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Risk communication: An analysis of message source and function in hurricane mitigation/preparedness communication

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Risk Communication: An Analysis of Message Source and Function in Hurricane
Mitigation/Preparedness Communication

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
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Andrew M. Gallo

ABSTRACT

In September 2008, the National Weather Service (NWS) predicted that Hurricane Ike would make landfall on Galveston Island as a strong category three storm. This led the NWS to release a statement of ‘certain death’ if people did not adhere to the emergency evacuation messages. Millions of people fled the Texas coast. Using Hazleton and Long’s (1993) taxonomy of public relations strategies, experimental methods were conducted with various evacuation messages to test emergency communication. Grunig’s (1997) situational theory of publics was used to determine strategy influence. Problem recognition, constraint recognition, and level of involvement were tested. In addition, tests were conducted to measure source expertise, trust, and attitude depending on the message source.

Results indicated that a national message source produced higher constraint recognition than a local message source. The national message source produced higher expertise, trust, and attitude than a local message source. The threat and punishment strategy produced the highest level of information-seeking behavior. Information-seeking behavior was the lowest when a persuasive strategy was used. Constraint recognition produced the weakest effect on information-seeking behavior. In conclusion, emergency management communicators must use the correct message strategy to have an effect on information-seeking behavior.

Chapter One

Introduction

“All neighborhoods ... and possibly entire coastal communities ... will be inundated during the period of peak storm tide,” a National Weather Service (NWS) advisory said in wake of Hurricane Ike’s predicted landfall on Galveston Island in September 2008. “Persons not heeding evacuation orders in single-family one- or two-story homes will face certain death.” The language of “certain death” created an unprecedented response from citizens all across the Gulf Coast, specifically residents in Texas, in the path of Hurricane Ike. Over one million people evacuated to places deemed structurally safe from the hurricane.

The NWS wasn’t the only organization/agency communicating messages of this magnitude. The United States Department of Homeland Security (DHS) Secretary Michael Chertoff, “urged people not to succumb to hurricane fatigue,” in referring to concerns that authorities were overestimating Hurricane Ike's potential impact. He added, "unless you're fatigued with living, I suggest you want to take seriously a storm of this size and scale.” In addition to the NWS and DHS having similar messages about the possible destruction Hurricane Ike could bring, Houston’s Mayor Bill White responded to reports that people in mandatory evacuation areas planned on staying in their homes and urged them to reconsider. “If you think you want to ride something out, and people are talking about a 20-foot wall of water coming at you, then you better think again.”

Message continuity at all levels of government is critical when dealing with hurricane mitigation and preparedness. A series of diverse evacuation messages during Hurricane Katrina in 2005 ultimately led to deaths and thousands being stranded without food, water or humane conditions for days. In addition, the mismanagement of information about possible levee failures throughout the city during Hurricane Katrina poised agencies involved in Hurricane Ike to explain all possible outcomes related to the storm's impact and to not recreate the scene that unfolded in New Orleans on national television.

Ineffective emergency communication during Hurricane Katrina led to one of the biggest failures of our government. However, what motivates citizens to respond to certain messages and not others? What type of sources and messages provoke different attitudes, beliefs, and behaviors? Will complacency outweigh hurricane preparedness and mitigation? Will the aftermath of Hurricane Ike support the threatening messages used by the NWS and others? Should "certain death" language be used again in emergency communication? It's critical to understand the attributes of hurricane preparedness and mitigation messages to diminish future risks. The NWS plays a vital role in emergency communication. It is often the main source for information regarding future hurricane projections, track, strength, storm surge, and other hurricane related factors.

The NWS, a division of the National Oceanic and Atmospheric Administration, released a hurricane preparedness guide that stated that one of the major problems with hurricanes making landfall in the United States is resident's perception of risk associated with these storms. It indicates several reasons for lack of preparedness and mitigation procedures. Besides infrastructure problems related to urban sprawl, a high percentage of

the population living along hurricane prone areas have only experienced “weaker” storms and not experienced the “major” storms that cause catastrophic damage. This has led many individuals to downplay the need to evacuate and remain complacent when experts urge residents to vacate at risk areas.

This study seeks to further understanding of the effects of emergency message strategies and message sources on individuals. The importance of understanding message effects in emergency communication is clear. The findings from this study may provide information about how communicators can best structure their messages to ensure the safety of the public.

This study explores message strategy effects in an emergency communication context using Hazleton and Long’s 1993 public relations process model and Grunig’s 1997 situational theory of publics. The public relations message strategies examined in this study were derived from Hazleton and Long’s public relations process model. Hazleton developed a taxonomy of seven public relations strategies that organizations use when communicating with publics. The seven strategies are: facilitative, informative, persuasive, promise and reward, threat and punishment, bargaining, and cooperative problem solving.

Grunig’s situational theory of publics is used to understand publics and measure their opinions about issues. Grunig and Hunt (1984) stated that communication behaviors of publics can be best understood by measuring how members of publics perceive situations in which they are affected. The theory consists of three independent variables and two dependent variables. The three independent variables are problem recognition,

constraint recognition, and level of involvement. These variables describe “perceptions that people have of specific situations, especially situations that are problematic or that produce conflicts or issues” (Grunig, 1997, p. 10). The dependent variables are information seeking and information processing.

The purpose of this study is to understand what strategy type and message source is most effective in emergency management communications. Below are the hypotheses and propositions this study tests.

H1: In emergency communication, message source will influence receiver variables.

P1.1: A national message source (NWS) will produce higher problem recognition than a local message source (HCG).

P1.2: A national message source (NWS) will produce higher constraint recognition than a local message source (HCG).

P1.3: A national message source (NWS) will produce higher level of involvement than a local message source (HCG).

P1.4: A national message source (NWS) will produce higher expertise than a local message source (HCG).

P1.5: A national message source (NWS) will produce higher trust than a local message source (HCG).

P1.6: A national message source (NWS) will produce more positive attitudes than a local message source (HCG).

P1.7: A national message source (NWS) will produce higher information-seeking than a local message source (HCG).

H2: In emergency communication, message strategy will influence receiver variables.

P2.1: Information seeking will be the highest when the threat and punishment strategy is used.

P2.2: Information seeking will be the lowest when the informative strategy is used.

H3: Level of involvement will produce the strongest effect on information seeking behavior.

H4: Constraint recognition will produce the weakest effect on information seeking behavior.

The following chapter provides a review of literature important to this study. Chapter 3 explains the methods and procedures used to gather data for this study. Chapter 4 reviews the results of this study, and Chapter 5 provides discussion of the results and draws conclusions about the findings of this study.

Chapter Two

Literature Review

The purpose of this study is to understand what strategy type and message source is most effective in emergency management communications. This chapter reviews the existing literature relevant to this investigation.

Emergency Management

Emergency management communications is “the dissemination of timely and accurate information to the general public, elected and community officials and the media. This plays a major role in the effective management of disaster response and recovery activities” (Haddow & Bullock, 2003, p. 63). The four phases of emergency management are mitigation, preparedness, response, and recovery. Figure 1 indicates the flow of different phases in emergency communication when a disaster occurs.

Figure 1: Four Phases of Emergency Communication¹



Communication is critical in the mitigation and preparedness phases of

¹ Source: <http://perryema.deltafour.com/images/4phases.JPG>

emergency management. The mitigation phase focuses on preemptive measures that can minimize the damage of a disaster. Mitigation activities are not done overnight. These are planned activities in advance of a known risk. An example is identifying what schools are deemed hurricane shelters and how many residents each school can accommodate.

“Federal, state, and local government agencies play a prominent role during this phase and, in general, are responsible for setting the agenda, engaging the appropriate players in planning and establishing and enforcing rules and regulations to achieve agreed-on plans” (Guion, Scammon, & Borders, 2007, p. 21). Mitigation promotes the implementation of strategies, technologies, and actions that will reduce the loss of lives and property damage in future disasters (Haddow & Bullock, 2003).

Preparedness focuses on reducing the negative outcomes of disasters. One of the main characteristics of this phase is “disseminating messages aimed at encouraging people to make choices about protective behaviors and monitoring compliance with community plans” (Guion, et al., 2007, p. 21). “During this phase, government agencies are responsible for ensuring the safety of people in the disaster area and the environment” (p. 21). An example of the preparedness phase is when the National Weather Service sends out information regarding tropical storm and hurricane warnings. Below lists the different characteristics of emergency management at each phase according to Guion, Scammon and Borders, 2007, p 21.

Table 1: Major Participants in Emergency Management in Disaster Phases

Emergency Management Phase/Participant	Mitigation	Preparedness	Response	Recovery
Government Agencies •Federal •State •Local	Planning Organization Coordination Regulations •Zoning •Building codes Infrastructure •Levees •Roads	Organization Infrastructure Education	Evacuation order Evacuation support Emergency aid Search and rescue Coordination of aid programs, such as Medicare and Medicaid	Coordination Shelter •Short-term •Long-term •Rebuilding Resources •Tax incentives •Loans •Jobs and training
Media •Television •Radio •Newspaper •Other	Agenda for public debate	Dissemination of information •Warnings •Instructions for response	Vivid depiction of disasters and rescue operations Informal coordination Hotlines	Dissemination of information about accessing aid Convey new image of community
Nongovernmental Organizations •Relief organizations •Community organizations •Faith-based and religious organizations	Preassigned roles (communications, emergency shelter, distribution of supplies)	Stockpile supplies Expand warehouse space Pre-position communications equipment	Provisions (food, medical supplies) Shelter Transportation Support labor	Provisions Labor for renovation and rebuilding

Even though communication messages are disseminated at all phases of emergency management, this study focuses on the type of messages that get people to act prior to a potential disaster. The response and recovery phases of emergency management are exercised when the disaster is happening or has taken place. It includes search and rescue, support labor and the coordination of aid programs at the response phase, and shelter coordination and job/training resources at the recovery phase.

Hurricane Classification

The Saffir-Simpson Hurricane Scale is a rating system that measures a hurricane’s intensity. The scale classifies hurricanes as category 1, 2, 3, 4, or 5 storms. The type of potential damage depends on the classification. The scale of potential damage ranges from minimal to catastrophic. Each number estimates the scale of property damage as related to the strength of the hurricane. Hurricanes classified as categories 3, 4, or 5 are considered major hurricanes because of the possibility of property damage and loss of life. Also, the scale gives an accurate representation of the amount and type of property damage and flooding to expect. The wind speed is the primary factor of the scale. Below,

Figure 2 gives a detailed description of the level of damage a storm can bring by category classification.

Figure 2: Saffir-Simpson Hurricane Scale²

Category	Damage Level	Description	Example
1	Minimal	Damage primarily to shrubbery, trees, foliage, and unanchored homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.	Hurricane Earl (1998)
2	Moderate	Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage of roofing materials of buildings; some window and door damage. No major damage to buildings. Coast roads and low-lying escape routes inland cut by rising water 2 to 4 hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying areas required.	Hurricane Georges (1998)
3	Extensive	Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage of roofing materials of buildings; some window and door damage. Some structural damage to small buildings. Mobile homes destroyed. Serious flooding at coast and many smaller structures near coast destroyed; larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Flat terrain 5 feet or less above sea level flooded inland 8 miles or more. Evacuation of low-lying residences within several blocks of shoreline possibly required.	Hurricane Fran (1996)
4	Extreme	Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows and doors. Complete failures of roofs on many small residences. Complete destruction of mobile homes. Flat terrain 10 feet or less above sea level flooded inland as far as 6 miles. Major damage to lower floors of structures near shore due to flooding and battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required and of single story residences within 2 miles of shore.	Hurricane Andrew (1992)
5	Catastrophic	Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Massive evacuation of residential areas on low ground within 5 to 10 miles of shore possibly required.	Hurricane Camille (1969)

² <http://www.earlyalert.com/images/Saffir-SimpsonDamage.jpg>

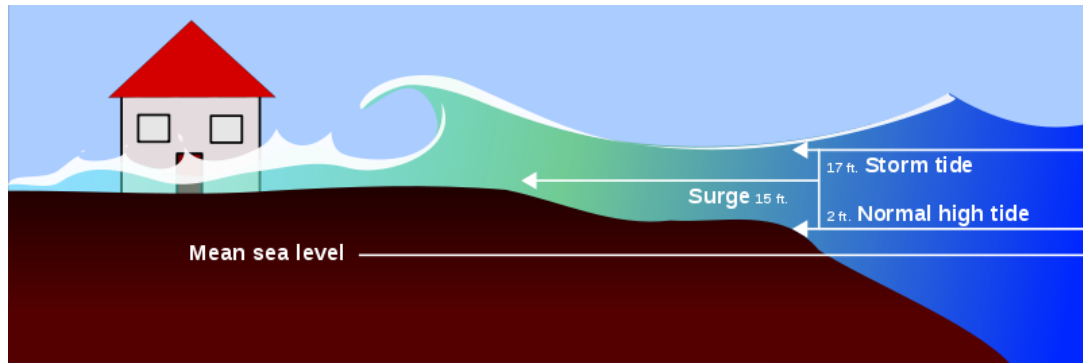
Hurricane Characteristics

When a hurricane makes landfall, the magnitude of destruction is determined by a variety of factors. These factors include storm surge, storm tide, wind, tornadoes and inland/freshwater flooding. The level of impact is determined by the strength of the storm.

