. Moreover, future studies should closely examine whether various types of responses (e.g. prayer, evacuation, buying supplies) influence each other or self-efficacy for that matter. It may also be important to know whether one or more types of responses supersede others. That is, an individual may believe prayer is the more effective response the day before hurricane landfall, in lieu of evacuation or buying supplies. From a broader perspective, many may view blogging about any topic as low on the list of priorities when it comes to hurricane preparedness.

Third, whether blog readers were individuals who expected to be directly or indirectly affected by Hurricane Ike may have influenced the outcome of the study. Individuals who did not feel susceptible to the hurricane threat may have communicated more messages of efficacy than those who experienced the fear of becoming a victim of a major hurricane. The number of blog readers who were most susceptible to the hurricane is unknown; and thus, it can be concluded that blog readers' comments may be skewed according to their vulnerability.

A fourth limitation is the disproportion of local blogs to national blogs. Local blogs were those, which appeared on the websites of local news media (TV and newspaper). National blogs were those, which were identified by the 2008 Weblog Awards for "Best Science Blog" and the "Top 10 Weather and Climate Blogs" lists. The study included a final sample of nineteen blogs, of which four were local and fifteen were national. This produced an unbalanced number of blog posts (67 posts from national blogs and 34 posts from local blogs) and blog comments (363 from national blogs and 486 from local blogs). In addition, 422 comments (nearly half) came from a single local blog. Future studies should attempt to achieve a more equally representative data set.

With regard to the type of blog (local versus national), activity may have varied due to the immediate need for information for its intended target audience. Whereas national blogs mostly serve readers in different geographic areas as well as across a range of weather or science topics, the local blogs in the study

deliberately focused on weather and storm information for southeast Texans (as evident by the local blogs appearing on local media websites). Also significant, was the close occurrence of three hurricanes (Hurricanes Gustav, Hanna, and Ike) to threaten the region within weeks. General characteristics of bloggers have been studied (see Rainie, 2005, and Technorati, n.d.); however, blog readers' characteristics are unknown, which may influence their activity.

Fifth, it is unclear whether or not threat and efficacy was conveyed in any interactive features of the posts. Audio and video clips, images, and maps may have contained threat and efficacy messages; however, these blog features were not analyzed in the current study. It is possible that blog readers' perceptions of threat and efficacy were affected by such features, which may be influencing adaptive responses to the hurricane. One way to learn more would be to analyze the EPPM content in any multimedia functions or displayed images (i.e. charts, maps, graphs) in the blog posts. Perhaps the use and/or need for these features change depending on how soon/far away a hurricane makes landfall.

Another consideration for future study would be to conduct an experiment in which the EPPM content of messages could be manipulated and included on the blog posts. Such a study could then test for the types of responses to the messages. This might give researchers a better understanding of creating, as well as analyzing EPPM messages.

Overall, the blogosphere serves a range of audience's needs and wants. Most media studies involving content analyses describe message components from the source, rather than analyzing the readers' perspectives. This investigation not only highlights the manner in which blog readers provide feedback to bloggers, but also the extent to which the readers may be informing each other in their threat and efficacy messages. Blogs fulfill multiple communicative functions (i.e. persuasion, comfort/support, sense of community). This may be an alternative explanation for low frequencies of EPPM content and fewer expressions of readers' perceptions of credibility. Specifically when it comes to social support and sense of community, individuals may turn to weak-ties (those who are not family or close friends) on the Internet to seek information, confirm their experiences, and cope with an event (see Wright & Bell, 2003, Wright, 2000). To this end, perhaps the EPPM and RISP content aren't as dreadful as some may interpret.

This investigation used the EPPM as a way of analyzing messages versus designing messages. Unlike other EPPM studies which might feature a hypothetical threat, this investigation centers on a particular event which poses an imminent physical risk. By focusing on blogs related to Hurricane Ike, the current study responds to recommendations to "gauge Internet usage during disasters" (Piotrowski & Armstrong, 1998, p. 344). Future investigations of blogs and specific risks, weather-related or otherwise, should apply the EPPM to understand

the message components which may be working to achieve behavioral change.
Furthermore, these studies should employ methods for measuring actual behaviors
to better comprehend the role of blogs in decision-making.

