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Assessing a need for a one-stop shop disaster management mobile application by identifying the perceptions and utilization of current disaster preparedness resources in southern Louisiana

Regina B. Leingang

Louisiana State University and Agricultural and Mechanical College

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ASSESSING A NEED FOR A ONE-STOP SHOP DISASTER MANAGEMENT MOBILE
APPLICATION BY IDENTIFYING THE PERCEPTIONS AND UTILIZATION OF CURRENT
DISASTER PREPAREDNESS RESOURCES IN SOUTHERN LOUISIANA

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource
Education and Workforce Development

by

Regina B. Leingang

B. S. Louisiana State University, 2005

M.P.A. Louisiana State University, 2009

May 2013

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This is dedicated to several people in my life. The first is my Uncle Les who was a scholar himself and showed me that hard work and determination certainly pay off. He had several obstacles he had to overcome during his short time on earth. First, he managed to survive and “beat the odds” after a traumatic injury that almost cost him his life. Instead he embraced his new self and managed to learn all functions such as walking and talking again and went on to obtain a law degree from Tulane Law School. His determination to never quit inspired me to continue this academic journey and he was certainly a “trooper.” The second obstacle he faced was cancer and unfortunately he lost his fight with cancer after a courageous battle.

The second person this is dedicated to is my father-in-law Gary Leingang. It was thanks to him and his tutoring abilities that I was able to pass the GRE which allowed me to obtain my Masters of Public Administration. During that time, I chose to take some classes in Human Resource Education and absolutely loved them. That positive experience, as well as several other events, allowed me to pursue my doctorate. Gary lost his fight with cancer in 2010, but he was an incredible husband, father, teacher, coach, and friend. His passion for life and making the best out of it certainly was an inspiration to me.

The third person that this is dedicated to, is my grandfather, that I lovingly call Steve J. Steve J instilled in me from a very young age that education is not a choice but a necessity. It was never a question of if I was going to go to college, but for how long! Don’t think he thought it would be this long! He is a public servant and has been my role model throughout my life. He has given of himself selfishly for many years with a myriad of positions that helped make a difference in our State. He was a State Representative for several terms, Parish President, and the Legislative Auditor. He is the quintessential definition of a leader, and he leads by example.

He is what I want to be when I grow up and I am beyond thankful to have such a positive influence and inspiration in my life.

The fourth person that this is dedicated to is my mother, Rachel Theriot. We did not have the easiest time growing up, but one thing she always cherished and made sure we had was an education. She worked very hard to ensure that my brother Ronnie and I were able to go to the best schools possible and have a wonderful education. Watching her obtain her master's degree at night and teaching by day illustrated to me that anything was possible as long as you put your mind to it and went for it.

This fifth and final person that this is dedicated to is my loving husband. I could not have done this without him by my side cheering me on along the way. The countless loads of laundry (not dishes) and meals that he prepared made it possible for me to focus on my studies and writing. The sacrifices he had to make to ensure our house was maintained and picking up my slack did not go un-noticed. Having him to run ideas by and see if they make sense, or conveyed what I wanted, was pivotal during this journey. He has been my champion along the way and when times got tough knew exactly when a "night off" was needed! Thank you for your constant and unwavering dedication to me and can't wait to celebrate our 30th birthdays and being a "Dr." in Hawaii!

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I also have to thank my HRE graduate school colleagues, those fellow students with whom I learned all about the joy of research, statistics, worked on group projects with, and studied together so that we could pass our exams. Thank you especially to “my friend Missy” Korduner for your guidance and pep talks, they really helped me through some low points during this dissertation journey. A very big, huge, thank you to Dr. Britt Britt, Brittany Buquoi, for all of your assistance and sharing of knowledge and insight with me since you were the first “Dr.” I really appreciate all of your help along this journey and thank you for being my CC’s buddy!

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	v
LIST OF TABLES	xii
LIST OF FIGURES	xiii
ABSTRACT	xiv
CHAPTER 1 INTRODUCTION	1
Rationale	2
Problem Statement	3
Purpose of the Study	4
Objectives	4
Significance of the Study	5
Definitions of Terms	11
References	16
CHAPTER 2 REVIEW OF RELATED LITERATURE	18
Brief History of Emergency Management	18
Preparedness Theory	19
Preparedness Resources	20
Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP)	21
Get a Game Plan Website and Mobile Application.	21
Official Louisiana Hurricane Survival Guide	21
United Way’s 211	23
511 Travelers Information System.	24
American Red Cross – Safe and Well Website	25
American Red Cross – Shelter View Website and Mobile Application	25
American Red Cross – Hurricane Mobile Application.	26
Layered Approach	27
“Mobile-Savvy” and Future Implications for Emergency Management	29
References	30
CHAPTER 3 METHODS	33
Population and Sample	33
Mixed Methods Approach	33
Ethical Considerations and Study Approval	34
Instrumentation	36
Validity and Reliability	37
Preparedness Score	37
Knowledge Score.	37
Usage Score	38
Technology Score	38
Data Collection	43
Data Analysis	44
References	46

CHAPTER 4 DEVELOPING AND CONDUCTING A SURVEY INSTRUMENT TO MEASURE AND EVALUATE THE UTILIZATION OF PREPAREDNESS RESOURCES

AVAILABLE	48
The Four Phase Emergency Management Model	49
Developing the Instrument.....	53
Preparedness and Demographics.....	55
Preparedness in Relation to Natural Disasters.	56
Population	58
Pilot Study.....	59
Instrument Creation and Score.....	60
Preparedness Score.....	61
Knowledge Score	62
Usage Score.....	64
Technology Score.....	64
Reliability.....	66
Discussion	67
References.....	68

CHAPTER 5 IDENTIFICATION OF THE UTILIZATION OF DISASTER PREPAREDNESS

RESOURCES: A QUALITATIVE APPROACH	72
Brief History of Disaster Research.....	72
Introduction.....	72
Significance of the Study	73
Phenomenology – Brief Overview	74
Procedures for Conducting Semi-structured Interviews.....	74
Approval and Confidentiality.....	75
Selection of Interviewees.....	76
Interview Questions.....	76
Pilot Study.....	78
Data Analysis	78
Selected Meaning Units	80
Thematic Analysis.....	84
Conclusion/Future Recommendations.....	87
References.....	90

CHAPTER 6 ASSESSING A NEED FOR A “ONE-STOP SHOP” DISASTER

MANAGEMENT MOBILE APPLICATION.....	92
Introduction.....	92
Rationale	93
Rise of the Smartphone.....	94
There’s an App for That!	96
Preparedness Resources – Going Mobile	98
American Red Cross – Hurricane Mobile Application.....	99
Purpose	100
Population and Sample	100
Objectives	101
Mixed Methods Approach	102

Ethical Considerations and Study Approval	103
Quantitative Results.....	103
Objective One.	103
Objective Two.....	108
Objective Three.....	109
Future Implications.....	112
“One-stop shop” Disaster Management Mobile Application	112
References.....	115
CHAPTER 7 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	117
Purpose	117
Objectives	117
Methods	118
Quantitative Findings	119
Qualitative Findings	122
Limitations	123
Increase Awareness	125
References.....	126
APPENDIX A OFFICIAL LOUISIANA HURRICANE SURVIVAL GUIDE.....	127
APPENDIX B VISUAL MODEL FOR MIXED METHODS PROCEDURE SEQUENTIAL EXPLANTORY MIXED METHODS DESIGN.....	143
APPENDIX C LOUISIANA STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD FOR PROTECTION OF HUMAN SUBJECTS APPROVAL LETTER AND NHI CERTIFICATE OF TRAINING	144
APPENDIX D INSTITUTIONAL REVIEW BOARD FOR PROTECTION OF HUMAN SUBJECTS APPROVAL LETTERS FROM SOUTHEASTERN LOUISIANA UNIVERSITY, UNIVERSITY OF LOUISIANA LAFAYETTE, AND UNIVERSITY OF NEW ORLEANS	146
APPENDIX E UNIVERSITY OF LOUISIANA AT LAFAYETTE HURRICANE RESEARCH SURVEY COVER LETTER.....	149
APPENDIX F INSTRUMENT APPROVAL AND DEPLOYMENT TIMELINE.....	150
APPENDIX G FEEDBACK FROM PILOT: 10/3/12 – 10/9/12	151
APPENDIX H LEINGANG DISASTER PREPAREDNESS AND UTILIZATION SURVEY CODED	155
APPENDIX I MEANING UNITS.....	168
VITA	183

LIST OF TABLES

Table 3.1 Knowledge Factor in the Leingang Disaster Preparedness and Utilization Survey	39
Table 3.2 Usage Factor in the Leingang Disaster Preparedness and Utilization Survey	40
Table 3.3 Technology Factor in the Leingang Disaster Preparedness and Utilization Survey	42
Table 4.1 Knowledge Factor in the Leingang Disaster Preparedness and Utilization Survey	61
Table 4.2 Usage Factor in the Leingang Disaster Preparedness and Utilization Survey	63
Table 4.3 Technology Factor in the Leingang Disaster Preparedness and Utilization Survey	65
Table 5.1 Breakdown of Interviewees Identified from the Leingang Disaster Preparedness and Utilization Survey	80
Table 5.2 Interviewees Technology Usage Identified by the Leingang Disaster Preparedness and Utilization Survey	83
Table 6.1 Age Distribution of Respondents to the Leingang Disaster Preparedness and Utilization Survey	104
Table 6.2 Self-Identified Ethnicity of Respondents to the Leingang Disaster Preparedness and Utilization Survey	105
Table 6.3 Highest Level of Education Completed by Respondents to the Leingang Disaster Preparedness and Utilization Survey	106
Table 6.4 Marital Status Reported by Respondents to the Leingang Disaster Preparedness and Utilization Survey	107
Table 6.5 Universities Distribution of Preparedness Total Score of Respondents to the Leingang Disaster Preparedness and Utilization Survey	108
Table 6.6 Preparedness Total Score from the Disaster Preparedness and Utilization Survey based on Selected Demographic Variables	110

LIST OF FIGURES

Figure 1.1 Natural disasters reported, 1975-2011 (Emergency Events Database, 2012)	6
Figure 1.2 Number of natural disasters reported 1900-2011 (Emergency Events Database, 2012)..	7
Figure 1.3 Distribution of Hazard Events in Louisiana from 1960 - 2009	9
Figure 1.4 Distribution of Losses by Hazard Type from 1960 - 2009.....	10
 Figure 2.1 Cellphone and Smartphone ownership, over time 2006-2012 (Pew Institute, 2013).	29
 Figure 4.1 Phases of Emergency Management Adapted from FEMA (2006) Principles of Emergency Management Independent Study Program.....	49
 Figure 5.1 Spectrum from Unstructured to Fully Structured Interviewing Adapted from Wengraf (2001).....	75
Figure 5.2 Thematic Analysis – Knowledge theme.....	85
Figure 5.3 Thematic Analysis – Usage theme.....	86
Figure 5.4 Thematic Analysis – Technology theme	87
 Figure 6.1 Changes in smartphone ownership, 2011-2012 (Pew Institute).	95
Figure 6.2 Cell Phone Activities (Pew Institute, 2013)	97
Figure 6.3 Downloading Apps (Pew Institute, 2013).	98

ABSTRACT

This dissertation was written in the Seven Chapter, Journal Style, format which identifies Chapters Three, Four, and Five as Journals One, Two, and Three. The purpose of this sequential explanatory mixed method study was to assess the need for a “one-stop shop” disaster management mobile application. This was done by identifying the perceptions and utilization of current disaster preparedness resources in the southern region of the United States. The perceptions and utilization levels were measured by obtaining statistical, quantitative results from the Leingang Disaster Preparedness and Utilization survey. Individuals at four universities in the Southern disaster prone area of Louisiana were surveyed. The survey yielded a preparedness score for each survey participant. The preparedness score was achieved based on subsequent scores in three categories: knowledge, usage, and technology. Knowledge was defined as simply knowing about that the preparedness resource available. Usage was defined as participants knowing that the resources existed and whether they chose to use it or not. Technology was identified as any medium the participant used to assist in their hurricane preparedness efforts. This included anything from printed resources to mobile applications. Respondents that identified they were available for more in-depth interviews that had the highest and lowest scores at each institution were contacted to further explore their survey results. The availability of a “one-stop shop” disaster management mobile application that is utilized before, during, and after a disaster would allow Louisiana residents to have one place to access the various emergency preparedness resources that are available for them. This study found that residents would be interested in utilizing a “one-stop shop” mobile application during disasters and therefore the researcher recommend modifying current disaster management mobile applications in order to meet this need.

CHAPTER 1

INTRODUCTION

Gerald Caplan, the father of modern Crisis Intervention, described crisis as “An obstacle that is, for a time, insurmountable by the use of customary methods of problem solving. A period of disorganization ensues, a period of upset, during which many abortive attempts at a solution are made” (Caplan, 1961, p.18). Although there is no precise definition for disaster, the Federal Emergency Management Agency ([FEMA], 2009a) defined it as “an occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries” (p.4). However, some experts believe that the definition of a disaster can be different based on the geographic, economic, and political situations of the disaster-prone countries (Kourosh & Larson, 2008). Quarantelli (1998) defined a disaster as a natural or man-made event that negatively affects life, property, livelihood, or industry often resulting in permanent changes to human societies, ecosystems, and environment. Disasters are relatively sudden, highly disruptive, and in most cases short lived although the effects that a disaster causes may be longer lasting (Kourosh & Larson, 2008).

The cause of a disaster may be due to: natural causes, such as a hurricane or an earthquake; a failure of technology, such as airplane crash or the collapse of a bridge; and an act of human violence, such as terrorism or an act of war. (Kourosh & Larson, 2008, p.63).

Researchers emphasize the need to conceptualize and understand the term disaster (Kourosh & Larson, 2008; Quarantelli, 1998; Quarantelli, Lagadec, & Boin, 2006). Other researchers believe that a disaster is an event caused by human or natural forces and resulting in an enormous loss of life and property (Vishal, Fuloria, & Bisht, 2011). During a crisis and/or a disaster, periods of uncertainty will take place and communication above all else is pivotal. Communication is a fundamental part of our lives, and communication methods are constantly changing. As technology grows, so does the variety of communication methods available for use during disasters.

Researchers and administrators are constantly seeking to identify strategies and new, innovative ways to increase the communication during these times.

Rationale

The book, *Disaster Communications in a Changing Media World*, identified historical uses of media and illustrated various technological advancements as well as their utilizations and implications with regards to disaster management (G. Haddow & K. Haddow, 2009). George Haddow and Kim Haddow (2009) discussed how, in the past, individuals would learn about disasters after the fact, and that is certainly not the case any longer. Due to new technologies constantly emerging and improving, individuals are learning about disasters in a more real-time manner. Gillmor and Hattotuwa (2007) illustrated this in their writing by stating that, “these technologies create new ways for citizens to be heard, governments to be held accountable and the State to answer to failures of governance” (p.1). Citizens are increasingly utilizing technology through various devices such as mobile phones to be heard. By using these devices citizens are able to hold decision makers accountable for actions that have or have not taken place which leads to a more transparent environment (Gillmore & Hattotuwa, 2007).

No matter which medium is chosen, the underlying structure of effective communication remains the same. If individuals are unsure of what information they wish to communicate or transmit, they run the risk of not being understood. Challenges to communicating in a world altered by the emergence and evolution of new media, the impact of “first informers” on disaster communications, and the changing roles of the government and traditional media as information gatekeepers will need to be dealt with by emergency managers in a creative manner (May, 2006). Communicating effectively and developing skills to do this is imperative especially in regards to the field of disaster management. As communication increases, the impact that a crisis or disaster can have on an area decreases. Research has shown that Americans are relating to one another in

different ways and social interaction is also changing (G. Haddow & K. Haddow, 2009).

Americans are utilizing computers and other technologies instead of one-on-one traditional engagements. A vast majority of all age groups go online to use email, and a growing number of people are using the internet to benefit from social networking sites (Zickuhr, 2010).

Problem Statement

A thorough review of the related research was conducted, and it is apparent that there are gaps in the communication realm with regards to disaster management and preparedness. It is important to see that incorporating new technologies within disaster management could close these gaps if utilized correctly and thought of creatively. It is anticipated that by the year 2020, mobile devices will be a primary connection tool to the internet for most individuals in the world (Chan & Chia, 2011). Clearly this will have dramatic implications for emergency managers. When discussing tactics to response, it is certainly important to use the layered approach and notify the public in as many different methods as possible. One way to help the public prepare for disasters is by incorporating various disaster preparedness resources together in one area for them to utilize. Since the public has constant access to information there will become even more of an expectation for information to be readily and easily accessible. Society is very comfortable with technology and technological advancements. This lends itself to a “mobile-savvy” public that could utilize a “one-stop shop” disaster management mobile application.

Debaillon and Rockwell (2005), conducted a study regarding the use of the cellular telephone amongst three groups, specifically high school students, college students and non-student adults. The results indicated that college students were the heaviest users of cellular phones, followed by high school students and non-student adults (Debaillon & Rockwell, 2005). For the purposes of this study, the researcher decided to target university students, staff, and

faculty in order to identify residents of Louisiana as the survey participants. The survey conducted was limited to hurricane prone universities in the southern part of Louisiana.

Purpose of the Study

The main purpose of this sequential explanatory mixed method study was to assess the need for a “one-stop shop” disaster management mobile application. This was first done by identifying the perceptions and utilization of current disaster preparedness resources in the southern region of the United States. The perceptions and utilization levels were measured by obtaining statistical, quantitative results from surveying individuals with valid university email addresses that were available in the university databases. Some respondents identified that they were available for more in-depth interviews, and the researcher met with them to explore further their survey results.

Objectives

1. To describe respondents to the researcher developed instrument, the Leingang Disaster Preparedness and Utilization Survey, based on the following demographic characteristics:
 - a) Age
 - b) Gender
 - c) Ethnicity
 - d) Highest educational level completed
 - e) Presence of children (dependents) at home
 - f) Home ownership
2. To determine the preparedness of staff, student, and faculty respondents at universities in the southern region of Louisiana as measured by the Disaster Preparedness and Utilization survey based on a preparedness score that was calculated for each respondent.

