VIGILANCE VERSUS COMPLACENCY: COMMUNICATION STRATEGIES USED

DURING FARGO'S RECENT MAJOR FLOODS TO CONFRONT RISK FATIGUE

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ABSTRACT

This study explored and evaluated the communication strategies used by Fargo city leaders to persuade residents to work together as a community to withstand the repetitive flood hazards that threatened the city on a yearly basis, especially in 1997, 2006, and 2009. The literature review explored vigilance and complacency as well as strategies used by high-reliability organizations (HROs) to manage crises with little or no failures. Difficulties in processing multiple messages, desensitization, and fatigue were identified as barriers to remaining vigilant in the face of multiple crises. The communication strategies applied by the HROs to maintain vigilance were shown to be working; however, limited application of those HRO communication strategies to communities have been undertaken in the field.

Individual, in-depth interview data were collected. The data revealed the emergence of risk fatigue as a result of multiple flood experiences; however, the strength of the communication strategies applied by city leaders made members of the community demonstrate resilience through their individual and collective actions to respond when called upon. The findings also revealed that all the HRO principles and tenets were identified from the evaluations of the residents to show that HRO principles can be transferred to communities to make them high reliability communities (HRCs).

Late John Manikwoski, Fr. Peter Obiefuna, John Blue, and their families. I am grateful to all my many friends that I have not mentioned here. I pray that God will bless them for their help to me.

Finally, I wish to dedicate this work to my late parents, Aaron and Catherine Attansey, who did not make it through grade school, yet insisted that all their children should secure a college degree. They are surely happy for my achievements. May they rest in Peace. Amen.

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CHAPTER ONE. INTRODUCTION

The centrality of communication permeates all aspects human endeavors. Novak and Sellnow (2009) observed, "Risk issues in organizations frequently originate in or are complicated by communication" (p. 350). This study is an attempt to explore how communication can moderate and mitigate the influence of some communication-induced psychological constructs that cause crisis in human social environments. In a world where mistakes often lead to catastrophes, organizations, communities, and individuals are always faced with challenges requiring the maintenance of the psychological constructs of vigilance.

Vigilance is defined "as the ability to sustain attention over a prolonged period of time" (Breckel, Giessing, & Thiel, 2011, p. 1754). Because vigilance has the potential to prevent crisis or to mitigate the effects of crises, communication scholars have begun to consider how increased human attention may help in the prevention of crises. Whether by way of natural disasters, system failures, or human errors, human attention is required to maintain order and the smooth running of human affairs. However, physical and psychological variables can compromise vigilance. These variables include the human attention span, the flow of information/information processing, fatigue caused by prolonged repetition, as well as desensitization caused by the repetitive airing of problems or crises in the media. To maintain this vigilance, some communication strategies must be in place.

Vigilance and the Human Attention Span

Vigilance has evaded observers for many reasons. Such failures can be caused by the monotony of the task (Larue, Rakotonirainy, & Pettitt, 2010) as well as the disruption caused by a prolonged period of observation (Endsley, 1996). Because of the failures associated with the human attention span, organizations adopt monitoring features typically with low-event tasks

(Endsley, 1996). Even in high-event tasks, "humans may be poor passive monitors of automated systems, irrespective of the complexity of the events being monitored" (Endsley, 1996, p. 166).

Some other impairment may be caused by the shift of the workers' duties from manual to supervisory control in which their responsibilities include executive functions wherein they monitor displays and act only in the instance of problems or system failures. Sometimes, human operators place too much confidence in automated systems which breed complacency (Endsley, 1996). Many other areas of human endeavor need vigilance for their sustenance.

The elusive nature of maintaining vigilance has remained a principal element of human performance in many situations involving automations such as military surveillance, air traffic control, cockpit monitoring, seaboard navigation, industrial process/quality control, nuclear power plant regulation and robotic manufacturing (Reinerman-Jones, Matthews, Langheim, & Warm, 2010). Monitoring has, therefore, become a very important task that calls for continuous vigilance. To maintain prolonged vigilance, organizations dealing with long monitoring have developed different methods of staying alert. One such method includes easier ways of processing information to reduce overload.

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Vigilance and Information Processing

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The present age is referred to "as the information age" because of the uncontrollable volumes of information. As early as the beginning of this century, Edmunds and Morris (2000), had observed that "the technological developments of the last 50 years have made more information more available to more people than at any other times in human history" (p. 18). While some of this information is vital for decision making, most information is irrelevant to particular organizations at given times. Butler and Gray (2006) observed, "despite these complexities, individuals, organizations, and societies increasingly depend on information

systems to reliably provide core services and capabilities" (p. 211). Because of the volume of information to be analyzed, decision making becomes very slow. For this reason, organizations must develop systems to quicken the process of analysis for faster decision making.

Vigilance, Risk Fatigue, and Desensitization

Other circumstances that mitigate vigilance include risk fatigue and desensitization. *Risk fatigue* is operationally described as disabling emotional numbness associated with repetitive threats of violence that can create a crisis among the people of a threatened area. Such a problem was well-described by Kapucu (2008) when he observed that "repeated hurricane threats and warnings–as with disease and terrorism–can cause numbness within a community, resulting in underestimation and under-preparedness, and hence increase public exposure to imminent dangers" (p. 243). Such a risk fatigue breeds *complacency*, which is defined as the "public's propensity to believe a threat would not happen and therefore the public ignores the threat and is unwilling to prepare for the threat" (Wang & Kapucu, 2007, p. 58). Vigilance is also weakened by the media effect known as *desensitization*, operationally described as a process involving changes in the emotional responsiveness and a gradual reduction in responsiveness to an arousal-eliciting stimulus as a function of repeated exposure (Krahé et al., 2011). Desensitization breeds complacency.

Statement of the Problem

The Brevity of the Human Attention Span

The best crisis-management strategies are those geared to prevention. Continuous vigilance facilitates crisis prevention, yet the circumstances already described, such as the brevity of the human attention span, the problem of processing excessive volumes of information, and numbness caused by risk fatigue and desensitization after repetitive

occurrences, weaken vigilance and can breed mindlessness and complacency. *Mindlessness* as a concept was developed by Langer (1989) as she contrasted this reliance on routine and complacency with *mindfulness* associated with full engagement of the faculties in the task or activity at hand. Although some studies have identified the existence of causes of mindlessness and complacency as well as the problems they create, research is scarce in addressing the solutions. For example, the study by Wang and Kapucu (2007) noted the existence of complacency in response to repeated threats but did not proffer enough solutions.

High-Reliability Strategies and Community Vigilance

Staying vigilant has helped some organizations to reduce accidents and prevent crises from occurring. Such organizations are known and referred to as *high reliability organizations* (HROs). They are organizations that "strive to prevent opportunity for error from becoming an occasion of error" (Weick, 1989, p. 127) and are noted for "failure-free organizational performance" (LaPorte & Consolini, 1991, p. 20) as well as striving to achieve "virtually problem-free performance under most trying of circumstances" (Ericksen & Dyer 2005, p. 908). A review of past practices suggests that there are some HRO communication strategies that could be adopted by communities seeking to keep their residents vigilant in the face of potential recurring natural disasters. Weick (1989) observed that, for the HROs, "responsibility for assuring operations continuity is more important than responsibility for effort" (p. 129). Maintenance of continuity is the work of communication as it helps to prevent what Weick (1989) referred to as "unexpected interruption from staff requesting explanations, justifications" (p. 129). However, minimal research has addressed the transfer of these communication strategies from the organization to the community level.

Community Resilience and Collective Mind

In explaining the difference between a collective mind and a group or organization, Weick and Roberts (1993) described a *collective* as "individuals acting as if they are a group" (p. 360), aware that a failure from any quarter affects the whole. When individuals in a community have experienced the repeated occurrence of disasters such as hurricanes, earthquakes, wild fires, tornadoes, and repeated floods, they may stay vigilant or become complacent. However, when community members have been able to repeatedly prevent crisis situations from escalating into catastrophes, some special communication characteristics may have influenced their ability to remain vigilant.

Context for the Study

The context of this study revolves around the crisis orchestrated by a recurring natural disaster because the community of Fargo, North Dakota, experienced flooding from 1997 through 2011. Crisis communication research continually builds on the study of different types of crises to provide guidelines for crisis management. The present study explores Red River flooding as an example of a natural disaster, from the details of the crisis timeline for the three most recent major floods of the Red River and the crisis mitigation by the Fargo community.

Flooding as a Natural Disaster

In their study of Federal Emergency Management Agency (FEMA) assistance to flood-disaster prone communities, Kick, Fraser, Fulkerson, McKinney, and De Vries (2011) affirmed that "of all natural disasters, flooding causes the greatest amount of economic and social damage" (p. 510). Also, according to the European Environmental Agency (EEA), cited by Huang (2011), disaster is a serious disruption of the functioning in a community or a society,

involving widespread human, material, economic, or environmental loses and impact, which exceeds the ability of the affected community or society to cope using its own resources.

Huang (2009) defined *natural disaster* as "an event mainly caused by natural events or forces" (p. 546). Assanangkornchai, Tangboonngam, and Edwards, (2004) observed that "flooding accounts for about 40 per cent of the world's major natural disasters" (p. 86). In support of this observation, Opperman et al. (2009) also opined that flooding is the most damaging natural disaster worldwide.

The Red River Flooding as an Example of a Natural Disaster

Drawing from Huang's (2011) definition that characterized flooding as a serious disruption for the functioning of a community or society at a human, material, economic, or environmental cost that cannot be handled by that community or society, the Red River flooding as a disaster is easy to see. In 1997, when Grand Forks, North Dakota, flooded, the event was characterized as a natural disaster by Seeger and Sellnow (2001). In that case, the flood forced almost 50,000 residents to evacuate; damaged over 8,000 homes; and generated more than $1 billion in claims (Whiteman & Kurlantzick, 2001). The flooding of the Red River mostly is caused by excessive snow, heavy spring rain, and warm temperatures melting the snow faster than usual, as well as ice jams blocking the flow of the river (Sellnow, Seeger, & Ulmer, 2002). These studies support the characterization of the flooding of the Red River as a natural disaster.

Details of the crisis timelines.

Figures 1.1, 1.2, and 1.3 illustrate the timelines for three recent Red River floods. The figures show how the major floods affected Fargo.

Figure 1.1. 1997 Red River Spring Flooding Timeline

Date	Events
April 2	News had warned residents along the Red River to be prepared for a crest as high as 38 ft., but the gauge was showing 19.90 ft.
April 10	The National Weather Service predicted that the crest would hit 39 to 39.5 ft. The gauge was showing 36.83 ft.
April 12	News showed that the predicted crest dropped from a top height of 39.5 ft. to a low of 37.5 ft. due to the discovery of a faulty automated gauge which was showing 36.92 ft.
April 14	The Fargo operations manager said another Red River crest would be unlikely again in Fargo because the unofficial crest reading of 37.61 ft. was slowly dropping.
April 16	News announced that the reading in Fargo was 39.17 ft.
April 18	By this day, the reading has reached 39.64 ft.
April 20	The reading was showing a slowing down at the 38.98 ft. flood level. This drop signals the end of the crisis phase.

Figure 1.2. 2006 Red River Spring Flooding Timeline

Date	Events
March 30	The Red River hit and passed the flood level at 17.29 ft.
March 31	The quick rise of floodwaters from 17.29 ft. to 20.84 ft. started the fear of flooding.
April 2	The floodwaters jumped higher and faster from 20.84 ft. to 29.37 ft.
April 3	News announced that the mayor of Fargo warns against complacency because the National Weather Service predicted the Red River would crest at 37.05 ft.
April 4	Fargo/Moorhead officials await the crest with cautious optimism.
April 5	News states that major damage is not expected as floodwaters inundate the area at 37.07 ft.
April 6	News states a steady fall of floodwater level, signaling relief from the flood crisis.

Figure 1.3. 2009 Red River Spring Flooding Timeline (Hasbargen, 2011,)

Date	Events
March 15	The National Weather Service (NWS) predicted a 50% chance the river would reach 38.00 ft in the Fargo area and a 33.30% chance of beating the 39.50 feet set in 1997.
March 19	The U. S. Army Corps of Engineers started constructing a levee to protect the south side of Fargo from the expected overland flooding.
March 21	Fargo began holding informational flood meetings for the public.
March 22	NWS predicted the river could reach 39.00 to 41.00 feet as early as March 27, one day earlier and one foot higher than previously predicted.
March 25	Fargo City commissioners unanimously approved an emergency evacuation plan to be used if necessary.
March 26	A major local hospital system evacuated residents of Fargo hospitals.
March 27	The NWS predicted a crest of 41.00 to 42.00 feet with a chance of reaching 43.00 feet.
March 29	The NWS announced the Red River had crested at 40.82 feet on March 28 but would rise again to 40.90 feet.
March 30	A dike breached at Oak Grove High School.
April 3	The NWS released its prediction for the second crest, predicting a 90% chance of reaching 40.40 feet, a 75% chance of reaching 41.00 feet, and a 25% chance of reaching 42.80 feet.
April 15	The NWS predicted the river would crest for a second time at 35.50 feet, signaling the unofficial end of the flood fight in Fargo.