Defined by the National Oceanic and Atmospheric Administration (NOAA), storm surge “is a large dome of water often 50 to 100 miles wide that sweeps across the coastline near where a hurricane makes landfall” (U.S. Department of Commerce, 2001, p. 5). The top of the dome consists of battering waves. The impact varies depending on the strength of the storm and the water level surrounding the coastline in which the hurricane will make landfall. The more shallow the water is, combined with strength, determines the height of the surge.

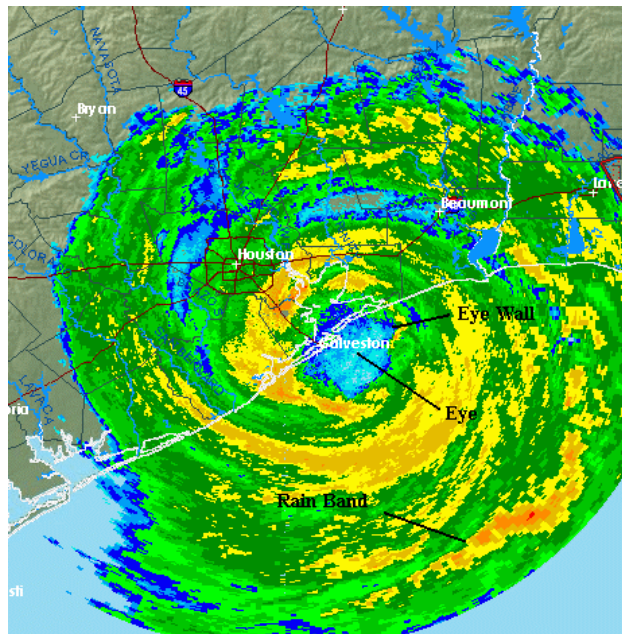
Another factor that determines the impact of a hurricane is storm tide. This is a combination between storm surge and astronomical tide. The time that a storm makes landfall determines the effect of storm tide. If a hurricane makes landfall during high tide the results can be more devastating in terms of property damage and loss of life. Figure 3 documents the difference tides can make on storm surge impact.

Figure 3: Storm Tide Diagram³



The main determinant of the Saffir-Simpson Scale as previously mentioned is wind. A tropical storm becomes a hurricane when winds are measured at a sustained 74 mph or greater. Winds can make ordinary signs, outdoor furniture, lawn decors, etc. into flying missiles. In addition, winds can be sustained well inland from the initial of landfall of the storm.

Figure 4: Parts of a Hurricane



The final impact determinant is inland/freshwater flooding. Depending on the

³ Source: <http://www.photographers1.com/Sailing/StormSurge.png>

speed of the storm, hurricanes can produce an excessive amount of rainfall in a short period of time. Flooding is often a major concern for inland residents. Large amounts of rainfall over a short period of time can also trigger mudslides in more mountainous regions along the East coast of the United States. According to the U.S. Department of Commerce (2001), freshwater flooding has accounted for 59% of U.S hurricane deaths between 1970 and 1999 (p. 7). One of the main reasons is flash flooding. Flash floods occur when there is a rapid rise in water levels due to substantial rainfall in a short amount of time.

These five elements determine the potential impact of a hurricane. Mitigation and preparedness communication informs residents about these attributes and how best to protect themselves and their property.

Hurricane Watches/Warnings

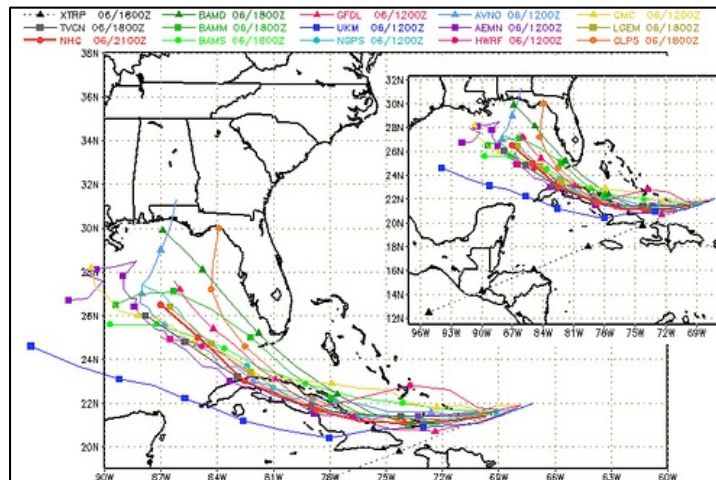
Once a storm is identified, the National Weather Service releases a series of advisories regarding the possibility of a tropical storm or hurricane making landfall along the coast of the United States. According to the NWS, an advisory is official information issued by the National Hurricane Center describing all watches and warnings in effect and provides details concerning location, intensity, movement, and precautions that should be taken. These advisories describe the storms potential landfall location by issuing four different classifications: tropical storm watch, tropical storm warning, hurricane watch, and hurricane warning. The NWS Web site defines these terms which are provided in Table 2 below.

Table 2: Tropical Storm/Hurricane Watches & Warnings⁴

Type	Description
Tropical Storm Watch	Tropical storm conditions with sustained winds from 39 to 73 mph are possible in the watch area with the next 36 hours.
Tropical Storm Warning	Tropical storm conditions are expected in the warning area within the next 24 hours.
Hurricane Watch	Hurricane conditions (sustained winds greater than 73 mph) are possible in the watch area within 36 hours.
Hurricane Warning	Hurricane conditions are expected in the warning area in 24 hours or less.

After these watches and warnings are in place, the NWS will make predictions based on various models about the possible landfall location of the storm. These models are often combined on a single chart to produce a spaghetti model. This model allows you to see the predicted direction of the storm by a variety of computer models and hone in on the consensus direction of the storm. See Figure.

Figure 5: Spaghetti Tracking Model⁵



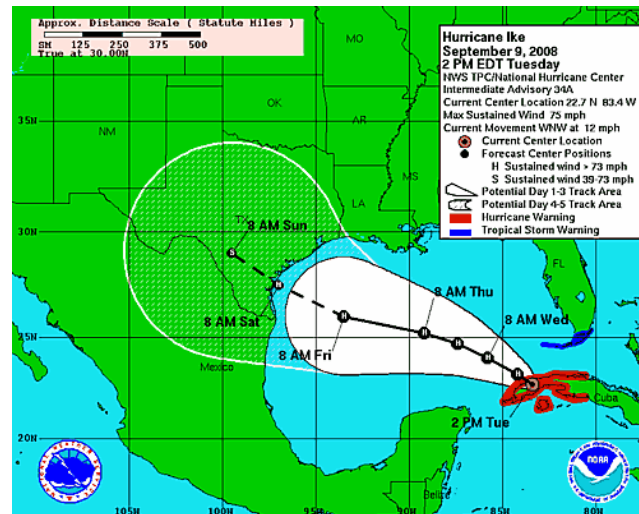
This is often described as the “cone of uncertainty.” The “cone of uncertainty,” shown in

⁴ Source: <http://www.nhc.noaa.gov/aboutgloss.shtml>

⁵ Source: <http://my.sfwmd.gov/sfwmd/common/images/weather/plots.html>

Figure 6, takes all the forecast tracks from a variety of different models and concentrates on a specific area. Once that area has been identified, the local government enacts their emergency preparedness plans and communicates with the public.

Figure 6: Cone of Uncertainty⁶



The risk communication literature review is divided into two sections. The first section focuses on risk communication literature and Hazleton’s (1993) taxonomy of public relations strategies. In studying past risk communication literature, it is important to identify the right variables to measure and common language used. The first two sections will focus on the message. The second section of the literature review will focus on Grunig’s (1997) situational theory of publics.

Risk Communication

There are numerous definitions for risk communication. Covelo (1992) defined risk communication as “the exchange of information among invested parties about the nature, magnitude, significance, or control of risk (p. 359). This involves “the act of conveying or transmitting information between interested parties about levels of health or

⁶ Source: <http://dpulling.files.wordpress.com/2008/09/cone-of-uncertainty.gif>

environmental risks; the significance or meanings of such risks; or decisions, actions, or policies aimed at managing or controlling such risks” (Davies, Covello, & Allen, 1987, p. 112).

Many risk communication studies use the definition of the National Research Council (1989). They defined risk communication as

“an interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management” (p. 21).

This definition stresses the importance of communication to all possible stakeholders. “Stakeholder involvement is pivotal in the development of a dialogue intended to result in a risk management or mitigation consensus” (Cole & Fellows, 2008, p. 214).

In addition, Palenchar (2005) stated that “risk communication provides the opportunity to understand and appreciate stakeholders’ concerns related to risks generated by organizations to engage in dialogue to address differences and concerns, carry out appropriate actions that can reduce perceived risks, and create a climate of participatory and effective discourse to increase harmony and mutuality” (p. 752-753).

It is critical to understand how to communicate this information. Heath and Abel (1996) noted that risk communication studies often center upon how technical experts frame and present technical information to concerned publics in language they can understand. The National Research Council (1989) stated that risk communication is

“successful only to the extent that it raises the level of understanding of relevant issues or actions and satisfies those involved that they are adequately informed within the limits of available knowledge” (p. 21). Satisfaction of risk communication messages relies on two components. Cole and Fellows (2008, as cited in Rowan 1991) stated that “first, it must communicate the probabilities and consequences of known risks to affected audiences” (p. 213). This is a critical part of risk communication. The risk communicators must present information to the public to instill an act of urgency in mitigation and preparedness phases. Second, “it should seek consensus among these audiences regarding a specific course of response and mitigation” (p. 213). It is important to have one message strategy when communicating risks. Once various messages enter the public sphere, the public is unsure of the issue and what source to believe. Two common themes emerged in risk communication literature: trust and credibility.

Trust and credibility are important components in risk communication. “The source of an organization’s perceived trust and credibility comes from its ability to care, competent commitment to solve the risk, honesty, and expertise” (Cole & Fellows, 2008, p.214). Spokespersons, either local or national, must be trusted in communicating this information. “Residents who demonstrated trust in industry and emergency response personnel were more likely to gather information, be knowledgeable, and exhibit positive behavioral intentions regarding emergency response procedures” (Palenchar & Heath, 2002). The more trust individuals have in these officials, the more likely they will be proactive in adhering to their message. Having universal trust is important. The risk communicator must know how to communicate to the various publics that will potentially be affected by the risk. “Risk communication becomes a tool for communication values

and identities as much as being about the awareness, attitudes, and behaviors related to the risk itself” (Palenchar & Heath, 2007, p.127). The public has to relate to the individual disseminating the message.

Another aspect of risk communication is care communication. In care communication, “risks are already known to the audience or appropriate experts, and risks for which management processes are scientifically determined and accepted by the audience” (Cole & Fellows, 2008, p.213). This message strategy is informative rather than persuasive. Using Hurricane Katrina and the New Orleans levees as an example, Cole and Fellows (2008, cite Lundgren and McMakin, 2004) that the objective of care communication is to alert an audience to the presence of a risk and to advise appropriate risk avoidance behavior.