3. To determine whether differences exist among residents' preparedness levels as measured by the Disaster Preparedness and Utilization survey based on selected demographic characteristics which include:

- a) Age
- b) Gender
- c) Ethnicity
- d) Highest educational level completed
- e) Presence of children at home
- f) Home ownership

Significance of the Study

This section will provide a brief description on the various significances of the study as well as identify databases available for researchers to utilize that are readily available to be investigated. Centre for Research on Epidemiology of Disasters (CRED) at the Catholic University of Louvain in Belgium, created a joint Emergency Disaster Database (EM-DAT) that provides free and open access to data that has been compiled and validated and is ready to be analyzed (Emergency Events Database, 2012). EM-DAT provides an objective basis for vulnerability assessment and rational decision-making in disaster situations (Emergency Events Database, 2012). EM-DAT provides information on the human impact of disasters such as the number of people killed, injured, or affected by disasters (Emergency Events Database, 2012). Disaster-related economic damage estimates and disaster-specific international aid contributions are also available on EM-DAT to be analyzed by researchers (Emergency Events Database, 2012).

Figure 1.1 illustrates a trend showing that disasters have occurred more in the last fifteen years than previously in history. It is important to note that this rise in the number of disasters could be biased by over-reporting and advances in technology now identifying more disasters that

occur. However, the increasing number of disasters yields more individuals being affected by disasters. This is certainly a cause for concern.

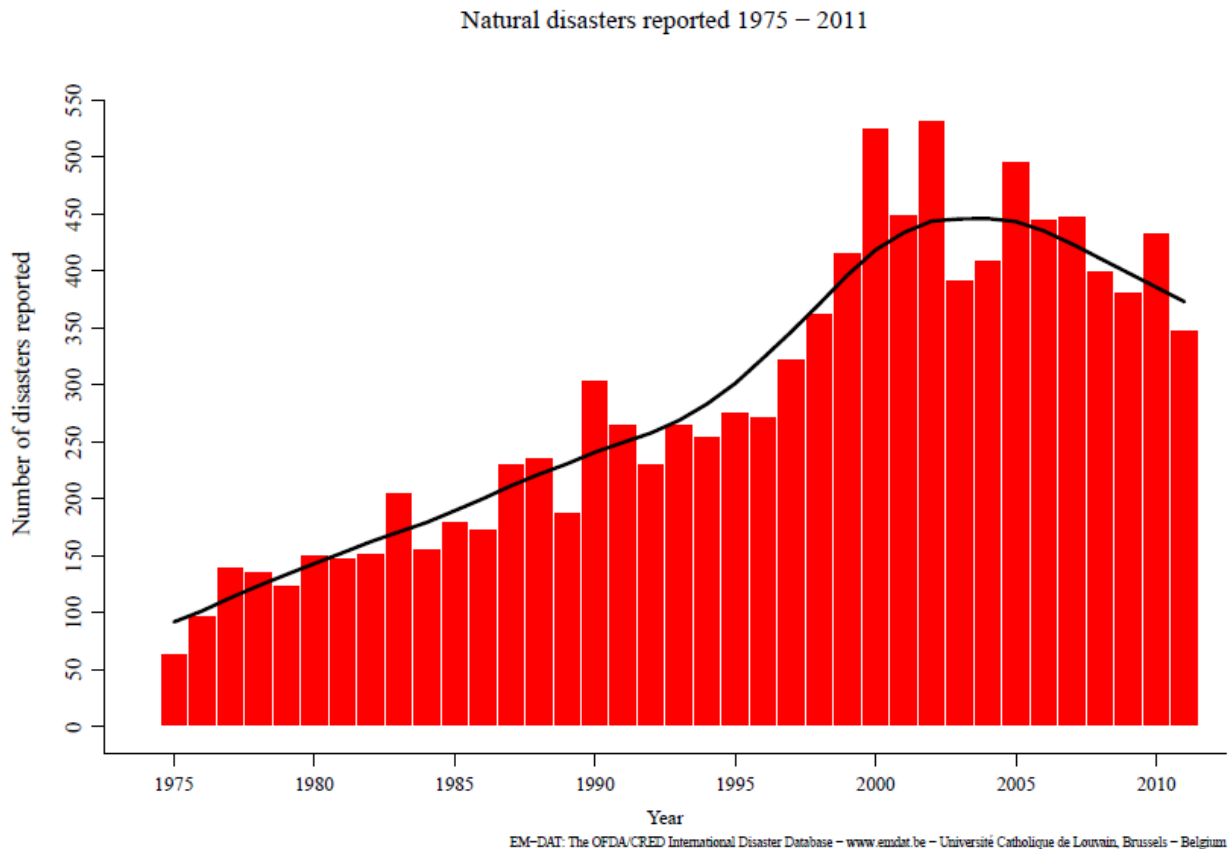


Figure 1.1 Natural disasters reported, 1975-2011 (Emergency Events Database, 2012)

Figure 1.1 illustrates a trend showing that disasters have occurred more in the last fifteen years than previously in history. It is important to note that this rise in the number of disasters could be biased by over-reporting and advances in technology now identifying more disasters that occur. However, the increasing number of disasters yields more individuals being affected by disasters. This is certainly a cause for concern.

Figure 1.2 illustrates the number of natural disasters reported has occurred more frequently over the last 20 years. Of the disasters measured within the EM-DAT database, floods and storms have the highest reported numbers.

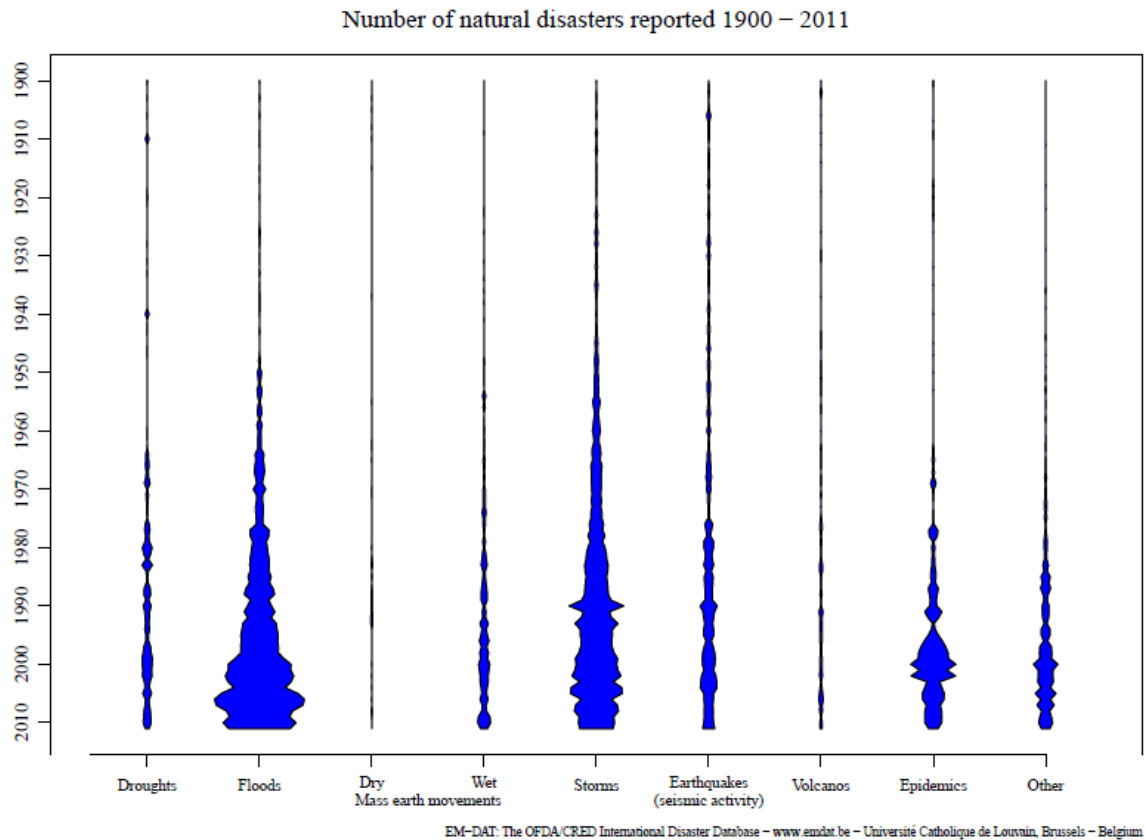


Figure 1.2 Number of natural disasters reported 1900-2011 (Emergency Events Database, 2012)

“The Hazards and Vulnerability Research Institute (HVRI) is an interdisciplinary research, graduate, and undergraduate training center focused on the development of theory, data, metrics, methods, applications, and spatial analytical models for understanding the newly emergent field of hazard vulnerability science” (Cutter & Bowser, 2012, ¶1). This website provides Spatial Hazard Events and Losses Database for the United States (SHELDUST™) data to assist researchers with identifying hazards and helping identify resiliency. In addition to the EM-DAT, the HVRI used SHELDUST™ databases and allows for multi-hazard studies to be conducted.

SHELDUST™ is a county-level hazard data set for the U.S. for 18 different natural hazard events types such as thunderstorms, hurricanes, floods, wildfires, and tornados. The data were derived from several existing national data sources such as National Climatic Data Center's monthly Storm Data publications and NGDC's Tsunami Event Database. Originally,

SHELDUS™ contained only those events that generated more than \$50,000 in damage or at least one death. However, we are currently in the process of removing these thresholds and are adding every loss causing (monetary and human) event as reported in the data sources used by SHELDUS™ (Hazards & Vulnerability Research Institute, 2012, ¶1).

It is important to note that since these databases are maintained in the private industry, some data quality within the site may vary. Also SHELDUS™ did not have specific data standards listed which could hamper the reliability and validity of the estimations provided in figures 1.3 and 1.4. There are only eight broad categories listed in SHELDUS™ which include the following: (1) Severe Weather (including hail, tornadoes, lightning, severe thunderstorms); (2) Coastal Hazards (including storm surge, high surf, rip currents); (3) Flooding; (4) Hurricane & Tropical Storm; (5) Tornado; (6) Wind; (7) Winter Weather (including ice storm, blizzard, heavy snowfall); (8) Drought & Heat (including high temperature, heat wave). Grouping hazards into these eight broader categories can lead to some issues with the data and its classification. According to Gall, Borden, Emrich, and Cutter (2011), another limitation of the SHELDUS dataset is that it “lacks indirect, insured and uninsured losses from natural hazard ...as well as losses from non-natural hazards” (p. 2162). Even with these identified issues SHELDUS™ data is excellent for discovering the differential impact of multiple hazard agents with regards to the overall disaster balance sheet (Gall et al., 2011). SHELDUS™ data allows users to identify where and when losses occurred and assists with the identification of trends in hazard losses (Gall et al., 2011).

Figure 1.3 was created using the SHELDUS™ dataset and it identifies eight broad hazard events totaling 82,254 events in Louisiana from 1960 – 2009. This figure illustrates that, during this timeframe, Hurricanes and Tropical Storms account for only five percent (971) of the events in Louisiana; however, it appears that five of the eight categories can be identified as part of the overall disasters, specifically hurricanes and tropical storms. For example, grouping wind (29%), tornados (7%), flooding (7%), and severe weather (42%) together would identify 85% or 80,449 of

the hazard events. The coastal category could also be identified as a contributing factor; however, SHELDUS data included coastal erosion in this category as well as storm surge and rip currents.

LOUISIANA

Hazard Losses

1960-2009

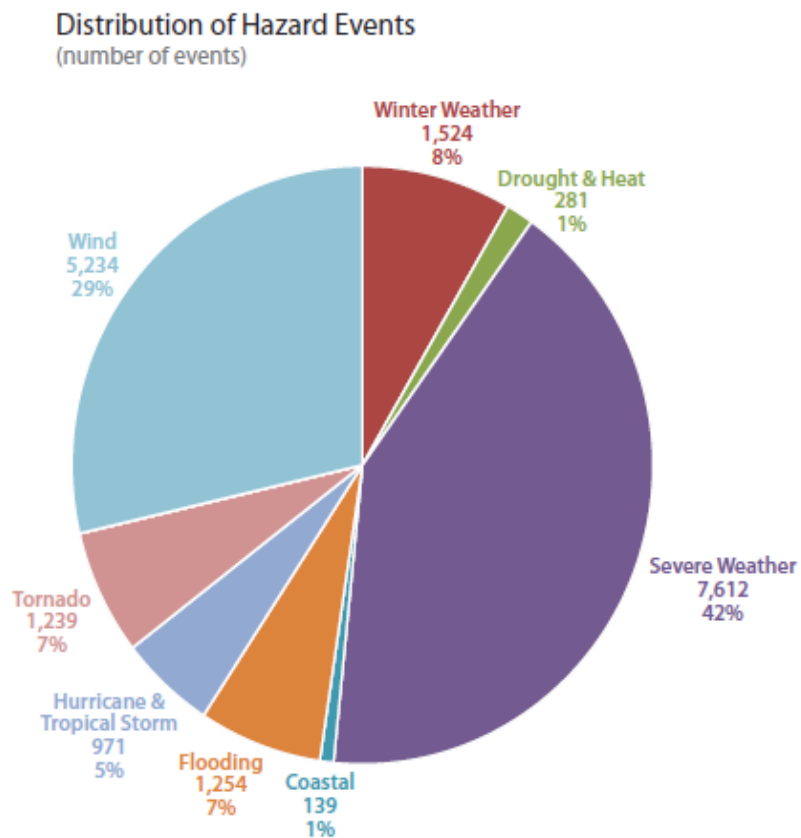


Figure 1.3 Distribution of Hazard Events in Louisiana from 1960 - 2009

Figure 1.4 was also created using the SHELDUSTM dataset and it shows the distribution of these losses in Louisiana by hazard type from 1960 – 2009.

LOUISIANA

Hazard Losses 1960-2009

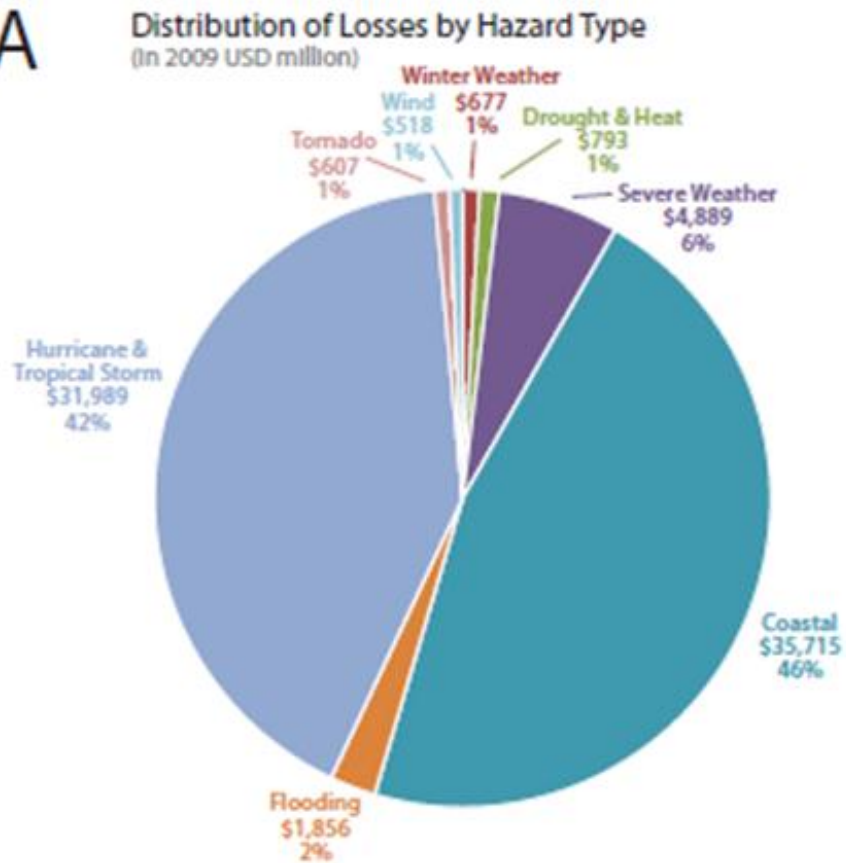


Figure 1.4 Distribution of Losses by Hazard Type from 1960 - 2009

The EM-DAT figures illustrate that disasters, specifically storms and floods, are increasing over the past 20 years both in Louisiana and as a whole. When looking at the SHELDUS™ data there are 11,076 losses, in US dollars, defined for four categories: severe weather (7,612); flooding (1,254); tornados (1,239); and hurricanes and tropical storms (971) which total 61% of the distribution of losses, in US dollars, from 1960 – 2009. These two datasets show that disasters are increasing and that this research is significant also due to it being cutting edge. This is the first time in history that mobile applications for natural disasters are available, and thus this research yielded some ground breaking information. The information that was learned through this study

provided insight as to how these mobile applications, and other disaster preparedness resources available, are being perceived and utilized by college students, staff, and or faculty in Louisiana. This demographic, college students, staff, and or faculty in Louisiana, has not been researched with regards to how they are currently utilizing disaster preparedness resources, and this study provided those results as well.

Definitions of Terms

The following definitions of terms are offered to assist in the understanding of the study.

American Red Cross: “Humanitarian organization, led by volunteers, that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies. It does this through services that are consistent with its Congressional Charter and the Principles of the International Red Cross Movement” (Federal Emergency Management Agency, 2012a, p. GLO-1).