Rationale for the Study

In their study of emergency management experiences in different countries, Moore, Trujillo, Strarns, Basurto-Davila, and Evans (2009) concluded, "understanding the factors contributing to success helps replicate success in future" (p. 28). There is, therefore, a need to identify the communication strategies that contribute to the maintenance of vigilance in a community to provide other communities that have not been vigilant with best practices for crises mitigation and prevention. Studying the communication strategies used by the Fargo community in its flood fights will provide other communities with a lived example.

Improvements normally come from learning as well as applying what is learned to what is already in place. For this reason, applying what scholars know about high reliability organization (HROs) to communities can provide useful insight about how communities can implement better strategies to prevent future crisis situations from escalating into catastrophes. As high reliability organizations successfully maneuver through high-risk situations with fewer failures, a community that can apply these principles may remain vigilant and mindful to avoid future crises. In situations where disasters strike repeatedly, the fear of risk fatigue is high. Therefore, to study risk fatigue to determine how repeated risk and crisis messages may cause complacency instead of eliciting vigilance is necessary. The fruit of that knowledge will help to develop communication strategies to reduce the problem.

General Research Question

Research on crisis situations reveals a focus on the threats and problems posed by these crises. According to Ulmer, Sellnow, and Seeger (2010), "the potential opportunities embedded in these events" (p. 691) should be also considered. To utilize these embedded opportunities, they first need to be identified. To this end, the general question guiding the present study reads:

How do the residents of a community facing repeated floods and similar natural disasters respond to communication messages designed to encourage vigilance in mitigating or preventing a crisis situation?

Definition of Concepts and Terms

According to Berg (2009), "To ensure that everyone is working with the same definition and mental image" (p. 39), the study is presenting the operational definitions of the terms and concepts as they will be used throughout the research. These terms and concepts are as follows:

1. Repeated: in this study, the verb *repeated* refers to the annually recurring flooding of the Red River around the Fargo area.

2. Natural hazard: by *natural hazard*, the study refers to crisess brought about by natural causes.

3. Communication messages: by *communication messages*, the study refers to all messages designed to motivate resilience in line with these HRO principles.

> a) *Preoccupation with failure*: messages that help to adopt "the mindset that anything can go wrong at any time" (Bogue 2009, p. 24).
>
> b) *Reluctance to simplify*: messages "holding a more accurate and nuanced picture of current operations" (Bogue, 2009, p. 24). For the HROs, when messages are simplified, they lose complexity and reduce adaptability (Bogue 2009).
>
> c) *Sensitivity to operations*: messages that emphasize the situation at hand. Such messages are referred to as "respectful communication that makes more not few pertinent things discussable" (Bogue, 2009, p. 24).

d) *Commitment to resilience*: messages that encourage staff/residents to "go the extra distance to take in more cues and information for subsequent problem-solving" (Bogue, 2009, p. 25).

e) *Deference to expertise*: messages that encourage the chain of command to "fluctuate so that deeper expertise can be drawn into operational decisions" (Bogue, 2009, p. 25).

4. Leaders: by *leaders*, the study refers to elected or appointed city members during the repeated flood crises.

5. Residents: in the study, *residents* refers to Fargo city dwellers who have been directly involved in fighting the repeated flooding of the Red River.

6. Resonated: *resonated* refers to those messages that help to motivate the residents into action in the flood fight.

Delineations to be Placed on the Study

The delineation placed on this study is the choice of Fargo as the center of the research. Many cities along the Red River, from Wahpeton to Winnipeg, have experienced more severe flooding than Fargo. However, the study is based on Fargo for several specific reasons: Fargo successfully contained the annually occurring flooding, especially the three major floods under consideration (1997, 2006, and 2009); Fargo is the largest metropolitan area in the region to have experienced successive major floods without experiencing significant material and/or property damage; and Fargo received national media coverage for its flood containment. The findings from this study, while limited to what can be claimed of the Fargo community, may provide insight for other communities experiencing similar repetitive natural disasters as they strive to keep their citizens vigilant.

Summary and Preview of the Dissertation Structure

Chapter one presented an introduction to the study, providing the suggestion that a communication strategy that elicits vigilance for high reliability organizations may be applied to communities seeking to prevent crises from repetitive natural disasters. The chapter addressed vigilance in communities that exist in crisis-prone natural-disaster areas and identified flooding as a natural disaster which could cause colossal damage to a community. A light also was shown on how repetitive flooding of the Red River has been a source of crisis for Fargo residents. Chapter one also explained how the efforts made to warn the public about impending disaster can often produce the negative effect of fatigue and desensitization. The proposed general research question seeks to identify the crisis-management strategies that have made the Fargo community successful in containing the repetitive flooding of the Red River without being weighed down by fatigue and desensitization.

Chapter two provides a literature review on what is known in research about different aspects of the study. The definitions and descriptions of the general terms pertinent to the study also are given elaborated. Following the conceptual framework, specific research questions are introduced. Chapter three provides a detailed, step-by-step methodology to be used in the completion of the study as well as the collection method. The data analyses as well as the results are presented in chapter four. Chapter five presents the discussion of the findings while chapter six presents the conclusions, limitations, and directions for future research.

CHAPTER TWO. LITERATURE REVIEW

The literature review explores what previous scholars have concluded about strategies by which organizations maintain vigilance in the face of repeated risks of crisis or disaster. The examination of mindfulness and mindlessness as well as the ways in which they impact the running of organizations in the face of crisis or disaster risks follows. The discussion examines how organizational mindfulness leads to what is known as high reliability organizations (HROs). Furthermore, the study explores community resilience and what aspects of HROs' communication strategies can be applied to a community to make it resilient. The chapter explores complacency to see how the concept mitigates community vigilance. Finally, the media contribution to complacency, known as desensitization, and the lapse of attention due to the monotony of the task, is examined before providing research questions. The review begins with a selected discussion of crises and crisis communication.

Crisis and Crisis Communication

The public relations research literature has grown and expanded during the past three decades, especially in the field of crises, crisis management, crisis communication, and even risk and issue management (Falkheimer & Heide, 2006; Jaques, 2009). There is, "no community and no organization, public or private immune from crises" (Ulmer, Sellnow, & Seeger, 2007, p. 3), organizations and communities spare no efforts in pre-crisis planning to forestall vulnerability when crisis strikes. The constant occurrence of crises/disasters and the surprise they pose for organizations and communities forced researchers to put more emphasis on planning and preparation for crisis management (Bechler, 1995). For this reason, the organizational planning literature has been referred to as the "best source of defense for managers when it is seen as a management tool, not as a shelf ornament" (Barton, 1991, p. 12). To better understand the full meaning of crisis planning, the term *crisis* and its ramifications will be clearly defined.

Crisis

       Crisis literature has developed over the years to streamline the boundaries of crises, crisis management, and crisis communication to give a generally accepted definition for all ramifications of crises. Many definitions have surfaced for the term *crisis* as recorded by Heath and Millar (2004), and Coombs (2010). One popularly accepted definition of *crisis* is the one which comes from Coombs (2007): "the perception of an unpredictable event that threatens important, expectancies of stakeholders and can seriously impact an organization's performance and generate negative outcomes" (pp. 2-3). This study adopts this definition because it covers the areas intended for this study. Another term deserving definition is *crisis management.*

Crisis Management

       The definition of *crisis management* has also gone through some refining to be accepted by many as "a set of factors designed to combat crises and to lessen the actual damages inflicted" (Coombs, 2007, p. 5). This definition shows what crisis management sets out to achieve as seeking "to prevent or lessen the negative outcomes of crisis and thereby protect the organization, stakeholders, and /or industry from damage" (Coombs, 1999, p. 140). One of the ways for organizations/communities to achieve this protection from crisis damages is *crisis communication*, which is defined as "the collection, processing, and dissemination of information required addressing a crisis situation" (Coombs, 2010, p. 20). Along with the definitions for these aspects of crisis management and communication, a need exists to discuss the phases of a crisis to determine what should be done at each stage of any given crisis.

Phases of a Crisis

Researchers agree that crises occur in phases but differ on the actual partitioning of the phases. Coombs (2010) provided a chronology of the early research conducted by scholars studying the phases of a crisis. The earliest scholar was Fink (1986) who divided crisis management into four phases: prodromal, acute, chronic, and crisis resolution. Fink was followed by Smith (1990) who identified the process of crisis management to include pre-crisis/disaster phase, crisis impact/rescue, and recovery/demise. Mitroff (1994) followed by partitioning the phases into five categories: signal detection, probing and prevention, damage containment, recovery, and learning. Coombs (2007) consolidated the phases into three groups: pre-crisis, crisis, and post-crisis. The present study uses these three phases, starting with the pre-crisis, moving to the crisis itself, and then to the post-crisis phase. Although these crisis phases are linked to each other, the post-crisis movements to pre-crisis phases are seen as the learning and preparation phases, the interest of this study.

The crisis learning period drawn from the post-crisis phase leads to the preparation stage, which is the pre-crisis. The post-crisis and pre-crisis phases are mostly intertwined to give the crisis manager enough knowledge "to attempt to diminish the likelihood of crisis in the first place" (Pauchant, Mitroff, & Lagadec, 1991, p. 215). Crisis learning provides crisis managers with strategies to tackle anticipated crisis occurrences. The post-crisis phase is the period when organizations and communities reflect on the actions that were successful, those that were not, and those in need of some fine-tuning (DiBella, Nevis, & Gould, 1996; Littlefield et al., 2010). While the post-crisis review gives crisis managers some insight about how to prepare for the next crisis, the pre-crisis phase is the time to apply insight in an effort to prevent the occurrence of another crisis or to mitigate its devastation if it comes.

Post-Crisis Learning

Post-crisis learning strategies abound in crisis literature. One post-crisis learning process that is gaining popularity among crisis managers is the understudy of crisis-response processes that yielded successful containment of some crises/disasters. The processes are referred to as learning from exemplary practices. Moore et al. (2009) affirmed that "understanding the factors contributing to success helps replicate successes in future" (p. 28). Researchers and practitioners have devoted time to understanding organizations that have successfully avoided crisis in order to identify the key to their success (Novak, 2006). Organizational theorists have proposed learning from high reliability organizations to reduce crises or to diminish crises/disaster effects (Roberts, 1990; Weick, 1987; Weick & Sutcliffe, 2001). To further the line of study that builds on successful crisis containment, Novak and Sellnow (2009) suggested more testing of the theoretical model of participatory communication practices as a builder of collective mindfulness and community resilience. This research will study Fargo's recurring flood fight to find out how community leaders managed those factors that cause failure in crisis management, one of which is desensitization caused by constant media portrayal of the crisis.

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Desensitization and Risk Fatigue

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In crisis situations, the media play very important roles that could be positive or negative. One negative media effect this study intends to analyze is desensitization. *Desensitization* is a process involving changes in the emotional responsiveness, a gradual reduction in responsiveness to an arousal-eliciting stimulus as a function of repeated exposure (Krahé et al., 2011). Weick (1989) observed that "to cope with mental workload is an arousing emotional experience which means that mental processes and products will be modified by affect" (p. 131). A study conducted by Carnagey, Anderson, and Bushman (2007) described desensitization to

media violence as a process "by which initial arousal responses to violent stimuli are reduced, thereby changing an individual's 'present internal state'" (p. 490). Krahé et al. (2011) discovered that, in the long run, habitual exposure to media violence may reduce anxious arousal in response to depictions of violence.

Another study done by Averill, Malstrom, Koriat, and Lazarus (1972) found that the more time individuals spent watching violent media depictions, the less they become emotionally responsive to violent stimuli, and as a result, the less sympathy they showed for victims of violence in the real world (Mullin & Linz, 1995). These studies were further strengthened by evidence found on the way chronic media-violence exposure tends to have long-term effects on viewers' attitudes towards violence and victims of violence through the process of desensitization (Huesmann & Kirwil, 2007).

Many of the studies listed long-term desensitization toward violence after chronic exposure to violent media, but importantly, studies showed traces of desensitization evident immediately after, or even during, a single exposure to film violence (Fanti, Vanman, Heinrich, & Avraamides, 2009; Mullin & Linz, 1995). The study conducted by Mullin and Linz (1995) examined the effects of repeated exposure to sexually violent films and their effect on emotional desensitization and callousness towards domestic-abuse victims. One of the findings from this study was that men who were tested for their sensitivity to the victims three days following the final film exposure exhibited lower sympathy for the victim and reported less victim injury than did men in the experimental groups with longer lag periods (Mullin & Linz, 1995). The study done by Fanti et al. (2009) also observed that participants, at the initial exposure to media violence, reported that they enjoyed the violent scenes less and felt more concern for the suffering of victims. However, after repeated exposure, participants became desensitized to

media violence. Fanti et al.'s (2009) findings suggested, "That desensitization might also result in decreased likelihood of being concerned for the victims of violence and therefore decreased likelihood of helping a victim of violence" (p. 185). Evidence from these studies leads to the question about what sort of effect media coverage of natural disasters has on people. The repetitive footage of natural disasters by news channels could lead to desensitization to the disaster and its victims, therefore leading victims to complacency. Would the repetitive media exposure improve people's mindfulness and lead them to vigilance? This analysis requires a better understanding of mindfulness and mindlessness.