The core focus of my study was derived from two hurricanes: Hurricane Katrina in 2005 and Hurricane Ike in 2008. These two storms, similar in size, but not strength garnered two different response plans. Hurricane Katrina was an awful display of emergency management and Hurricane Ike was a strong representation of message affects and coordination and trust in the source of the message as well as the message itself. Cole and Fellows (2008) highlighted the poor display of emergency management mitigation and preparedness during Hurricane Katrina.

Cole and Fellows (2008) conducted a case study that documented the risk communication failures during Hurricane Katrina (2005) in the city of New Orleans. They concluded that inadequate clarity, insufficient credibility, and failure to properly adapt to critical audiences resulted in a failure of consensus communication and crisis communication (p. 211). Their findings highlighted some important issues in risk

communication. They found that crisis messages were inadequate, message preparation prior to the crisis is essential, effective messages must be delivered by credible sources, and messages must be adapted to encompass a wide variety of different demographic characteristics.

“Risk communicators are faced with the dual challenge of translating existing and emergent technical and/or scientific material regarding the anticipated event into lay person’s terms and arousing an understanding of the severity of the potential consequences an event may have on the populace” (Cole & Fellows, 2008, p. 211-212). Due to the difficulty of forecasting landfall coordinates of hurricanes days out, meteorologists predict the different characteristics of these storms such as paths, landfall, and strength. “Individuals who do not perceive the risk as personally relevant may minimize such messages” (p. 212).

In order to have a better understanding of the core principles of risk communications, studies must be conducted to document the challenges/mishaps. During Hurricane Katrina, people were hesitant to leave their valuables behind and received unclear messages from officials or they lacked knowledge on how to evacuate. According to Cole and Fellows (2008), “hurricane roulette” was present during Hurricane Katrina. This means that citizens felt lucky they would be able to ride out the storm. Conflicting evacuation messages left vague and uncertain understanding of what to do and what was required. “When individuals perceive themselves at risk, their ability to comprehend and to process information declines significantly” (Cole & Fellows, 2008, p. 224). Language used in these messages conveyed several meanings. Another variable that led to many not evacuating was the lack of spokesperson credibility. This led to people not trusting the

messages they received. Messages must be credible from credible people or organizations.

Another important aspect of understanding risk communication messages is use of common vocabulary. Hurricane Katrina communication messages were filled with confusing advisory language and inconsistent messages. This includes adapting these messages to a variety of target audiences. Factors involved in target audiences are income, education, race, ethnicity, and residential location. In risk communication, it is important that the communicator understand the various target audiences that will be receiving the message and how to respond to their needs. Cole and Fellows (2008) study featured different factors that led individuals to not respond to risk management messages. These are past experiences, trust in public officials, lack of knowledge, vocabulary, target audience, and the role of media.

Past Experience

Dombroski, Fischhoff, and Fischbeck (2006) offer a general approach to predicting public compliance with emergency recommendations (p. 1675). The approach starts with a general risk assessment that includes factors that could affect behavior. The implications of these factors should be used to improve emergency risk assessment models and improve preparedness for disasters. Different variables play different factors in risk preparedness. Baker (1991) concluded the most important determinants are actual risk levels, citizen's beliefs that their homes are at high risk, and official recommendations and warnings. The impact of many variables, including risk area, evacuation notices, housing, storm threat information, hurricane probability forecasts, hurricane experience, length of residence, hurricane awareness, crying wolf, and

demographics have an effect on preparedness.

Past experience factors into whether you respond to risk communication mitigation and preparedness messages. Siegrist and Gutscher (2008) investigated the affects of past experience on mitigation behavior. Results suggested that “people without flood experience envisioned the consequences of a flood differently from people who had actually experienced severe losses due to a flood” (p. 771). Weinstein (1989) said that “past experience seems to be an important factor influencing people’s perception of hazards” (p. 772). On the contrary, people who had not been affected by a flood strongly underestimated its effect. Mitigation campaigns are needed to increase knowledge about these risks. “Risk communication must not focus solely on technical aspects, in order to trigger motivation for mitigation behavior, successful communication must also help people to envision the negative emotional consequences of natural disasters” (Weinstein, 1989, p. 771). This study highlighted the need for people to understand that non-experience should not equate to low knowledge of a potential hazard and what you can do to protect yourself and your property. People can be knowledgeable about disaster risks and still not have the motivation to act accordingly.

Kapuca (2008) examined the role of household preparedness in response to disasters. Findings suggested that household and individual preparedness is an important factor in preparedness for natural disasters. Kapuca’s study reconfirms a common theme in risk communications: complacency. Kapuca found that “households, even with significant experience with disasters, can be complacent in response to disasters” (p. 526). Why does personal experience lead to complacency?

Martin, Bender, and Raish (2007) investigated the cognitive perceptual process

people go through when faced with risks. The variables they looked at were the role of motivation, decision stages of risk readiness, and subjective knowledge. Subjective knowledge, based on someone's direct or indirect experience, was essential in preparedness. They investigated a number of risk-mitigating actions taken by those in risk situations. They concluded that "personal experience can have a powerful impact on recognition of risk and the willingness to protect oneself from risk" (p. 897). These past experiences become the basis for individual beliefs in their own knowledge about risk.

Halpern, Millstein, Ellen, Adler, Tschann, and Biehl (2001) found that "participants who had experienced a natural disaster or engaged in a particular risk behavior estimated their chance of experiencing a negative outcome resulting from that event or behavior as less likely than individuals without such experience" (p. 120). The findings suggest that behavioral experiences drive risk judgments.

Trust and Credibility

An important aspect in risk communication is the source of the message and the perceived trustworthiness of the source. During Hurricane Katrina, a segment of the population of New Orleans didn't trust officials disseminating the evacuation messages. This was because different federal, state, and local officials were disseminating different messages to the same audience. In addition, it's important to understand how trust can be built around these issues.

Heath and Abel (1996) discovered "that communities that engage in more extensive efforts to create emergency response systems and inform residents of those measures increase the risk of tolerance of community members" (p. 151). They concluded, "when community officials provide emergency response systems and the

information citizens need to protect themselves in the event of an emergency those efforts can be demonstrated to foster support for the industry” (p. 151). The argument here is that “responsible parties -- industry and government -- in communities where potentially dramatic risks exist are wise to acknowledge those risks and to work proactively to inform members of the public about the protective measures they can take in the event of emergency” (p. 153).

Risk communicators must be proactive in the way they disseminate information to the public. This involves knowing that a risk exists from the declaration of experts in the field. Heath and Abel (1996) found that “although community members are concerned that unfavorable events will occur, they believe emergency response personnel are prepared to respond properly” (p. 158).

In addition, Heath and Abel’s (1996) found that television messages were the preferred way to be contacted by emergency response personnel. A key aspect of their findings was how respondents trusted government officials. Respondents “seem to trust their own judgment more than that of officials or do not know the advantages of taking the emergency response measures recommended by emergency response experts” (p. 165). They concluded that “people may trust government and industry more when those entities acknowledge potential dangers and give proactive solutions to problems rather than attempt to downplay them by stressing the improbability that emergencies will occur” (p. 170).

Lack of Knowledge

Lack of knowledge also has been found to impact people’s response to emergency situations. Previous research suggests that people did not know what to do during an

emergency. According to Heath and Abel (1996) “Residents believe government officials are prepared to respond properly and to serve as credible sources of opinion” (p. 166). Trust is a fluid attribute the public looks for in government officials.

Baker (1995) studied the effect of hurricane probabilities on public response. Numerous hypothetical threat scenarios were used to assess hurricane probability forecasts and risk variables associated with public response. “The most important practical finding in hurricane preparedness is the local officials’ advice or orders regarding evacuation (p. 146). “This was the most important element affecting evacuation, regardless of whether probabilities are included in people’s information or not” (Baker, 1995, p. 146). The importance of trust in public officials was critical to the outcome of Hurricane Katrina in 2005. Residents said that they had the least trust for public officials and the messages they were disseminating. Baker (1995) found that people often feel that they are more knowledgeable than public officials in mitigation and preparedness activities.

Heath and Palenchar (2000) found that because “concern remains high that risk events are likely to occur and harm community safety, citizens are willing to become knowledgeable of emergency response measures” (p. 131). This knowledge “gives citizens a greater sense of control, which may translate into trust for industry and city emergency response efforts” (p. 131). Mitigation campaigns can build trust in favor of community and government officials.

McEntire and Myers (2007) discussed what local governments must do to prepare for various disasters. They identified a step-by-step approach to establish a process of local ordinances, assessing risk, creating emergency operations plans, and educating the

public.

Through the mitigation phase, “effective public relations efforts can build community support through collaborative, community-based decisions regarding the kinds of risks that exist, and the emergency response measures that can be initiated as needed for public safety” (Heath & Palenchar, 2000, p. 132). According to the authors, risk management, perception, and communication research address five themes. These themes are the likelihood that specific risks will occur, who will be affected if they occur, magnitude of effect, mitigation of the occurrence, and mitigation of impact.

One of the primary goals of the practitioner is to disseminate information to “potentially affected communities so that they know that emergency warning and response systems are in place and that measures can be taken to reduce personal exposure to the risk if it occurs” (p. 135). According to Heath (1995), “risk communication campaigns are best when they are coupled with community relations efforts that include messages that respond to citizens’ desire to know what to do to increase their safety in the event of a health or life threatening emergency” (p. 135).

Some of the key variables in these campaigns are trust and cognitive involvement. “Trust is a central factor in predicting whether members of a community accept and rely on the conclusions and recommendations of people who are trained in science, business operations, engineering, and emergency management.” (Heath, 1995, p. 135) Cognitive involvement states that the “more people believe that some dire consequence can result, the greater their level of cognitive involvement” (p. 136).

Some characteristics of individuals who are cognitively involved are that they “acquire, pause to consider, and evaluate information more thoroughly” (Heath, 1995, p.

136). An interesting result of the study showed that “people who are cognitively involved have a higher sense of risk, are less trusting of government and industry officials” (p. 149). Public officials must understand the different comprehension levels between professional risk communicators and the general population.

Knocke and Kolivras (2007) studied flash flood awareness in southwest Virginia. They concluded that there is a “knowledge gap between flood experts and the general public about the level of perceived risk that the latter has toward the powerful flood waters” (p. 155). The knowledge gap affects communication capabilities and efficiency of the warning process. Their research found that even though people had knowledge of flash floods, it wasn’t enough to garnered a proper level of awareness. To effectively communicate this information to the public, new warning methods must be developed.

Vocabulary

Vocabulary plays an important part in how individuals understand mitigation and preparedness messages. It must consist of general terms that the majority of the population can comprehend. Communicating a message with unclear language can cause individuals not to take the recommended action.

Hellier, Aldrich, Wright, Daunt, and Edworthy (2007) studied warning signal words and the meaning of their usage. These signals are often used on “warning signs and labels to denote the level of hazard implied by the situation they indicate” (p. 323). They conducted a multidimensional analysis of rating 17 signal words. In doing so, three dimensions emerged: the level of hazard implied by the signal words, the extent to which they explicitly implied risk and the explicitness of the instruction given.

The results support a general code of using certain signal words for certain

hazards. This “suggests that that there might be utility in mapping signal words to the conditions that they indicate in terms of the extent to which the situation or product constitutes explicit risk” (Hellier, et al., p. 323). Citing Wogalter and Silver (1990), they argue that signal words recommended for use are too limited in number and are over used. This results in desensitization to them and habituation. However, previous research studies have revealed a consistent relationship between signal words and perceived hazards. This research “supports the use of signal words in warning implementation to quantify hazard and also suggest that the dimensionality of signal words can be further refined to include not only hazard but also the explicitness with which risk is implied” (p. 337). Common vocabulary needs to be agreed and used among various stakeholder organizations.

Manoj and Baker (2007) discussed the lack of common vocabulary between response organizations, organizations and citizens. This can be attributed to the problems related with mitigation and preparedness. They indicate that the primary challenge in responding to both natural and man-made disasters is communication.

The use of signal words and warnings were echoed during Hurricane Ike. The same message was being disseminated through all communication channels. It will be interesting to see if ‘certain death’ language will face desensitization due to prior use and the outcome ‘better than expected’ outcome of the Hurricane Ike.