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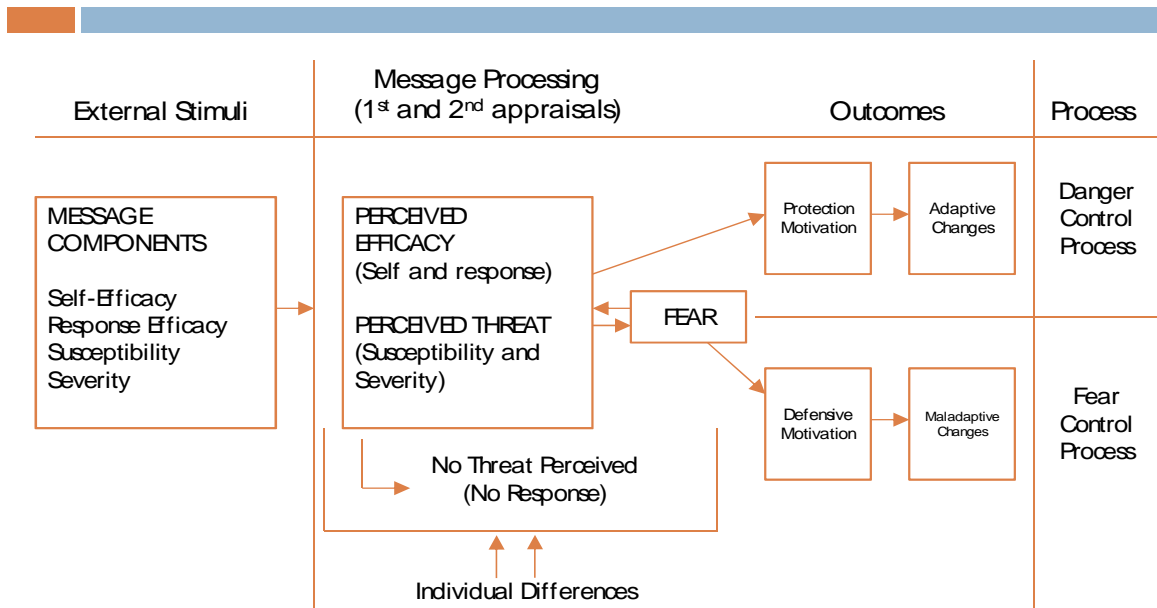
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Wright, K. B., & Bell, S. B. (2003). Health-related support groups on the Internet: Linking empirical findings to social support and computer-mediated communication theory. *Journal of Health Psychology, 8*(1), 39-54.

Appendix A

The EPPM Descriptions and Examples

Extended Parallel Process Model (EPPM)



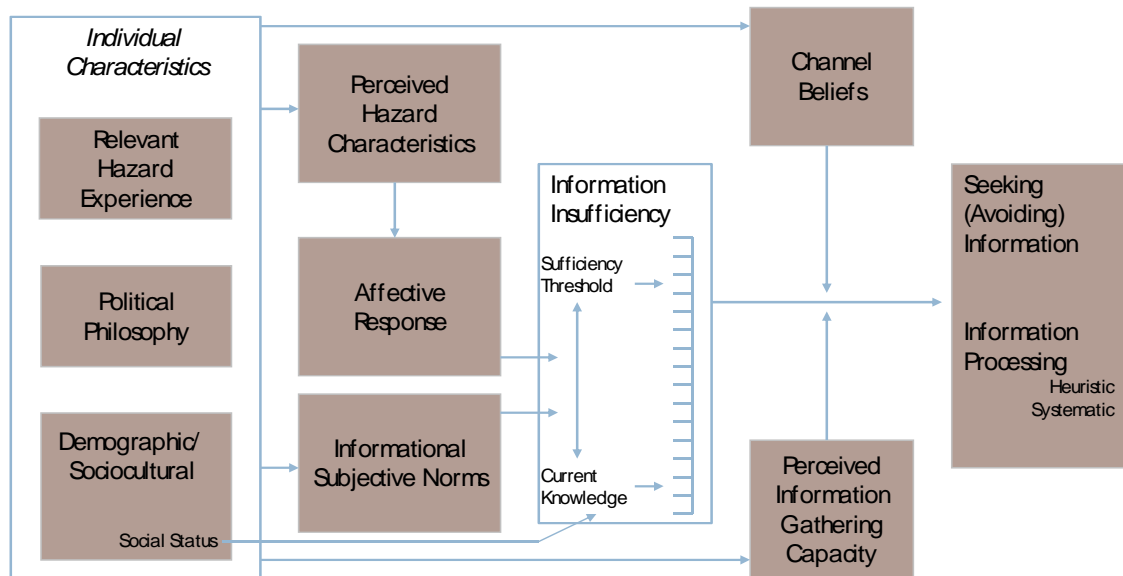
Concept	Definition	Example
Fear	Fear is an internal emotional reaction characterized by subjective experience (the psychological dimension, e.g. "I am scared") and the physiological arousal. Fear is aroused when a serious and personally relevant threat is perceived.	Fear of heights, spiders, snakes, public speaking, hurricanes
Perceived Threat	Thoughts or cognitions about a danger or harm that exists in the environment.	
Perceived Severity	An individual's beliefs about the significance or magnitude of the threat.	"The storm is strengthening to a category 4 storm."
Perceived Susceptibility	An individual's beliefs about his/her risk of experiencing the threat.	"All residents in Galveston County will be affected."
Perceived Efficacy	Thoughts or cognitions about the effectiveness, feasibility, or ease with which a recommended response prevents a threat.	
Response Efficacy	An individual's beliefs about the effectiveness of the message's recommendations in deterring the threat.	"The Mayor is asking all residents to evacuate the area."
Self-Efficacy	An individual's belief about his/her ability to carry out a recommended response.	"I won't be able to evacuate because I can't leave my pets."