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Mindfulness vs. Mindlessness

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The most common understanding of mindfulness as a concept is moment-to-moment awareness without judgment (Thera, 1962). Langer (1989) defined *mindfulness* as a "state of alertness, and lively awareness . . . expressed in active information processing" (p. 138) and *mindlessness* as a state in which individuals engage in minimal processing of information that is relevant to their current task. The concept of mindfulness is best described as a process of drawing novel distinctions. These novel distinctions may be in matters of grave importance or even in trivial matters, as long as they are seen as new to the viewer (Langer & Moldoveanu, 2000). Such a process can lead to a number of consequences, including a greater sensitivity to one's environment, more openness to new information, the creation of new categories for structuring perception, and enhanced awareness of multiple perspectives in problem solving (Langer & Moldoveanu, 2000). Mindfulness, as described, fosters vigilance while mindlessness breads complacency that may result in actions not taken to avoid a crisis. However, some organizations, in their crisis management and preparedness, have beaten this complacency and remained vigilant, and are known as high reliability organizations.

High Reliability Organizations (HROs)

Brief History of HROs

   The theory of high reliability organizations has permeated all aspects of human organizations and industries. Knowing a little about how it all began is necessary to appreciate the progress achieved is important. According to Rijpma (1997), from the 1981 publication of the book on the human dimension of the 1979 nuclear meltdown on Three Mile Island by Sills, Wolf, and Shelanski, "work on high risk systems began with Charles Perrow's book *Normal Accident*" (p. 15). Before HRO theory, scholars thought that "centralized mechanistic control systems are not capable of responding sufficiently rapidly" (Bierly III & Spender, 1995, p. 639). The development had a steady fine-tuning from high-risk organizations to what is known today as high reliability organizations. This fine-tuning came after several failures and gradual developments. For Perrow (1984), our technological advancement has overtaken our administrative capability, and neither centralization nor decentralization will work very well (Bierly III & Spender, 1995). The ideas that complex systems are prone to failures led Perrow to call the accidents that occur from such systems "normal accidents" (Rijpma, 1997, p. 15). Trying to solve the same problem of high-risk organizations, Williamson (1975) suggested a focus on the self-interest of the actors in complex systems. He thought that, to remove the sources of risk, the employment contract should be reshuffled so that employees know for sure what their commitments are right from the start (Bierly III & Spender, 1995). Another theorist who studied high-risk organization was Ouchi (1980) who introduced the idea of culture into the administration of complex systems. As Bierly III and Spender (1995) put it, training would acculturate individuals becoming members of a given organization into the "system's beliefs and perceptions" (p. 641).

The introduction of culture into the control of these high-risk organizations took a turn when Wilkins and Ouchi (1983) further explored the idea. According to Bierly III and Spender (1995), they set up cultural modes that will control organizations as "(1) long history and stable membership; (2) absence of institutional alternatives; and (3) interaction among members" (p. 643). They also observed that organizational culture can arm decision-makers with categories, routines, and examples of successful and unsuccessful solutions.

Culture in high-risk systems.

Weick (1987) further developed the idea that culture had much to offer decision-makers in high-risk organizations. In an approach for handling high-risk organizations, culture becomes the underlying pattern of meanings articulated into both the formal and the informal aspects of the organization, especially in decision-making which controls the entire system (Bierly III & Spender, 1995). Moreover, with many problems caused by life situations, culture helps not only to solve such problems, but also, to generate learned methods for coping with such experiences (Gregory, 1983; Krefting & Frost, 1985; O'Neil, Beauvais, & Scholl, 2001). Weick (1987) was, therefore, right in noting that "the cultural mode of control may be the crucial source of administrative control in high risk organizations" (Bierly III & Spender, 1995, p. 643). Noting the difference between high-risk and high reliability organizations, Weick (1987) described high reliability organizations as those that choose reliability above profit, thereby lifting high-risk up to high reliability organizations (Bierly III & Spender, 1995). The origin of high reliability organizations leads to the exploration of the important tenets of the HRO theory.

Tenets of HROs.

The metamorphosis of high-risk organizations into high reliability organizations came through the assemblage of conceptual knowledge that has developed over time. By studying the

activities of organizations which "require nearly error-free operation" (Weick & Roberts, 1993, p. 357), organizational theorists arrived at some decisive points. These theorists included Perrow (1984) and his book, *Natural Accidents*; Ouchi (1980); Wilkins and Ouchi (1983); Weick (1987), who focused on the people who attempt to operate within the system; and Rochin, LaPorte, and Roberts (1987), who studied activities of the aircraft carrier. Finally, Weick (1987) and Wilkins and Ouchi (1983) settled on organizational culture and learning as the base upon which to build high reliability organizations. For them, "the existence of culture indicates shared knowledge about the collective and its context" (Bierly III & Spender, 1995, p. 644). Shared culture and knowledge mean training and learning. By learning and unlearning, individuals are acculturated into the organizational culture (Weick, 1987; Weick & Roberts, 1993; Wilkins & Ouchi, 1983). Wilcoxson and Millett (2000) made it clear that "culture determines what a group pays attention to and monitors in the external environment and how it responds to this environment" (p. 91). On the basis of this statement, Weick and Roberts (1993) built their high reliability theory.

In an effort to explore statements already made by theorists, Weick and Roberts (1993) expanded the theory of high reliability organizations. Their concern was that "organizations concerned with reliability enact aggregate mental processes that are more fully developed than those found in organizations concerned with efficiency" (Weick & Roberts, 1993, p. 357). In explaining what they meant by "a fully developed mental process" (p. 357), they explored these statements: "organizations preoccupied with reliability may spend more time and effort organizing for controlled information processing (Schneider & Schiffrin, 1977), mindful attention (Langer, 1989), and heedful action (Ryle, 1949)" (p. 357). With the conviction that a reliable system must be a smart system and that such a system must be mediated by a collective mental process, Weick and Roberts (1993) proceeded to analyze such ideas as group mind, mind

as disposition to heed, group as interrelated activity, heedful interrelation as collective mind, variations in heed, illustrations of heed in interrelating, heedful interrelating, and heedless interrelating. All these concepts are connected to the collective mind.

The collective mind.

The development of the concept the collective mind expanded in a gradual progression. The word *collective*, according to Weick and Roberts (1993), differed from group or organization, and rather, "it refers to individuals who act as if they are a group" (p. 360). Such individuals learn as a mental process to interrelate and, by so doing, contribute to the collective mind (Weick & Roberts 1993). In a collective mind, interrelation is done heedfully. Weick and Roberts (1993) explained, "people act heedfully when they act more or less carefully, critically, purposefully, attentively, studiously, vigilantly, conscientiously, and pertinaciously" (p. 361). Explaining further, Weick and Roberts (1993) argued that "heedful" is not the same as *habitual,* but a performance that comes from training and experience as the fruit of conscientious communication between members. The training and experience become the forces all the actors in the system use to "weave together, thinking, feeling, and willing" (p. 362). In describing the group activity as interrelated actions, Weick and Roberts (1993) developed some defining properties of group action:

> 1) Individuals create the social forces of group life when they
> act as if there were such forces;
>
> 2) They construct their actions (contribute), while envisaging a
> social system of joint actions (represent), and interrelate the constructed
> action with the system that envisaged (subordinate);

3) Contributing, representing, and subordinating create a joint situation of interrelations among activities referred to as a system; and

4) The effect produced by a pattern of interrelated activities vary as a function of style (e.g., heedful-heedless) as well as strength (e.g., loose-tight) with which the activities are tied together pp. 362-364

These outlined properties of group action make possible, the actions of a system to become the sum of the actions of the individuals who make up the group (Weick & Roberts, 1993). These actions make up the collective mind which adds up to a collective mindfulness. Therefore, for HROs, *collective mindfulness* can be described as a system where everyone works both individually and together, yet is acutely aware that small failures in safety protocols or processes can lead to catastrophic, adverse outcomes (Weick & Sutcliffe, 2001).

Building of the collective mind starts with activities that get the individuals trained and cultured through education and constant communication. The training prepares each member of the system to respond to every problem as if it were the individual's personal concern. As Smart et al. (2003) put it, "personnel are trained and cultured to accept and perpetuate the view that when they see a problem they 'own it' until they solve it or until someone else who can solve it takes responsibility for it" (p. 736). The individuals are equipped with the organizational learning and social skills that "enable people to represent and subordinate themselves to communities of practice" (Weick & Roberts, 1993, p. 377). This community of practices makes up the body of shared knowledge that is the culture of a given organization. This body of knowledge makes the activities of the crew more fully interrelated, and members, by their contributions, representations, and subordination, create this pattern of joint action (Weick & Roberts, 1993). The organizational learning makes organizations behave more rationally and effectively than

individual human beings (Smart et al., 2003). In high reliability organizations, learning and culture depict a relationship in which shared values, openness, and disclosure become a way of life, a collective mind. A well-developed collective mind produces a collective mindfulness that is the key feature of high reliability organizations.

High reliability theory in practice.

Organizations that operate in high-risk, complex, hazardous, and tight-coupling systems have challenged both researchers and practitioners for many years. The search for a solution caught the attention of researchers such as Ouchi (1980), Wilkins and Ouchi (1983), Perrow (1984), Rochlin et al. (1987), and Weick (1987). Because *human reliability* was defined by Weick (1989) as "the probability that a person (1) correctly performs some system-required activity in a required time period (if time is a limiting factor) and (2) performs no extraneous activity that can degrade the system" (p. 127), research put forward principles that will make human beings reliable in such systems. These principles included preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Barrett, 2006; Bogue, 2009; Frankel, Leonard, & Denham, 2006). As these principles are related to complex and tightly coupled systems, they work in interrelation with each other; and as Bogue (2009) put it, they "tend to interpenetrate, inform, and influence one another" (p. 24). To these principles, Baker, Day, and Salas (2006) added teamwork. A short explanation of how each principle works will show what to emulate in HRO principles.

The first principle is *preoccupation with failure*. The continuous awareness that anything can go wrong without warning keeps personnel in constant alert to prevent what Weick (1989) represented as an "opportunity for error from becoming an occasion for error" (p. 127). This preoccupation stays in place, as Frankel et al. (2006) observed, everywhere in HROs, "even in

the most successful endeavors" (p. 1693). The second principle is *reluctance to simplify*. No HRO's operation is treated as if it has been done before. In all operations, "HROs strive for a balance between components such as principles and experience, anticipation and resilience, input and demand, routine and non-routine, flux and order" (Weick, 2011, p. 22). By not simplifying, all the complexities are reexamined in every operation for "a more complex understanding of their environment and operating conditions" (Barrett, 2006, p. 27). The third principle is *sensitivity to operations*. According to Bogue (2009), *sensitivity to operations* entails "a widespread concern for, if not awareness of, the granular details of routine operations" (p. 24). Every operation is given the complete attentiveness required for detection and correction of errors. *Deference to expertise* describes the HRO's dramatic shift in operational decision making. When the unexpected occurs, decision making shifts to the expert regardless of status (Frankel et al., 2006). Such a shift reduces the timing for an error-correction response. Finally, *commitment to resilience* is a principle that makes the HROs give quick and complete attention to the minutest sign of error. These principles are desirable for communities to build resilience.

Community Resilience

In looking at what the literature says about resilience, this study is interested in discovering ways in which a community can take on the HRO principles. A general description of the construct as seen by other scholars is explored. This general view of resilience touches those things that enhance resilience as well as the social constructs that coexist with resilience. More attention will be expended on community resilience, the main thrust of this study. Aspects of community life that call for resilient actions in order to maintain the community's stability, especially in a crisis, are explored.

Resilience as a construct has several interpretations and definitions which are derived from different determinants. Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008) derived the origin of resilience from physics and mathematics to describe materials that bend and return to normal without breaking. From this physical metaphor, resilience started being applied to individuals as well as to communities and larger societies. For Rutter (1987), resilience refers to individuals who prosper in high risks. Werner and Smith regarded individuals who adapt successfully to stressful circumstances as being resilient. Grotberg (1995) described inner strengths, such as personal optimism and self-esteem as well as adapting, coping, and personal connectedness, as components of resilience. Some other researchers regarded all the things that foster and sustain connectedness with others as aspects of resilience (Davis, Cook, & Cohen, 2005; Fuller, McGraw, & Goodyear, 1999; Norris et al., 2008). This study examines the components of resilience as they refer to communities and to crisis/disaster management as well as how a community could take on the HRO principles.