Target Audience

When communicating risk mitigation and preparedness messages, it is apparent that the communicator knows their target audiences and how best to communicate with them. Highlighted in the mess that followed Hurricane Katrina, it is important that all

demographics are receiving the same message regardless of ethnicity, religion, gender, socio-economic status, etc. It was evident in New Orleans that the African-American population wasn't communicated with effectively.

Eisenman, Cordasco, Asch, Golden, and Glik (2007) studied the factors that influenced evacuation decisions in impoverished communities. Using Hurricane Katrina as a case study, they indicated that family, friends, and community organizations played a positive and negative role evacuation decisions. Through a series of qualitative interviews, they concluded that disaster plans must account for situations in less affluent communities. Questioning the orders of local officials, one respondent said, "the last storm we had there, it was more people got hurt on the highway traveling away from the storm, running out of gas, accidents, than it would have been if they stayed home" (p. S111). The obstacles they encountered should lead to new strategies that have an emphasis on community-based communication and preparation strategies. Subjective norms also played a role in whether to evacuate.

McIvor and Paton (2007) sought to further develop a model for natural hazard preparedness. They examined the role of attitudes, mitigation and social norms plays in natural hazards. Their study examined "whether social-cultural factors influence the decisions people make regarding their relationship with natural hazards" (p. 79). People's attitudes and social norms influence their perception of these hazards and ultimately how they prepare for them.

McIvor and Paton (2007) concluded that mitigation activities must be on-going within the community in future risk communication: "People living in communities at risk from natural hazards continue to demonstrate poor knowledge of risk mitigation

procedures and a reticence to adopt protective measures” (pp. 79-80). It is important to know your target audience when developing risk communication messages. “Perceptions of risks and hazards are culturally and socially constructed; people interpret it in the context of their experience, beliefs, and expectations” (p. 80). Subjective norms and attitudes influence the efficacy of engaging in risk mitigating behavior. Knowing how to communicate to your target audience is critical.

Connelly and Knuth (1998) studied how information format can influence the extent to which target audiences understand and respond to risk-related information. The “purpose of the study was to measure anglers’ perceptions and anticipated responses to various health advisory presentation formats so that risk communicators producing advisories could consider likely audience response when preparing information for anglers” (p. 652). Their study examined four components of risk information presentation: reading level, diagram vs. text, tone, use of information. They stated that “the manner in which risk information is presented to target audiences is a critical influence on their ultimate response in terms of attitudes, behaviors, and perceptions related to the risk” (p.650). Doing research on your audience “regarding information needs and communication formats may help clarify which approaches to take” (p. 649). They found that the use of graphics could improve the understanding of risk information by certain audiences. In addition, the study found that there is no consensus communication strategy that has similar effects on all target audiences. The media also plays an important role in risk communications.

Media

Perez-Lugo (2004) analyzed the role of the media in the sociology of natural

disasters. Media has been “mainly viewed as management tools used to influence people’s preparedness and response to natural disasters” (p. 210). Focusing in on the media-audience relationship during natural disasters, it was revealed that “media also have latent functions in disasters, which consist of emotional support and companionship” (p.222).

Perez-Lugo (2004) concluded that disaster research points out the role of the mass media during disasters as crucial in disseminating information in a quick efficient manner. “There importance lies in their power to increase preparedness and facilitate recovery by changing people’s attitudes about natural hazards” (p. 211). Mitigation and preparedness is key when dealing with risk communications. During the mitigation phase, “the media are considered a disaster information provider through coverage of non-local disasters, which helps the community raise disaster awareness and prepare for future events” (p. 212). In the preparedness phase, “the mass media provide factual information about the approaching hazard and tips to prepare for its impact” (p. 212).

Through quantitative interviews, the study found a lack of interest in the preparedness phase. “Instead of looking for ways on how to secure life and property, they wanted the physical location of the hurricane” (Perez-Lugo, 2004, p. 218). People said they take action based on previous personal and collective experiences with hurricanes. “The media-audience relationship remains a very important aspect of the people’s coping strategies during disasters” (p. 223). Many news organizations have the capabilities to broadcast live in disaster situations.

“Media presence during Hurricane Katrina allowed the world not only to see the atrocities experienced by the evacuees but also to see clearly and repeatedly the

contradictions and failings by all levels of government” (Guion, et al., 2007, p. 23). The mass media serve various functions for society, one of which is a channel for emergency managers to disseminate information in times of imminent danger (p. 25). Media disseminate this information voluntarily. Mass media can play a critical role during the mitigation phase because media coverage contributes to the formation of public attitudes, which in turn influence legislative actions (p. 21). Citing Fishman and Casarett (2006), Guion, et al. (2007) noted that this information can shape beliefs, attitudes, and perceived norms and can subsequently influence behavior.

Public Relations Strategies

Hazleton (1993) noted that symbols are the primary means of accomplishing public relations. In order to better understand how symbols are developed and used for the purpose of communicating with others (p. 89), Hazleton developed a matrix to analyze public relations symbols. The function element of the matrix associates the audience and the assumptions about message affects (Hazleton, 1993). Characteristics of the audience must be taken into account in the classification of these messages according to their functional characteristics (Hazleton, 1993). This allows communicators to postulate about motivational, cognitive, and behavioral characteristics of audiences (Hazleton, 1993).

The matrix also analyzes message effects and message processing at the psychological level. These “messages may be understood as objects to be understood by individuals” (Hazleton, 1993 p. 91). The psychological level is most apparent in the public relations strategic planning process. This level seeks to understand how people respond to and understand communication (Hazleton, 1993). Organizations use symbols

to accomplish goals related to the public relations function. The functions proposed at this level represent “the goals of public relations in terms of the impact and meaning of messages to individual recipients” (p. 94).

Influenced by the social change literature of Zaltman and Duncan (1976), Hazleton derived four message functions that may accurately capture mass media based strategies (Hazleton, 1993). He also developed two message functions based on Grunig’s two-way symmetrical and two-way asymmetrical public relations models. These are the most commonly used in public relations strategy creation at the psychological level. Hazleton used these six functions to develop a taxonomy of public relations strategies that organizations typically use when communicating with publics (Werder, 2006). The seven strategies are: facilitative, informative, persuasive, promise and reward, threat and punishment, bargaining, and cooperative problem solving. The definitions Hazleton (1993) used to describe these strategies are provided below.

Facilitative

A facilitative strategy is accomplished by making resources available to an audience that allow them to act in ways that they are already predisposed to act. Resources may be tangible artifacts, such as tools or money, or they may be directions which tell someone how to accomplish a particular action.

Informative

An informative strategy is based upon the presentation of unbiased facts. This strategy does not draw conclusions, but presume that the audience will infer appropriate conclusions from accurate data. Informative messages may suggest a variety of alternative solutions to problems. Informative messages are characterized by the use of

neutral language, and organic or natural patterns of organization.

Persuasive

Persuasive strategies are characterized by appeals to audience values, or affect and a biased presentation of information. They may use language which is not neutral and reflects the importance of the issue and the involvement of the source in the situation. These types of messages are directive in the sense that they provide a call for action either tacitly or explicitly.

Promise and Reward

Promise and reward strategies involve the exercise of power to obtain compliance. They include a directive and a contingent outcome which may be explicitly or tacitly linked to performance of the directive request. They imply or point out that the source of the message controls an outcome desired by the receiver of the message.

Threat and Punishment

Threat and punishment strategies involve the exercise of power, threats and promises to obtain compliance. They include a directive and a contingent outcome which may be explicitly or tacitly linked to performance of the directive request. They imply or point out that the source of the message controls an outcome feared or disliked by the receiver of the message.

Bargaining

Bargaining is characterized by an organized exchange of messages between communicators. Strategic withholding of information and deceptions designed to mislead others concerning your acceptable range of alternatives and to discover the other party's acceptable range of alternatives are used. Bargaining communication is characterized by

the use of contrasting symbols which differentiate groups, such as “we” and “they”.

Cooperative Problem Solving

Cooperative problem solving messages reflect a willingness to jointly define problems and solutions to problems. Cooperative problem solving messages are characterized by the use of inclusive symbols, “we” and not “they.” In contrast to bargaining, problem solving is characterized by an open exchange of information.

Situational Theory of Publics

Using the concept of ‘publics’ derived from classic public opinion theorists Dewey and Blumer, Grunig “formalized those theories and provided means for identifying and measuring publics and their opinions” (Grunig, 1997, p. 9). Dewey and Blumer concluded that “publics arise around issues or problems that affect them.” After they recognize that a problem affects them, “publics organize into issue groups to pressure organizations that cause the problems or to pressure government to constrain or regulate those organizations” (p. 9). Grunig and Hunt (1984) describe a public as a loosely structured system whose members, existing with a population or linkage, detect a problem and behave as though they were one body to solve the problem.

According to Grunig and Hunt (1984), the situational theory of publics “states that communication behaviors of publics can be best understood by measuring how members of publics perceive situations in which they are affected by such organizational consequences” (Hamilton, 1992, p. 124). In essence it describes different aspects of communication effects on publics. Grunig (1997) noted that publics begin as disconnected systems of individuals experiencing common problems; but they can evolve into organized and powerful activist groups” (p. 9).

“The situational theory provides a means of segmenting a general population into groups relevant to public relations practitioners” (Grunig, 1997, p. 8). This is an important concept when it comes to creating public relations campaigns. The foundation of the theory rests on the balance of trying to “predict the differential responses most important to public relations professionals: responsiveness to issues; amount of and nature of communication behavior: effects of communication on cognitions, attitudes, and behaviors; and the likelihood of participation in collective behavior to pressure organizations” (Grunig, 1997, p. 9). Vasquez (1993) adds that “publics are recognizable based on their shared behaviors, and the communication behavior publics can be understood by measuring how members of a public perceive situations in which they are affected by organizational consequences” (p. 208).

Aldoory (2001) stated that “the situational theory of publics is one of the most useful theories for understanding why publics communicate and when they are most likely to communicate.” She points out that there is a significant gap in our understanding of the situational theory regarding any antecedent factors that may help explain involvement, constraint recognition, and problem recognition, the three independent variables in the theory. Most research has studied the dependent variables and the predictability of the independent variables, and most research has found strong support for the theory.

Hallahan (1999) defined a public as a group of people who relate to an organization, who demonstrate varying degrees of activity or passivity and who might or might not interact with others concerning their relationship.

An active public is described as one who seeks information. Hamilton (1992)

citing Grunig (1989) characterized active publics. These “people communicating actively develop more organized cognitions, are more likely to have attitudes about a situation, and more often engage in a behavior to something about the situation” (p. 124). A passive public is the opposite of an active public. They make little to no effort to seek information.

The situational theory of publics consists of three independent variables and two dependent variables. The two dependent variables consist of active and passive publics. They have also been described by their characteristics as information-seeking and information processing. Clarke and Kline (1974) described the two dependent variables as premeditated information seeking, “the planned scanning of the environment for messages about specified topic.” Information processing “describes message discovery the unplanned discovery of a message followed by continued processing of it.”

The theory is comprised of three independent variables; problem recognition, constraint recognition and level of involvement. “The three concepts together predict not only when people will communicate; they also predict that active communication behavior more often results in effects of communication -- cognitions, attitudes, individual and collective behaviors --than does passive communication behavior” (Grunig & Repper, 1992, p. 136). Grunig (1997) describes the independent variables as situational. “They describe perceptions that people have of specific situations, especially situations that are problematic or that produce conflicts or issues” (p.10).

Problem Recognition

Problem recognition stated in Aldoory (2001) is the extent to which individuals recognize that issues or events are problems to be concerned about” (p. 165). Major

(1993) found that the likelihood of communication is increased by problem recognition, such that, among people who face problems, information seeking and processing are likely to occur even under low involvement situations. Hamilton (1992) found that problem recognition did not account for active media use and that other variables played a role.” Citing Major (1993), Aldoory and Sha (2007) found that the likelihood of communication is increased by problem recognition, such that among people facing problems, information seeking and processing are likely to occur even under low involvement situations.