Guide for all-hazard Emergency operations planning - Glossary of Terms. Retrieved from <http://www.fema.gov/pdf/plan/glo.pdf>

Checklist: “Written (or computerized) enumeration of actions to be taken by an individual or organization, meant to aid memory rather than provide detailed instruction” (Federal Emergency Management Agency, 2012a, p. GLO-1). Guide for all-hazard Emergency operations planning - Glossary of Terms. Retrieved from <http://www.fema.gov/pdf/plan/glo.pdf>

Emergency: As identified by the Stafford Act, an emergency is "any occasion or instance for which, in the determination of the President, Federal Assistance is needed to supplement state and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States" (Federal Emergency Management Agency, 2012b, ¶6). VII. Glossary of Terms. Retrieved from <http://www.fema.gov/vii-glossary-terms>

Emergency Alert System (EAS): “A digital technology (voice/text) communications system consisting of broadcast stations and interconnecting facilities authorized by the Federal Communication Commission. The system provides the President and other national, state, and local officials the means to broadcast emergency information to the public before, during, and after disasters” (Federal Emergency Management Agency, 2012a, p. GLO-3). Guide for all-hazard Emergency operations planning - Glossary of Terms. Retrieved from <http://www.fema.gov/pdf/plan/glo.pdf>

Emergency Operations Center (EOC): “The physical location at which the coordination of information and resources to support incident management (on-scene operations) activities normally takes place. An EOC may be a temporary facility or may be located in a more central or permanently established facility, perhaps at a higher level of organization within a jurisdiction. EOCs may be organized by major functional disciplines (e.g., fire, law enforcement, and medical services), by jurisdiction (e.g., federal, state, regional, tribal, city, county, parish), or some combination thereof” (Federal Emergency Management Agency, 2009b, p. 12-5).

Emergency Public Information: “Information that is disseminated primarily in anticipation of, during, or after an emergency that relates to the emergency and provides public safety or other information for the general welfare of the public” (Federal Emergency Management Agency, 2012b, ¶7). VII. Glossary of Terms. Retrieved from <http://www.fema.gov/vii-glossary-terms>

Evacuation: “Organized, phased and supervised withdrawal, dispersal, or removal of civilians from dangerous or potentially dangerous areas, and their reception and care in safe areas” (Federal Emergency Management Agency, 2009b, p. 12-9).

Federal Emergency Management Agency (FEMA): “FEMA’s mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards”

(Federal Emergency Management Agency, 2012b, ¶1) Retrieved from

<http://fema.gov/about/index.shtm>

Hurricane: “A tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye". Circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere” (Federal Emergency Management Agency, 2012a, p. GLO-7). Guide for all-hazard Emergency operations planning - Glossary of Terms. Retrieved from

<http://www.fema.gov/pdf/plan/glo.pdf>

Major Disaster: “Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion in any part of the United States that, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby” (Federal Emergency Management Agency, 2012b, ¶11). VII. Glossary of Terms. Retrieved from <http://www.fema.gov/vii-glossary-terms>

Mitigation: “Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or man-made disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect” (Federal Emergency Management Agency, 2009b, p.12-12).

National Incident Management System (NIMS): “A system that provides a proactive approach guiding government agencies at all levels, the private sector, and nongovernmental organizations to work seamlessly to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location or complexity, in order to reduce the loss of life or property and harm to the environment” (Federal Emergency Management Agency, 2009b, p. 12-14).

National Response Framework (NRF): “Guides how the Nation conducts all-hazards response. The NRF documents the key response principles, roles and structures that organize national response. It describes how communities, States, the Federal Government, and other private-sector and nongovernmental partners apply these principles for a coordinated, effective national response. It describes special circumstances where Federal interests are involved and catastrophic incidents where a State would require significant support. It allows first responders, decision-makers, and supporting entities to provide a unified national response” (Federal Emergency Management Agency, 2009b, p. 12-15).

Paratransit: “The family of transportation services which falls between the single occupant automobile and fixed route transit. Examples of paratransit include taxis, carpools, vanpools, minibuses, jitneys, demand responsive bus services, and specialized bus services for the mobility impaired or transportation disadvantaged” (Federal Emergency Management Agency, 2012b, ¶14).

VII. Glossary of Terms. Retrieved from <http://www.fema.gov/vii-glossary-terms>

Parish: “In Louisiana, a civil division corresponding to a county in other states” (<http://www.dictionary.net/parish>).

Preparedness: “Those activities, programs, and systems that exist before an emergency and that are used to support and enhance response to an emergency or disaster” (Federal Emergency

Management Agency, 2012b, ¶15). VII. Glossary of Terms. Retrieved from

<http://www.fema.gov/vii-glossary-terms>

Recovery: “Those activities that continue beyond the emergency period to restore critical community functions and manage reconstruction” (Blanchard & Lawrence, 2007, p.5)

Response: “Activities to address the immediate and short-term effects of an emergency or disaster. Response includes immediate actions to save lives, protect property, and meet basic human needs. Based on the requirements of the situation, response assistance will be provided to an affected state under the National Response Plan (NRP) using a partial activation of selected Emergency Support Functions (ESFs) or the full activation of all ESFs to meet the needs of the situation” (Federal Emergency Management Agency, 2012b, ¶20). VII. Glossary of Terms.

Retrieved from <http://www.fema.gov/vii-glossary-terms>

Saffir-Simpson Scale: “The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time. The scale - originally developed by wind engineer Herb Saffir and meteorologist Bob Simpson has been an excellent tool for alerting the public about the possible impacts of various intensity hurricanes. The scale provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity. In general, damage rises by about a factor of four for every category increase” (National Oceanic Atmospheric Administration, National Weather Service Saffir-Simpson Hurricane Wind Scale, 2012, ¶1) Retrieved from: <http://www.nhc.noaa.gov/aboutsshws.php>

Shelter-In-Place: “Means people inside a building should remain inside until the danger passes. Shelter-in-place protection is used when evacuating the public would cause greater risk than staying where they are, or when an evacuation cannot be performed” (National Center for Biomedical Research and Training, 2006, p. 34).

Special Needs Populations: “Populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures; who have limited English proficiency or are non-English speaking; or who are transportation disadvantaged” (Federal Emergency Management Agency, 2009b, p. 12-20).

State Government: “Any state of the United States, or any United States Territory or possession” (Federal Emergency Management Agency, 2012b, ¶22). VII. Glossary of Terms. Retrieved from <http://www.fema.gov/vii-glossary-terms>

Utilization: defined as the act of using (or not using) various disaster preparedness resources currently available through different mediums such as paper, internet, and even mobile applications (Leingang, 2012).

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CHAPTER 2

REVIEW OF RELATED LITERATURE

Emergency management is a broader set of functions that go beyond search and rescue, emergency medical services, temporary shelter and feeding, and restoring lifelines. Emergency management also includes (1) hazard mitigation to prevent or lessen the impact of disaster, such as building levees or moving people out of floodplains; (2) disaster preparedness, such as emergency planning and training; (3) disaster response activities, such as conducting search and rescue activities; and (4) disaster recovery, usually meaning the restoration of lifelines and basic services (Waugh & Streib, 2006, p.131).

Brief History of Emergency Management

The field and profession of emergency management have been evolving into a more collaborative enterprise since the 1940s and 1950s (Waugh & Streib, 2006). This transformation has gradually moved beyond the classic top-down bureaucratic model to become a more dynamic and flexible network model that facilitates multi-organizational, intergovernmental, and intersectional cooperation. There have been strong pressures to return to command and control approaches, which are inconsistent with the shared responsibility and authority that characterizes the national emergency management system and interfere with the collaboration that is necessary to address natural and man-made hazards and manage disaster operations (Waugh & Streib, 2006).

The field of management grew during the end of the Nineteenth Century with the rise of the industrial revolution and it became more formalized throughout Twentieth Century (Pine, 2007). Management concepts were called upon to assist in guiding and developing the growth of industrial manufacturing in both the United States and Europe. As the field of management grew, emergency management theory also evolved in response to the need for theory and concepts. Additionally, proven practices need to be established to assist in responding to the impacts from disasters such as hurricanes, floods, earthquakes, and even chemical spills (Pine, 2007).

The foundation for emergency management is traditional management, and the literature builds on these established managerial concepts (Pine, 2007). Management theory provides a

foundation for supporting the rise of emergency management theory by utilizing the management process which includes solid planning/preparedness, organizational structure, leadership, and organizational/program assessment (Koontz, 1980). Many of the early writers in management contended that there was a right way of organizing work and accomplishing tasks (Gilbreth, 1911). Weber (1947) discussed management concepts as being built on the engineering approaches to acknowledge the impacts of bureaucracies. In addition, the role of the “manager” can be displayed by one that directs the organization to achieving goals in a rational manner (Mintzberg, 1973). Solid interpersonal and organizational communications are key issues faced by emergency managers today, and this has been illustrated through various texts such as Haddow’s *Disaster Communications in a Changing Media World* (G. Haddow, & K. Haddow, 2009).

Preparedness Theory

Light (2005) reported that actual movement towards preparedness at the local level during disaster situations was a significant weakness in areas of the Gulf Coast affected by Hurricanes Katrina and Rita. Communities and residents need to be prepared for natural and human-made disasters because these can strike anywhere, regardless of location, culture, or history (Mathbor, 2007). Communities that are well-trained culturally, socially, and psychologically are better prepared and are more effective in responding to the aftermath of disasters (Mathbor, 2007).

When danger is recognized as being imminent and threatening, people seek safety and their behavior is generally adaptive (Quarantelli, 1988). People take action to seek safety and protect themselves, their families, and even others. Individuals also seek confirmation of official warning messages and supplement official information with information received from exchanges with neighbors, friends, and relatives (Kreps, 1984). Immediate response and preparedness to a disaster requires a coordination of effort among many different units.

In those first critical moments of an emergency, numerous jurisdictions and agencies with different yet overlapping responsibilities must quickly coalesce. Even more critical, because the time and location of most emergencies are not predictable, agencies that may have no time to prepare must quickly leverage required information, assets, and response capacity, closely coordinating efforts in reaction to the immediate situation on the ground (Dorn, Savoia, Testa, Soto, & Marcus, 2007, p.330).

With regards to preparedness, connectivity is pivotal in ensuring that information is being administered and received in a clear and concise manner. Connectivity can be defined as a seamless web of people; organizations, resources, and information that can best catch, contain, and recover from an incident or disaster (Marcus, Dorn, & Henderson, 2006). Based on this definition as well as the preparedness theory, the more connected individuals are, the better prepared they should be to deal with the disaster and the quicker they should recover from the disaster.

Preparedness Resources

Thus far, research has shown that there are several resources that are free to the public that are not being used to their fullest extent (Dorn et al., 2007; Light, 2005; Marcus et al., 2006). Some are not being utilized at all. In addition to the traditional newspaper, television, and radio there are several specific resources available for Louisiana residents such as the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website, the Get a Game Plan smartphone application, Official Louisiana Hurricane Survival guide, United Way's 211, and the 511 Traveler Information System (DOTD, 2006; Louisiana 211, 2012; GOHSEP 2012; GOHSEP, 2013). There are also other preparedness resources available through the American Red Cross (ARC) to everyone, not just Louisiana residents, such as the American Red Cross Safe and Well Linking website, the American Red Cross Shelter View website and mobile application; and the American Red Cross Hurricane mobile application (ARC, 2010; ARC, 2012a; ARC, 2012b; ARC, 2013a; ARC, 2013b).

Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP).

According to GOHSEP's website, the mission of the agency is to lead and support Louisiana and its citizens in the preparation for, response to, and recovery from all emergencies and disasters (GOHSEP, 2012). The website has information available to Louisiana citizens to help with preparedness, prevention, response, recovery, interoperability, and mitigation. GOHSEP's website contains the State's disaster plans as well as training and exercises that are available in Microsoft PowerPoint slides, Microsoft Word documents, and also Adobe PDF's (GOHSEP, 2012).

Get a Game Plan Website and Mobile Application. In addition to the State's plans and training exercises, GOHSEP also provides the "get a game plan.org" website and mobile application (GOHSEP, 2013). The "get a game plan.org" website contains emergency preparedness resources to help the public develop their own game plan. The mobile application is designed for both the iPhone and iPad. The most current version of the application is version 1.4 and was updated in August 2011. The mobile application allows the user to check off items on the emergency checklist and add members to their user or family profile by accessing their phones contacts. The "stay informed" area of the application also links users to follow GOHSEP on both Twitter and Facebook. Besides these areas discussed, the rest of the information contained within the mobile application is static (GOHSEP, 2013).

Official Louisiana Hurricane Survival Guide. Another resource that is available for the public to utilize is the Official Louisiana Hurricane Survival Guide (APPENDIX A). This Guide was created through a collaborative partnership of the National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), and GOHSEP in June 2011 (GOHSEP, 2011). The Guide is available in three different languages: English, Spanish, and Vietnamese. Copies of the Official Louisiana Hurricane Survival Guide are distributed by the American Red Cross and are intended for the Greater New Orleans, Lafayette, and Lake Charles

citizens who use the maps and contra-flow routes to evacuate when disasters threaten the coastal areas of the State. The Hurricane Survival Guide is also available for downloading on GOHSEP's website, Louisiana.gov website, and Louisiana State Police website, <http://www.lsp.org>, under the emergency information section (GOHSEP, 2011).

The Official Louisiana Hurricane Survival Guide is 16 pages in length and contains a wealth of information (GOHSEP, 2011). The Guide identifies preparedness resources available to the residents of Louisiana. The first page is an introduction and message from Governor Bobby Jindal followed by definitions and terminology used during disasters. The Guide also contains a list of suggested supplies residents should gather and/or have available for their hurricane survival kit. The Saffir Simpson scale is also contained within the Guide and lists the five different categories of hurricanes and their corresponding wind intensity. The Guide provides information regarding hurricane hazards such as storm surge, tides, and complete inundation of storm water. Accompanying issues related to hurricanes such as damaging winds, tornados being produced, and flooding information are also provided for residents to become informed and be prepared. Information regarding what to do before, during, and after a storm or hurricane is contained within the Guide as well as maps discussing the phased evacuation and contra-flow plan. Nine Emergency Shelter Information points are listed as well as information on the American Red Cross's Safe and Well website. Information regarding the national alert system and all-hazard radio frequencies in Louisiana is also provided. Various resources available to Louisiana residents such as call 211, 511 traveler information systems, and others are identified in the Guide to be utilized during a disaster. Finally, the Guide concludes with important contact information and phone numbers for each parish's emergency management office, sheriff's office, and parish websites URL's. It should be noted that the Guide is also available on the internet for downloading, mentions every disaster preparedness resource that is listed on the Disaster

Preparedness and Utilization survey that was created and administered to Louisiana residents (GOHSEP, 2011).

The Guides Supply Suggestions list is intended to be used just as a guide or checklist when gathering hurricane supplies (GOHSEP, 2011). However, it does not recommend three to five days' supply of canned or dried foods per person. The Guide actually suggests residents have a two week supply of these emergencies necessities, and then simply lists a wide variety of items. Confusion among residents could occur due to this not being in accordance with what the American Red Cross suggests, a 3 – 5 days' supply of food per person (American Red Cross, 2006). Images are used throughout the Guide to help illustrate to residents the information provided within the Guide (GOHSEP, 2011). However, this section of the Guide discusses hazard mitigation actions such as securing the roof, loose roof shingles, and /or installing shutters on your home. Yet, the image included of the home does not have hurricane shutters. Instead, it has aesthetically pleasing shutters that are placed on the home for decoration purposes and not to mitigate a disaster (GOHSEP, 2011).

United Way's 211. United Way's 211 service is an easy to remember phone number that is used for linking people and resources in Louisiana (Louisiana 211, 2012). This information and referral line is available 24/7 for Louisiana residents to request information regarding critical health and human services available in the State. According to the website, 211 provides free and confidential information and referrals. Louisiana residents can call 211 from any landline or cell phone in Louisiana for help with food, housing, employment, health care, counseling, and more. Louisiana has six different service areas that provide information and referrals to designated parishes (Louisiana 211, 2012).

211 statewide coverage is made possible by the partnership between the Southwest Louisiana Education and Referral Center Inc., 232-HELP, VIA LINK 211 Call Center, 211 Baton Rouge Crisis Intervention Center, The Volunteer Center of Southwest Louisiana, 310-INFO, 2-1-1 United Way of Northeast Louisiana, Centerpoint Community Services 2-1-1, and the Louisiana Association of United Ways; and the state of Louisiana (Louisiana 211, 2012). Louisiana is one of 18 states that provides 211 services across the entire state according to the website. (Louisiana 211, 2012, p.1)

United Way's 211 critical information service is another resource that is available for residents to use before, during, and after a disaster (Louisiana 211, 2012). This is an interesting resource to note because of its simplistic use of technology only involving a telephone. The service does not require use of the Internet or any smartphone application. Therefore, this resource is unique in times of a disaster assuming other services or technologies do not function properly. It is important that disaster managers use a layered approach in how they are going to ensure residents receive information. Having the United Way's 211 information service available to residents satisfies this requirement by being a critical information service that an individual can dial into.

511 Travelers Information System. In 2006, Louisiana launched the 511 Traveler Information Systems in conjunction with Louisiana Department of Transportation and Development ([DOTD], 2006). 511 Traveler Information is another resource that can be utilized by the public before, during, and/or after a disaster. DOTD maintains the 511 Traveler Information System. Weather-related information is updated regularly and Louisiana State Police also update information about incidents that significantly affect traffic (DOTD, 2006). Travelers in Louisiana are able to access real-time traffic and road condition updates by dialing 5-1-1 on their phones, accessing their website at www.511a.org, or by following DOTD on Twitter and Facebook. Information can be accessed in real-time by citizens to obtain updates on traffic and road conditions by using the 511 Traveler Information System (DOTD, 2012). Citizens can also dial 511 from their telephone and identify the route or region about which they are seeking information. Residents using this resource will know the road conditions and traffic issues before

they leave their home, and they can plan and adjust their routes accordingly. This resource could also be used in disaster situations to assist with evacuating residents out of Louisiana, either by contra-flow or not, in an efficient and effective manner (DOTD, 2012).

American Red Cross – Safe and Well Website. American Red Cross Safe and Well Website is another resource that is available to citizens to assist them after a disaster has occurred (American Red Cross, 2012a). The American Red Cross Safe and Well Website is a central location for people in disaster areas in the United States to register their current status, and for their loved ones to access that information. Individuals can register on the safe and well website by going to www.redcross.org and searching “safe and well” or going to the website directly <https://safeandwell.communityos.org/cms/index.php>.