A community needs to stay focused and alert at all times, just as high reliability organizations do, to withstand possible crises and disasters that often hit without warning. *Resilience* has been defined as "successfully adapting to stressful circumstances and thus effectively managing the stress" (Maybery, Pope, Hodgins, Hitchenor, & Shepherd, 2009, p. 328). Lopez-Marrero and Tschakert (2011) held that "resilience emphasizes enhancing human capacity to improve the anticipation of, preparation for, and mitigation of natural hazards" (p. 243). For a community, resilience involves "the ability of a system to sustain itself through adaptation and occasional transformation" (Magis, 2010, p. 412). Pfefferbaum (2005) added that community resilience can also be seen as "the ability of community members to take meaningful, deliberate, collective action to remedy the impact of a problem, including the ability to interpret

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the environment, intervene and move on" (p. 20). The argument is that resilient communities normally learn from hazards, disasters, and crises to cope, to adapt, and to reshape for possible changes (Magis, 2010). Community resilience, therefore, involves those systems in place that can determine community's ability to mobilize and respond to any community threats. Landau and Saul (2004) outlined four themes that had been important to community resilience: "Community and social connectedness; collective communication regarding trauma; 'getting back on the horse' by . . . reestablishing the rhythms and routine of life; and having a positive vision of the future (renewed hope)" (p. 295).

A brief description of these themes sheds more light on what community resilience entails. *Community and social connectedness* refers to the social systems available in a given community. Such systems include all sources of the members' interrelatedness in the community. Landau (2007) argued that family relationships are an innate characteristic that helps to build resistance to despair in humans. The connectedness of a community grows through civic organizations and places of gathering such as churches, community centers, schools, hospitals, shops, etc. Community learning is fostered at these social centers (Lopez-Marrero & Tschakert, 2011). These researchers argued that, in such gathering places, "learning is attained through social memory, the lessons that have been learned from past disasters, from accumulated experience . . ." (p. 230).

Collective communication regarding trauma is a very important aspect of community resilience. Norris et al. (2008) described this communication as a "creation of common meanings and understandings and the provision of opportunities for members to articulate needs, views, and attitudes" (p. 140). Seeger (2006) observed that crisis planning, "involving a wide set of stakeholders, including the community, results in a more effective plan" (p. 238). A collective

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communication gets all stakeholders involved and, at the same time, creates awareness. Such a collective communication involves person-to-person communication about the crisis which should be fashioned to be positive.

Another theme that encourages resilience is called *"getting back to the horse"* which means reestablishing the rhythm of societal life. The resources needed for this return to happen includes "community relationships built upon shared values and trust that promote cooperation between members of the community" (Maybery et al., 2009, p. 328). Norris et al. (2008) added other resources to include emergency management systems, social capital, social support, and a sense of community. These community resources help to create "knowledge sharing, diverse experiences, skills . . . as well as common goals" (Lopez-Marrero & Tschakert, 2011, p. 231). By bonding together in partnership and collaboration, individuals are encouraged to bounce back to normalcy. Finally, community resources such as social ties associated with community centers help to *create positive visions* for the future in the community (Maybery et al., 2009). They argued that "members of resilient communities intentionally develop personal and collective capacity that they engage to respond to and influence change" (p. 327).

The social constructs that coexist with and enhance resilience include well-being, social capital, social support, and social sustainability. *Well-being* describes the situation where an individual or a group is well-endowed with the capacity to handle stressful circumstances (Maybery et al., 2009). *Social capital* describes a situation where "individuals invest, access, and use resources embedded in social networks to gain returns" (Norris et al., 2008, p. 138). *Social support* describes the "social interactions that provide individuals with actual assistance and embed them into a web of social relationships perceived to be loving, caring and readily available in times of need" (Norris et al., 2008, p. 138). Social sustainability can be said to be the

community's ability to continue to plug ahead despite contexts of change (Magis, 2010). For a community to be able to withstand the devastation often caused by disasters and crises, it must have some resources in place (Maybery et al., 2009). Such resources include good leadership, people who are ready to follow, good financial security (which includes employment opportunities), family income and assets, and investments and local infrastructures. The value of all these resources is described further.

According to Maybery et al. (2009), all these resources, held together by relationships between neighbors and social ties, lead to connectedness; good communication creates a strong sense of community. This *sense of community* is described as "high concern for community issues, respect for and service to others, sense of connection, and needs fulfillment" (Norris et al., 2008, p. 134). These researchers observe that a sense of community gives rise to what they referred to as "tight coupling," which is, "the tendency to want individuals, groups and organizations to come together tightly to resist danger" (p. 138). This type of tight coupling only occurs if, in a crisis response, a community becomes aware that "changes in one component engender a response from other components" (Norris et al., 2008, p. 138). With such a good network of social ties, individuals can recover from serious stress or just accept their situation. Some individuals often stay vigilant and cope with disasters while others become mindless and complacent.

It is also important to assess the coping mechanisms in the situation of crisis. In the study of the Agueda, a Portuguese territory that has a history of flooding, researchers found that, in the areas of greatest exposure to risk in the municipality, individuals were willing to tolerate and live with the risk. The individuals' decision were normally prompted by a feeling of familiarity with

the flood disaster, assessment of cost/benefits, and the perception that the flood impact was not catastrophic and could be controlled (Figueiredo, Valente, Coelho, & Pinho, 2009).

According to the findings of White (1945), the "flood hazard is underestimated by most people because of the infrequency of major floods, the weakness of human memory, and the reluctance of some people to admit that past floods may be repeated or exceeded" (p. 51). Even in a non-flood disaster, people descend into complacency after the repeated occurrence of a particular disaster. In a study about public complacency under repeated emergency threats, Wang and Kapucu (2007) found that public complacency became highest at the occurrence of the fourth hurricane, Jeanne. They recorded that, "when Jeanne appeared, people had already experienced three hurricane threats and become complacent" (p. 68).

In addition, citizens in disaster-prone areas have a tendency to expect the authorities to take care of their safety. This argument is buttressed by the study by ten Brinke, Dollee, van Waveren, and Wouters (2010) on contingency planning for large-scale floods in the Netherlands, where the authors suggested that the "division of roles" hinders disaster preparation and response because it does not get the citizens involved as "partners" in crisis management (p. 68). Preparation and response can be improved by strengthening the collaboration of local and national authorities and by getting citizens and the business community involved. Seeger (2006), on crisis-response planning, also wrote that "involving a wide set of stakeholders, including the community, results in a more effective plan" (p. 238).

Exploring the fact that coping mechanisms change according to the culture of the community and the nature of the disaster is important. This argument is supported by the study conducted by Horioka, Murakami, and Kohara (2002) about how the Japanese cope with risk. They found that the Japanese rely mostly on themselves and also rely, to some extent, on the

market, family members, relatives, friends, and the government. Another thing to note is that coping mechanisms and advice-givers vary considerably by events (Horioka et al., 2002).

This variation leads to the inquiry about the effects complacency has on risk. As has been noted by Wang and Kapucu (2007), complacency sets in after a repeated crisis or disaster occurrence. In a study done on making HIV a public concern in Australia, Newman and Persson (2009) found that early media coverage indicated an initial "complacency" about HIV by "representing AIDS as a risk only to homosexuals and intravenous drug users" (p. 14). These complacency attitudes would easily lead people to a false sense of security and, therefore, make them less mindful about their safety.

Finally, to learn the effects that fatigue has on risk perception is vital. According to a study conducted by Chan (2011), fatigue was identified as the most critical risk item and could play a critical role in triggering a bundle of synergetic risk items, leading to multiple causality accidents. The loss of attention due to mental fatigue was described as limitations caused by effortful attention (Grier, Warm, Dember, Matthews, & Galinsky, 2003; Helton, Lopez & Tamminga, 2008; Langner, Willmes, Chatterjee, Eickhoff, & Sturm, 2010). Research also asserts that "the repetitive nature of typical vigilance assignments induces participants to withdraw their attentional effort from the task and perform it in an increasingly mindless routinized manner" (Langner et al., 2010, p. 500).

The explanation is that the monotony of a risk situation is assumed to lead to the disengagement of conscious awareness about the task (including a preoccupation with task-irrelevant thoughts). This reference is supported by research done by Larue et al. (2010). They concluded that "the monotony of the task can lead to an important impairment, which can be referred to as a 'monotonous state'" (p. 1215). Despite all these possibilities for mindlessness

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and complacency, Fargo residents have remained resilient in fighting the annually occurring flood risks. The discovery of their strengths and communication strategies which this study has set out to do will add to the crisis preparedness literature.

This research studies the crisis-management program and communication strategies that helped the Fargo community contain the recurring flood disasters threatening the community on an annual basis. The study will identify factors that contribute to successful flood disaster preparedness and management. Research shows that media exposure to violence induces desensitization, that repeated disaster warnings elicit public complacency, and that continuous vigilance can give rise to mental fatigue; yet, Fargo residents have remained resilient. These facts and the prevailing success of the community in its flood management raise the following questions to be studied.

Research Questions

RQ1 How have the messages of city leaders during the repeated flood crises affected the resolve of the residents of Fargo to engage in ongoing flood-mitigation activities?

RQ2 To what extent are principles of HROs evident in the perceptions of community members about how the city leaders managed the flood crises?

RQ3 How were complacency and vigilance reflected in the perceptions of the Fargo residents who had experienced repeated flood crises?

Summary

The literature review has systematically examined what research had to say about the important areas of this study. A number of gaps such as, remedies to communication induced psychological problems; do disaster and warnings have effect on public complacency; and

transferring HRO principles to communities; have been identified through this literature review. Two of these gaps stem from communication efforts to maintain vigilance in crisis/disaster-prone areas. Novak and Sellnow (2009) observed, "risk issues in organizations frequently originate in or are complicated by communication" (p. 350). The first of these communication-induced problems stems from the uncontrollable volumes of information. In processing volumes of threats and warnings about crises/disasters, the human attention span tends to snap; giving way to complacency, and research is scant with solutions.

The second aspect of this problem, the media effect that mitigates vigilance, is desensitization. This study explored the communication strategies that contributed to the Fargo community's vigilance despite repetitive crisis/disaster threats, as well as media portrayal of violence and the desensitization prevalent with such exposure of violence.

Finally, the study identifies the HROs as an organizational setup that has successfully maintained vigilance in crisis despite near misses of catastrophes. The study intends to discover aspects of this organizational structure and the communication strategies of the HROs that may be present in the Fargo community which have enabled the community to remain vigilant despite flood disasters and disaster warnings. The next chapter provides the methodology used to investigate the identified research questions.

CHAPTER THREE. METHODOLOGY

Rationale for Qualitative Methodology

All researchers should strive to employ rigorous methods of sampling, data collection, data analysis, and interpretation in line with a scientific inquiry framework that suits the particular study (Hanson, Balmer, & Giardino, 2011). After thorough reflection on the object of inquiry and considering the available research methods, a qualitative research methodology was chosen for this study because of its ability to extract the fullest information about people, places, and events: "It therefore offers the opportunity to 'unpack' issues, to see what they are about or what lies inside and explore how they are understood by those connected with them" (Ritchie, 2003, p. 27). Because the study is an exploratory inquiry, qualitative methods appear better suited than quantitative approaches. Peshkin (1988) argued, "qualitative inquiry potentially responds to the fullness of the people, events and settings that we study, it may attend to that which quantitative research is likely to not see or to ignore" (p. 418). He contended that, in an explanatory inquiry, "quantitative researchers tend to look hard, but seldom much more than once, as in the questionnaire or test of a given individual" (p. 418). This argument is one of the reasons why "qualitative methods began to be seen as a more valid and valuable approach to research" (Snape & Spencer, 2003, p. 9).

Other reasons for the choice of a qualitative methodology for this inquiry include the fact that "qualitative researchers are intrigued with the complexity of social interactions as expressed in daily life and the meanings participants themselves attribute to these interactions" (Marshall & Rossman, 1999, p. 2). Moreover, because the inquiry is about natural phenomena, and an exploration, qualitative research will be best able to learn the worldview of individuals or groups as they themselves see it (Baxter & Eyles, 1997). Another interesting strength of qualitative research is that it makes the vast opportunities possible through the holism of being there in

person (Peshkin, 1988). Because qualitative methods have been chosen as the fitting method for this study, it is important to choose the type of qualitative inquiry that will be best.

The Inquiry

Qualitative methodology, according to Colucci (2007), includes a variety of methods, the most popular of which are participant observation and interviews. Lewis (2003) referred to the data collected through them as "naturally occurring or generated data" (p. 56). The choice of method for any research is defined by the information that the researcher desires to collect (Denzin & Lincoln, 2003). The present study used interviews, rather than participant observations, because they explored past events. Fontana and Frey (2003) wrote, "Interviewing is one of the most common and most powerful ways in which we try to understand our fellow human beings" (pp. 61-62). Interviewing also "reproduces a fundamental process through which knowledge about the social world is constructed in normal human interaction," (Legard, Keegan & Ward, 2003, p. 138). Interviewing also "produces a way of generating empirical data about the social world by asking people to talk about their lives," (Holstein & Gubrium, 2002, p. 112). The researcher adopted interviews as the form of data collection, necessitating the determination of the correct type of interviewing.