Constraint Recognition

The second independent variable is constraint recognition. “People do not communicate about problems or issues about which they believe they can do little or about behaviors they do not believe they have the personal efficacy to execute” (Grunig and Repper, 1992, p. 135). Constraint recognition represents the extent to which individuals perceive obstacles, or barriers, in a situation that limit their freedom to plan their own behavior (Werder, 2005, p. 226). Citing Grunig and Ipes (1983), Aldoory and Sha (2007) concluded, “for a campaign to move people to develop organized cognitions and perhaps to change their behavior, it must show people how they can remove constraints to their personally doing anything about the problem.

Level of Involvement

Level of involvement is the extent to which an issue, problem, or situation has personal relevance to an individual (Werder, 2005, p. 226). Pavik (1988) defines it as “a perceived emotional connection or relevance, involvement increases the likelihood of individuals attending to and comprehending messages.” This creates an active audience.

These high-involved publics often seek additional information to supplement their beliefs. Lovelock and Weinberg (1984) stated that level of involvement is the degree of importance or concern that a product or behavior generates in different individuals.

Research on involvement and other independent variables has led to a greater understanding of the probability of information seeking and information processing. These studies and others have shown that, in general, members of a public are more likely to seek information and communicate actively when they perceive an issue to be a problem. People communicating actively develop more organized cognitions, are more likely to have attitudes about a situation and more often engage in a behavior to do something about the situation. An active public often seeks information through a variety of media, interpersonal contacts, and specialized channels. Passive publics are more likely to process information from mass media (Aldoory, 2007).

The situational theory of publics has been extended over the years by researchers testing different situations on the independent variables. Personal and impersonal dimensions of the independent variables have been created and tested. They argued that independent variables, such as level of involvement, were driven by either egoistic concerns or altruistic concerns. Results of these studies indicated that distinguishing situations by personal and impersonal dimensions usefully extended the situational theory because of the dimensions' improvement in segmenting publics. Goal compatibility is the extent to which goals or objectives of one party are similar to and coincide with the goals and objectives of another party (Page & Hazleton, 1999).

Hazleton's (1993) public relations strategies will be the foundation for my message treatments. These strategies are typically used by organizations to communicate

a message. Current research does not measure these strategies in a risk communication context. This study will help better understand the type of message strategies that are most effective when the public is at risk. Messages for my treatments will be derived directly from the definitions of the strategy types identified by Hazleton.

Grunig's situational theory of publics will help identify the effects of these message strategies on the public. By understanding how the public responds to problem recognition, constraint recognition and level of involvement will allow experts in the risk communication field to better craft messages to garner the necessary/desired response from the public. In risk communications, reaching your target audience is critical. By understanding message strategies and the variables identified in the situational theory of publics, organizations will be able to reach their target publics and yield the desired outcomes.

The purpose of this study is to understand what message source and strategy type is most effective in emergency management communications. Below are the hypotheses and propositions this study seeks to test.

H1: In emergency communication, message source will influence receiver variables.

P1.1: A national message source (NWS) will produce higher problem recognition than a local message source (HCG).

P1.2: A national message source (NWS) will produce higher constraint recognition than a local message source (HCG).

P1.3: A national message source (NWS) will produce higher level of involvement than a local message source (HCG).

P1.4: A national message source (NWS) will produce higher expertise than a local message source (HCG).

P1.5: A national message source (NWS) will produce higher trust than a local message source (HCG).

P1.6: A national message source (NWS) will produce more positive attitudes than a local message source (HCG).

P1.7: A national message source (NWS) will produce higher information-seeking than a local message source (HCG).

H2: In emergency communication, message strategy will influence receiver variables.

P2.1: Information seeking will be the highest when the threat and punishment strategy is used.

P2.2: Information seeking will be the lowest when the informative strategy is used.

H3: Level of involvement will produce the strongest effect on information seeking behavior.

H4: Constraint recognition will produce the weakest effect on information seeking behavior.

The next chapter explains the methodology used in this study. The experimental procedures, the treatment conditions, the instrumentation, and the data analysis procedures are included.

Chapter Four

Methodology

The purpose of this study is to understand what strategy type and message source is most effective in emergency management communications. Below are the hypotheses and propositions this study tests:

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P1.1: A national message source (NWS) will produce higher problem recognition than a local message source (HCG).

P1.2: A national message source (NWS) will produce higher constraint recognition than a local message source (HCG).

P1.3: A national message source (NWS) will produce higher level of involvement than a local message source (HCG).

P1.4: A national message source (NWS) will produce higher expertise than a local message source (HCG).

P1.5: A national message source (NWS) will produce higher trust than a local message source (HCG).

P1.6: A national message source (NWS) will produce more positive attitudes than a local message source (HCG).

P1.7: A national message source (NWS) will produce higher information-seeking than a local message source (HCG).

H2: In emergency communication, message strategy will influence receiver variables.

P2.1: Information seeking will be the highest when the threat and punishment strategy is used.

P2.2: Information seeking will be the lowest when the informative strategy is used.

H3: Level of involvement will produce the strongest effect on information seeking behavior.

H4: Constraint recognition will produce the weakest effect on information seeking behavior.

Methodology

A controlled experiment was conducted to test the four hypotheses and nine propositions posited by this study. Werder (2005) designed an experiment to test the effect of Hazleton's public relations strategies on the receiver variables of problem recognition, constraint recognition, and level of involvement. This study seeks to replicate and extend that study in the context of emergency communication.

Research Participants

Research participants were recruited from five undergraduate classes at a large southeastern public university: Principles of Public Relations; Introduction to Advertising; Mass Communications and Society; Public Relations Research; and Marketing Management. The sample consisted of a total of 147 participants. The participants included 96 females and 51 males. The age range of students who

participated in this study was 18 to 44. The average age was 22. Those who volunteered to participate in the study did not receive any incentive.

Stimulus Materials

Using a 2 x 6 factorial design, 12 treatment conditions and two control treatments were created. Each participant in the survey was randomly assigned one of twelve different treatment conditions or one of two control conditions. A minimum of 10 questionnaires were completed for each treatment and control condition. A total of 147 questionnaires were completed. These treatments varied by message source and strategy type. Six of the treatment conditions created were from the National Weather Service and six were from the Hillsborough County Government.

The six message types were derived from Hazleton's (1993) public relations message strategies: informative, facilitative, persuasive, promise and reward, threat and punishment and cooperative problem solving. The message treatments were in the form of hurricane press advisories with information coming directly from past hurricane releases. Each of the press advisories for all 12 treatments was almost identical. The content was identical in all 12 treatments. The format was replicated from an official hurricane advisory sent out to the media/public during a hurricane. The name of the hurricane, Jacob, was chosen. The name of the storm is not related to any previous hurricane that had hit Florida.

The information in the press advisory was changed to simulate a category three hurricane approaching Tampa Bay. Cities/locations in the advisory were changed to make the simulation as real as possible. The only changes that were made to distinguish the

differences between the two message sources were the headline, logo and sidebar. The headline read, “Hillsborough County Government Hurricane Advisory” and “National Weather Service Hurricane Advisory.”

The logos of both these organizations were placed above the sidebar in the same location and of the same size. The manipulations used to test message strategy were placed in the sidebar. The sidebar was offset from the rest of the material in a gray-shaded box. The boxes on all the treatments were the same size. The manipulations ranged between 13 and 17 lines of text. The word count ranged from 36 to 50. The control messages were unrelated to the issue featured in the treatment materials. They consisted of a press release about a new hiring at the National Weather Service Office in Wisconsin and a hurricane preparedness convention in Tampa. An identical survey followed all 12 treatments and the control condition.

Instrumentation

The questionnaire consisted of the variables identified in Grunig’s situational theory of publics. Twenty-six items were created to measure problem recognition, constraint recognition, level of involvement and information-seeking behavior. Responses to were rated on a 7-point Semantic-differential scale. Participants were asked to rate the indicated statements, 1 (*strongly disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neutral/no opinion*), 5 (*somewhat agree*), 6 (*agree*), and 7 (*strongly agree*) on a continuum.

Each variable was tested by the following statements. Problem recognition was measured by the subsequent statements: 1) Based on the weather advisory I read, I

believe this situation qualifies as an emergency; 2) I recognize the existence of a weather-related emergency situation; 3) I don't believe this emergency situation is serious; 4) I want to understand this emergency situation better; 5) I need to seek out additional information to better understand this emergency situation.

Constraint recognition was measured by these statements: 1) I believe that I am not able to evacuate; 2) I cannot do anything about this emergency situation; 3) I believe that there are constraints or obstacles that limit my ability to evacuate; 4) I do not understand this evacuation enough to do anything about it; 5) I do not understand this emergency situation enough to do anything about it; 6) I do not have the ability to make a difference in the outcome of this emergency situation.

Level of involvement was measured by the following statements: 1) I am personally affected by this emergency situation; 2) I have strong opinions about this emergency situation; 3) I have strong opinions about evacuation; 4) I am personally affected by this evacuation; 5) This evacuation does not involve me; 6) This emergency situation does not involve me.

Three statements were used to measure information-seeking behavior: 1) I will actively seek more information about this emergency situation; 2) I plan to seek out additional information on ways I can better prepare for this emergency situation; 3) I don't want any more information about this emergency situation.

In addition, trust and expertise were measured by using three statements each. These questions changed if someone received a National Weather Service treatment or a local government treatment. Trust was measured on the National Weather Service

questionnaire by the following items: 1) I trust information provided by the National Weather Service; 2) The National Weather Service is a trustworthy organization; 3) The National Weather Service is a credible organization. Expertise was measured by: 1) The National Weather Service has adequate expertise to handle this emergency situation; 2) The National Weather Service provides the most accurate information about emergency situations; 3) The National Weather Service is knowledgeable about emergency preparedness.

Trust was measured on the local government questionnaire by the following statements: 1) I trust information provided by the local government; 2) The local government is a trustworthy organization; 3) The local government is a credible organization. Expertise was measured by: 1) The local government has adequate expertise to handle this emergency situation; 2) The local government provides the most accurate information about emergency situations; 3) My local government is knowledgeable about emergency preparedness.

Attitudes toward the National Weather Service and the Hillsborough County Government were measured by a semantic-differential scale. The terms measured consisted of bad : good, negative : positive, incompetent : competent, and not important : important.

The last section of the questionnaire asked participants to provide demographic information. This included gender, age, ethnicity, type of dwelling, highest level of education completed, registered voter, and number of children they have.

A pretest was conducted to determine the validity of the message treatments used in this study. This manipulation check was performed to assess the degree to which the weather emergency situation message treatments agreed with Hazleton's (1993) public relations strategy definitions. An expert panel, consisting of 7 graduate students agreed that the treatments reflected the definition.

Data analysis was conducted using SPSS 15.0 for Windows. An alpha level of .05 was required for significance in all statistical procedures, which included reliability analysis, correlation analysis, linear regression analysis and analysis of variance (ANOVA). Due to the sampling procedure used, not all treatments had the same number of responses. The next chapter presents the results from the study.

Chapter Five

Results

The purpose of this study is to understand what message source and strategy type is most effective in emergency management communications. This study tested the following hypotheses and propositions:

H1: In emergency communication, message source will influence receiver variables.

P1.1: A national message source (NWS) will produce higher problem recognition than a local message source (HCG).

P1.2: A national message source (NWS) will produce higher constraint recognition than a local message source (HCG).

P1.3: A national message source (NWS) will produce higher level of involvement than a local message source (HCG).

P1.4: A national message source (NWS) will produce higher expertise than a local message source (HCG).

P1.5: A national message source (NWS) will produce higher trust than a local message source (HCG).

P1.6: A national message source (NWS) will produce more positive attitudes than a local message source (HCG).

P1.7: A national message source (NWS) will produce higher information-seeking than a local message source (HCG).

H2: In emergency communication, message strategy will influence receiver variables.

P2.1: Information seeking will be the highest when the threat and punishment strategy is used.

P2.2: Information seeking will be the lowest when the informative strategy is used.

H3: Level of involvement will produce the strongest effect on information seeking behavior.

H4: Constraint recognition will produce the weakest effect on information seeking behavior.

Descriptives

Descriptive statistics were conducted to find out information about the participants. Of the 147 participants in the study, 34.7% (n = 51) were male and 65.3% (n = 96) were females. All percentages reflect the valid sample. Table 3 shows the participants race identification.