The American Red Cross Safe and Well Website is a way for people affected by a disaster to enter information regarding their welfare so family and friends can check their status. Because people self-register, the Red Cross cannot verify the information and is not responsible for any inaccuracies. (American Red Cross, 2012a, p.1)

Available in both English and Spanish, this resource is accessible 24/7 to help provide displaced families with relief and comfort during a stressful time (American Red Cross, 2012a).

American Red Cross – Shelter View Website and Mobile Application. The American Red Cross Shelter View website and/or mobile application is another resource available for residents to utilize (American Red Cross, 2010). This resource allows individuals to search for open Red Cross shelters by address, city, state, and/or zip codes. The Shelter View website and mobile application are both updated every 30 minutes from the Nation Shelter System. The mobile application allows the users to check where shelters are open at any given time in the United States (American Red Cross, 2010). A more detailed view is also available, showing you exactly where the shelter is, last reported resident count, capacity, and the local chapter involved with the shelter (Huang, 2011).

The American Red Cross “Shelter View: application, released in Apple's iTunes Store February 2011, has hit the top 10 list of free utilities after experiencing a surge in downloads to help those affected by Hurricane Irene find the closest shelter and get to safety. The application displays real time shelter information from the National Shelter System, updated every thirty minutes, utilizing the NSS Shelter Data Exchange Standard (SDES). The application provides a simple work flow to allow users to see a national map and list view of open Red Cross shelters, location maps, and information about the shelter population, capacity, incident and disaster relief operation information (PR Newswire, 2011, p. 1).

American Red Cross – Hurricane Mobile Application. The American Red Cross launched its official Hurricane mobile application on July 28, 2012 (American Red Cross, 2012b). This application puts lifesaving information right in the hands of people who live in or who visit hurricane-prone areas (American Red Cross, 2012b).

Be ready for severe weather with Hurricane by American Red Cross. Monitor conditions in your area or throughout the storm track, prepare your family and home, find help and let others know you are safe even if the power is out – a must have for anyone who lives in an area where a hurricane may strike or has loved ones who do (American Red Cross, 2013a, p.1)

The mobile application features step- by-step instructions informing users on what to do even if the power is out and cell towers are down from a storm (American Red Cross, 2013a). The Hurricane application allows users to monitor weather conditions in specified areas as well as alerts from NOAA. In addition to these features, a user can also let family and friends know that they are safe with the customizable “I’m safe” alert for Facebook, Twitter, email, and even text message. Other features of the hurricane mobile application include the ability to see an illustrated history of hurricanes in your designated area as well as allowing users to learn the difference between hurricane warnings and watches in order to ensure they are knowledgeable and ready for a hurricane if one should threaten their area (American Red Cross, 2013a). “We want everyone to be to be ready for hurricanes,” said Bill Brent, Regional CEO for the Eastern NC Region (American Red Cross, 2012b, p. 1). The Hurricane App is intertwined with other social networks such as Facebook and Twitter. This entanglement allows users to receive and

spread emergency information and share their status with friends and family any time. The American Red Cross Hurricane mobile application is the third mobile application available to the public free of charge for download by the American Red Cross (American Red Cross, 2013b). The first two mobile applications available were the First Aid and Shelter View mobile applications (American Red Cross, 2013b). The Hurricane application was created and available for download at the beginning of the 2012 Atlantic Hurricane season, which starts on June 1 and ends on November 30 (National Oceanic and Atmospheric Administration, 2012). The Hurricane mobile application was the first in a line of disaster specific mobile applications that the American Red Cross offered to citizens free of charge. The other disaster specific mobile applications that the American Red Cross now offers to assist citizens with getting prepared are: Earthquake created on December 2012, Wildfire created on January 2013, and most recently Tornado created on February 2013 mobile applications (American Red Cross, 2013b).

Layered Approach

A layered approach to disaster management and communication is discussed in several different ways throughout the literature (Drabek & Stephenson, 1971; G. Haddow, & K. Haddow, 2009; Mileti & Sorensen, 1990; Peek & Mileti, 2002; Pittman, 2012; Quarantelli, 1988). Peek and Mileti (2002) discussed using a layered approach by identifying that “during the warning period, people invariably actively seek out further information on their own and in response to getting a warning in order to verify and confirm what they heard” (p.517). In Drabek and Stephenson, (1971) and Mileti and Sorenson (1990) the act of individuals seeking out further information is referred to as warning confirmation.

In an article titled *Americans are Indifferent toward Disasters, Survey Says*, Pittman (2012) discussed how despite the amount of money and investments made by emergency management and public safety agencies with regards to alerting and notification systems, a

majority of respondents (71 percent) stated that they were unsure if their area had an alerting and notification system. The 2012 Public Safety Survey hones in on the emotional reactions of citizens to disaster and emergency situations and evaluates the level of apathy toward public safety notifications and alerts. There is a need for continuous communication and education by emergency managers and other public safety officials about ways in which citizens can be warned. Individuals would like to receive alerts through their television, phone calls, text messages, and even traditional outdoor warning sirens depending on the availability and the type of event that occurred. Based on the fact that individuals want to receive alerts by different methods researchers recommend using a layered approach to notify the public (Pittman, 2012). Emergency managers and designated officials should use any and every notification system possible such as indoor and outdoor warning systems, telephone and text notifications, national and local television; local radio stations, as well as social media platforms in order to spread the message through a variety of communication channels (Pittman, 2012).

It is important to note that with multiple sources of information being disseminated sometimes this can result in a “variation in risk perception about what to do about the warning” (Peek & Mileti, 2002, p.517). This idea of confusion occurring due to receiving a message or warning several different ways is further echoed in works by Flynn and Chalmers (1980) and Perry, Lindell, and Greene (1981). Even with the possibility of the message construing the public’s view of its importance it has been illustrated that having a warning communicated over multiple channels, whether utilizing printed and electronic media or having the message personally delivered, individuals understanding, belief and response to the warning were enhanced (Bechtel & Churchman, 2003). When discussing tactics to response it is important to use the layered approach and notify the public in as many ways, means, methods, etc... as possible.

“Mobile-Savvy” and Future Implications for Emergency Management

The number of individuals that are purchasing smartphones is increasing which is leading to a more “mobile-savvy” public. This trend is illustrated in Figure 2.1 below from the Pew Internet and American Life Project (Pew Research Institute, 2013). “The Pew Internet and American Life Project is one of seven projects that make up the Pew Research Center, a nonpartisan, nonprofit “fact tank” that provides information on the issues, attitudes and trends shaping American and the world” (Pew Research Institute, 2013, p.1). The reports are based on nationwide random phone and online surveys as well as qualitative research (Pew Research Institute, 2013). The Pew project seeks to be an authoritative source on the evolution of the internet through surveys by examining how Americans use the internet and how their lives are affected by these activities (Pew Research Institute, 2013).

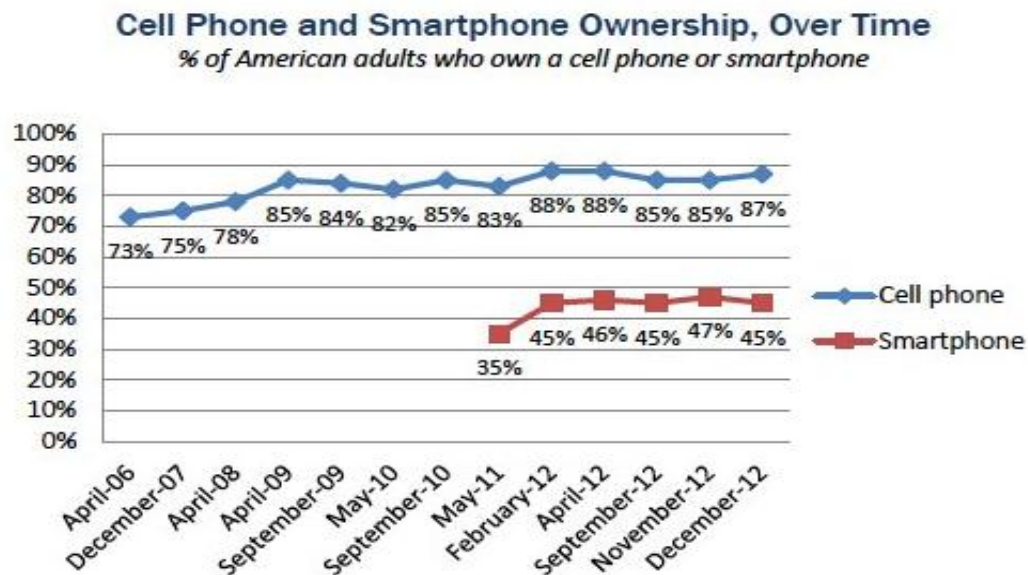


Figure 2.1 Cellphone and Smartphone ownership, over time 2006-2012 (Pew Institute, 2013).

Figure 2.1 illustrates that 85% of American adults own a cell phone and 45% of American adults are smartphone owners as of December 2012. This is an increase of 10 percentage points over the 35% of Americans who owned a smartphone in May 2011 (Brenner, 2013). According to the 2012 Public Safety Survey, Americans remain complacent when it comes to disasters and less than one-half of people surveyed said they would take action based on a severe weather warning (Pittman, 2012). Research shows that current emergency preparedness resources are not being utilized, even in the coastal hurricane-prone state of Louisiana.

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CHAPTER 3 METHODS

Population and Sample

The target population for this study was adults who utilized preparedness resources in the southern region of Louisiana. The accessible population consisted of all students, staff, and faculty whose email addresses that were available through the public database systems and/or various listservs at four universities in the southern region of Louisiana.

Mixed Methods Approach

In order to address the research question for this study, the researcher used a mixed methods approach using a Sequential Explanatory design. Social science research utilizes both quantitative and qualitative methods in order to help research complex issues (Rossman & Wilson, 1994). The sequence, priority, and connecting of the qualitative phase and the quantitative phase are illustrated in APPENDIX B. This design is adapted from the Sequential Explanatory (Creswell & Clark, 2011).

The quantitative component of this study was done using a census (100% sample) of all those individuals whose email addresses were available from the four university databases. The four universities that participated in this study were as follows: Louisiana State University, Southeastern Louisiana University, University of Louisiana at Lafayette, and University of New Orleans. Each university had their own policies and procedures in place that the researcher had to abide by in order to disseminate the survey at the respective university.

For the purpose of the qualitative component of the study, a purposeful sample was used. The purposeful sample involved intentionally selecting individuals to learn and understand the central phenomenon, meaning perceptions and utilization of preparedness resources (McMillan & Schumacher, 1994). The original intent was to purposefully select respondents with the highest and

lowest scores on the survey that consented to be contacted for a follow-up interview. Due to the nature of the sequential design, the selection of the participants in the qualitative component of the research study depended on the results from the survey in the quantitative phase.

Ethical Considerations and Study Approval

Prior to collecting any data for this study, an application for exemption from institutional oversight was submitted to the LSU Institutional Review Board (IRB). The approval for this study with exempt status (IRB#E7051) was granted on October 16, 2012 by Dr. Robert C. Mathews (APPENDIX C). After obtaining exemption from the home university, the researcher had to complete the IRB paperwork at the other universities before collecting any data from them. The approval at the University of Louisiana (UL) at Lafayette (FA12-2-LSU) was granted on October 22, 2012 as being exempted by Nicole Muller (APPENDIX D). Exempt status was approved at Southeastern Louisiana University (SELU) and granted on November 7, 2012 by Michelle Hall (APPENDIX D). The University of New Orleans (UNO), required a Principal Investigator (PI) to be a current faculty member at UNO. The PI had to sign off on the study before the application was sent to their Review Board. The approval for this study with exempt status (01Nov12) was granted on November 1, 2012 by Robert Laird (APPENDIX D).

Once all approvals were received, the researcher identified how the survey was going to be administered to each university. Rapport and buy-in was needed at each university in order to proceed with the research study and abide by each university's rules and procedures. Contact was made at UL Lafayette through the IRB chair, Dr. Nicole Muller. At the recommendation of Dr. Muller, the researcher contacted the Communications and Marketing department at UL Lafayette and was referred to the Director. Director Aaron Martin worked with the researcher to complete a letter (APPENDIX E) that contained a link to the survey that was sent out through UL Lafayette's broadcast system to all students, staff, and/or faculty with a valid email address in the database.

This survey was sent out at the request of Director Martin on Sunday, November 11, 2012 in the evening. The survey was left open for one month and the link was disabled on Tuesday, December 11, 2012.

The researcher's original plan was to send the survey via a broadcast email at the home university, LSU. Due to policies in place, this was not a realistic plan. The researcher identified individuals that would be able to disseminate the survey to groups of LSU students, staff, and/or faculty. The research was first able to successfully administer the survey through the Student Tigers Rallying, Interacting, and Promoting Education and Service (S.T.R.I.P.E.S) Advisor Missy Korduner. Mrs. Korduner sent the survey to 974 S.T.R.I.P.E.S participants from 2010,-2012 student-staff members on Monday, November 5, 2012. Since this population was only undergraduate students, the researcher continued to reach out to other individuals at LSU in order to obtain responses from staff and/or faculty as well. Once the survey was sent to S.T.R.I.P.E.S participants, at the request of the researcher, Mrs. Korduner forwarded it to the LSU Ambassadors through Assistant Director Kelli Webber on Friday, November 9, 2012. The LSU Ambassadors listserv contained approximately 140 LSU students. After looking at the preliminary results of the survey, it was clear that more emails needed to be sent to the LSU population. The researcher called on the graduate advising committee, which is composed of departmental graduate advisors and members of the Graduate Council, for assistance, Dr. James Richardson, Director of Public Administration at LSU, assisted the researcher in sending out the survey to the entire Masters of Public Administration listserv containing 141 email addresses on Wednesday, November 14, 2012. Dr. Rachel Beech, Director of Disaster Science Management at LSU, assisted the researcher in sending the survey to Disaster Science Management students at LSU. Susan Crochet also sent the survey to 175 full time staff members through the Information Technology Services (ITS) listserv

on November 14, 2012. All of the survey links for LSU student body, staff and/or faculty remained open until December 14, 2012.

SELU's Dr. Michelle Hall provided 5,000 email addresses for SELU students to be surveyed. These email addresses were obtained by eliminating students who had previously been selected for a survey this semester, those under 18, and those under the Family Educational Rights and Privacy Act (FERPA). From the remaining email addresses, a random sample of 5,000 remaining students was provided to the researcher. The researcher sent the survey to these email addresses through SurveyMonkey® on November 19, 2012. The survey link for SELU students remained open for one month and was disabled on December 19, 2012.

Dr. Kiefer, the PI for the research study at UNO, worked with the researcher to compile a letter containing a link to the survey that was sent out through UNO's broadcast system to all students, staff, and/or faculty with a valid email address in the database. This survey was sent out at the request of Dr. Kiefer on Friday, December 7, 2012. The survey was left open for several weeks, and the link was disabled on Friday, January 4, 2013.

The entire process from approval, administration, to disabling the link for the survey is illustrated in the Instrument approval and deployment Timeline (APPENDIX F).

Instrumentation

After a thorough review of the related literature, the researcher determined that no existing instrument entirely and satisfactorily demonstrated fidelity to the conceptualization of disaster preparedness resources being utilized by college students, staff, and faculty in the southern region of the United States. Therefore the researcher developed a survey as the primary method of data collection for the quantitative component of this study, the Leingang Disaster Preparedness and Utilization Survey.

Validity and Reliability

The instrument was reviewed by a panel of subject-matter experts (SMEs) to establish face and content validity. The SMEs have expertise in adult education and disaster management. Appropriate revisions were made to the instrument based on the input of each SME with regards to the necessity, structure, and clarity of each question. A pilot survey was administered on Wednesday, October 3, 2012 to 13 graduate students enrolled in a doctoral Mixed Methods course. Volunteers available at the researcher's home university, Louisiana State University, were requested to respond to the questionnaire before disseminating it to all members of the university. Feedback on issues such as readability, clarity, and amount of time taken to complete the survey was solicited and appropriate revisions made. (APPENDIX G)

Preparedness Score

Once data was collected, preparedness scores were determined based on respondents answers to the survey questions. The Leingang Disaster Preparedness and Utilization Survey yielded a preparedness score for each survey participant. The preparedness score was achieved based on subsequent scores in three categories: knowledge, usage, and technology. Knowledge was defined as simply knowing about that the preparedness resource available. Usage was defined as participants knowing that the resources existed and whether they chose to use it or not. Technology was identified as any medium the participant used to assist in their hurricane preparedness efforts. This included anything from printed resources to mobile applications. Once data was collected, preparedness scores were determined based on respondents answers to 36 of the 63 survey questions.

Knowledge Score. The first factor, measuring knowledge, consisted of 13 items for a total of 23 possible knowledge points. The 13 items that comprised the knowledge score are listed in Table 3.1.

It is important to note that if they answered one question with a “no” there was skip logic in place. Skip logic, sometimes referred to as conditional bracketing, was used in the survey to direct the respondents to different questions based on the previous answer provided. For example, if they answered “no” to the question “Do you know what the Saffir Simpson scale is?”, then they would not have had an opportunity to answer the next question “Do you understand the Saffir Simpson scale?” Therefore, the total points available for a respondent could have been lower due to the other questions being skipped. The questions are grouped based on answers in order to create tables that were easier to read. The questions are not in numerical order of how they were administered in the questionnaire.

Usage Score. The second factor, measuring usage, consisted of six questions for a total of 62 possible points. The skip logic in place only affected two questions for a total of two possible points. The items that comprised the usage score are listed below in Table 3.2.

Technology Score. The third factor, measuring technology, consisted of 17 questions for a total of 37 possible points and included anything from printed guides to mobile smartphone applications,. The items regarding the technology score are listed below in Table 3.3.