Interview Formats

Fontana and Frey (2003) described the three most common types of interviewing as structured, group, and unstructured interviews. They defined *structured interviewing* as research where "the interviewer asks all respondents the same series of pre-established questions with a limited set of response categories" (p. 68). The second method, *group interviews*, is defined as "a qualitative data gathering technique that relies upon the systematic questioning of several individuals simultaneously in a formal or informal setting" (pp. 70-71). The third method,

described as open-ended and ethnographic, is *unstructured interviewing* which "can provide a greater breadth of data than the other types, given its qualitative nature" (p. 74). The unstructured type of interviewing is important because of its specific difference with structured interviewing which demands limited response categories. The unstructured interview may have an initial set of questions but is not limited to those questions because the interviewer freely applies follow-up questions and probes to explore further into respondents' answers.

This researcher preferred the unstructured interview type for a series of reasons. Initially, unstructured interviewing grasps the people's point of view because "personal accounts are seen as central importance in social research, because of the power of language to illuminate meaning" (Legard, Keegan, & Ward, 2003, p. 138). As this study explored a societal concern, the unstructured design of interviewing provided the researcher with opportunities to lead participants through their responses to areas of thought they may not have explored from the onset.

Because the researcher considered unstructured interviewing very important for data collection, the need arose to specify the chosen interview design and the reason for the choice. In the qualitative research method, two designs of unstructured interviewing stand out: the group interview, also known as a *focus group design*, and *in-depth individual interviewing*. This researcher preferred the in-depth, individual interviewing to focus group interviewing for several reasons. Considering the type of data sought, the study explored detailed personal experiences of individual participants. According to Lewis (2003), "for in-depth understanding of the personal context within which the research phenomena is located and for detailed subject coverage" (p. 58), an in-depth individual interview was preferable. As a conversation with a purpose, unstructured, in-depth interviewing "permits the researcher to explore fully all the

factors that underpin participants' answers, reasons, feelings, opinions and beliefs" (Legard et al., 2003, p. 141). Moreover, in view of the subject matter, Lewis (2003) suggested, "very complex systems, processes, or experiences, are generally best addressed in in-depth interviews because of the depth of focus and the opportunity for clarification and detailed understanding" (p. 58). Finally, and most importantly for this study, "because interviews generally take place at a location of the participant's choosing, in-depth interviews are more accessible to potential participants than group discussion and thus are ideal for very busy study groups" (p. 59). In-depth individual interviews were, therefore, preferred for this study. Another qualitative requirement of the study was the choice of area to be covered and the population sample that would be a good representation of the area.

Geographic Area of Study

The study focused on the areas most affected by the repetitive flood disasters that have disturbed Fargo residents on a yearly basis. The study's best choices were the areas of danger marked by the Federal Emergency Management Agency (FEMA). After years of observation, FEMA marked the Red River floodplains, indicating areas of greater dangers in red, as seen in Figure 3.1.

In adopting this geographic area, the study focused on the areas marked red by FEMA (These areas are on the far right of the figure and follow along the river from the top to the bottom of the map), but extended to adjoining areas within Fargo. From these danger areas, the researcher decided to select at least two residents who were affected in one way or another by the repetitive flood disasters, who had lived in the area for at least 15 years, and who were willing to participate in the research.

Figure 3.1. FEMA Flood Plains: Fargo
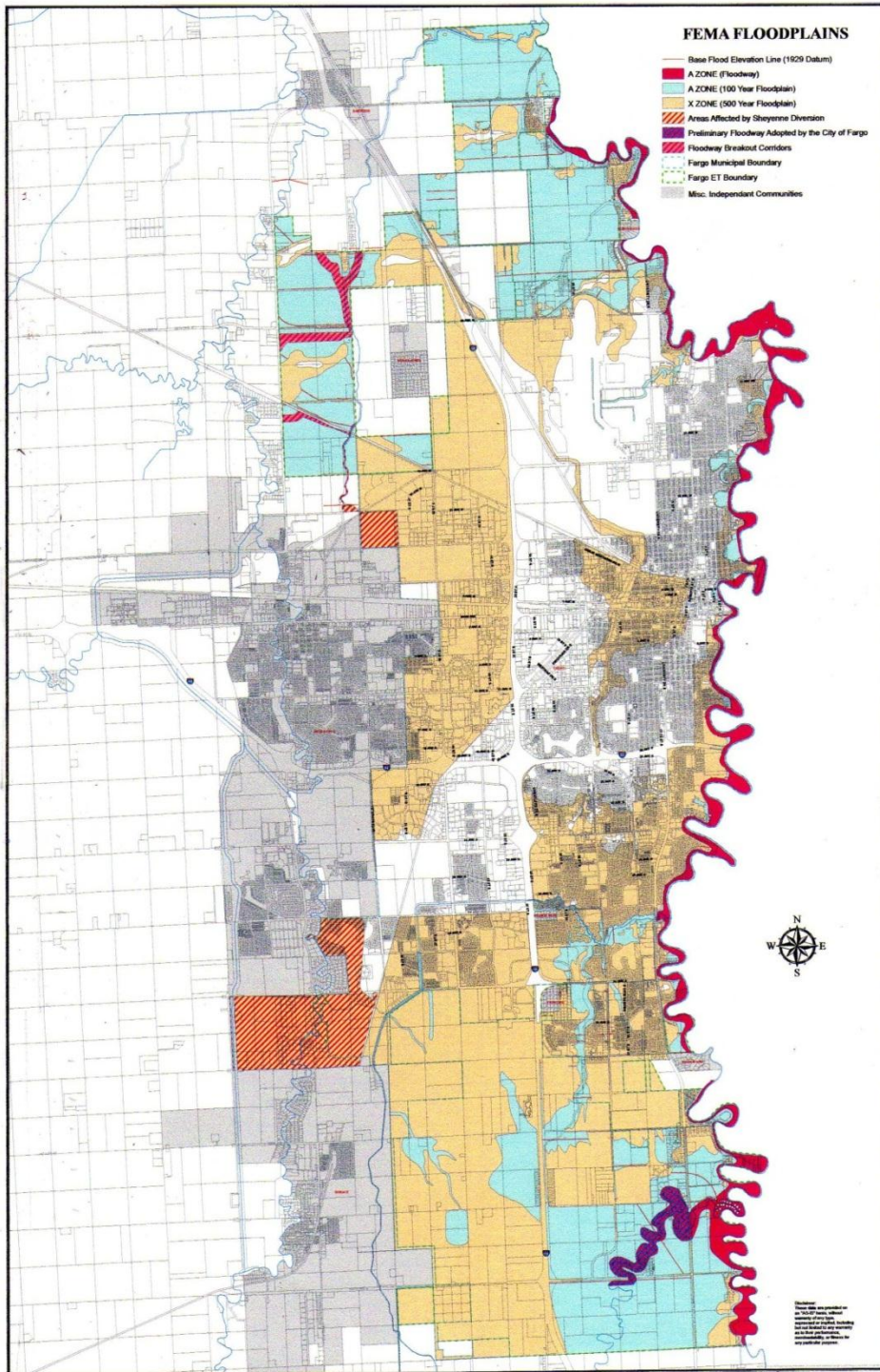
These zones, according to the Fargo engineering office, from the north to the south of Fargo along the Red River included Trollwood, Longfellow, Washington, Horace Mann, Downtown, Hawthorne, Clara Barton, Lincoln, River Drive, Rose Creek, and Bennett. From this geographical area, the choice of participants was undertaken by selecting two or more participants from each zone and close-linked area.

Population

As previously described, the sampling of the population for this study was based on a marked out geographic area. The choice of participants was also determined on a volunteer basis. However, the researcher, in trying to increase the quality of the sample for the study, made some effort to have a balanced population representation and to include, young, middle-aged, and older adults of both sexes. This intention was partially, but not fully, achieved because of the natural composition of the population in the specific geographic area as one occupied mostly by people who can afford to live in the place. A description of the sample provides further explanation.

Sample

The 22 participants chosen from the described geographic areas were seen as a good representation of the residents from the areas with the greatest flood danger. The researcher also sought external input by including two interviews with individuals who participated in the flood fights but did not live in the danger areas. Table 3.1 is a visual representation of the demographic characteristics of the sample interviewed for this research project.

A brief description of the abbreviations used in this table and the informational content helps the reader to better understand the demographic data. The headings describe the following content: "No" is the participant identification number; "Age" represents the participant's age (It should be noted that participants were given categories: 21+ = 21-40, 41+ = 41-50, 51+ = 51-60, and 61+ =

61 and older.); "Sex" is F for female and M for male; "Ed. Level" is the level of education

reported by the participant (Ph.D. for doctoral degree, MA for master's degree, PRO for

professional degree, BA for bachelor's degree, and Dip for high school diploma);

"Income Level" was self-reported as high, middle, or low; "Home" represents the status of

ownership (owned or rented);

Table 3.1. Demographic Details

No	Age	Sex	Ed. Level	Income Level	Home	In Fargo	In this Resid.	Property Sbagged	Flood Damage	Years of Focus	Flood Insur.
1	51+	F	PRO	High	Own	34yrs	31yrs	Yes	No	2009	Yes
2	61+	M	Ph.D.	High	Own	31	31	Yes	No	1997	Yes
3	51+	M	BA	High	Own	34	20	Yes	No	2009	Yes
4	61+	M	BA	Middle	Own	61	18	Yes	Yes	1997	Yes
5	61+	M	MA	Middle	Own	44	44	Yes	Yes	1997	Yes
6	61+	F	MA	High	Own	20	19/1	Yes	No	1997	Yes
7	51+	M	BA	Middle	Own	58	12	Yes	No	2009	Yes
8	21+	M	BA	Low	Own	23	23	Yes	No	2009	Yes
9	61+	F	Dip	Rtd.	Own	50	20/12	Yes	Yes	2009	Yes
10	61+	M	Ph.D.	High	Own	39	20/1.5	Yes	Yes	2009	Yes
11	51+	F	BA	Middle	Own	40	31	Yes	No	2006	Yes
12	51+	F	BA	Middle	Own	33	11	Yes	No	1997	Yes
13	61+	M	MA	High	Own	37	18	Yes	Yes	1997	Yes
14	61+	F	BA	High	Own	83	43	No	No	Any	Yes
15	61+	M	BA	High	Own	48	43	No	No	2009	Yes
16	41+	M	BA	Middle	Own	27	23/1.5	Yes	No	2009	Yes
17	51+	M	BA	Middle	Own	20	10/18	Yes	No	2009	Yes
18	61+	M	BA	Middle	Own	37	37	No	Yes	2009	Yes
19	61+	M	Ph.D.	Middle	Own	41	31/10	Yes	No	1979	Yes
20	61+	F	BA	Middle	Own	43	33/8	Yes	No	2009	Yes
21	61+	M	BA	Middle	Own	25	25	No	No	1997	No
22	51+	M	MA	Middle	Own	21	13/8	Yes	No	1997	Yes
23	61+	M	Ph.D.	High	Own	35	31	Yes	No	1997	Yes
24	61+	F	MA	Middle	Own	35	31	Yes	No	1997	Yes

"In Fargo" shows the number of years the respondent has lived in Fargo; "In this Resid."

shows how long the respondent has lived in the residence (first number is previous residence

before moving as a result of flood or buyout; second or single number as the current residence);

"Property Sbagged" represents whether the property has ever been sandbagged; "Flood Damage" shows if a resident's home ever incurred flood damage; "Year of Focus" provides the respondent's choice about which flood year he or she wanted to use to start discussing his or her flood experiences (1997, 2006, or 2009); and "Flood Insur." shows if the participant ever bought flood insurance.

The description of the resultant sample is as follows: the total number of participants interviewed was 24. Of these people, 16 were male while 8 were female. Four members of the sample had doctoral degrees; 5 had a master's degree; 1 had a professional degree; 12 had college degrees; and 1 had a diploma. As already explained, their actual ages were not recorded. One person was 21 and above; 1 individual was 41 and between 50; 7 people were 51 and between 60; and 15 people were 61 and older. The shortest number of years any of the respondents lived in Fargo was 20 years while the longest number was 83 years. The longest number of years lived in their present residences was 44 years while the shortest was 18 years. Some (20) of the respondents said they had sandbagged their property to save it from flooding while 4 said they never sandbagged their property. While 19 respondents said they had never had flood damage, 5 people said they had experienced damage to their residences. The flood year choice of residents to begin their discussion split with 11 each for the flood years of 1997 and 2009. One respondent preferred to start with 2006 while one person was comfortable to start with any year because her personal perception was that all years were all the same. Finally, 23 respondents had purchased flood insurance while 1 person had not.