Table 3: Participants Race Identification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasian	100	68.0	68.5	68.5
	Hispanic	15	10.2	10.3	78.8
	African-American	14	9.5	9.6	88.4
	Asian	5	3.4	3.4	91.8
	American Indian	1	.7	.7	92.5
	Pacific Islander	2	1.4	1.4	93.8
	Other	9	6.1	6.2	100.0
	Total	146	99.3	100.0	
Missing	99	1	.7		
	Total	147	100.0		

Participants identified themselves as Caucasian 68.5% (n = 100). The highest level of education completed was ‘some college’ at 92.5% (n = 135). The type of dwelling was either ‘house’ 42.6% (n = 58) and ‘apartment’ 52.9% (n = 72). Those who surveyed did not have any children 97.1% (n = 132). Most people surveyed were registered voters at 92.6% (n = 126). When asked if they would need to assist an elderly family member during an evacuation, 39.7% (n = 54) indicated yes and 60.3% (n = 82) indicated no. The mean age of the participants was 21.86. The ages ranged from 18 to 44.

Data analysis began with an examination of descriptive statistics for all items used to measure the receiver variables of problem recognition, constraint recognition, level of

involvement, expertise, trust, attitude, and information seeking behavior. The item means and standard deviations are shown in Table 4. Item means ranged from 2.65 to 6.12. The item “I believe that I am not able to evacuate,” which measured constraint recognition, produced the lowest mean of 2.65. The item “I recognize the existence of a weather related emergency situation,” which measured problem recognition, produced the highest mean of 6.12.

For problem recognition, the item “I recognize the existence of a weather-related emergency situation” produced the highest mean ($M = 6.12$, $SD = 1.101$). “I need to seek out additional information to better understand this emergency situation” produced the lowest mean ($M = 4.71$, $SD = 1.640$).

Constraint recognition is reversed when looking at the mean. The item “I believe that I am not able to evacuate” produced the highest mean ($M = 2.65$, $SD = 1.488$) and the item “I believe that there are constraints or obstacles that limit my ability to evacuate” produced the lowest mean ($M = 3.85$, $SD = 1.650$).

For level of involvement, the item “This emergency situation does not involve me” had the highest mean ($M = 5.55$, $SD = 1.540$). “I have strong opinions about this emergency situation” produced the lowest mean ($M = 4.02$, $SD = 1.474$).

The source in the items used to measure expertise and trust were changed to match the different treatment conditions. The source was the National Weather Service and the Hillsborough County Government in the different treatment conditions.

“The source is knowledgeable about emergency preparedness” produced the highest mean under expertise of the source, ($M = 5.26$, $SD = 1.339$). “Expertise of the

source provides the most accurate information about emergency situations” produced the lowest mean ($M = 4.45$, $SD = 1.350$).

For trust of the source, “The source is a credible organization” produced the highest mean ($M = 4.92$, $SD = 1.405$). “The source is a trustworthy organization’ generated the lowest mean ($M = 4.81$, $SD = 1.577$).

An “important” attitude toward the source produced the highest mean ($M = 5.72$, $SD = 1.213$). A “positive” attitude toward the source produced the lowest mean ($M = 5.08$, $SD = 1.243$)

For information seeking behavior, the statement “I don’t want any more information about this emergency situation” had the highest mean ($M = 5.70$, $SD = 1.655$). “I will actively seek more information about this emergency situation” produced the lowest mean ($M = 4.71$, $SD = 1.703$).

Table 4: Item Mean and Standard Deviation

	N	Minimum	Maximum	Mean	Std. Deviation
1 PR Based on the advisory I read, I believe this situation qualifies as an emergency.	146	1	7	5.47	1.405
2 PR I want to understand this emergency situation better.	145	1	7	4.83	1.692
13 PR I recognize the existence of a weather-related emergency situation.	146	1	7	6.12	1.101

Table 4. Continued

	N	Minimum	Maximum	Mean	Std. Deviation
14 PR I need to seek out additional information to better understand this emergency situation.	146	1	7	4.71	1.640
21 PR REV I don't believe this emergency situation is serious.	146	1	7	5.51	1.496
3 CR I cannot do anything about this emergency situation.	146	1	7	3.57	1.922
4 CR I do not have the ability to make a difference in the outcome of this emergency situation.	146	1	7	3.66	1.884
7 CR I do not understand this evacuation enough to do anything about it.	146	1	7	3.33	1.801
11 CR I do not understand this emergency situation enough to do anything about it.	146	1	7	2.98	1.595
15 CR I believe that there are constraints or obstacles that limit my ability to evacuate.	146	1	7	3.85	1.650
23 CR I believe that I am not able to evacuate.	146	1	7	2.65	1.488
10 LI I am personally affected by this emergency situation.	145	1	7	5.14	1.597

Table 4. Continued

	N	Minimum	Maximum	Mean	Std. Deviation
12 LI REV This evacuation does not involve me.	146	1	7	5.14	1.772
16 LI REV This emergency situation does not involve me.	146	1	7	5.55	1.540
17 LI I have strong opinions about this emergency situation.	146	1	7	4.02	1.474
20 LI I am personally affected by this evacuation.	145	1	7	4.74	1.625
26 LI I have strong opinions about evacuation.	146	1	7	4.05	1.379
6 EXP The SOURCE has adequate expertise to handle this emergency situation.	147	1	7	4.71	1.424
9 EXP The SOURCE is knowledgeable about emergency preparedness.	146	1	7	5.26	1.339
18 EXP The SOURCE provides the most accurate information about emergency situations.	146	1	7	4.45	1.350
8 TRUST The SOURCE is a trustworthy organization.	146	1	7	4.81	1.577
19 TRUST I trust information provided by the SOURCE.	146	1	7	4.88	1.402
25 TRUST The SOURCE is a credible organization.	146	1	7	4.92	1.405

Table 4. Continued

	N	Minimum	Maximum	Mean	Std. Deviation
ATT GU11536902ood	146	1	7	5.25	1.166
ATT Positive	146	1	7	5.08	1.243
ATT Competent	146	1	7	5.10	1.363
ATT Important	146	1	7	5.72	1.213
5 IS REV I don't want any more information about this emergency situation.	145	1	7	5.70	1.655
22 INFOSEEK I plan to seek out additional information on ways I can better prepare for this emergency situation.	146	1	7	4.88	1.659
24 INFOSEEK I will actively seek more information about this emergency situation.	146	1	7	4.71	1.703
Valid N (listwise)	139				

Prior to hypothesis testing, Cronbach's alpha was used to assess the internal consistency of the multiple-item indexes for problem recognition, constraint recognition, level of involvement, information-seeking behavior, expertise, trust and attitude. Reversed items were transformed before performing the reliability analysis. The results of the analysis are shown in Table 5

. Table 5: Final Cronbach's Alpha for Multiple-Item Indexes

<i>Variable</i>	<i>α</i>	<i>Number of items</i>
Problem Recognition	.65	4
Constraint Recognition	.66	5
Level of Involvement	.79	5
Information Seeking- Behavior	.81	3
Expertise of the Source	.73	3
Trust of the Source	.90	3
Attitude Toward the Source	.87	4

Five items were included to test problem recognition; however the alpha indicated scale reliability was higher by dropping the item “I need to seek out additional information to better understand this emergency situation.” The four remaining items produced a reliability coefficient of .65. Six items were used to test constraint recognition. The alpha indicated scale reliability was higher by dropping the item “I believe that there are constraints or obstacles that limit my ability to evacuate.” The five remaining items produced a reliability coefficient of .66. Six items were also used to test level of involvement. The alpha indicated scale reliability was higher by dropping the item “I have strong opinions about this emergency situation.” The five remaining items produced a reliability coefficient of .79. The three items used to test information-seeking behavior produced a reliability coefficient of .81. The three items used to test the expertise of the source produced a reliability coefficient of .73. The three items used to

measure trust of the source produced a reliability coefficient of .90. Finally, the four items were used to test attitude of the source and produced a reliability coefficient of .87.

While alpha values between .80 and 1.00 indicated high reliability (Berman, 2002), it is generally agreed that the lower limit of .70 is still a useful measure of constructs (Broom & Dozier, 1990; Stacks, 2002). While the situational theory of publics is a strong theory, a strong criticism is the weak internal reliability of the items that measure its constructs.

Hypothesis 1

Hypothesis 1 stated that in emergency communication, message source will influence receiver variables. Receiver variables are problem recognition, constraint recognition and level of involvement. To test this hypothesis, regression analysis was performed. Message source, the independent variable, was regressed on the measures of problem recognition, constraint recognition and level of involvement, the dependent variables. The results of the analysis are shown below.

Proposition 1.1 stated that a national message source (NWS) will produce higher problem recognition than a local source (HCG). The local government produced a higher mean score ($M = 5.63$, $SD = .94943$) than the National Weather Service ($M = 5.36$, $SD = 1.04410$). However, the results of ANOVA were not significant, $F(1,143)=2.629$, $p=1.07$. Therefore, P1.1 is not supported.

Proposition 1.2 stated that a national message source (NWS) will produce higher constraint recognition than a local message source (HCG). While the ANOVA was not significant, $F(1,144)=3.142$, $p=.078$, the National Weather Service produced a higher

mean score ($M = 3.49$, $SD = 1.07795$) than the local government ($M = 3.19$, $SD = .99157$). Thus, there is mixed support for P1.2.

Proposition 1.3 stated that a national message source (NWS) will produce a higher level of involvement than a local message source (HCG). The local government produced a higher mean score ($M = 4.94$, $SD = 1.04625$) than the National Weather Service ($M = 4.65$, $SD = 1.10609$); however, the ANOVA test was not significant, $F(1,142)=2.620$, $p=.108$. Thus, P1.3 is not supported.

Proposition 1.4 stated that a national message source (NWS) will produce higher expertise than a local message source (HCG). The results of the ANOVA test were significant, $F(1,143) = 26.39$, $p = .000$. The NWS produced a significantly higher mean score ($M = 5.23$, $SD = .95076$) over the local government source ($M = 4.36$, $SD = 1.07876$). P1.4 was supported.

Proposition 1.5 stated that a national message source (NWS) will produce higher trust than a local message source (HCG). The results were significant, $F(1,142) = 44.79$, $p = .000$. The NWS produced a significantly higher mean score ($M = 5.51$, $SD = 1.05697$) than the local government source ($M = 4.21$, $SD = 1.27383$). Thus, P1.5 was supported.

Proposition 1.6 stated that a national message source (NWS) will produce more positive attitudes than a local message source (HCG). The ANOVA results were significant, $F(1,143) = 27.14$, $p = .000$. The NWS produced a significantly higher mean score ($M = 5.69$, $SD = .88395$) than the local government source ($M = 4.86$, $SD = 1.05531$). Thus, P1.6 was supported.

Proposition 1.7 stated that a national message source (NWS) will produce higher information-seeking than a local message source (HCG). The local government source produced a higher mean score ($M = 5.28$, $SD = 1.43204$) than the National Weather Service source ($M = 4.92$, $SD = 1.41293$), and the ANOVA results were not significant, $F(1,143)=2.297$, $p=.132$. Thus, P1.7 is not supported.

Hypothesis 2

A series of one-way ANOVAs were conducted to test this hypothesis. Hypothesis 2 stated that, in emergency communication, message strategy will influence receiver variables. Results indicated that problem recognition was significantly affected by strategy type, $F(6,138)=3.00$, $p=.001$. An evaluation of mean scores indicated that the threat and punishment strategy produced the greatest influence on problem recognition ($M = 5.85$, $SD = .76691$), followed by the persuasive strategy ($M = 5.69$, $SD = .83256$) and the promise and reward strategy ($M = 5.68$, $SD = 1.06646$). The means for problem recognition across all treatments are shown in Table 6.

In addition, results indicated that level of involvement was significantly affected by strategy type, $F(6,137)=2.821$, $p=.013$. An evaluation of the mean score indicated that the threat and punishment strategy produced the greatest influence on level of involvement ($M = 5.23$, $SD = 1.8875$), followed by the facilitative strategy ($M = 5.03$, $SD = .78658$), and the cooperative problem-solving strategy ($M = 4.90$, $SD = 1.11252$). The means for level of involvement across all treatments are shown in Table 6.