It is important to note that due to the method of delivering the survey through SurveyMonkey® it is assumed that the participants have some prior knowledge regarding technology. Also, since the survey was disseminated through universities, it is also assumed that even if the participants did not own the technological devices themselves, such as computers, they had access to them through college campus resources.

Table 3.1

Knowledge Factor in the Leingang Disaster Preparedness and Utilization Survey

Knowledge Items
Have you heard of the term “shelter-in-place”? Yes (1 point) No (0 points)
Do you know what the term “shelter-in-place” means? Yes (1 point) No (0 points)
Do you know if a mobile application exists that provides you with information regarding currently open shelters? Yes (1 point) No (0 points)
Do you know if there is a mobile application that you can download and use to assist you during a hurricane? Yes (1 point) No (0 points)
Do you have a hurricane evacuation plan for the 2012 hurricane season? Yes (1 point) No (0 points)
Do you know about the Official Louisiana Hurricane Survival Guide that Louisiana prepares for its residents? Yes (1 point) No (0 points)
Do you know if Louisiana provides Emergency Shelter Information (e.g. locations and availability) to its residents? Yes (1 point) No (0 points)
How prepared are you for the current hurricane season? Not prepared at all (0 points) Somewhat prepared (1 point) Very prepared (2 points)
Do you know what the Saffir Simpson scale is? Yes (1 point) No (0 points)
Do you understand the Saffir Simpson scale? Yes (1 point) No (0 points)
Do you have a disaster plan for your animals/pets? Yes (1 point) No (0 points)
Do you know about the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way’s call 211 Service 511 Traveler’s Information System Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I do not know about any of these resources

Note. *yes = 1; no=0

Table 3.2

Usage Factor in the Leingang Disaster Preparedness and Utilization Survey

Usage Items
Have you put your evacuation plan into action during the 2012 hurricane season? Yes (1 point) No (0 points)
Have you read the Official Louisiana Hurricane Survival Guide that Louisiana prepares for its residents? Yes (1 point) No (0 points)
Have you ever used any of the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way's call 211 Service 511 Traveler's Information System Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I have not used any of those resources
In the past month, have you used any of the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way's call 211 Service 511 Traveler's Information System Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I have not used any of those resources in the last month

(Table 3.2 continued)

Usage Items
<p>If you had an opportunity would you... (Check all that apply)**</p> <p>Track any hurricane/tropical storm</p> <p>Track hurricanes/tropical storms in the Gulf of Mexico</p> <p>Track hurricanes/tropical storms when they are 120 hours away from landfall (5 days)</p> <p>Track hurricanes/tropical storms when they are 72 hours away from landfall (3 days)</p> <p>Track hurricanes/tropical storms when they are 48 hours away from landfall (2 days)</p> <p>Track hurricanes/tropical storms when they are 24 hours away from landfall (1 day)</p> <p>Track hurricanes/tropical storms when they are less than 24 hours away from landfall (<1 day)</p> <p>Access the GOHSEP website to develop a game plan</p> <p>Identify a shelter before an oncoming hurricane/tropical storm makes landfall</p> <p>Evacuate within Louisiana</p> <p>Evacuate outside of Louisiana</p> <p>No, I would not do any of those things</p> <p>Other (please specify)</p>
<p>What resources have you used during this 2012 hurricane season? (Check all that apply)*</p> <p>GOHSEP website</p> <p>Get a Game Plan mobile application</p> <p>Louisiana Citizen Awareness and Disaster Evacuation Guide</p> <p>United Way's call 211 Service</p> <p>511 Traveler Information System</p> <p>National Oceanic Atmospheric Administration (NOAA) website</p> <p>National Public Radio (NPR)</p> <p>American Red Cross website</p> <p>American Red Cross Safe and Well Linking System</p> <p>American Red Cross – Shelter View mobile application</p> <p>American Red Cross – Hurricane mobile application</p> <p>Other hurricane mobile applications besides the American Red Crosses</p> <p>Local new station</p> <p>Local radio station</p> <p>Local newspaper</p> <p>I did not use any of those resources during this hurricane season</p> <p>Other (please specify)</p>

Note. *yes = 1; no=0 **answers: track any hurricane=7; track hurricanes in the Gulf=6; track 120 hours=5; track 72 hours=4; track 48 hours=3; track 24 hours=2; track <24 hours=1; other yes = 1; no=0

Table 3.3
Technology Factor in the Leingang Disaster Preparedness and Utilization Survey

Technology Items
<p>Do you currently own any of the following items? (Check all that apply)*</p> <p>Radio</p> <p>Weather Radio</p> <p>Land line (home) phone</p> <p>Basic Cell Phone</p> <p>Smart phone with the ability to download mobile applications</p> <p>Desktop computer</p> <p>Laptop computer</p> <p>iPad or tablet with the ability to download mobile applications</p> <p>No, I do not own any of these items</p>
<p>Have you signed up for any alerting and notification system?</p> <p>Yes (1 point) No (0 points)</p>
<p>Which of the following resources have you EVER used to get information about an emergency such as a hurricane? (Check all that apply)*</p> <p>Local TV news</p> <p>Local radio station</p> <p>National network TV stations</p> <p>Online news</p> <p>Text alerts from local government</p> <p>Mobile application</p> <p>Local government</p> <p>Social media (Facebook, Twitter)</p> <p>NOAA weather radio</p> <p>Online sites for disaster agencies</p> <p>None of the above</p> <p>Other (please specify)</p>
<p>Have you ever accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website to help prepare for a disaster?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website to help prepare for a disaster during the 2012 hurricane season?</p> <p>Yes (1 point) No (0 points)</p>
<p>Do you have a Facebook account?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you used your Facebook account in the last month?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you ever accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP's) profile on Facebook?</p> <p>Yes (1 point) No (0 points)</p>

(Table 3.3 continued)

Technology Items
Do you have a Twitter account? Yes (1 point) No (0 points)
Have you used your Twitter account in the last month? Yes (1 point) No (0 points)
Do you follow the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on Twitter? Yes (1 point) No (0 points)
Would you follow the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on Facebook and/or Twitter if you received up to date information regarding disasters? Yes (1 point) No (0 points)
Have you ever used social media to get information during an emergency or disaster event? Yes (1 point) No (0 points)
Have you used social media to get information during the 2012 Hurricane season? Yes (1 point) No (0 points)
Have you EVER used social media to share information during an emergency or disaster event? Yes (1 point) No (0 points)
Have you used social media to share information during this 2012 Hurricane season? Yes (1 point) No (0 points)
If a "one-stop shop" Disaster Management mobile application existed would you? (Check all that apply)* Download the application on your smartphone or tablet Download and use the application daily on your smartphone or tablet Download and use the application weekly on your smartphone or tablet Download and use the application monthly on your smartphone or tablet Download and use the application during disasters only on your smartphone or tablet Not download the application – this already exists Not download the application – it would not be useful to me Other, please specify

Note. *yes = 1; no=0

Data Collection

The survey was administered via an online survey system (SurveyMonkey®). This method of data collection was chosen for a variety of reasons. First, it was the most cost-effective approach for the researcher to use due to the department having a yearly membership to SurveyMonkey®. Second, by using this particular survey system, the survey was accessed online with a URL to guide respondents to the survey. Once the respondent had completed the survey he or she simply

submitted the answers online. There was no need to mail the survey back or to coordinate meeting face-to-face to obtain the completed survey. Third, using an internet survey allowed the researcher to collect and organize the data in a manner which decreased the amount of user error that can occur with data entering responses.

Dillman, Smyth, and Christian (2009) are widely recognized as the creators of an accepted method for maximizing survey response rates based on extensive research conducted. Dillman et al., (2009) recommend using five different contacts with survey recipients, providing a financial incentive to completing the survey, and making the survey easy for the respondent to take as well as send back to the researcher. It was necessary to modify these recommendations due to using the internet survey format and not being financially able to provide incentives to participants in the study. Instead of using five varied contacts as suggested, the researcher made initial contact with participants through sending out an email with an introduction to the study as well as a link for them to take the survey. Once the survey was completed, an automatic thank you message appeared thanking those who had participated in the study. Due to time constraints as well as each university's policies and procedures for administering the survey, only one contact was able to be made with the individuals requested to participate in the study.

Data Analysis

Charles and Mertler (2002) stated that in qualitative research an investigation relies on numerical data. Variables are isolated and the researcher causally relates them to determine the magnitude and frequency of relationships. Then, the researcher will determine which variables to investigate and chooses instruments, which will yield highly reliable and valid scores (Charles & Mertler, 2002).

Qualitative research is “an inquiry process of understanding where the researcher develops a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the

study in a natural setting” (Creswell, 2012, p.15). The researcher used the prototypical follow-up explanations variant to the explanatory design (Creswell & Clark, 2011). The data obtained through the instrument had the priority for addressing the research question which was to assess the need for a “one-stop shop” disaster management mobile application by identifying the perceptions and utilization of current disaster preparedness resources in the southern region of the United States.

Development is the reason for choosing the mixed methods design as identified by Greene, Caracelli, and Graham (1989). This means that the researcher sought to use the results from one method to help develop or inform the other method. For this study, an instrument was developed as the quantitative component. These survey results were used to develop the qualitative research component. The qualitative component consisted of follow-up interviews from survey respondents that consented within the survey to be contacted by the researcher for follow-up questions. By using a mixed methods approach, this study identified trends or relationships with quantitative data and further explained the reasons behind these identified trends with the qualitative component.

The mixed methods sequential explanatory design was used for this research study (APPENDIX B). The design is adapted from the sequential explanatory design proposed by Creswell and Clark (2011). The mixed methods sequential explanatory design consists of two distinct phases: quantitative followed by qualitative (Creswell & Clark, 2011). The design started with the collection and analysis of the quantitative data from the survey that was administered. The researcher used prototypical follow-up explanations variant to the explanatory design (Creswell & Clark, 2011). The data obtained through the instrument had the priority for addressing the research question which was to assess the need for a “one-stop shop” disaster management mobile application by identifying the perceptions and utilization of current disaster preparedness resources in the southern region of the United States. Mixing is the explicit interrelating of the study’s

qualitative and quantitative strands and has been referred to as combining and integrating – that is, it is the process by which the researcher implements the independent or interactive relationship of a mixed methods study (Creswell & Clark, 2011). For this research study, the strategy of connecting was used. This means that the results of the survey, specifically the quantitative component, helped build and shape the qualitative interview section of the research. In this study, the priority was given to the quantitative phase and this is illustrated with capital letters in the sequential explanatory design (APPENDIX B). The main purpose of the qualitative phase was to assist the researcher in further explaining the quantitative results. When used in combination with one another, quantitative and qualitative methods complement each other and allow for a more complete and thorough analysis (Tashakkori & Teddlie, 2008). Therefore the researcher was able to interpret how the qualitative results helped to explain the results of the survey, or the quantitative data.

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CHAPTER 4

DEVELOPING AND CONDUCTING A SURVEY INSTRUMENT TO MEASURE AND EVALUATE THE UTILIZATION OF PREPAREDNESS RESOURCES AVAILABLE

Gerald Caplan (1961), the father of modern Crisis Intervention, described crisis as “an obstacle that is, for a time, insurmountable by the use of customary methods of problem solving. A period of disorganization ensues, a period of upset, during which many abortive attempts at a solution are made” (p.18). Gilliland and James (1988) defined crisis as “a perception of an event or situation as an intolerable difficulty that exceeds the resources and coping mechanisms of the person” (p.3). A more simplistic definition by Benedict (1994) is viewing crisis as simply as a “situation out of control” (p.22). Recent definitions of crisis identify the differences between crisis and disaster (Quarantelli, Lagadec, & Boin, 2006). According to Quarantelli et al., “crisis involves an urgent threat to the core functions of a social system. A disaster instead is seen as a crisis with a bad ending” (2006, p.23). Based on these definitions by leaders in the field, it is imperative that individuals are prepared in the event of a crisis. This idea of preparedness is further echoed by the Federal Emergency Management Agency (FEMA).

The Federal Emergency Management Agency (FEMA) is the federal agency responsible for leading the Nation’s efforts to prepare for, protect and mitigate against, respond to, and recover from the impacts of natural disasters and man-made incidents or terrorist events. FEMA’s formation in 1979 by a Presidential executive order directed the combination of federal programs that addressed emergency management for all types of incidents into a single agency (Federal Emergency Management Agency, 2008, p.1).

FEMA’s mission, adopted in 1993, was to “Reduce the loss of life and property and protect our institutions from all hazards by leading and supporting the Nation in a comprehensive, risk-based emergency management program of mitigation, preparedness, response, and recovery” (FEMA 1997, p. 5). FEMA’s mission paved the way to what is known as the four phase emergency management model.

The Four Phase Emergency Management Model

The Four Phase Emergency Management Model produced by FEMA's mission in 1997 consisted of the following stages: Mitigation, Preparedness, Response, and Recovery (FEMA, 2006). All four phases should be viewed in a cyclical manner with the recovery and mitigation phases being interrelated (FEMA, 2006). Figure 4.1 illustrates the cyclical nature of the four phases with preparedness being the most important phase identified in this study, and highlighted in a darker color to illustrate this.

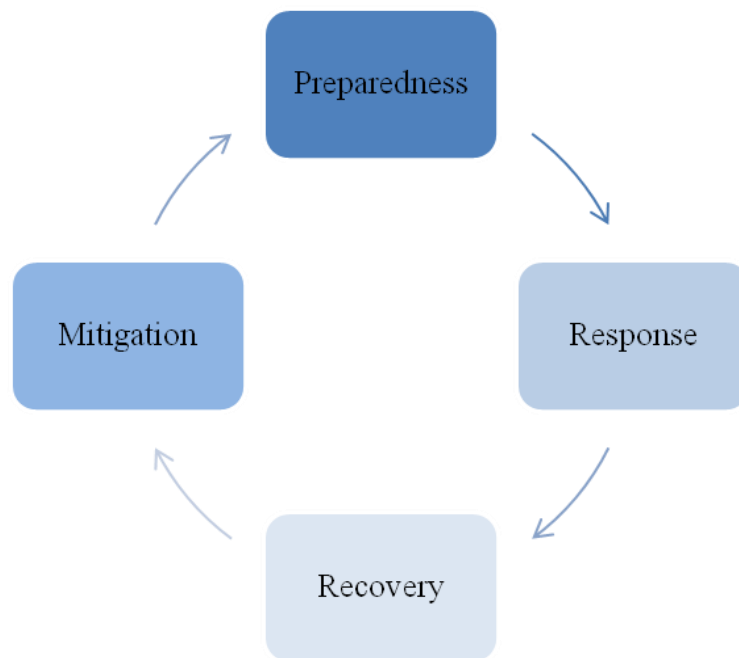


Figure 4.1 Phases of Emergency Management Adapted from FEMA (2006) Principles of Emergency Management Independent Study Program

During phase one, mitigation, measures are taken that will either prevent the onset of a disaster or reduce the impacts if a disaster occurs. Mitigation measures are categorized as being structural, infrastructural, and non-structural (Peek & Mileti, 2002). Structural and infrastructural mitigation efforts are any action or measure taken, that attempts to keep hazards away from

buildings and people (Peek & Mileti, 2002). Nonstructural mitigation measures strive to assist in the distribution of the population and the constructed environment in order to limit the amount of losses to a disaster (Peek & Mileti, 2002). Louisiana has several mitigation efforts currently being utilized to prevent or reduce the impact of natural disasters on the State. The first is the collaborative process of Hazard Mitigation Planning where together hazards are identified, assessed, and decisions are made on how to minimize or eliminate hazards (Governor's Office of Homeland Security and Emergency Preparedness [GOHSEP], 2011a). In 1990, the GOHSEP was created to coordinate State disaster declarations authorized by the Governor (GOHSEP, 2012a). GOHSEP, in cooperation with the State Hazard Mitigation Planning Committee, developed the state of Louisiana Hazard Mitigation Plan (GOHSEP, 2011a). The Plan is one measure that illustrates the State is committed to reducing the risk of death, injury, and property loss (GOHSEP, 2011a). The second measure is FEMA's Pre-Disaster Mitigation (PDM) program that provides funding for hazard mitigation planning and the implementation of mitigation projects before a disaster occurs (FEMA, 2013a). The third and final measure is the Hazard Mitigation Grant Program (HMGP). This provides grants to state and local governments to implement long-term mitigation measures (GOHSEP, 2013a).

According to FEMA (2006) phase two, preparedness, consists of the plans or preparations made to save lives and to help response and rescue operations. Louisiana has several resources available for free to assist residents with becoming more prepared. In addition to the traditional sources such as the newspaper, TV, and Radio, Louisiana also has resources on the web such as Get a Game Plan which helps its citizen's plan for a disaster (GOHSEP, 2012b). GOHSEP also has a plethora of materials available on its website to assist people with being prepared for a disaster or crisis such as the official Louisiana Hurricane Survival Guide, how to put together an emergency kit, and family tips to design your family disaster plan (GOHSEP, 2013c). Other preparedness

resources that Louisiana offers its residents are United Way's 2-1-1 and 511 Traveler Information systems. These services do not require the use of the internet or any smartphone technology. Instead, residents can dial into these two services and receive information and assistance (211 Call Center Search, 2012). The American Red Cross (ARC) provides other preparedness resources to everyone and not just Louisiana residents. Some of these resources include the American Red Cross Safe and Well Linking website, the American Red Cross Shelter View website and mobile application; and the American Red Cross Hurricane mobile application.

The third phase, response, is referred to as the activities that take place in order to deal with the direct effects of a disaster or incident (FEMA, 2007). Response can include actions taken to save lives, protect property, and meet basic human needs such as providing food, water, and safety to individuals (FEMA, 2007). When first responding to a disaster, the State utilizes the assistance of only local and state officials (Federal Emergency Management Agency U.S. Department of Homeland Security [FEMA], 2013b). The Federal government responds if the loss of life and property overwhelms the local and state officials' response (FEMA, 2013b). Louisiana also utilizes the Emergency Alert System (EAS) and releases pertinent information through GOHSEP with the help of other state agencies that may be involved in the response actions (GOHSEP, 2011b). As indicated by GOHSEP, "depending on the scope of the emergency or the type of situation, these messages may be initiated by either the Parish or State emergency management organizations" (2011b, ¶1).