The Qualitative Interview Questionnaire

Before designing the qualitative interview questionnaire for this study, the researcher faced a number of considerations. The first thing considered was how to produce the set of questions that would get the best responses from the interviewees. Many sample qualitative interview protocols were examined to find a design that was best suited for the present research. The researcher finally adopted the qualitative interview design suggested by Janesick (1998). Drawing from this style of questioning which starts questions with words such as "can you describe how," "how do you see," "to what extent would you," "and what does your," the researcher designed the qualitative interview questionnaire. Another consideration was designing the demographic questions. In formulating the demographic questions, the researcher applied the basic demographic survey templates, with minor changes, to adapt the questions to the sample and issues under examination in the study. Sensitive topics, such as age and household income, were left open by providing ranges of years (for age) and general categories of high, middle, and low (for income). For the purpose of validation, the qualitative interview questionnaire underwent three tests. The first test was face validity. The researcher examined the questions to determine if they were appropriate for the researcher's area of study. Second, the researcher consulted content experts who reviewed the qualitative interview questionnaire and approved it as fitting for the research project. Finally, before the qualitative interview questionnaire was used for data collection, the researcher conducted a trial interview with a fellow graduate student and found that the questions were understandable, produced sufficient data, and provided information that could be used to answer the research questions. Satisfied with the results of these validity checks, the researcher proceeded. The interview method applied in this study relied on a blend

of open questions and probes, a qualitative approach that serves best in hypothesis generation

and hypothesis testing. The qualitative interview questionnaire is shown in Figure 3.2.

Figure 3.2. Interview Questions

Age: 21-40; 41-50; 51-60; 61-
Sex: Female; Male
Level of Education: High School; Bachelor's; Master's; Doctorate
Income level: Low; Middle; High
Home: Own; Rent
Have you lived in Fargo for the past 15 years, especially in 1997, 2006, and 2009**?**
a   How long have you lived in Fargo?
b.   How long have you lived at your current residence?
c.   Have you ever had to sandbag your property to protect it from flooding?
d.   Have you ever experienced flood damage to your home?
e.   Fargo has experienced significant flood events in 2009, 2006, and 1997. Thinking of
         these three major floods, which one would you feel more comfortable to discuss first?
         Probe further for the other flood years.
f.   Did you purchase flood insurance in 1997, 2006, or 2009?
Initial Interview Questions
1   Describe your experience or involvement during the recurrent flooding of the Red River
         Valley over the past 15 years.
2 a.   How would you evaluate the information/messages from Fargo city leaders during the
         management of the repeated flood crises?
2 b.   What kind of information/messages from Fargo city leaders did you find to be most
         helpful?
2 c.   What kinds of information/messages from Fargo city leaders did you find to be least
         helpful?
3   Considering the flow of information from city leaders to the residents, did you feel that
         you got enough so you knew what to do and what not to do?
 4   What were your perceptions about the confidence flowing from city leaders themselves
         who were presenting information/messages during the flood crisis?
5   Did you ever think that Fargo community would fail to control the flood? Why or why
         not?
6   How did your experiences in previous floods affect the way you responded to each new
         flood crisis?
7   Would you characterize the Fargo community as complacent or vigilant (or both) during
         the flood crises? Please explain.
8   Would you consider yourself or the community as resilient? Can you tell me more?

Procedure

Data Collection

University policy and federal law demand that all investigators whose data collection process involves human subjects should seek approval from the Institutional Review Board (IRB). The IRB approval for this study was received before the data collection started (See Appendix C). Before the approval was granted, the researcher successfully completed the IRB training. The process of recruiting the actual population was slow and hard, to say the least. Recruiting participants from among the residents living along the Red River meant recruiting from the highest-placed economic members of society. Worse still, the researcher being from a foreign country and having a foreign accent did not make matters easier.

The researcher first sent an advertisement calling for volunteers to participate in the study. This poster, approved by the IRB, appears as Appendix A. Because the data were collected in the already designated areas, mostly along the Red River, these posters were personally delivered to some homes and individuals by the researcher. The researcher had to drive out to these areas at lunch and supper times. Many posters were delivered. After delivering the posters, the researcher had to wait for replies. After some time waiting when nothing seemed to be happening, the researcher started thinking about alternatives. One alternative that came to mind was calling friends from other parts of the state to recommend people who lived in the selected geographic area and whom the researcher could contact. The process yielded some positive results. Some responses also started trickling in as a result of the posters. Applying a snowball sampling method, the researcher was able to identify the desired sample of 24 participants.

The data collection process was completed by asking participants to discuss the interview questions. Before every interview, interviewees read and signed the participant informed consent form, marked Appendix B. After most of the initial answers, the researcher asked some probing questions depending on how much the respondent's answer was to the point, understood, and of sufficient detail. If the initial answer covered the question well enough, the probe was omitted.

Data Analysis

The process of data analysis falls into six phases which, according to Marshall and Rossman (1999), are (a) organizing the data; (b) generating categories, themes, and patterns; (c) coding the data; (d) testing the emergent understandings; (e) searching for alternative explanations; and (f) writing the report. Detailed descriptions for some of these stages follow.

Organizing the data.

The data organizing involved transcribing the recorded data and becoming immersed in the data. The immersion meant reading and re-reading the scripts to familiarize oneself with the recorded interviews. Spencer, Ritchie, and O'Connor (2003) observed that, "this stage involves generating a set of themes and concepts according to which the data are labeled, sorted and synthesized" (p. 214). The detailed description of the data-organization process, in line with the directions of Marshall and Rossman (1999) is presented.

The initial set of interviewees was from the target areas. Every interview was recorded and transcribed by the interviewer before the next interview to enable the researcher to observe the nature of the data being collected as they compared with previously gathered data. Furthermore, during the transcription process, the transcriber, who was also the interviewer, employed the help of a group of NDSU students who listened to the first set of the recordings, compared them with the transcripts, and confirmed the accuracy and correctness of the

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transcription. Only in a few cases, when more than one interview was conducted on the same

day, were the transcriptions of some interview records carried over to the next day. Copies of the

transcriptions were made and read to assess the strength of the data. After about 18 interviews,

the interviewer/researcher started noticing a repetition of some information and descriptions of

certain occurrences. Before total saturation, the researcher chose to go outside the areas at

greatest risk to gain more diversification in the data. These participants were considered for how

they were affected by the flood fights, and participant groupings included "buy-outs,"

"evacuees," and both bought-out and evacuated individuals who had experienced flood damage

as well as those participants unaffected by any of the above.

Once the data were all transcribed, the researcher analyzed the data to determine how

much was usable for the current study. A description of the collected data is given in Table 3.2.

Table 3.2. Breakdown of the Interview Transcripts for Analysis

Description	No. of lines	Percentage
The total data set	2782	100%
Demographic data	314	11%
Lines providing headings for the questions	501	18%
Data pertaining to Interview Question 1	185	6.6%
Data pertaining to Interview Question 2a	184	6.6%
Data pertaining to Interview Question 2b	192	6.9%
Data pertaining to Interview Question 2c	110	3.9%
Data pertaining to Interview Question 3	127	4.6%
Data pertaining to Interview Question 4	130	4.7%
Data pertaining to Interview Question 5	116	4.1%
Data pertaining to Interview Question 6	143	5.1%
Data pertaining to Interview Question 7	119	4.2%
Data pertaining to Interview Question 8	117	4.2%
Data pertaining to Demo Question tales	393	14.1%
Data from final Probes, what else could you share?	151	5.4%

Total Unusable lines = 815= 29.2%
Total usable lines = 1967= 71%

Table 3.2 showed that 1,967 lines of data, equivalent to 71% of the entire data set, were available for analysis while the 815 lines that were generated by demographic information and questions within the text made up the remaining 29.2%. The coding continued with 1,967 lines, reflecting 71% of the data.

Coded Data

The coding process used for the data analysis in this study was previously tested and proven to yield valid results, Corbin and Strauss (2008). The process has three stages: open coding, which "requires a brainstorming approach to analysis" (p. 160); axial coding, referred to as "comparative analysis . . . comparing incident against incident for similarities and differences" (p. 195); and selective coding, by which themes are used to break through data and identify examples. Each of these steps is described in line with the way it was applied to the data for this study.

Open coding.

Because this process is about understanding the data and getting very familiar with them, the transcript was read and re-read three times as the first step of the analysis. After the first and second reading of the entire data, the researcher used markers to highlight important sentences and phrases that seem to have some significance with the research questions. During the subsequent readings, the researcher started pulling those relevant sentences and phrases together as headings. Finally all the highlighted sentences and phrases were further grouped together under each interview question.

Axial coding.

The process of axial coding involves reading through the grouped sentences and phrases to form themes. This process took a lot of mental evaluation to be able to form sentences or

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phrases that appeared many times as expressing some distinct ideas. From such recurring ideas, the researchers formed the themes. In doing the axial coding, the researcher used the constant comparison approach to incorporate the meanings expressed by the themes from the present study with those drawn from previous research to identify the themes and categories that would be used in the third phase of the coding.

Selective coding.

The selective coding process involved using the major themes as categories and returning to the data to identify examples that depicted the themes. At this point of the coding process, the researcher started developing concepts and tying them together in order to answer each research question. The process involved going through the themes many times and matching them with each other to see how they form an idea. The researcher did matching and re-matching of themes to make sure that the outcome gives the correct representations of the evaluations of residents' perceptions. The researcher, in putting these concepts together, was also making sure that the concept statements were coherent. The researcher also completed a final reading to be convinced that the process had yielded satisfactory results. The written report for the results of the coding process is presented in the next chapter.

Summary of the Chapter

In this chapter, the qualitative research approach was justified for use in this study. Interviews, which produce generated data, were preferred to participant observation, which produces naturally occurring data. Three different types of interviewing were considered before unstructured interviewing was chosen for the study. Individual, in-depth interviews were preferred to focus-group discussion.

The geographical area covered by the study was comprehensively demarcated. The chapter also discussed the process of identifying the population for the study and systematically described the sample in greater details. The instrument for the study was described to include the process through which it was designed. Finally the procedure for data collection as well as the process of collecting and organizing the data was explained.

The next chapter presents the results of the entire analytic process. The presentation includes a detailed set of tables that explain the results, as they are organized under different interview questions that are used to answer various research questions.

CHAPTER FOUR. RESULTS

This study explored the perceptions of the residents in Fargo, North Dakota, about the city leaders' communication strategies during repetitive flood disasters that have plagued the city for the past 15 years. The presentation of these results proceeds in seven stages and presents the residents' perceptions as proceeding from their answers to interview questions. The answers to these interview questions are evaluated according to their relationship with each research question. Additional data came from stories that arose as part of respondents' demographic introductions, data from interview question 1which was asked to be sure that interviewees actually participated in the flood fight, and data accrued from the additional probes at the end of the interview. These additional data are also evaluated for strengthening the answer to all three research questions. In each response category, recurrent themes are evaluated to determine their contribution to the clarification of the research questions.

Research question one asks how the messages during the repeated flood crises affected the resolve of the Fargo residents to engage in ongoing flood-mitigation activities. In search for answers to this question, a number of interview questions were asked as follows: 2a. "How would you evaluate the information/messages from Fargo city leaders during the management of the repeated flood crises?" This question had follow-up questions. 2b. "What kinds of information/messages from Fargo city leaders did you find to be most helpful?" 2c. what kinds of information/messages from Fargo city leaders did you find to be least helpful?" Interview question 3, relating to research question one, asked residents: "Considering the flow of information from city leaders to the residents, did you feel that you got enough, so you knew what to do and what not to do?" Interview question 4, relating to research question one, asked the following: What were your perceptions about the confidence flowing from city leaders themselves who were presenting the information/messages?"

Research question two was as follows: To what extent are principles of the HROs evident in the perceptions of community members about how the city leaders managed the flood crises? To find answers this research question, two interview questions were asked. Interview question 5 asked, "did you think that Fargo community would fail to control the flood? Why or why not?" The second interview question specific to answering the research question was question 6, which asked, "how did your experiences in the previous floods affect the way you responded to each new flood crisis?"

Research question 3 asked the following: How were complacency and vigilance reflected in the perceptions of the Fargo residents who had experienced repeated flood crises? In order to find answers to research question 3, two interview questions were asked. 7. "Would you characterize the Fargo community as complacent or vigilant (or both) during the flood crises?" An additional chance was also given to the researcher to probe further. 8. "Would you consider yourself or the community as resilient?" In this question, the interviewer still had options for further probe questions.

The presentation of the data from the interviews proceeded by starting with interview questions relating to research question one. The results from the answers to each interview question were grouped in themes. The analysis of these themes provided a total evaluation of the residents' perceptions about the information/messages coming from city leaders during the repetitive flood crises.