<p>Danger Control Process</p> <p>Fear Control</p>	<p>Danger control processes are primarily cognitive processes where individuals evaluate perceived threat and perceived efficacy. For example, when both are high, protection motivation is elicited and individuals make adaptive changes.</p> <p>Fear control processes are primarily emotional processes where individuals respond to and cope with their fear, not the danger. For example, when perceived threat is high and perceived efficacy is low, maladaptive outcomes are more likely.</p>	
<p>Outcomes</p> <p>Protection Motivation</p> <p>Adaptive Changes</p> <p>Defensive Motivation</p> <p>Maladaptive Changes</p>	<p>An outcome is the end result or effect.</p> <p>The determinant of danger control actions.</p> <p>Favorable actions to protect or respond to danger.</p> <p>The determinant of fear control actions.</p> <p>Adverse actions to manage fear.</p>	<p>Having emergency supplies, listening to news, evacuating</p> <p>Ignoring evacuation warnings, doing nothing to prepare property</p>

Appendix B

The RISP Model Descriptions and Examples

Model of Risk Information Seeking and Processing (RISP)



Concept	Definition	Example
Information Insufficiency	The size of the gap between information held and needed	
Perceived Information Gathering Capacity	An individual's perceived ability to perform the information seeking and processing steps necessary for the outcome he or she desires, especially when an outcome requires more cognitive effort and non-routine gathering of information.	If I want to get more information about hurricanes, I know where to find more information and what questions to ask experts. I would know how to separate fact from fiction. I could readily take the time to gather any addition information I may need. I believe I could understand information on this topic if I make an effort.
Informational Subjective Norms	Pressures from relevant others to keep on top of risk information	People who are important to me feel I should stay on top of information about hurricanes.
Channel Beliefs	Beliefs that individuals have about channels of risk information could affect the information-seeking and processing strategies people employ.	The media often exaggerate the news. News media often represent their own bias and interests. The news stories are just a series of unconnected events that don't add up to much. When the same information appears

		<p>in many places, I'm more likely to believe it. Stories with statistics are more believable than those without.</p> <p>Individual news items may seem like bits and pieces, but in the long run they form a meaningful pattern.</p>
Affective Response	<p>Responses such as worry or anger, or even positive responses such as hope, which could influence a person's sense of information insufficiency about a risk</p>	<p>When there is a hurricane watch, I become worried listen to the news. When I think about evacuating, I become angry about leaving. When there is a hurricane, I feel optimistic that I will survive.</p>
Perceived hazard characteristics	Risk perceptions	<p>The storm is severe enough to cause damage to my property, but it is not moving in my direction.</p>
Individual characteristics	Socio-demographic variables and other individual characteristics	<p>Political philosophy, socio-economic status, past experience with hurricanes</p>

Appendix C

Coding Worksheet – Post

Researcher's Initials: _____ Date/Time of Post: _____
Blog ID: _____ Post ID: _____

BLOGGER ACTIVITY

- | | | | |
|----|--|-----|----|
| 1. | Does the blogger include internal links in the post? | YES | NO |
| | a. If yes, are the links to other blogs? | YES | NO |
| | b. If yes, are the links to mainstream media sites? | YES | NO |
| | c. If yes, are the links to institutions/organization sites? | YES | NO |
| | d. Unknown | YES | NO |
| | e. Other types of links? | YES | NO |
| | i. Please specify: _____ | | |
| 2. | Does the blogger include quotes (direct or indirect) in the post? | YES | NO |
| | a. If yes, are the quotes from other blogs? | YES | NO |
| | b. If yes, are the quotes from mainstream media sites? | YES | NO |
| | c. If yes, are the quotes from institutions/organization sites? | YES | NO |
| | d. Unknown | YES | NO |
| | e. Other types of quotes? | YES | NO |
| | i. Please specify: _____ | | |
| 3. | Does the blogger include images, charts, or photographs in the post? | YES | NO |
| 4. | Does the blogger include audio in the post? | YES | NO |
| 5. | Does the blogger include video in the post? | YES | NO |