The fourth and final phase of the emergency management model is recovery (FEMA, 2006). Recovery is defined as "those activities that continue beyond the emergency period to restore critical community functions and manage reconstruction" (Blanchard & Lawrence, 2007, p.5). Although common perception in the United States is that the federal government intercedes and restores everything to the way it was before the disaster, the reality is that even federal

assistance is at best a measure to allow residents and the jurisdiction to establish basic functionality as the basis for life after the disaster (FEMA, 2007).

This research study focused on the second phase of the model, preparedness. FEMA also began focusing on planning as part of the preparedness cycle. In order to manage the entire life cycle of a potential crisis planning need to take place (FEMA, 2012). The preparedness cycle lists planning as one of the key components and illustrates the way to plan by organizing, training, exercising the plan, evaluating it, and finally improving it (FEMA, 2010). This preparedness cycle was created from breaking down phase two, preparedness, within the original emergency management model (FEMA, 2010).

Gillespie and Streeter (1997) have defined preparedness as “almost any predisaster action which is assured to improve the safety or effectiveness of disaster response” (p.157). Kreps (1991) suggested that preparedness before a disaster and improvisation after the disaster are two foundations in emergency management. According to Peek and Mileti (2002), “preparedness involves hazard detection systems, identification of evacuation routes and shelters, maintenance of emergency supplies and communication systems, procedures for notifying and mobilizing key personnel and pre-established mutual aid agreements with neighboring communities” (p.514). Other actions that are also crucial to the preparedness process are training and educating emergency responders, citizens, and community leaders (Peek & Mileti, 2002).

It should be noted that not all scholars are in agreement regarding the four phase model that FEMA has laid forth. Neal (1997) has indicated that the four phase model is useful, but perhaps an over-simplified heuristic device. Nonetheless, mitigation, preparedness, response and recovery have played a significant role in establishing the field and categorizing distinct emergency management functions (Peek & Mileti, 2002; Pine, 2007; Spittal et al., 2008). Various

research studies have demonstrated the value of both crisis preparedness and planning (Howell & Miller, 2006; Peek & Mileti, 2002; Quartantelli, 1988).

A plethora of research exists on various aspects of preparedness planning in the United States (G. Haddow, & K. Haddow, 2009; Horney, Snider, Malone, Gammons, & Ramsey, 2008; Lindell & Perry, 2000). However, there is very little research that addresses how to identify if individuals are prepared and utilizing preparedness resources available to them for their designated region. The primary objective of this study was to develop an instrument to measure the disaster preparedness level, specifically regarding hurricanes, of residents in Louisiana. Additionally, this would create a framework for other researchers and could be used to evaluate preparedness levels and identify the current utilization of resources.

Developing the Instrument

What measurement to use? In order to develop an instrument to measure preparedness, it is imperative to first identify what measurements are going to be used and what they intend to measure. Several instruments have been developed by researchers and organizations, however only two of them discuss hurricane preparedness specifically (Cherniack, Sandals, Brooks & Mintzer, 2008; Rincon, Linares & Greenberg, 2001). Rincon et al., looked at hurricane preparedness and whether or not previously experiencing a hurricane led to better preparedness for future hurricanes (Rincon, 2001). This study used a 31-item survey with majority of the questions provided in a “yes” or “no” format (Rincon et al., 2001). Based on the results of 325 respondents, 242 experienced a hurricane and 83 did not. The study found that having experienced a major hurricane does not enhance hurricane preparation for future hurricane seasons (Rincon et al., 2001). It is important to illustrate that this study was conducted seven years after the hurricane made landfall in Florida and therefore could have led to the individuals not being influenced by that hurricane, Andrew, on their preparation for future ones.

Another study that also took place in Florida and focused solely on hurricane preparedness is Cherniack et al., 2008. This study focused specifically on a vulnerable population, the elderly, and their preparedness regarding hurricanes. The instrument they used was a written questionnaire that contained 25 questions. The survey was developed based on the American Red Cross guidelines for hurricane preparedness and took about 15 minutes to complete. The survey consisted primarily of “yes” and “no” answers and was administered to a convenience sample of 547 geriatric participants in 2006 and 2007. This study found that there was no correlation between the subjects’ age, race, income, education, and prior experience with hurricanes and their possession of suggested disaster supplies. The survey also found that among this population, aged 65 and above, television was the most popular information sources among respondents. It is important to note that the subject population for this study was ambulatory veterans attending one clinic in a hurricane-vulnerable area and therefore may not be representative of larger vulnerable populations. Another limitation of this study is that it required elderly individuals to remember possible adverse events that took place one or two years ago (Cherniack et al., 2008).

In addition to hurricane preparedness studies there have been other natural hazard studies conducted regarding earthquake preparedness that such as (Paton, Smith, Johnston, Johnston, and Ronan, 2003) and measuring tsunami preparedness (Johnston, Paton, Crawford, Ronan, Houghton, & Burgelt, 2005) to name a few. The Paton et al. study was qualitative in nature, and they developed and tested a social-cognitive model of preparedness. This model was developed in order to assist both the research and the formulation of practical risk communication strategies. Paton et al. (2003), model is based on other models that have proven to predict the adoption of preventative health behaviors. Identification of these behaviors needed to take place before awareness of health behaviors could be addressed it is a parallel problem (Paton et al., 2003). There is a substantial amount of research available in the area of health and behavior changes regarding natural hazard

preparation (Bishop, Paton, Syme, & Nancarrow, 2000; Lindell & Perry, 2000; Paton et al., 2003). However, there is little research currently available regarding the preparedness level or utilization of preparedness resources, specifically hurricane, available to residents. The research that does exist looks at personal preparedness as a whole and not necessarily the utilization of the resources available (Citizen Corporation, 2009).

Paton et al. (2003) identified that the perception of risk, critical awareness, and anxiety regarding the hazard; are some factors that initially motivate individuals to prepare. If these variables are present at the appropriate levels, a person will progress to forming intentions to prepare (Paton et al., 2003). Intentions, in relation to hazard preparedness, have been found to have two components: intention to prepare and intention to seek information (Paton et al., 2003). Paton et al. (2003) stated that preparedness is only predicted by the intention to prepare and even if a person has an intention to prepare, preparedness may not eventuate due to the perceived infrequency of the hazard event.

Preparedness and Demographics. Studies have been conducted that investigate the preparedness relationship between demographic characteristics such as age, sex, education, income, marital status, dependents present (minors under the age of 18), ethnicity, and owning one's home with the levels of hurricane preparedness (Edwards, 1993; Sattler, Kaiser, & Hittner, 2000; Spittal, McClure, Siegert & Walkey, 2008). Overall, there is an inconsistent pattern of correlations regarding preparedness. However, there is a general trend of individuals that are most and least likely to be prepared. Spittal et al. (2008) found two significant demographic predictors of earthquake preparations: home ownership and length of residency. Home ownership was defined as simply owning a home and was not explicitly stated that it had to be on a foundation or could be mobile (Spittal et al., 2008). Edwards (1993) conducted a survey of household preparedness in Tennessee and found that a positive relationship existed among earthquake

preparedness levels and the presence of children at home (dependents present) and education level attained. Further, Edwards (1993) found that residents were involved in seeking and sharing information, but that did not automatically mean that they took action.

Preparedness in Relation to Natural Disasters. The majority research has focused on preparedness in relation to earthquake activity (Edwards, 2003; Lindell & Perry, 2000; Spittal et al., 2008) and especially centered on the state of California (Lindell & Perry, 2000). However, some research has been conducted on preparedness in regards to hurricane-prone areas (Horney et al., 2008; Kapucu, 2008; Kim & Kang, 2010; Kusenbach, Simms, & Tobin, 2010). A survey was conducted before hurricane season began in North Carolina, and it sought to directly measure hurricane preparedness (Horney et al., 2008). In order to directly measure hurricane preparedness, they asked residents in a high-risk coastal county in North Carolina to report whether or not their household had an evacuation plan and a disaster supply kit containing the items recommended by the American Red Cross, a three-day supply of food and water for each family member and pet. The Horney et al. (2008) study consisted of qualitative interviews that were coded and found a statistically significant association between the household having a disaster supply kit and the reported number of hurricanes that the household had experienced. Kapucu (2008) examined how prepared households were in response to disasters and the role non-profit organizations played in the public's preparedness. This study used a mail survey method to identify the hurricane preparedness levels of Central Florida residents. Kapucu (2008) found that households, "even with significant experience of disasters, can be complacent in response to disasters" (p. 526). Kusenbach et al. (2010) conducted research in Florida, but with mobile home residents and identifying their preparedness levels, or lack thereof. This study explored decisions of the mobile residents to evacuate by conducting interviews with 75 mobile home park residents in Ruskin, Florida. Another study that took place in hurricane-prone areas examined communication and

household hurricane preparedness for residents in Tuscaloosa, Alabama with regards to responding to Hurricane Ivan in 2004 (Kim & Kang, 2010). The study's method of obtaining data was by conducting telephone survey interviews three weeks after Hurricane Ivan hit the community. According Kim and Kang (2010), "the evaluation revealed that an integrated connection to community-level communication resources—comprising local media, community organisations and interpersonal networks—has a direct impact on the likelihood of engaging in pre-hurricane preparedness activities and an indirect effect on during-hurricane preparedness activities" (p. 470). Some limitations of the study were that it used landline phones to conduct the survey interviews and that they were administered three weeks after Ivan landed (Kim & Kang, 2010). Therefore several of the phones could have been out of order or individuals could have been difficult to reach to interview.

After reviewing related literature, it appears that in addition to their being fewer studies conducted in hurricane-prone areas, very few are focused directly on specific area populations. Two surveys, the Harvard Medical School's survey of Hurricane Katrina evacuees, and The National Organization on Disability (NOD, 2005a) were both conducted on Hurricane Katrina Evacuees. The NOD met with 26 individuals from 18 shelters (including operations both American Red Cross affiliated and non-affiliated), 4 community based organizations, and 8 emergency operations centers (NOD, 2005b). They met with individuals with and without disabilities in order to examine if differences existed in perceptions of preparedness (NOD, 2005a). This study also looked at the individuals' confidence in disaster response organizations.

According to the Citizen Corps Citizen Preparedness Review guide (2006), "Surveys that are representative of the U.S. population often lose the ability to assess findings for sub-segments because of the small number of respondents in a given sub-segment" (p.4). The guide recommends that researchers focus the survey on specific segments of the population such as

disadvantaged individuals, individuals with disabilities, and those living in urban or specific high hazard areas. By focusing the survey on a designated audience analyses can assure reliable data for those specific population segments. The study conducted took the approach that that Citizen Corps Citizen Preparedness Review guide (2006) recommended and focused on a specific audience instead of being representative of the entire U.S. population.

Population

The target population for this study was adults who utilized preparedness resources in Louisiana. Due to the sampling strategy used in the Leingang Disaster Preparedness and Utilization Survey being focused on a local population, the results cannot necessarily be generalized for populations in other locations. The accessible population consisted of all students, staff, and faculty whose email addresses was available through the public database systems and/or various listservs at four universities in the southern region of Louisiana. This population yielded individuals that are currently residing, or have resided, in Louisiana. For the purpose of the research conducted, residents are defined as individuals that are currently, or have lived, in Louisiana for an extended period of time. This research does not include anyone who has not ever lived, or is not currently living, in Louisiana. This study used higher education institutions to identify individuals residing in Louisiana. The following higher education universities in Louisiana were asked to participate in this research study: Louisiana State University Agricultural & Mechanical, Southeastern Louisiana University, University of Louisiana Lafayette, and University of New Orleans.

Approval for implementation of this research was obtained from the researcher's academic institutional review board in the Fall of 2012. The researcher provided documentation from her home institution's Internal Review Board (IRB) approval to each institution. The other three universities also required their institution's review board to approve the study prior to

administering the survey. Each institution had unique policies for sharing email addresses and/or sending out broadcast emails to individuals in their databases. Two institutions used their broadcast system to send the survey to their entire student, staff, and faculty. One institution, after eliminating students who had previously been selected for a survey that semester, those under 18, and those under the Family Educational Rights and Privacy Act (FERPA), generated a random sample of 5,000 students email addresses. The fourth institution neither allowed the researcher to send broadcast emails nor provided researchers with individuals email addresses. Therefore, in order to administer the survey at this institution the researcher needed to get “buy-in” and establish rapport with various colleges and/or directors in order to administer the survey. Since there were different delivery methods at each institution, data were analyzed for each individual institution.

It is important to note that due to the method of delivering the survey through SurveyMonkey® it is assumed that the participants have some prior knowledge regarding technology. Also, since the survey was disseminated through universities, it is also understood that even if the participants did not own the technological devices themselves, such as computers, they had access to them through college campus resources.

Pilot Study

The instrument was first reviewed by four Subject-Matter Experts (SMEs) to test for content and face validity of the instrument. All four of the SMEs have experience in evaluation as faculty members or doctoral-level graduate students. One of the SME’s had expertise in program evaluation, qualitative research, and mixed method studies. Based on the feedback and recommendations from the SMEs, appropriate revisions were made to the instrument including rewording of items and the addition of several responses. After the instrument was amended, 13 doctoral-level graduate students piloted the instrument. Feedback in regards to relevance, clarity of questions, structure, and aesthetics were provided. Based on this feedback, further revisions were

made to the instrument. Some of these updates included changing the preparedness resources listed and eliminating questions that asked the same information in different ways. It is important to note that the pilot and survey administration took place during the 2012 Hurricane season which began on June 1, 2012 and ended on November 30, 2012 (National Oceanic Atmospheric Administration, 2012). During this time Hurricane Isaac, a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale), made landfall in southeastern Louisiana. This could have resulted in skewed survey results due to the hurricane being a threat to southeastern Louisiana where the survey was administered.

Instrument Creation and Score. The Leingang Disaster Preparedness and Utilization Survey was created after a thorough review of the literature indicated that there was no existing instrument available that would be appropriate for gathering Louisiana resident's preparedness levels. This instrument included three factors and had a total of 36 items comprising an overall preparedness score. The survey consisted of 63 items total; however, several of those items focused on demographic information and were not included in calculating the preparedness score of the participants. Most questions could be answered with either a "yes" or "no" in accordance with how several other surveys were designed (Rincon et al., 2001; Cherniack et al., 2008; Citizen Corporation, 2009). The remaining questions were multiple choice and check all that apply answers regarding behaviors the respondents had knowledge of (examples: Did you live in Louisiana during the following hurricanes. Did you go to a shelter in Louisiana for any of the following hurricanes?). There was one open item question on the survey (Please list below what a 3 day supply of non-perishable food consists of). The survey took approximately 10-15 minutes to complete.

Preparedness Score

The Leingang Disaster Preparedness and Utilization Survey yielded a preparedness score for each survey participant. The preparedness score was achieved based on subsequent scores in three categories: knowledge, usage, and technology. Knowledge was defined as simply knowing about that the preparedness resource available. Usage was defined as participants knowing that the resources existed and whether they chose to use it or not. Technology was identified as any medium the participant used to assist in their hurricane preparedness efforts. This could include anything from printed resources to mobile applications. Once data was collected, preparedness scores were determined based on respondents' answers to 36 of the 63 survey questions.

Table 4.1
Knowledge Factor in the Leingang Disaster Preparedness and Utilization Survey

Knowledge Items
Have you heard of the term “shelter-in-place”? Yes (1 point) No (0 points)
Do you know what the term “shelter-in-place” means? Yes (1 point) No (0 points)
Do you know if a mobile application exists that provides you with information regarding currently open shelters? Yes (1 point) No (0 points)
Do you know if there is a mobile application that you can download and use to assist you during a hurricane? Yes (1 point) No (0 points)
Do you have a hurricane evacuation plan for the 2012 hurricane season? Yes (1 point) No (0 points)
Do you know about the Official Louisiana Hurricane Survival Guide that Louisiana prepares for its residents? Yes (1 point) No (0 points)
Do you know if Louisiana provides Emergency Shelter Information (e.g. locations and availability) to its residents? Yes (1 point) No (0 points)
How prepared are you for the current hurricane season? Not prepared at all (0 points) Somewhat prepared (1 point) Very prepared (2 points)
Do you know what the Saffir Simpson scale is? Yes (1 point) No (0 points)

(Table 4.1 continued)

Do you understand the Saffir Simpson scale? Yes (1 point) No (0 points)
Do you have a disaster plan for your animals/pets? Yes (1 point) No (0 points)
Do you know about the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way's call 211 Service 511 Traveler's Information System Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I do not know about any of these resources

Note. *yes = 1; no=0

Knowledge Score. The first factor, measuring knowledge, consisted of 13 items for a total of 23 possible knowledge points. The 13 items that comprised the knowledge score are listed in Table 4.1

It is important to note that if they answered one question with a “no” there was skip logic in place. Skip logic, sometimes referred to as conditional bracketing, was used in the survey to direct the respondents to different questions based on the previous answer provided. For example, if they answered “no” to the question “Do you know what the Saffir Simpson scale is?”, then they would not have had an opportunity to answer the next question “Do you understand the Saffir Simpson scale?” Therefore, the total points available for a respondent could have been lower due to the other questions being skipped. The questions are grouped based on answers in order to create tables that were easier to read. The questions are not in numerical order of how they were administered in the questionnaire.