Research question 1: How have the messages during the repeated flood crises affected the resolve of the Fargo residents to engage in ongoing flood mitigation activities?

Three interview questions asked of the Fargo residents who experienced the repetitive flood crises. The answers to these questions were used to answer research question one. Answers

to each interview question were analyzed to glean the residents' perceptions in relation to the research question.

IQ 2a: How would you evaluate the information/messages from Fargo city leaders during the management of the repeated flood crises?

The respondents' answers to this interview question were grouped into four themes: "information got better", "messages improved," "messages good and available," "positive effect," and "negative comments." All four themes were examined and analyzed one after the other, starting with the first one, Information got better.

Table 4.1. Numbers of Responses and Themes Revealed

IQ 1: How would you evaluate the information/messages from Fargo city leaders during the management of the repeated flood crises?

Themes	No. of Responses	Description of themes
Information got better	8	Messages had a gradual improvement
Information sufficient	20	Information was sufficient and to the point
Messages had positive effect	10	Information really resonated well and positively with residents
Negative comments	6	1997 flood fight was chaotic

Information got better.

The perceptions of the Fargo residents about the messages coming from the city leaders have statements showing that the information/messages had a gradual improvement. Statements under this theme appeared in the transcript about eight times. Such statements were as follows: "messages got progressively better," "messages got better with each new flood crisis," "by the time we got through the floods, information became clearer and understood," "each year they got better," "for subsequent years, messages on TV were very helpful," "but each time it flooded

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they got better and better," "after '97 flood, the city became more involved communication wise," and "I think they got better each time we had a big flood."

Information good and available.

Statements showing that, in the residents' evaluation, they felt that the city leaders presented messages that were good and available were recorded under this theme. Such statements appeared 20 times in the data, as follows: "we have a wonderful city management and leadership," "communication was exceptional," "communication was frequent," "I think it has been fantastic," "they were good about keeping us informed about everything," "the engineering department had one man for different areas to keep us updated," "it was wonderful; they offered hope, encouragement, and help with all kinds of information," "it was on moment-to-moment basis," "information was 24 hours a day, and it is wonderful," "very good, the morning meetings … very informative," "I think the city leaders were responsible," "they didn't hide any kinds facts from us," "they were upfront," "the communication line with the people from the city had been excellent," "people we talked to had been very responsive," "they pre-urged things quite well," "our communication was pretty good and consistent," " we had excellent ways of finding out what we needed to know during all that," and "we watched that communication every day."

Messages had positive effect.

The set of statements grouped under this theme represents the evaluations of residents that showed how much the information/messages from city leaders resonated with them. Statements in this category appeared 10 times in the transcript and are presented here as follows: "I give them high marks," "we worked well together," "just excellent," "high degree of organization," "it was just first class," "they did a great job," "they had information out," "if one

had any question you could pretty much get an answer right away," "they were good, they were vigilant," and "if there were any criticism at all, it will be that they were overly efficient."

Negative comments.

In everything that concerns life, there are always varieties. Under this theme, all the residents' communication evaluations that were negative are grouped. In general the negative comments described the 1997 flood experience. Such negative statements appeared in the transcript about six times as follows: "in 1997, there were more uncertainties," "it wasn't a consistent message," "in 1997 flood it was chaotic, there wasn't good communication," "we didn't know for sure what was going on," "there was just chaos, you felt alone," and "in 1997, it was scary, there was no flood meetings."

IQ 2b: What Kind of Information/Messages from Fargo City Leaders Did You Find to be Most Helpful?

The responses to this question were grouped into seven themes: predictions, city activities, resident activities, organizational information, general information, general knowledge, and warnings/readiness. In order to get a clearer understanding of the responses to this question, each theme is given an individual treatment.

Table 4.2. Numbers of Responses and Themes Revealed

IQ 2: What kind of information/messages from Fargo city leaders did you find to be most helpful?

Themes	No of Responses	Description of themes
Predictions	19	Predictions, the most helpful of all the messages
City Activities	13	Knowing what the city was doing was very helpful
General information	15	Helpful information with no particular category
Organizational info.	10	City's messages to keep residents organized
General Knowledge	7	Knowledge-based information to residents
Warning & Prep.	6	Messages with early preparation warnings
Required of Residents	4	Messages telling residents what to do

Predictions.

All the responses describing the presence of such information/messages relating to crest levels, water level, weather, and what the river was doing were grouped under this heading. Information/messages that fall under this theme appeared in the data 19 times. Details of the appearances of the theme were as follows: "I think the crest levels," "weather was important," "was there a storm coming through?," "was it going to freeze," "if there would be ice jams further up the river," "predictions of the crest levels," "what the river valleys were doing?," "how close they were following their predictions," "that we may know the flood levels," "what level they were expecting the river to be," "how high the water was going to be," "how the water was doing," "when it starts going down," "prediction statements fairly absolute," "just the water levels," "how high it was going to be," "how the crest was going to be," "prediction of when the crest was going to come," and "how high the flood was going to come,"

City activities.

This theme describes all the information/messages about the city's responsibilities. The theme also describes what the city should do and what it should provide. The responses that fall under this theme appeared 13 times in the transcript as follows: "what they were doing on their own part," "keeping everybody on the same page," "what needed to be done," "making us have a unified front," "to know who was in charge of our sandbags," "who will bring them," "keeping the people in calm assurance," "supplying equipment," "supplying information and materials," "what area they were going to work on," "what they thought we need to do," "if they needed help for certain areas," and "offer hope and encouragement."

General information.

The theme of general information describes all the information/messages that informed residents but have no particular category. Information and messages under this theme appeared 15 times in the transcripts: "communication was good," "daily briefing," "keep us updated," "we were always in contact," "condition of sandbags," "keep us current," "know what is going on," "general information," "tell us what they think," "whom to call," "all kinds of information," "morning briefing," " updating us," "what area they were going to work," and "daily briefing on Radio and TV."

Organizational information.

There were some information/messages that fall under the category of what the city was doing to keep the community organized. Such information/messages fall under the theme "organizational" and were observed about 10 times in the data as follows: "coordination of volunteers," "when volunteers will be available," "what was going on in my neighborhood," "if we need help for certain areas," "where to get sandbags," "who to call for sand," "what stores were open late," "coordination of groups of people for sandbagging," "where to go for help," and "where to be of help."

General knowledge.

The general knowledge theme represents all the residents' evaluations which state that the most helpful information/messages they received were those through which they learned something new from the city leaders. Statements under this theme reflect the categories of training and learning that appeared seven times in the data: "how they are making our sandbags," "show us how to build sandbags," "how to lay them down," "how to build the dikes," "how to lay them," "building of dikes," and "how to lay routes for the sandbags."

Warnings and preparedness.

The theme of warnings and preparedness describes all the information and messages from the city leaders which gave the residents an early warning and prepared them for what to expect when the flood disaster struck. The evaluations in this category appeared in the data about six times as follows: "things to help us be prepared," "preliminary planning," "telling us to get flood insurance," "warned us to get our houses in order," "to get our papers," and "if we may need gas pumps."

Required of residents.

In this theme, all the activities required of the residents, gleaned from the information/messages from the city leaders are grouped. Information/messages in this category appeared four times in the transcripts: "we have to build the dikes," "if we work together, we get through this," "what we are to do that day," and "the disaster phone lines which we should call and receive answers to urgent messages."

IQ 2c: What Kind of Information/Messages from Fargo City Leaders Did You Find to be Least Helpful?

The responses to this interview question range from outright monosyllabic negation to negations with comments, with some negative and some positive comments to show that there were some information/messages that were not helpful. Because 'no' has no varieties, suffice it to say that the theme appeared seven times in the data. The remaining three themes will be grouped into their categories and explained.

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Table 4.3. Numbers of Respondents and Themes Revealed

IQ 2 c: What kind of information/messages from Fargo city leaders did you find to be least helpful?

Themes	No of responses	Description of themes
Negative Statements	9	Negation of the existence of least helpful messages
Positive Comments	6	Assent that all messages were helpful
Presence of the least helpful	11	Absence of helpful messages in 1997 flood fight

Negative statements.

Most of the statements under this theme were negations of the existence of any information/messages that were evaluated by the residents as least helpful to them. While some were simply "no," expressed the same sentiment with statements such as, "I don't know," or "I don't think so." Such statements appeared in the data nine times with many variations: "I don't know that there was any that weren't helpful," "I don't . . . in crisis any information is helpful," "just can't think of any," "I am not sure about that," "I guess I can't think of any," "I don't know," "I really can't fault them," "I don't really know if there was any," and "well, I can't."

Positive comments.

This theme represents the evaluations that stated that there were no messages that were not helpful and also added a positive statement that all the messages were helpful. Another response category under this theme includes the evaluations that applied double negatives. These two categories, which appeared six times in the data, are as follows: "I don't think that there was any that wasn't helpful," "I think they were all helpful," "I think generally they were all helpful," "I thought they did a very good job," "I guess that's a difficult one to answer," and "I don't think that there was anything they communicated that wasn't helpful."

Presence of the least helpful.

This theme presents the residents' evaluations that showed how they observed some information/messages that were least helpful. Evaluations under this theme are presented fully so that the respondents' points of view are clearly understood. These evaluations appeared 11 times in the transcripts: "In 1997 flood, there wasn't always a unified, uniform or consistent information," "they didn't always coordinate," "In 1997, they didn't always come together," "There might be conflicting messages from one office to another, but I can't even give an example," "I think initially in '97 the first flood, we were kind of like wild, wild west," "we didn't know what we were doing," "we didn't know how to build sandbags," "in '97 they weren't consistent with each other," "just the delay in the notice of the evacuation," "'97 wasn't as ordered as last year's," "in '97 when the gauge failed, we saw the water rising but they were still saying it was not," and, finally, "they were ambiguous when trying to buy our house after the flood."

IQ 3: Considering the Flow of Information from the City Leaders to the Residents, Did You Feel that You Got Enough to Know What to Do and What Not to Do?

From the tone of this question, it would have been easier to group the evaluations into positive and negative. There is only one negative, which referred to the 1997 flood, while the rest of the responses were positive. The following sorting is, therefore, done according to the kinds of affirmations, such as direct affirmations, I-think affirmations, pre-1997 affirmations, help from sources besides the city, unsolicited information, and other positive information. A compilation and brief description of each theme in this category follow.

Table 4.4. Numbers of Responses and Themes Revealed

IQ: 3: Considering the flow of information from the city leaders to the residents, did you feel that you got enough to know what to do and what not to do?

Themes	No. of Responses	Description of themes
Direct affirmations	14	Residents got enough information
I think affirmations	10	Enough information that began with I think
Help from others	12	Helpful info from City leaders direct to residents
Unsolicited affirmations	6	Unexpected helpful information
Other positive affirmations	9	Uncategorized helpful information
Post-1997 Affirmations	5	Information that helped to heave a sigh of relief

Direct affirmation.

The theme of direct affirmation topped all other affirmations in the residents' evaluation of the information/messages coming to them so that they knew what to do and what not to do during the recurrent flood crises. There were many affirmations, but what is presented in this category are the 14 that were direct: "we knew what days we would have sandbags," "we knew what days sandbags would be brought out," "we got lots of communications," "we got enough information," "we got all the information we needed," "they did a very good job giving information to us," "we had up-to-the-second information," "city officials were always on air talking about how things were going," "yes, we did get good information," "yes, absolutely," "absolutely, absolutely," "information was always there," "appropriate information," and " appropriate support."

I-think affirmations.

In this theme, all the affirmations and assurances that the residents got enough information/messages from the city leaders to know what to do and what not to do started with either "I think" or "I thought." There were about 10 affirmations in this category such as: "I think

we did in the last flood," "I think we got wonderful messages," "well I thought so," "yes, I think

we did," "I think the answer is yes," "I felt we got enough," "I thought they did pretty well," "I

thought they were helpful," "I think they did, Oh yes, common sense prevailed," "I think in most

part yes," and "I think we definitely got enough."

Help from others.

The information delivery for this theme was not coming directly from the city leaders,

but was directly or indirectly initiated by them. The category recorded 12 useful

information/messages coming to residents through different sources, either directly or indirectly

mediated by the city leaders: "community meetings ahead of time," "neighborhood meetings

ahead of time," "lots of communications between neighbors, kept each other updated," "city

engineers were available to us," "There were Internet pictures not available before," "the

engineers told us how to lay sandbags," "they taught us how to use plastic wraps to secure

them," "they have websites," "they have alert systems on phones," " they have emergency

response numbers to call," "it didn't always come from the city leaders but the people they set

up," and "neighborhood meetings."

Unsolicited affirmations.

The unsolicited affirmations made up a theme of reported information/messages that

reached the people; even though they messages were important to the residents, they were not

solicited. Most of such messages were reported with clauses such as "even" or "also." Responses

for this theme appeared about seven times in the data: "we had even health information," "told

also what not to touch," "they told us what not to use," "they even chart to show the elevations,"

"reports of what went by, new situations and where trouble sports were," "even what to turn off

and what to unplug," and "to make sure nothing seeps through."