MESSAGE CONTENT

- | | | | |
|----|--|-----|----|
| 6. | Indicate all of the following, which appear in this individual message post: | | |
| | a. Anticipated outcomes or damages (perceived susceptibility) | YES | NO |
| | b. Severity of hurricane (perceived severity) | YES | NO |
| | c. Actions to take to prevent risks (response efficacy) | YES | NO |
| | d. Expected outcomes of taking preventative actions (self efficacy) | YES | NO |

RESEARCHER COMMENTS:

Appendix D

Coding Worksheet – Comment

Researcher's Initials: _____ Date/Time of Comment: _____

Blog ID: _____ Comment ID: _____

BLOG USER (READER) CHARACTERISTICS

- | | | |
|---|-----|----|
| 1. Is there information about the user? | YES | NO |
| i. If no, does the reader use a pseudonym? | YES | NO |
| ii. If no, does the reader use “anonymous”? | YES | NO |
| b. Picture? | YES | NO |
| c. Link to user's information? | YES | NO |
| d. If known, what is his/her title or occupation? _____ | | |
| 2. Does the user include internal links in the comment? | YES | NO |
| a. If yes, are the links to other blogs? | YES | NO |
| b. If yes, are the links to mainstream media sites? | YES | NO |
| c. If yes, are the links to institutions/organization sites? | YES | NO |
| d. Unknown | YES | NO |
| e. Other types of links? | YES | NO |
| i. Please specify: _____ | | |
| f. Does the user include quotes (direct or indirect) in the comment? | YES | NO |
| g. If yes, are the quotes from other blogs? | YES | NO |
| h. If yes, are the quotes from mainstream media sites? | YES | NO |
| i. If yes, are the quotes from institutions/organization sites? | YES | NO |
| j. Unknown | YES | NO |
| k. Other types of quotes? | YES | NO |
| i. Please specify: _____ | | |
| 3. Does the user include images, charts, or photographs in the comment? | YES | NO |
| 4. Does the user include audio in the comment? | YES | NO |
| 5. Does the user include video in the comment? | YES | NO |
| 6. Does the user make comments about other users? | YES | NO |

MESSAGE CONTENT

7. Indicate all of the following, which appear in this individual comment:
- | | | | | |
|----|--|----------------------------|-----|----|
| a. | Anticipated outcomes or damages | (perceived susceptibility) | YES | NO |
| b. | Severity of hurricane | (perceived severity) | YES | NO |
| c. | Actions to take to prevent risks | (response efficacy) | YES | NO |
| d. | Expected outcomes of taking preventative actions | (self efficacy) | YES | NO |

NEWS CREDIBILITY

1.	Trustworthy	0	1	2	3	4	5
2.	Current	0	1	2	3	4	5
3.	Biased	0	1	2	3	4	5
4.	Fair	0	1	2	3	4	5
5.	Report the whole story	0	1	2	3	4	5
6.	Objective	0	1	2	3	4	5
7.	Dishonest	0	1	2	3	4	5
8.	Up-to-date	0	1	2	3	4	5
9.	Believable	0	1	2	3	4	5
10.	Balanced	0	1	2	3	4	5
11.	Accurate	0	1	2	3	4	5
12.	Timely	0	1	2	3	4	5

RESEARCHER COMMENTS:

Appendix E

News Credibility Scale

1. Trustworthiness – Blog user expresses the blogger or blog information is truthful or dependable

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of trustworthiness	Explicit statement(s) regarding trustworthiness		Subtle mention of trustworthiness		Explicit statement(s) regarding trustworthiness
Comment focuses on topic with no mention of trustworthiness	e.g. “I have no faith in you.”		e.g. “I guess you could be right.”		e.g. “I can always depend on your forecast.”

2. Current – Blog user expresses the blogger or blog information is happening, existing, or in effect at the present time

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of currency	Explicit statement(s) regarding currency		Subtle mention of currency		Explicit statement(s) regarding currency
Comment focuses on topic with no mention of currency	e.g. “The hail you described happened hours ago.”		e.g. “Maybe that’s happening in some areas.”		e.g. “I can’t believe you are blogging right now when tornados are in your area.”