Table 4.2

Usage Factor in the Leingang Disaster Preparedness and Utilization Survey

Usage Items
Have you put your evacuation plan into action during the 2012 hurricane season? Yes (1 point) No (0 points)
Have you read the Official Louisiana Hurricane Survival Guide that Louisiana prepares for its residents? Yes (1 point) No (0 points)
Have you ever used any of the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way's call 211 Service 511 Traveler's Information System Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I have not used any of those resources
In the past month, have you used any of the following resources that are available to Louisiana residents? (Check all that apply)* Official Louisiana Hurricane Survival Guide United Way's call 211 Service 511 Traveler's Information System Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website Get a Game Plan.org website Get a Game Plan mobile application American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application No, I have not used any of those resources in the last month
If you had an opportunity would you... (Check all that apply)** Track any hurricane/tropical storm Track hurricanes/tropical storms in the Gulf of Mexico Track hurricanes/tropical storms when they are 120 hours away from landfall (5 days) Track hurricanes/tropical storms when they are 72 hours away from landfall (3 days) Track hurricanes/tropical storms when they are 48 hours away from landfall (2 days) Track hurricanes/tropical storms when they are 24 hours away from landfall (1 day) Track hurricanes/tropical storms when they are less than 24 hours away from landfall (<1 day)

(Table 4.2 continued)

Access the GOHSEP website to develop a game plan Identify a shelter before an oncoming hurricane/tropical storm makes landfall Evacuate within Louisiana Evacuate outside of Louisiana No, I would not do any of those things Other (please specify)
What resources have you used during this 2012 hurricane season? (Check all that apply)* GOHSEP website Get a Game Plan mobile application Louisiana Citizen Awareness and Disaster Evacuation Guide United Way's call 211 Service 511 Traveler Information System National Oceanic Atmospheric Administration (NOAA) website National Public Radio (NPR) American Red Cross website American Red Cross Safe and Well Linking System American Red Cross – Shelter View mobile application American Red Cross – Hurricane mobile application Other hurricane mobile applications besides the American Red Crosses Local new station Local radio station Local newspaper I did not use any of those resources during this hurricane season Other (please specify)

Note. * yes = 1; no=0 **answers: track any hurricane=7; track hurricanes in the Gulf=6; track 120 hours=5; track 72 hours=4; track 48 hours=3; track 24 hours=2; track <24 hours=1; other yes = 1; no=0

Usage Score. The second factor, measuring usage, consisted of six questions for a total of 62 possible points. The skip logic in place only affected two questions for a total of two possible points. The items that comprised the usage score are listed in Table 4.2.

Technology Score. The third factor measuring technology, including anything from printed guides to mobile smartphone applications, consisted of 17 questions for a total of 37 possible points. The items regarding the technology score are listed in Table 4.3.

Table 4.3
Technology Factor in the Leingang Disaster Preparedness and Utilization Survey

Technology Items
<p>Do you currently own any of the following items? (Check all that apply)*</p> <p>Radio</p> <p>Weather Radio</p> <p>Land line (home) phone</p> <p>Basic Cell Phone</p> <p>Smart phone with the ability to download mobile applications</p> <p>Desktop computer</p> <p>Laptop computer</p> <p>iPad or tablet with the ability to download mobile applications</p> <p>No, I do not own any of these items</p>
<p>Have you signed up for any alerting and notification system?</p> <p>Yes (1 point) No (0 points)</p>
<p>Which of the following resources have you EVER used to get information about an emergency such as a hurricane? (Check all that apply)*</p> <p>Local TV news</p> <p>Local radio station</p> <p>National network TV stations</p> <p>Online news</p> <p>Text alerts from local government</p> <p>Mobile application</p> <p>Local government</p> <p>Social media (Facebook, Twitter)</p> <p>NOAA weather radio</p> <p>Online sites for disaster agencies</p> <p>None of the above</p> <p>Other (please specify)</p>
<p>Have you ever accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website to help prepare for a disaster?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) website to help prepare for a disaster during the 2012 hurricane season?</p> <p>Yes (1 point) No (0 points)</p>
<p>Do you have a Facebook account?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you used your Facebook account in the last month?</p> <p>Yes (1 point) No (0 points)</p>
<p>Have you ever accessed the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP's) profile on Facebook?</p> <p>Yes (1 point) No (0 points)</p>

(Table 4.3 continued)

Do you have a Twitter account? Yes (1 point) No (0 points)
Have you used your Twitter account in the last month? Yes (1 point) No (0 points)
Do you follow the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on Twitter? Yes (1 point) No (0 points)
Would you follow the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on Facebook and/or Twitter if you received up to date information regarding disasters? Yes (1 point) No (0 points)
Have you ever used social media to get information during an emergency or disaster event? Yes (1 point) No (0 points)
Have you used social media to get information during the 2012 Hurricane season? Yes (1 point) No (0 points)
Have you EVER used social media to share information during an emergency or disaster event? Yes (1 point) No (0 points)
Have you used social media to share information during this 2012 Hurricane season? Yes (1 point) No (0 points)
If a "one-stop shop" Disaster Management mobile application existed would you? (Check all that apply)* Download the application on your smartphone or tablet Download and use the application daily on your smartphone or tablet Download and use the application weekly on your smartphone or tablet Download and use the application monthly on your smartphone or tablet Download and use the application during disasters only on your smartphone or tablet Not download the application – this already exists Not download the application – it would not be useful to me Other, please specify

Note. *yes = 1; no=0

Reliability

One of the most popular reliability statistics currently used in research is Cronbach's alpha (Cronbach, 1951). Cronbach's alpha is used to determine the internal consistency or average correlation of items in a survey instrument in order to gauge its reliability (Cronbach, 1951). Majority of the questions on the Leingang Disaster Preparedness and Utilization survey were nominal dichotomous yes or no answers. Therefore the analysis used for this type of data should

use a special case of Cronbach's alpha called the Kuder-Richardson 20 (*KR20*) reliability index (Kuder & Richardson, 1937). In SAS 9.3 this is done by analyzing the data using the Cronbach alpha. The Leingang Disaster Preparedness and Utilization survey was analyzed for reliability using the *KR20*. This was done on the yes/no items for each question that comprises the following factors: Knowledge, Usage, and Technology. The reliability was provided with three of the four institutions being combined due to sampling issues with LSU it was removed in order to determine the reliability. For the knowledge items N=21 and the Cronbach alpha is .82. Usage, N=41 and the Cronbach alpha is .74 and the final factor, technology, N=37 and Cronbach alpha is .83. When looking at all three of these factors together they equal the preparedness score that was determined and N=99 and the Cronbach alpha is .83. According to George and Mallery (2003) these scores indicate that the factors are reliable because the Cronbach's alpha coefficient is greater than .70. When looking at knowledge and technology the Cronbach's alpha coefficients were above 0.80, proving good to excellent internal consistency (George & Mallery, 2003).

Discussion

This study resulted in the development of a survey instrument that can be utilized to measure residents' preparedness and utilization of selected local, state, and government resources. The question for individuals residing in coastal areas is not if a storm or disaster will occur, but when. Therefore it is important to be able to identify what resources are being used and if they are being used to their fullest potential. This survey is the first of its kind due to it being specifically designed for Louisiana residents with specific disaster preparedness resources identified. This could serve as a framework for other states to utilize and incorporate their local resources in order to identify the utilization and preparedness of their residents. Along with providing a framework, this study also investigated the use of mobile applications during a disaster. This is the first time in history that mobile applications for natural disasters are available, and thus incorporating these

cutting-edge resources could yield in ground-breaking information. The survey could then provide insight as to how specific disaster-related mobile applications, and other disaster preparedness resources available, are being perceived and utilized by residents.

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CHAPTER 5

IDENTIFICATION OF THE UTILIZATION OF DISASTER PREPAREDNESS RESOURCES: A QUALITATIVE APPROACH

Brief History of Disaster Research

Researchers have identified Prince's (1920) dissertation on the Halifax disaster, investigations of natural disasters following Prince's (1920) research, and research regarding the conditions of panic, as the beginning of disaster research (Peek & Mileti, 2002; Phillips, 1997). Prince's methodology incorporated qualitative data and that tradition set forth in 1920 continues through disaster research conducted today (Phillips, 1997). Glaser and Strauss (1965) published the *Awareness of Dying*, a widely acclaimed qualitative study. Two years later, Glaser and Strauss (1967) published a follow-up work, *The Discovery of Grounded Theory* that led to an interest in and the support of qualitative methodology (Phillips, 1997). During the 1970's the first qualitative journals originated as well as qualitative research guides that could be referenced and used (Lofland 1971; Phillips 1997; Schatzman & Strauss, 1973; Schwartz & Jacobs, 1979; Spradley, 1980). Continuing this trend of research, new qualitative journals and publications appeared during the 1980s and 1990s such as the *Journal of Contemporary Ethnography*, *Qualitative Health Research*, *International Journal of Mass Emergencies, and Disasters*. These publications and journals illustrate the dedication to publish qualitative work since its inception (Phillips, 1997). There are very few social science specialization areas that can state that they have such an established and long-term qualitative research tradition (Phillips, 1997). Disaster research has a long history of incorporating qualitative methodology in order to conduct research. The methods that are used in social science research, particularly on disasters, are not unique (Stallings, 1997).

Introduction

Qualitative data that has been collected from in-depth follow up interviews can be used to explain, cross-check, and enrich data that has been obtained through a quantitative method

(Creswell, 2012). Denzin (1978) first outlined how to triangulate methods by combining methodologies within a study regarding the same phenomenon. Two methods of triangulation are identified. The first method is the within-methods triangulation, which is the use of either multiple quantitative or multiple qualitative approaches (Denzin, 1978). The second method is the between-methods triangulation which involves the use of both quantitative and qualitative approaches. By utilizing the between-method triangulation the researcher is able to cancel out any inherent bias' within one method to result in a convergence of the truth (Denzin, 1978). For the research study conducted, a between-method triangulation approach was taken, and this article details how qualitative disaster research is evolving. It also discusses a modified Van Kaam phenomenological approach from Moustakas (2004) and semi-structured interviewing for model and theory building.

Significance of the Study

The world is becoming progressively more vulnerable to natural disasters. Natural disasters are increasing and human and economic costs are reaching catastrophic proportions. The human population is increasing and more individuals are migrating to hazard-prone areas such as the coastlines (Peek & Mileti, 2002). Disaster research has an established qualitative tradition in existence that illustrates this research method as an appropriate way to conduct scientific inquiry (Phillips, 1997). According to Stallings (1997), "those who equate disaster research with qualitative field work may be surprised at the frequency with which survey research has been performed in the study of disaster-related phenomena" (p.13). Bourque, Shoaf, and Nguyen's (1997) research on California earthquakes was unique because it was conducted by empirically assessing strengths and weaknesses of the survey research methods, with data that was generated from six surveys conducted in the aftermath of the earthquakes. This research study was modeled after the research conducted by Bourque et al. (1997). This study used data that was generated from responses to the Leingang Disaster Preparedness and Utilization survey

that was administered to four higher education institutions and conducted during the 2012 Hurricane season in Louisiana.

Phenomenology – Brief Overview

A phenomenological study defines meaning for a number of individuals lived experiences regarding a concept or a phenomenon (Creswell, 2012). The basic purpose of phenomenology is to take into account all individual experiences and create a description of the overall phenomenon or concept (Creswell, 2012). This description consists of what the individuals experienced and how they experienced it (Moustakas, 1994). Moustakas (1994) phenomenology focused less on the interpretations of the researcher and more on descriptions of individual's experiences. "In addition, Moustakas focuses on one of Husserl's concepts, epoche (or bracketing), in which investigators set aside their experiences, as much as possible, to take a fresh perspective toward the phenomenon under examination" (Creswell, 2012, p.60). It is important to note that the transcendental approach, which occurs when the researcher perceives everything as being fresh and being heard for the first time, is seldom perfectly achieved (Creswell, 2012). In order to achieve this approach and remove any bias that may exist for this study, the researcher chose to hire a contractor to conduct the interviews. The contractor hired was selected based on their specialization in quantitative research. This allowed the researcher to observe from an outside perspective and not be involved first hand. This allowed for a more transcendental approach to the study.

Procedures for Conducting Semi-structured Interviews

An interview can be defined as "questioning by one person and answering by another" (Dillon, 1990, p.154). This form of interviewing can be used for a variety of purposes (Dillon, 1990). The type of interviewing used for this study was a research interview, designed for the purpose of improving knowledge with regards to disaster research and residents preparedness. The

interviews were conducted in a semi-structured capacity. Semi-structured interviews are fluid in structure and flexible in nature (Lewis-Beck, Bryman, & Liao, 2004). Semi-structured interviews are different from structured interviews due to semi-structured interviews being organized around an interview guide (Lewis-Beck et al., 2004). The interview guide contains topics, questions, themes, or general areas that are to be covered during the interview but ensures flexibility in how and what sequence the questions are posed (Lewis-Beck et al., 2004). Overall the goal is to allow for flexibility during the interview, which allows various areas to be followed up with and developed by the interviewer with different interviewees (Lewis-Beck et al., 2004). Figure 5.1 illustrates Wengraf's (2001) spectrum from unstructured to fully structured interviewing (p.61). The interviews conducted for this research study fell on the lightly structured side of the continuum with model and theory building resulting from the interviews conducted.

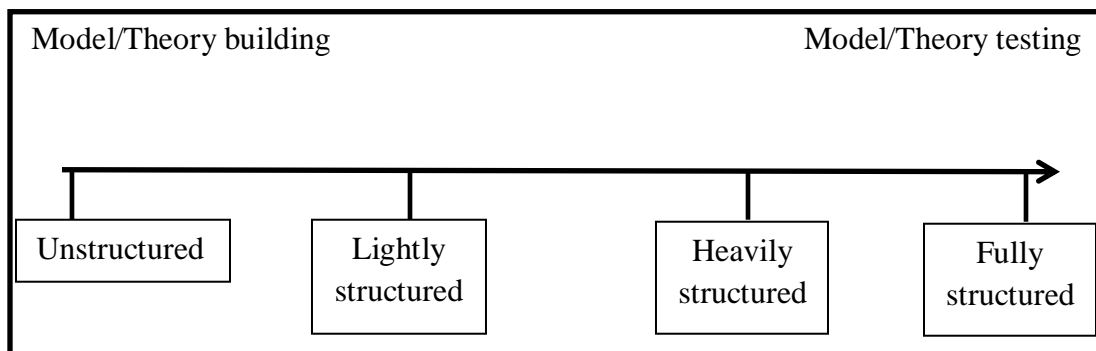


Figure 5.1 Spectrum from Unstructured to Fully Structured Interviewing Adapted from Wengraf (2001)

Approval and Confidentiality

Approval to conduct the study was granted by an internal review board from the researchers' home institution. All the interviewees consented to being interviewed upon completion of the survey and were reminded of this before the interviews were conducted. Permission to record the interviews was obtained from the participants before the interviews were

conducted. The participants were also reminded that participation in the interview was voluntary and that they were able to withdraw from being interviewed at any point. The names of the interviewees did not appear on any of the files associated with the interviewing processes and procedures. Interviewees' names were replaced with fictitious names in order to maintain anonymity. An unbiased contractor was hired by the researcher to conduct and transcribe the interviews. Hiring an unbiased individual helped to remove any bias that the researcher may possess that could come through during the interviews, leading toward a more transcendental approach. The hired interviewer was a qualitative researcher and very familiar with interviewing procedures.

Selection of Interviewees

Interviewees were selected based on a preparedness score obtained by completion of the Leingang Disaster Preparedness and Utilization survey. The preparedness scores were calculated based on subcategory scores for knowledge, usage, and technology. These three subcategories were agreed upon by the researcher and the Subject Matter Experts (SMEs). The scores of each survey participant were obtained and calculated with SAS version 9.3. Once all the scores were calculated, the participants that provided a valid email address were identified. Of those identified, the five highest and lowest scorers (including all ties) at each university were chosen for follow-up interviews.

Interview Questions

The interview questions were created based on the answers received from the Leingang Disaster Preparedness and Utilization survey. The follow-up guiding questions were reviewed by SMEs and were conducted in a semi-structured interview by the hired contractor.

12 guiding questions for selected interviewees:

1. How long have you lived in Louisiana?
2. How many hurricanes have you experienced while living in Louisiana?
 - a. Have you experienced hurricanes while living in any other states?
3. Who is the primary person in your household responsible for hurricane preparedness?
4. Does your household have a disaster plan?
 - a. What is the disaster plan?
 - b. Have the members of your household practiced this plan?
5. Do you have disaster supplies in your household?
 - a. What are they?
6. How prepared were you for the 2012 Hurricane Season?
 - a. Can you provide specific examples of what you did to prepare?
 - b. What could you have done better?
7. Of all the preparedness resources which ones would you say are the most helpful and why?
 - a. Which of these resources have been the least helpful?
8. Are there any barriers to preparedness that you have experienced?
 - a. If so, what are they?
9. If you know that a hurricane is projected to come into the Gulf of Mexico, what do you do to prepare for it?
10. What additional information would you like to see become available to help you get prepared for the next hurricane season?
11. How often do you use social media?
 - a. What forms?
12. How often do you use mobile applications on your phone?
13. Have you ever used any disaster management mobile applications?

14. Did you obtain all of the information you needed from that mobile application?

15. Would you like to see additional information in the app?

16. How would you like to receive information regarding disasters in the future?

Pilot Study

A pilot study was conducted that consisted of the follow-up questions to the Leingang Disaster Preparedness and Utilization Survey. This pilot study took place with the first interviewee, Steve. After the interview was conducted, the hired contactor immediately transcribed the interview using a word processing program on a laptop computer. The researcher reviewed the transcription and along with the other SMEs agreed upon adding four questions (12-16 above) specifically related to the mobile application use.

Data Analysis

The procedure outlined by Moustakas (1994) was used due to the systematic steps in the data analysis as well as the guidelines for assembling the textual and structural descriptions. This approach consists of a variety of procedural steps to analyze and organize the data for analysis. Moustakas (1994) used a modified van Kaam method for analysis that consists of seven steps: 1) listing and preliminary grouping; 2) reduction and elimination; 3) clustering and thematizing the invariant constituents; 4) final identification of the invariant constituents and themes by application; 5) construct for each participant an individual textural description; 6) construct for each participant an individual structural description; 7) construct for each participant a textural-structural description of the meanings and essences of the experience.