The other receiver variables were not significant; however, the mean scores are shown in Table 6. For constraint recognition, the facilitative strategy had the highest

mean ($M = 2.96$, $SD = .83875$), followed by the threat and punishment strategy ($M = 3.17$, $SD = .94281$). For expertise, the persuasive strategy produced the highest mean ($M = 5.32$, $SD = 1.25230$), followed by the cooperative-problem solving strategy ($M = 4.98$, $SD = .89738$). The persuasive strategy also had the highest mean for the trust receiver variable ($M = 5.24$, $SD = 1.25230$). Second was the cooperative-problem solving strategy type ($M = 5.21$, $SD = 1.09279$). For attitude, the persuasive strategy produced the highest mean ($M = 5.62$, $SD = .86826$), followed by the cooperative-problem solving strategy ($M = 5.49$, $SD = .79668$).

Hypothesis 2 stated that in emergency communication, message strategy will influence receiver variables. Threat and punishment had the highest mean for information-seeking behavior ($M = 5.48$, $SD = 1.36572$), followed by promise and reward ($M = 5.37$, $SD = 1.35465$). Proposition 2.1 stated that information-seeking behavior will be the highest when the threat and punishment strategy is used. Thus, proposition 2.1 is supported.

Proposition 2.2 stated that information-seeking behavior will be the lowest when the informative strategy is used. However, the persuasive strategy produced the lowest mean for information-seeking among strategies, ($M = 4.80$, $SD = 1.698$). Thus, proposition 2.2 is not supported. While the informative strategy did produce a low mean for information-seeking behavior, the persuasive strategy produced the lowest mean score.

Table 6: ANOVA Strategy Type/Receiver Variables

Strategy Type/Receiver Variables		N	Mean	Std. Deviation
PR	Threat and Punishment	20	5.8500	.76691
	Persuasive	21	5.6905	.83256
	Promise and Reward	20	5.6875	1.06646
	Cooperative	21	5.5595	.88000
	Facilitative	21	5.5238	.74542
	Informative	24	5.4896	1.11920
	Control	18	4.5139	1.12613
	Total	145	5.4897	1.00384
CR	Facilitative	21	2.9683	.83934
	Threat and Punishment	20	3.1667	.94281
	Persuasive	21	3.2222	.96944
	Promise and Reward	20	3.3000	.83875
	Informative	24	3.4028	1.00111
	Cooperative	21	3.5317	1.34125
	Control	19	3.8070	1.21241
	Total	146	3.3390	1.04210
LI	Threat and Punishment	20	5.2333	1.08875
	Facilitative	20	5.0333	.78658
	Cooperative	21	4.9048	1.11252

Table 6. Continued

	Promise and Reward	20	4.8333	1.21876
	Persuasive	21	4.8016	1.06278
	Informative	23	4.7319	.98311
	Control	19	3.9649	1.00551
	Total	144	4.7917	1.08309
EXPERT	Persuasive	21	5.3175	.85943
	Cooperative	21	4.9841	.89738
	Promise and Reward	20	4.7667	.96791
	Informative	23	4.7536	1.27215
	Threat and Punishment	20	4.7167	1.14593
	Facilitative	21	4.5238	1.04654
	Control	19	4.4912	1.37153
	Total	145	4.7977	1.10225
TRUST	Persuasive	21	5.2381	1.25230
	Cooperative	21	5.2063	1.09279
	Threat and Punishment	20	4.9000	1.25237
	Facilitative	21	4.8413	1.19545
	Informative	22	4.7727	1.33090
	Promise and Reward	20	4.6500	1.63469
	Control	19	4.3684	1.54718
	Total	144	4.8611	1.33770
ATT	Persuasive	21	5.6190	.86826

Table 6. Continued

Cooperative	20	5.4875	.79668
Informative	24	5.4063	.96631
Facilitative	21	5.2857	1.17070
Promise and Reward	20	5.2375	1.02108
Threat and Punishment	20	5.1500	1.09545
Control	20	4.7750	1.33007
Total	146	5.2860	1.05495
INFOSEEK Threat and Punishment	20	5.4833	1.36572
Promise and Reward	20	5.3667	1.35465
Cooperative	21	5.2857	1.37148
Facilitative	21	5.1429	1.20909
Informative	24	5.1111	1.67004
Persuasive	20	4.8000	1.69761
Control	19	4.4211	1.11023
Total	145	5.0943	1.42871

Hypothesis 3

Hypothesis 3 stated that level of involvement will produce the strongest effect on information-seeking behavior. Linear regression analysis was conducted to test this hypothesis. For the analysis, problem recognition, constraint recognition, and level of involvement were the independent variables and information-seeking behavior was the dependent variable. Results indicated that the three independent variables, together contributed to 32% of the variance in information-seeking, $R = .572$, $R^2 = .327$,

$F(3,138)=22.34, p=.000$. However, an examination of the coefficient analysis, shown in Table 7, indicated that problem recognition produced the strongest effect on information-seeking behavior. Therefore, H3 was not supported.

Hypothesis 4

In addition, Hypothesis 4 stated that constraint recognition will produce the weakest effect on information-seeking behavior. The results shown in Table 7 indicate that H4 is supported.

Table 7: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.193	.750		.258	.797
	LI	.393	.122	.308	3.224	.002
	PR	.485	.125	.351	3.885	.000
	CR	.121	.102	.089	1.179	.241

a. Dependent Variable: INFOSEEK

The next chapter provides a discussion of the results and draws conclusions about the findings of this study. It also includes limitations of the study, future research, and conclusions.

Chapter Six

Discussion

The purpose of this study is to understand what message source and strategy type is most effective in emergency management communications. Results indicated that a national message source produced higher constraint recognition. The national message source produced higher expertise, trust, and attitude than a local message source. The threat and punishment strategy produced the highest level of information-seeking behavior. Information-seeking behavior was the lowest when a persuasive strategy was used. Constraint recognition produced the weakest effect on information-seeking behavior.

This study examined Hazleton's (1993) public relations strategies. Specifically, message strategy effects were examined using J.E. Grunig's (1997) situational theory of publics to determine strategy influence on individuals' problem recognition, constraint recognition, level of involvement, information seeking behavior, expertise, trust and attitude toward the source of emergency communication. Four hypotheses were tested.

Hypothesis 1: In emergency communication, message source will influence receiver variables.

P1.1: A national message source (NWS) will produce higher problem recognition than a local message source (HCG). This proposition was not supported. Respondents indicated that they are most likely to recognize the existence of a problem if it is communicated at the local level. This makes sense because local officials have a better

understanding of the local environment and the potential effects of an emergency situation. The local source plays a significant factor in whether publics will be active or passive. Local officials are a prominent factor in disseminating emergency information to the public. They are better educated on the perceived risks and how to minimize the effects of the emergency.

P1.2: A national message source (NWS) will produce higher constraint recognition than a local message source (HCG). This proposition produced mixed support. “Constraint recognition represents the extent to which individuals perceive obstacles or barriers, in a situation that limit their freedom to plan their own behavior” (Werder, 2005, p.226). This is important because it states that national messages that are not localized for a public can lead to the public feeling constraints on what actions they should take during an emergency situation. Local officials must communicate this information for the public to feel that they can do something in the emergency situation and not feel constrained.

P1.3: A national message source (NWS) will produce higher level of involvement than a local message source (HCG). This proposition was not supported. This means that publics are more likely to be more involved in the emergency situation if they message source is from local officials. “An emotional connection of relevance increases the likelihood of individuals attending to and comprehending messages” (Pavik 1988). The public perceives themselves to be more involved in an emergency situation when the information is communicated at a local level. Local communicators understand the geo-spatial map of the area and can best make decisions to help the public from a risk. Once

the public understands the existence of an emergency situation, having a local official conveying the message will make the public more active.

The local officials have a significant role in emergency communication. The local source creates higher problem recognition, produces lower constraint recognition and a higher level of involvement. These three items help shape the role local officials have when communicating emergency messages. Not only must they be knowledgeable on the local effects of the emergency, they must shape public opinion to get the public to act in a certain manner that is most beneficial to the community. The next three propositions yielded significant results on the attributes of the message source.

P1.4: A national message source (NWS) will produce higher expertise than a local message source (HCG). This proposition was supported with significance. The national message source yielded a higher level of expertise than the local source. In emergency communication, especially with the hurricane situation used in our treatments, people believe that there is a higher level of expertise at the national level. This makes sense because the National Hurricane Center makes predictions about these storms using sophisticated resources. Local officials often communicate that they are waiting for updated hurricane information from the National Hurricane Center via their scheduled advisories. This may have engrained the public to view the national message source as having more expertise. The local officials must take that information and shape messages to reach their publics. For local officials, it may be best to communicate the source of the message as from a national source to establish the expertise of the message.

P1.5: A national message source (NWS) will produce higher trust than a local message source (HCG). This proposition was supported with significance. This was an interesting discovery about the trust of local officials in emergency situations. Results indicated that the public has higher trust in a national message source than a local message source. This may reflect back to the argument that the public is used to hearing that they are waiting on information from the National Hurricane Center. Local officials seem to communicate the trust in the national message source in terms of their communication strategy. Communicators need to factor the trustworthiness of the national message source into their messages to become more credible. When communicating an emergency situation, having interviews and live updates from a national source may be a resourceful way to build trust in local officials. This shows the communication with the national source and having them share their expertise to make the best local emergency decisions.

P1.6: A national message source (NWS) will produce more positive attitudes than a local message source (HCG). This proposition was supported with significance. The attitudes tested were bad : good, negative : positive, incompetent : competent, and not important : important. The attitude 'important' produced the highest mean score. 'Positive' and 'Competent' yielded the lowest means. This finding confirms the expertise and trust of the message source. The public views the national message source as being more important, positive, competent, and good. The local message source must communicate the message as being from a national message source to have the message be perceived by the attitudes tested in this study.

P1.7: A national message source (NWS) will produce increases information-seeking than a local message source (HCG). This proposition was not supported. This means the public looks toward the local message source to provide specific information on what actions they should take. The public needs to understand the local risks involved with the emergency and how best to protect themselves. While the national message source may produce higher expertise, trust, and attitude, the local component is still an important factor in the public's actions to seek out additional information.

Hypothesis 2: In emergency communication, message strategy will influence receiver variables.

P2.1: Information-seeking will be the highest when the threat and punishment strategy is used. This proposition was supported. This correlates directly with my introduction situation with Hurricane Ike. Residents reacted toward evacuation orders at unprecedented levels when certain death language was used regarding the intense nature of the hurricane. This indicates that when communicating emergency information, it may be best to communicate the 'worst possible outcome' as the message. Fear tactics, since 2001, seem to have a greater effect on the public's actions toward an emergency situation. In addition, it makes the public want to seek out additional information on the emergency situation because the severity of it is the message.

When communicating to the public about emergency situations, the threat and punishment strategy generated the highest information-seeking behavior. Communicators can't use 'certain death' language every time a hurricane approaches the United States and expect to get the same reaction each time. The punishment aspect of the message is

critical. By saying that emergency response personnel are not going to risk their own lives to rescue you because you failed to listen to emergency evacuation messages sets a precedent that if you disobey mandatory evacuation messages that you will be dealt to deal with the consequences.

P2.2: Information-seeking will be the lowest when the informative strategy is used. This proposition was not supported. Information-seeking was the lowest when the persuasive strategy was used. This means that the public doesn't want to be told how to act during emergency situations. They want to make their own decisions on how best to deal with the situation by using the information they have. This is an important finding because it indicates the type of message that should not be used when communicating emergency communication.

Hypothesis 3: Level of involvement will produce the strongest effect on information seeking behavior.

This hypothesis was not supported; however the results were significant. This means that level of involvement does play a significant role in information-seeking behavior. The more a person is involved in the emergency situation means that they will seek out additional information. It is important to target the public that has the greatest potential of being affected by the emergency situation because it will allow them to seek out additional information on how to respond. Level of involvement and problem recognition are vital to information-seeking behavior. If communicators target these publics with the correct message type, the desired response indicated by national and local officials will be executed.