3. Bias – Blog user expresses the blogger or blog information is unfair or influenced by someone or something

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of bias	Explicit statement(s) regarding bias		Subtle mention of bias		Explicit statement(s) regarding bias
Comment focuses on topic with no mention of bias	e.g. “This blog is always fair.”		e.g. “Are you sure your weather alert is impartial?”		e.g. “This blog favors people who subscribe to the RSS feeds”.

4. Fair – Blog user expresses the blogger or blog information is reasonable or unbiased

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of fairness	Explicit statement(s) regarding fairness		Subtle mention of fairness		Explicit statement(s) regarding fairness
Comment focuses on topic with no mention of fairness	e.g. “Your predictions have never been fair or reasonable.”		e.g. “That seems logical.”		e.g. “Your predictions so far have been valid and sound.”

5. Report the whole story – Blog user expresses the blogger or blog information is complete

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of completeness	Explicit statement(s) regarding completeness		Subtle mention of completeness		Explicit statement(s) regarding completeness
Comment focuses on topic with no mention of completeness	e.g. “Poor communication is not the only reason for ineffective evacuations.”		e.g. “Is there anything else about the storm’s track?”		e.g. “This blog tells me everything I need to know.”

6. Objective – Blog user expresses the blogger or blog information is based on facts rather than unsupported thoughts or opinions

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of objectivity	Explicit statement(s) regarding whether information is based on facts		Subtle mention of whether information is based on facts		Explicit statement(s) regarding whether information is based on facts
Comment focuses on topic with no mention of objectivity	e.g. “Why aren’t others reporting the same thing?”		e.g. “I heard something like that in the elevator today.”		e.g. “The National Weather Service confirmed what you said.”

7. Dishonest – Blog user expresses the blogger or blog information has little integrity

0	1	2	3	4	5
Strongly Disagree		Neutral			Strongly Agree
Absence of dishonesty	Explicit statement(s) regarding honesty		Subtle mention of honesty		Explicit statement(s) regarding honesty
Comment focuses on topic with no mention of dishonesty	e.g. "Thank you for being open and straightforward."		e.g. "That's not what they're saying on my local news."		e.g. "People like you cause unnecessary panic and fear to manipulate us."

8. Up-to-date – Blog user expresses the blogger or blog information is advanced, highly developed, or complex

0	1	2	3	4	5
Strongly Disagree		Neutral			Strongly Agree
Absence of advanced knowledge	Explicit statement(s) regarding advanced knowledge		Subtle mention of the latest knowledge		Explicit statement(s) regarding advanced knowledge
Comment focuses on topic with no mention of advanced knowledge	e.g. "You use the most out-dated techniques in your forecasts."		e.g. "You interpret the hurricane model better than I can."		e.g. "Your tracking equipment is the most sophisticated of its kind."

9. Believable – Blog user expresses the blogger or blog information is convincing

0	1	2	3	4	5
Strongly Disagree		Neutral			Strongly Agree
Absence of believability	Explicit statement(s) regarding believability		Subtle mention of believability		Explicit statement(s) regarding believability
Comment focuses on topic with no mention of believability	e.g. "I don't believe that for a second!"		e.g. "That scenario is somewhat realistic."		e.g. "You got me convinced."

10. Balanced – Blog user expresses the blogger or blog information is even, stable, or sensible

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of balance	Explicit statement(s) regarding balance		Subtle mention of balance		Explicit statement(s) regarding balance
Comment focuses on topic with no mention of balance	e.g. “Earlier you said one thing, now you’re saying something else.”		e.g. “It’s important to give consistent information.”		e.g. “You’re a sensible person.”

11. Accurate – Blog user expresses the blogger or blog information is correct, representative, or free from errors

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of accuracy	Explicit statement(s) regarding accuracy		Subtle mention of accuracy		Explicit statement(s) regarding accuracy
Comment focuses on topic with no mention of accuracy	e.g. “That information is completely wrong.”		e.g. “Only part of what you said is correct.”		e.g. “That is exactly what happened.”

12. Timely – Blog user expresses the blogger or blog information is appropriate or well-timed

0	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
Absence of timeliness	Explicit statement(s) regarding timeliness		Subtle mention of timeliness		Explicit statement(s) regarding timeliness
Comment focuses on topic with no mention of timeliness	e.g. “Whatever, that information is irrelevant now.”		e.g. “If I knew that sooner, I might have bought batteries at the store.”		e.g. “Glad I read this blog before I evacuated.”