The process of analysis began during the data collection stage when conducting interviews. The process of analyzing the data, as it becomes available, through transcriptions of interviews, inevitably shapes the ongoing data collections (Ezzy, 2002). The ongoing collection of data yields

a high quality collection of data (Broom, 2005). Analyzing data as it is collected is labeled as “sequential analysis and it allows the researcher the opportunity to go back and refine questions, develop hypotheses, and pursue emerging avenues of inquiry in further depth” (Broom, 2005, p.71). This approach allows the researcher the opportunity to establish initial themes and look for deviant or negative cases throughout the data collection stage (Broom, 2005). Establishing this type of analysis allows the researcher to be open to patterns that may have been unforeseen and that may go against what was originally intended (Broom, 2005).

The researcher conducted data analysis by systematically reading through each transcript several times. After reading through the transcripts, the researcher wrote notes and discussed ideas with SMEs noting emerging patterns within the data collected (Broom, 2005). The researcher also used a process Ezzy (2002) recommended, which uses the margins of the page to record anything seemingly interesting or significant. Since the interviews were conducted and transcribed by a hired contractor, the researcher using a word processing program to insert comments in the transcribed document. Murphy, Dingwall, Greatbatch, Parker, and Watson (1998) refer to this process as “open coding” (p.134). During this process the data begins to break down and the researcher is able to conceptualize and categorize the data thoroughly (Murphy et al., 1998). This process also allows for concepts to be identified and patterns to form through the grouping of similar themes and incidences in a systematic way (Broom, 2005). During this process, it is imperative to retain the complexity of the respondents’ experiences, which is done by documenting conflicts and contradictions within the data (Broom, 2005). Therefore any irrelevant or repeated statements were removed from the transcripts, which yielded statements that are considered to be horizons (Moustakas, 1994). The information is then broken down further into more manageable and discriminating units, which are identified as the meaning units of the experience. After the

meaning units were identified, the researcher synthesized the meaning units and themes into a description of the experience (Moustakas, 1994).

Table 5.1
Breakdown of Interviewees Identified from the Leingang Disaster Preparedness and Utilization Survey

Gender	Years Lived in LA	Hurricanes Experienced	Primary person	How prepared for 2012?	Have a disaster plan?
Male = 5 Female = 3	> 5 years = 6 < 5 years = 2	> 4 = 4 < 4 = 4	They are = 7 Mom = 1	Not prepared = 3 Prepared = 5	Yes = 3 No = 5

Selected Meaning Units

What is the disaster plan?

David: I think I do have a plan. For Issac, we board up the front windows and empty the fridge and make sure my neighbors who were staying had keys to my house and told them how to feed my fish and put my dog in the car and left.

Vicky: We go into the closet that has no windows.

Joey: Basically, we stock up on canned foods. We have two kids so we have to get supplies for them, diapers and wipes and make sure that we have plenty of water. It's a gallon, about a gallon of water per adult and then a little over a half a gallon per child per day. I like to be ready for five days of independent sustainment. As far as evacuation goes, going the opposite way the hurricane is going.

Chris: We get supplies. We get canned food and water. We get a big plastic tub and put all of our important documents in it and our medicine in it. We look at the evacuation routes. We fill the bathtubs with water.

Have the members of your household practiced this plan?

Vicky: No, but I put the chairs in there to make it comfortable so that when hurricane season starts I tell me family members... I go in there and also I put my important papers in there. That closet it's not against an outside wall nor does it have a window. So, it's the most secure room in the house... And we live on high ground so we usually don't evacuate.

Joey: Yes.

Rachel: No... We've just sat and we've discussed what would happen and generally we go from there. If we have to go, we probably go bunk up with some friends or family up north somewhere.

Chris: No.

Do you have disaster supplies in your household? What are they?

Allison: Not specifically for disasters, but I do have matches and candles and a grill for charcoal and stuff. So, I could survive, but it's not specifically meant for hurricanes... Well I have flashlights or a flashlight. I have a ton of canned food and nonperishable items and stuff and lots of bottled drinks.

David: Only flashlights and tools. I'm a carpenter. No first aid or food, long-term food supplies.

Vicky: Not right now, but when hurricane season starts we start getting the water and the canned foods and the cereals... Flashlights, get new batteries for the flashlights, look for the radio that you can crank up... A few years ago I bought a car that had Onstar. So, in case all communication went out, I could use that... And then this year, I had to get the charger for my cell phone so I can charge it.

Joey: We do. We bulk up a little bit during hurricane season, but we have some stuff to get by for a good couple of days here... We have canned food, bottled water, we got some guns for both defense and also for hunting in case we do need to do more than five days. Sleeping stuff and some tent, I have a family tent in case we need to sleep outside and then some solar powered panels to charge small stuff, nothing big, but some small stuff.

Paul: No.

Rachel: Yes, we always try to make sure that we have batteries and flashlights and propane and any supplies you might need. We try and stock up on anything we need before a storm hits. We always try to make-do with what we got. So, worst case scenario, we always try to make sure we have something to drink and we always fill up the bathtubs and everything else... Dry goods. We try to make sure that we have water, bottled water, stocked up, just in case. We make sure that we have plenty of food for the animals. I guess just the basics. Just make sure that we have enough food and water and everything else. We have hand crank radios if we run out of power. We have a generator. So, if we really need the electricity on we can get the generator going. We make sure we have stocked up on gas and diesel, enough to fill up the vehicles if we need to. We always make sure the vehicles have full tanks and everything else. So, if we do have to get out of dodge, we can go.

Steve: I wouldn't say disaster supplies. I have groceries that I would probably use in the event of a disaster... Some Diet Cokes in the fridge. I have some tea, some green tea that's bottled in the fridge. I'd probably take that. I have some bread. I'd probably bring some bread. Peanut butter... My dog. I'd bring my dog and my dog's food and my dog's medicine. Luckily she's pretty healthy so she doesn't need much medicine as of right now... Maybe clothes. I'd bring some clothes.

Have you ever used any disaster management mobile applications?

Allison: No. I was not aware that there were any... Yea. It notifies me when there's flood warnings in the area.

David: I downloaded the Entergy's mobile app while I was evacuated for Issac.

Joey: There's a hurricane tracker. I think that's actually where we got the checklist... An app that the state provided, but I think I used the news, one or two news channel trackers for hurricanes and then I think the state had an app that they put out last year that I used.

American Red Cross – Hurricane Mobile Application. The American Red Cross launched its official Hurricane mobile application on July 28, 2012. This application puts lifesaving information right in the hands of people who live in or visit hurricane-prone areas (American Red Cross, 2012).

Be ready for severe weather with Hurricane by American Red Cross. Monitor conditions in your area or throughout the storm track, prepare your family and home, find help and let others know you are safe even if the power is out – a must have for anyone who lives in an area where a hurricane may strike or has loved ones who do (American Red Cross, 2013a, p.1).

The mobile application features step-by-step instructions informing users on what to do even if the power is out and cell towers are disabled from a storm (American Red Cross, 2013b). Bill Brent, Regional CEO for the Eastern NC Region, stated that “we want everyone to be to be ready for hurricanes” (American Red Cross, 2012, p. 1). The application allows users to monitor weather conditions in specified areas as well as alerts from the National Oceanic Atmospheric Administration (NOAA) (American Red Cross, 2013b). In addition to these features, a user can also let family and friends know that they are safe with the customizable “I’m safe” alert for Facebook, Twitter, email, and even text message. Other features of the hurricane mobile application include the ability to see an illustrated history of hurricanes in your designated area. The mobile application also assists users with learning the difference between hurricane warnings and watches by having a hurricane knowledge test incorporated into the application. This helps to ensure that the mobile application users are knowledgeable and ready for a hurricane if one should threaten their area. Another feature of the Hurricane App is that it has social networks intertwined with it, such as Facebook and Twitter. This entanglement allows users to receive and spread emergency information and share their status with friends and family any time (American Red Cross, 2013b).

University A and B results were obtained using a census (100% sample) of all students, staff, and faculty with valid email addresses at these institutions through a broadcast email that was administered to the entire university. The survey results are based on a non-random sample of respondents that opted to take the survey. Since the data are based on a non-random sample, a margin of error could not be computed, and the results are not projectable to any population other than the respondents in this sample. However the respondents were the individuals that the researcher was targeting considering they were residents of Louisiana.

The third university, University C, results were obtained through a random cohort student only sample. This sample is random due to the University providing the researcher with valid email addresses for students that were randomly selected once those with any student official holds were removed. This sample also included students that had not been surveyed that semester and therefore controlled for the threat to external validity, reactive or interaction effects of testing (Campbell & Stanley, 1963).

It should be noted that all of the results collected have threats to external validity regarding a sample bias' considering that the sample may not represent the population of Louisiana residents (Campbell & Stanley, 1963). While the sample does represent the individuals that the researcher intended, there is an issue with the overall generalizability since it may not be reflective of the general population.

Objectives

The objectives for this research study were as follows:

1. To describe respondents to the researcher developed instrument, the Leingang Disaster Preparedness and Utilization Survey, based on the following demographic characteristics:

12. What additional information would you like to see become available to help you get prepared for the next hurricane season?

Allison: That little pamphlet that I saw. That was really helpful, so those in stores and around the post office or something. If they were more readily available, I think that would be good.

David: I feel like there's not information about shelters where people could go outside of on the Northshore. I feel like there's not good options for where you should evacuate. Maybe it could be helpful to know how many beds does Shreveport have. What's the availability in Jackson? I just think if you haven't been there or unless you call the hotels in the city, you don't know which way to go. Streamlining the information through one office is helpful. The city government could implement some kind of live feed or maybe it exists. I don't know. If they could come up with some type of live communication instead of having to wait to get it through nola.com or something I think would be helpful. Just being able to access that. That's it.

Vicky: Maybe a little uniform check list. Maybe LSU or some other institution or the city government could have a little checklist saying if you're going to stay, you need to do this. If you're going to leave, you need to do this... And have it and print it out before hurricane season starts.

Joey: I didn't really file for anything like the disaster food stamps or anything like that. I know a lot of people who did and that system just seemed like it was just really broken. So, not really preparedness, but more relief. As far as preparedness, I really felt like I have everything we need except for that generator.

Paul: Maybe more awareness because some people don't take it seriously and I don't know how they don't because we live in hurricane central here. More public awareness I guess. To me, it's kind of common sense, but to some people they think they can ride it out and they can't... I have some friends that think they're invincible and I don't want them to get hurt or get trapped like in New Orleans in Katrina or anything so I just want them to be safe.

Rachel: There's one thing that I've never seen that I'd be curious on seeing. For those livestock and stuff if there's maybe places out of state out of the way where you have to get your livestock out with you otherwise the animal people will knock on your door and say, "why did you leave your animals behind". Maybe places where they're accepting these refugee animals on camps so that people with horses and cows and goats and stuff can go and wait out for the week until they're allowed to go back home.

Steve: I haven't been affected by a hurricane in any way... If I had been affected by a hurricane I would definitely have a different opinion, but one of my friend's actually his house got flooded in Carencro. I guess just growing up in Louisiana and he's from Louisiana too. I personally wouldn't buy a property that's lower than surrounding properties. Like my granddad's house. He built his house with his bare hands and he got a bulldozer and he a ton of mud because they live

where the swamp used to be and so he actually built his property up so his surrounding neighbors might be flooding, but he's not flooding. I'll take stuff like that into account when buying property and stuff.

Chris: Information related to supply availability. What places have ice. What places have water. That kind of thing. I'd like to see a mobile app that has that information so that when people are evacuating they just have to look at their phone for where to get gas, water, ice, that sort of thing.

13. How often do you use social media?

Allison: I use Youtube... And then I e-mail and text.

David: Every four hours.

Vicky: I don't.

Joey: I e-mail all the time, but as far as things like Facebook and stuff I do not belong to Facebook. I do not have a Facebook account at all. I don't use twitter or anything like that either.

Paul: Everyday.

Rachel: I use facebook every single day. I use twitter if I absolutely have to and that means if I'm being forced and twisting my arms back. I used Myspace when it first came out. That was it. I don't think we really use all that much else yet. My friends have told me about Pinterest, but I'm not over there yet because I don't need to be addicted to anything else.

Steve: Not too often. My Facebook account got hacked, so I tend not to use it much anymore. I deleted it and my teacher actually made me go back and reactivate it because he likes his students to communicate with him via Facebook. So, other than that I would say I don't communicate through social media.

Chris: Everyday. More than everyday.

13a. What forms?

David: I use facebook. I don't know if Gmail counts. I don't do twitter or any of the other things. I just do facebook. That's pretty much it.

Paul: Facebook and twitter... I may not post everyday, but I read through it and I'm subscribed to WAFB and all the local stuff.

Steve: And twitter... Twitter too. I don't follow hurricane things though. I usually just keep up with current event stuff. Kind of sciencey stuff I guess.

Chris: Twitter. Facebook. Not Pinterest. Instagram. That sort of thing. If that's what you mean when you say "social media"

14. How often do you use mobile applications on your phone?

Allison: Yes. I do have quite a few. I have the Weather Channel app.

David: Once an hour.

Vicky: I just use texting that's it.

Joey: I have a bunch. I have I an iPhone. I put apps on it and an iPad with a bunch of apps on it.

Paul: Everyday. That's mainly what I do.

Rachel: Pretty much every single day. I'm pretty much always on my e-mail on my phone. I'm always checking the web on my phone. When I'm at school, I'm always watching out for different things that are going on on-campus, where the bus stops, where the bus is and what not. So, I'm always using my phone.

Chris: All day. Everyday.

15. Have you ever used any disaster management mobile applications?

Allison: No. I was not aware that there were any... Yea. It notifies me when there's flood warnings in the area.

David: I downloaded the Entergy's mobile app while I was evacuated for Issac.

Joey: There's a hurricane tracker. I think that's actually where we got the checklist... An app that the state provided, but I think I used the news, one or two news channel trackers for hurricanes and then I think the state had an app that they put out last year that I used.

Paul: I can't say that I have.

Rachel: No. I didn't even know they existed.

Chris: No.

16. Did you obtain all of the information you needed from that mobile application?

Allison: Yes and no. They do have where you can see the radar, but it is really limited on the phone and usually if it's bad weather or something I'll go to the computer because on the phone it's limited to three hour radar and online they have longer... So that is a big limit and then there's really not detailed information on any kind of flood warnings or hurricane warnings. It just says where they are.

David: It seemed helpful.

Joey: No. Definitely not. What makes me the most confident is not the information from these apps. It's the mix between my almost compulsiveness nature of making sure everything is ready and then my military training. If it weren't for those two things, being self-initiated or being a self-initiator is not going to make-up or lack thereof is not going to make, be made up for by apps. No, those don't give me everything I need. They're a good start, as good as it gets other than booking it myself and those things.

17. Would you like to see additional information in the app?

David: Yea. With the power outages. I'm sure everyone wanted to know when the power's coming back on... So, that'd be cool. Yea and I think they did have that the power's expected to come on in this time frame, but it was such a ridiculous time frame.

Joey: Maybe gas spots. Good places to get gas Power. Where the power's up may be a good idea or, what would be awesome actually is for an app to tell you the closest hotel that you can get for evacuation or something like that. That would be really nice because that was frustrating for Gustav. We kept heading away, heading away, heading away, and it was just really hard to find a hotel.

18. How would you like to receive information regarding disasters in the future?

Allison: For hurricanes and stuff, probably e-mail or text or something because that's what I check most often.

David: I'm not a big fan of being notified via text or e-mail. Unless it's a very official important update. Unless it's like hey, "we're under a mandatory evacuation." I think that's a level of importance that would be appropriate for a mass e-mail or something. There was some kind of list. I think it's important for me as an individual to be able to access that information. So, on how I choose and on my own terms I think it's kind of around the 21st century, 22nd century in the future. So, I think that's kind of where my comfort level is with getting information.

Vicky: Text.

Joey: I think the text system works really well. I like how they have that set up.

Paul: Pushed to my phone or on TV or something like that. I mean most people have access to that so on the Internet or e-mails like LSU e-mails or even just public service announcements or stuff like that.

Rachel: Generally really through e-mail or if it's an imminent threat, maybe have a text message especially on the eve of landfall. Text message of "landfall is at this time" because generally you can get your cell phone charged a lot easier than a computer or what not because even if you lose power, you can get a generator up and running for a little bit so you can charge your phone. Your phone can run for about 12, 12-18 hours before it loses its battery. Especially if you have a 3G

wireless network and Internet on the phone, you have a better chance of getting information opposed to a computer that you rely on.

Steve: I guess the news is good. You can go on Google. It usually works. Google type in weather and it pops up and usually lets you know what's going on. The weather channel seems to be good at it too.

Chris: Any way really. The more the better. As long as the information is not contradictory. E-mail. Text. Anything like that.

VITA

Regina Burrough Leingang was born in Metairie, Louisiana, in 1983 to Rachel Elaine Theriot and Ronald Mark Burrough Sr. She is a 2001 graduate of St. Thomas More High School in Lafayette, Louisiana. In 2005, she earned her Bachelor of Science degree from Louisiana State University and in 2009 she earned a Master of Public Administration degree from Louisiana State University. In the spring of 2010, she was nominated for and participated in LEAD-Emerge, a leadership program for professionals at Louisiana State University. Upon graduation of this program, she decided to continue her education and pursue a doctoral degree. Regina is the wife of David Paul Leingang. She is the proud granddaughter of Gwen and Steve Theriot as well as the younger sister of Ronald Burrough Jr. Regina is the daughter-in-law of Mona and the late Gary Leingang. She is a sister-in-law to Janet Ramke, Katie Burrough, Paul Leingang, and Steve Ramke. Regina is honored to be the godmother of Adalyn Lesley Burrough and Allison Lesley Langhettee. She is the niece of Wanda Theriot and the cousin of both Allison and Callie Langhettee. She was employed with the Federal Bureau of Investigation's Law Enforcement Online/InfraGard Support Center from May 2004 to March 2013. Regina accepted a position at the Louisiana Legislative Auditor's Office in the Human Resource/ Professional Development department in March 2013. She was awarded the degree of Doctor of Philosophy in the Louisiana State University Spring 2013 Commencement Ceremony.