Hypothesis 4: Constraint recognition will produce the weakest effect on information seeking behavior.

This hypothesis was supported. Constraint recognition produced the weakest effect on information-seeking behavior. A public that feels constrained during an emergency situation is most likely to become passive about the situation because they feel that they cannot do anything to prevent it. These individuals see obstacles and barriers in the emergency situation that prohibits them from seeking additional information or taking action.

Limitations

The results are limited to the demographic surveyed. They are not generalizable to a greater population. The source of the message may not make a difference in how risk communication messages are received. The use of 'emergency' is also a limitation because that definition varies among people. A hypothetical situation was used which may not be reality. It is tough to argue how people in Tampa Bay would act to a direct hit by a hurricane because the area hasn't been hit by a hurricane directly since the early 1900s.

In addition, the population surveyed was college undergraduate students who don't own their own dwelling. Their 'life' as a college student may not depict the typical lives of those living in the Tampa Bay area that may deal with this type of emergency situation. Traditionally, college-students are not known to be an information-seeking public. Students were surveyed during the beginning of hurricane season. The season doesn't usually increase in activity until August and September. If this survey was

conducted during a period of higher activity, hurricane communication may have been more recent in their minds.

In conclusion, this study discovered the type of message source and message type that is best to use in emergency communication. This study extends the situational theory of publics to emergency communication. Future research would need to experiment with other types of emergency situations. Hurricanes are only a major concern for part of the country. Extending this study to other emergency situations could further validate the results of this study. The variables tested also provide communicators with structure on how to communicate these messages to the public. Emergency communication is critical. By understanding how a public responds to these messages is vital to getting the message out to its intended publics.

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Appendices

Appendix A: Questionnaires



Informed Consent to Participate in Research

Protocol Title: Risk Communication

Please read this consent document carefully before you decide to participate in this study.

My name is Andrew Gallo. I am a graduate student here at the University of South Florida. Thank you for taking time to participate in this study. Your participation is completely voluntary. There is no penalty for not participating.

The purpose of this study is to get students to evaluate various messages. If you choose to participate, you will be asked to view several messages presented in the form of advisories. You will then be asked to answer a set of questions regarding the advisories. It will take about 15 minutes to complete the entire questionnaire. You can stop at any time without penalty and you do not have to answer any question you do not wish to answer.

All answers are confidential to the extent provided by law. There are no known risks associated with this study and there are no direct benefits to you for participation. No compensation will be provided for your participation.

Please read the following page and answer the questions.

Instructions: The majority of this questionnaire makes use of rating scales with seven places. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully, be sure to answer all items. Answer the questions to the best of your ability.

Section I: Please answer the questions using the scale below. Please write the number that corresponds to your choice in the space preceding the question.

- 1) Based on the weather advisory I read, I believe this situation qualifies as an emergency.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 2) I want to understand this emergency situation better.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 3) I cannot do anything about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 4) I do not have the ability to make a difference in the outcome of this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 5) I don't want any more information about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 6) The local government has adequate expertise to handle this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 7) I do not understand this evacuation enough to do anything about it.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 8) The local government is a trustworthy organization.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 9) The local government is knowledgeable about emergency preparedness.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 10) I am personally affected by this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 11) I do not understand this emergency situation enough to do anything about it.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 12) This evacuation does not involve me.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*

- 13) I recognize the existence of a weather-related emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 14) I need to seek out additional information to better understand this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 15) I believe that there are constraints or obstacles that limit my ability to evacuate.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 16) This emergency situation does not involve me.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 17) I have strong opinions about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 18) The local government provides the most accurate information about emergency situations.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 19) I trust information provided by the local government.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 20) I am personally affected by this evacuation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 21) I don't believe this emergency situation is serious.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 22) I plan to seek out additional information on ways I can better prepare for this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 23) I believe that I am not able to evacuate.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 24) I will actively seek more information about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 25) The local government is a credible organization.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 26) I have strong opinions about evacuation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*

Section II: Please answer the next set of questions to the best of your ability.

Please place an 'X' on the line that best corresponds with your attitude toward the local government in this emergency situation.

Bad ____ : ____ : ____ : ____ : ____ : ____ : ____ Good

Negative ____ : ____ : ____ : ____ : ____ : ____ : ____ Positive

Incompetent ____ : ____ : ____ : ____ : ____ : ____ : ____ Competent

Not important ____ : ____ : ____ : ____ : ____ : ____ : ____ Important

Section III: Please answer the next set of questions that best applies to you.

Sex: _____ Male _____ Female

Age: _____

Race:

_____ Caucasian

_____ Hispanic

_____ African-American

_____ Asian

_____ American Indian

_____ Pacific Islander

_____ Other

Highest level of education you have completed:

- High School Graduate
- Some college
- Trade/technical/vocational training
- College Graduate
- Some postgraduate work
- Post graduate degree

Type of dwelling:

- House
- Condo
- Townhouse
- Apartment
- Mobile home
- Other

Do you have children?

- Yes No

Are you a registered voter?

- Yes No

Do you have an elderly relative that would need your assistance in the case of an emergency?

_____ Yes _____ No

Thank you for your time. Have a great day.



Informed Consent to Participate in Research

Protocol Title: Risk Communication

Please read this consent document carefully before you decide to participate in this study.

My name is Andrew Gallo. I am a graduate student here at the University of South Florida. Thank you for taking time to participate in this study. Your participation is completely voluntary. There is no penalty for not participating.

The purpose of this study is to get students to evaluate various messages. If you choose to participate, you will be asked to view several messages presented in the form of advisories. You will then be asked to answer a set of questions regarding the advisories. It will take about 15 minutes to complete the entire questionnaire. You can stop at any time without penalty and you do not have to answer any question you do not wish to answer.

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Section I: Please answer the questions using the scale below. Please write the number that corresponds to your choice in the space preceding the question.

- 1) Based on the weather advisory I read, I believe this situation qualifies as an emergency.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 2) I want to understand this emergency situation better.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 3) I cannot do anything about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 4) I do not have the ability to make a difference in the outcome of this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 5) I don't want any more information about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 6) The National Weather Service has adequate expertise to handle this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 7) I do not understand this evacuation enough to do anything about it.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 8) The National Weather Service is a trustworthy organization.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 9) The National Weather Service is knowledgeable about emergency preparedness.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 10) I am personally affected by this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 11) I do not understand this emergency situation enough to do anything about it.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
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- 13) I recognize the existence of a weather-related emergency situation.
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Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 17) I have strong opinions about this emergency situation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 18) The National Weather Service provides the most accurate information about emergency situations.
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- 19) I trust information provided by the National Weather Service.
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- 25) The National Weather Service is a credible organization.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*
- 26) I have strong opinions about evacuation.
Strongly Disagree __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ *Strongly Agree*

Section II: Please answer the next set of questions to the best of your ability.

Please place an 'X' on the line that best corresponds with your attitude toward the National Weather Service in this emergency situation.

Bad ____ : ____ : ____ : ____ : ____ : ____ : ____ Good

Negative ____ : ____ : ____ : ____ : ____ : ____ : ____ Positive

Incompetent ____ : ____ : ____ : ____ : ____ : ____ : ____ Competent

Not important ____ : ____ : ____ : ____ : ____ : ____ : ____ Important

Section III: Please answer the next set of questions that best applies to you.

Sex:

_____ Male _____ Female

Age: _____

Race:

_____ Caucasian

_____ Hispanic

_____ African-American

_____ Asian

_____ American Indian

_____ Pacific Islander

_____ Other

Highest level of education you have completed:

- High School Graduate
- Some college
- Trade/technical/vocational training
- College Graduate
- Some postgraduate work
- Post graduate degree

Type of dwelling:

- House
- Condo
- Townhouse
- Apartment
- Mobile home
- Other

Do you have children?

- Yes No

Are you a registered voter?

- Yes No

Do you have an elderly relative that would need your assistance in the case of an emergency?

_____ Yes _____ No

Thank you for your time. Have a great day.

Veteran Meteorologist Becomes Leader at NOAA's National Weather Service Office in Milwaukee

May 23, 2009

Stephen Brueske, a meteorologist with 24 years of forecasting experience, begins his duties today as meteorologist in charge at [NOAA's Milwaukee National Weather Service forecast office](#).

“Steve has worked at a variety of [National Weather Service](#) locations and brings a wealth of weather forecasting knowledge that will serve the people of southern and southeastern Wisconsin well,” said [Lynn P. Maximuk](#), director of the 14-state National Weather Service central region.

Brueske's National Weather Service experience includes serving as a radar instructor at the warning decision training branch in Norman, Okla.; a term as science and operations officer at the Charleston, S.C., forecast office; and meteorologist in charge at the Great Falls, Mont., forecast office. Prior to his selection to lead the Milwaukee office, he was deputy chief of the systems operations division at western region headquarters in Salt Lake City.

“One of the most important duties for any meteorologist in charge is to make sure area residents are promptly informed of changing weather conditions. This forecast office has a very talented staff with long-standing relationships with local government, emergency managers and the media and I look forward to working with all our partners to provide accurate and timely weather forecasts and warnings,” Brueske said.

Brueske earned his Bachelor of Arts in chemistry, with a minor in computer science, from Bethel University in Minnesota. He studied atmospheric science at Creighton University, and received his master's degree in meteorology from Penn State University in 1990. Prior to joining NOAA he served eight years in the U.S. Air Force as a weather officer.

NOAA understands and predicts changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and conserves and manages our coastal and marine resources.

***Note:** Media interested in arranging interviews with Steve Brueske may contact the Milwaukee weather forecast office in Dousman at 262-965-5061 ext. 726.*

**Hillsborough County News Release, May 2, 2009
For Immediate Release**

For media use only:
Willie Puz, Public Information Manager
Communications
Telephone: 813-307-8379
Cellular Phone: 813-546-2086

Official County Hurricane Guides Now Available

Hillsborough County's Emergency Management team works year round to ensure we are ready to respond to a hurricane or any other type of disaster. And we want you to be prepared, too.

The *2009 Hurricane Guide, the Official Guide for the Tampa Bay Area* is now available at local post offices, with local fire stations and libraries receiving them in the coming weeks. This Official Hurricane Guide, both in English and Spanish, covers all aspects of hurricane preparedness, from knowing your evacuation zone and what to take should you need to evacuate, to advice for homebound patients and protecting senior citizens and your pets. A full list of County shelters, with addresses, is also provided.

In addition, the Guide offers ten reminders on actions to take now that will help keep you and your family and pets safe.

Another opportunity to get your hurricane preparedness questions answered is at the May 31 Tampa Bay Hurricane Expo at the Museum of Science and Industry. This free event is co-sponsored by Hillsborough County and the City of Tampa. You can learn more about hurricane preparedness and the Tampa Bay Hurricane Expo at www.TampaBayHurricaneExpo.com.

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Hillsborough County Government Hurricane Advisory

Hurricane JACOB

Hurricane Jacob Intermediate Advisory

Hillsborough County Government Office
Tampa, FL – 1:00 P.M. EDT – Sept. 12, 2009

At 1 p.m., Hillsborough County (Tampa Bay) was placed under a hurricane watch. Hurricane conditions are likely to occur within the next 36 hours.

Hurricane Jacob is moving toward the east-northeast near 12mph. A turn toward the east is expected later today. The center of Jacob will be near the entrance of Tampa Bay by late tomorrow. Because Jacob is a very large hurricane, weather will begin to deteriorate along the coastline soon.

Data from Air Force reconnaissance planes indicate that maximum sustained winds remain near 115mph with pockets of higher gusts. Jacob is a category three hurricane on the Saffir-Simpson scale. This is a major hurricane; the damage level could be extensive.

The storm is expected to produce a coastal storm surge up to 14 feet. Residents along the coast can expect to experience above normal tide and dangerous battering waves soon. Currently, water levels along the coast have already risen more than 3 feet.

Hurricane Jacob is expected to produce rainfall amounts of 7 to 10 inches over western and central Florida.



A category three hurricane will make landfall in Tampa Bay in the next 36 hours. Please join the local government in evacuation efforts. Together we can protect the residents of our community. Your cooperation will ensure the safety of all residents as we prepare for the storm.

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