Other positive affirmations.

This theme contains affirmations that were not easy to categorize. The statements in this category are not very direct. They were negative, yet being in the affirmative, they merit grouping as a separate category. Such affirmations appeared about eight times in the data: "the mayor and city commissioners held neighborhood meetings in 2009," "yes they were helpful," "they had meetings every morning, every day," "when we were told to evacuate, we knew why," "we would listen to them every morning," "they did their best to keep us updated," "good information about dike building," and "they had doable plans, and they communicated it."

Post-1997 affirmations.

The evaluations under this theme represent affirmations through which respondents heaved a sigh of relief. They got what was missing in the first year of flood fighting, and it showed from their affirmation that they appreciated such information/messages. Affirmations in this category appeared about five times in the data: "in the beginning they didn't have a lot to pass on, but now they do," "yes after 1997," "they got better," "information got progressively better," and "you knew better as years went by."

IQ 4: What Were Your Perceptions About the Confidence Flowing from the City Leaders Themselves Who Were Presenting the Information/Messages During the Flood Crises?

This interview question generated many very valuable evaluations about the confidence flowing from the information/messages going from Fargo city leaders to the residents during the flood crises. All the evaluations were positive, making them hard to sort. The statements are, however, divided into four themes as follows: confidence in themselves, confidence in residents, other assurance messages, and confidence personified. A brief description of each theme follows.

Table 4.5. Numbers of Responses and Themes Revealed

IQ 4: What were your perceptions about the confidence flowing from city leaders themselves who were presenting information/messages during the flood crisis?

Themes	No. of Responses	Description of themes
Confidence in themselves	12	Perceived leaders confidence in themselves
Confidence to Residents	14	Info that made residents confident
Other assurance messages	11	Strengthening resident's conf. in the leaders
Confidence personified	12	Conf. in the person of Mayor D. Walaker

Confidence in themselves.

Under this theme, the study presents the residents' evaluations that portrayed the city leaders as being confident in themselves through the messages they sent to the residents. The statement categories in this theme appeared about 11 times in the data: "they projected an air of confidence," "they were confident in themselves," "they portrayed a high level of confidence in the mayor," "We were confident because we saw them on TV every day," "from the way they behaved, we believe they can handle it," "from the way they spread information, residents had absolute confidence," "they were strong, forceful, and forthcoming," "they were very calm," "They were very decisive," "they exuded confidence in themselves," and "they were pretty confident."

Confidence to residents.

Residents' evaluations under this theme were grouped in line with how much assurance and confidence residents drew from the statements just by looking at the city leaders and their comportment. In this category, there were about 14 evaluations as follows: "I felt confident with what they were telling us," "they instilled confidence in us," "I trusted them because of previous experiences," "they did it right before so they will do it again," "I felt confident they could

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handle it," "the impression I got was that they were able to handle it," "they were reassuring to homeowners that somebody was there for them," "I felt they were in control," "I felt they were constantly sharing so they can do it," "I felt confident," "I believe what he says," "we are confident that they knew what to do," "they instilled confidence in us," and "I think we felt confident."

Other assurance information/messages.

Under this theme are grouped all the other positive evaluations from residents that helped to strengthen their confidence in the ability of the city leaders to lead them safely through the flood crises. Statements appear under this category 11 times and are presented as follows: "they will give correct information," "they were on the whole encouraging," "they had things under control," "I can't say enough good things about our leadership and their communication style," "they had access to best information and they communicate them," "they were always adjusting," "they knew what needed to be done and did them," "they were organized," "they just became professional flood fighters," "they had a lot of contingency plans, and they told us that in terms of the-what-if-scenario," and "they were all on the same page and were giving useful directions."

Confidence personified.

The residents' confidence about their city leaders rested on the person of the city's mayor, Dennis Walaker. The residents placed much confidence on him. This theme represents the residents' evaluation of the city's mayor's and his participation in the flood fights. The examples in this theme appeared about 12 times in the data and are as follows: "I think, in particular, Dennis Walaker gets a lot of credit," "He exuberated confidence on TV," "Mayor Walaker is solid as a rock," "He never got overly emotional," "never showed excitement,"

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"concern, yes but no panic," "Mayor Walaker was inspiring to everybody," "Mayor Walaker did a phenomenal job remaining calm, very relaxed, never seen to be frustrated," "Mayor Walaker was great," "Mayor Walaker is the water guy," "we have a wonderful spokesman in mayor Dennis Walaker," and "people were comfortable with his knowledge and involvement in the flood fight."

Research question 2: To what extent are principles of the HROs evident in the perceptions of community members about how the city leaders managed the flood crises?

Two interview questions were asked of the Fargo residents who experienced the repetitive flood crises. Their answers to these two questions were used to answer research question 2. Answers to each interview question were analyzed to discover the residents' perceptions in relation to the research question.

IQ: 5. Did You Ever Think that the Fargo Community Would Fail to Control the Flood? (Why or Why Not?)

The responses for this question varied. The perceptions evaluated here were not only based on the facts on the ground, but also on the psychological disposition of individual respondents. Some people were optimists while some were pessimists, but there were others whose evaluations were based on the facts on the ground; this set of respondents was greater. All the perceptions are grouped into three separate themes to represent those who said yes in 1997; those who said yes, as a possibility; and those who said no with or without reasons.

Table 4.6. Numbers of Responses and Themes Revealed

IQ 5. Did you ever think that Fargo community would fail to control the flood?

Themes	No. of Responses	Description of themes
Yes in 1997	5	Fear in 1997 but assured in other years
Yes as a possibility	6	Fargo failure will not for lack of preparation
No with/without reason	10	No fear that Fargo would fail

Yes in 1997.

The perceptions recorded under this theme represent evaluations of residents who feared a failure in 1997, but may have been more assured in later years. The answers expressed some worry and anxiety about the safety of the city during the 1997 flood. Such statements appeared five times in the data as follows: "I think in 1997 there was more anxiety," "well, in '97 I was anxious," "it was harder in '97 when Grand Forks fail," " Yes in '97 I thought we were going to experience the same thing as Grand Forks," and "wow, yea in 1997."

Yes as a possibility.

Under this theme, the responses were rather positive but with guarded optimism. These residents believed that the flood would be controlled but left some opening for the unexpected. For such people, if Fargo failed to control the flood, it would not be that they were not well prepared for it but that "mother nature just proved stronger." Such perceptions appeared six times in the transcripts: "there was always a possibility of Grand Forks," "yes, I didn't but now I do," "yea, I did have doubt in my mind," "you have to have that fear to keep you vigilant," "I always knew better than to think that every area in Fargo will stay dry," and "yes I am a pessimist."

No, with/without reason.

Under this theme, the responses showed the perceptions of residents who never thought that Fargo would fail to control the flood. While some of the respondents offered reasons for their perception, others did not. Statement under this category appeared 10 times in the transcripts and are recorded as follows: "In general I am an optimist," "we have more experience in fighting the flood," "No, I didn't have any fears," "we got much more prepared," "No I always thought we are going to manage it," "No, the lesson of Grand Forks was in everybody's mind,"

"fail to control it? No," "definitely, No," "no, I didn't, I never felt we were going to fail," and "but not in 2009."

IQ: 6: How Did Your Experience in Previous Floods Affect the Way you Responded to Each New Flood Crisis?

This question generated many responses that expressed the residents' perceptions about Fargo during the repeated flood crises. While some people said they learned something generally good, others learned how to do things which, in this dissertation, are referred to as learning in software or in hardware; some others had a negative or a positive experience. The responses generated for this question were grouped under these themes: learning generally, learning in software, learning in hardware, negative experience, and positive experience.

Table 4.7. Numbers of Responses and Themes Revealed

IQ 6. How did your experiences in previous floods affect the way you responded to each new flood crisis?

Themes	No of Responses	Description of themes
Learning generally	9	Learning acquired during the flood crises
Learning in software	7	How to do things learnt during the flood crises
Learning in Hardware	3	Materials to provide before the flood
Negative experience	6	No new learning acquired but stress
Positive experiences	7	What made then stronger to fight the flood

Learning generally.

The perceptions recorded for this theme described the knowledge residents acquired during the repeated flood crises. Those perceptions include those things they learned as individuals as well as what they learned together as a community. The newly acquired knowledge, which appeared nine times in the transcripts, were expressed in these terms: "learning surely improved," "I learned to be personally prepared," "yes we learned what to do and what not to do," "after each flood, you learned how hard it can be," "the more we have been

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having the flood, the more knowledge everybody has," "in the first flood we didn't know what to expect," "Oh yes, I learned a lot in '97," "in '97 we didn't have a clue what we were supposed to do," and "we had to be told everything, now we learned."

Learning in software.

Under this theme, the learning which respondents recorded was about how to do things. The residents' perceptions showed that there were many things that could not be done without prior learning. Such learning was recorded under this theme and appeared in the transcript about seven times in the answers to the question: "I learned how to prepare before the flood came," "how to fill the sandbags," "trouble sports were covered," "how to do things," "how to start earlier emptying my basement," 'to respect the river," and how to build the sandbag."

Learning in hardware.

Under this theme, the learning which respondents recorded was about what to get ready before the flood actually strikes. Having gone through the floods, residents came to learn and know what they had to provide before the flood. In their perceptions, they recorded the materials necessary in order to get them ready for a fair fight with the flood. These evaluations appeared about three times in the data as follows: "learned to provide a generator and pumps," "provide all the equipment you may need," and "we buy back-up pumps."

Negative experiences.

Statements under this theme were the evaluations of residents' recorded experiences that showed perceptions that they did not learn anything new or that they thought the past floods made them feel bad about the new floods. Statements in this category appeared six times in the data as follows: "I didn't think we did anything different," "Very bad, I don't like the stress,"

"you just feel like, not this again," "it is brutal," "it is terrible," "here we go again," and "just too much."

Positive experiences.

The expressions recorded under this theme were residents' perceptions that showed how their experiences improved their power for fighting the flood or made them feel more comfortable fighting the flood. Such perceptions appeared about seven times in the transcripts: "I am much calmer," "with more confidence," "the sequence became easier," "know what to expect," "if we got through '97, we can get through others," "mentally I was geared up," and "every year we are more efficient."

Research question 3: How were complacency and vigilance reflected in the perceptions of the residents of Fargo who had experienced the repeated flood crises?

To answer this research question, two interview questions were asked to determine residents' perceptions about the presence of some psychological constructs, such as complacency, vigilance, and resilience, both among the residents themselves and among the city leaders. Their answers, again, were analyzed to sift out salient point to answer the research question.

IQ: 7. Would You Characterize the Fargo Community as Complacent or Vigilant (or Both) During the Flood Crises?

The responses to this question were also grouped in themes. The responses to this interview question had many statements that were similar, making it difficult to divide them into many themes. The responses were, therefore, divided into two themes, one representing vigilance and the other, instead of being complacent, covers both vigilant and complacency because no response stood for complacency alone.

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Table 4.8. Numbers of Responses and Themes Revealed

IQ 7: Would you characterize the Fargo community as complacent or vigilant (or both) during

the flood crises? Please explain.

Themes	No. of Responses	Description of themes
Vigilant	20	Refute of the presence of complacency
Both Vigilance & Complacency	4	Evaluation show some complacency despite overwhelming vigilance

Vigilant.

The theme "vigilant" was found in all the answers. Respondents only added aspects of

complacency after they had stated that the community was vigilant. Under this theme, the

responses ranged from residents who said simply vigilant, definitely/absolutely, such statements

include, "the community is definitely vigilant," "they are vigilant," "oh, the city is very vigilant,"

"vigilant, very vigilant," "oh vigilant absolutely," "the community is always vigilant," "oh, I say

definitely vigilant." Other comments include, I think, or I would say, were the most recurrent

variations, such statements include, "I think they were vigilant," "I think vigilant," "I think we

are always vigilant," "I would say vigilant, definitely vigilant," "I think definitely vigilant," and

"I will say vigilant." Other additions started with "oh" or "no" in statements such as, "Fargo

community? No, vigilant," "no, we are vigilant," and "oh no, the city is vigilant," while others

just negated complacency by statements such as "there is nothing complacent about the

community," "complacent is not a word for Fargo," "Fargo community complacent? No," and

"no, there was never complacency." The statements under this theme appeared in the data about

20 times. The number of appearances will suffice in this dissertation.

Both vigilant and complacent.

Under this theme, respondents stated that the community was both vigilant and complacent during the recurrent flood crises. One interesting finding was that every respondent explained the reason for the complacency. Because of the reasoning behind the claims, all four statements in this category are fully entered in this dissertation: "those directly next to the river are vigilant, but people a distance away from it became more complacent, saying they handled it before they can handle it again," "I would say both, most were vigilant but few did not get too excited about it until they realized it was pretty serious," "they were vigilant through 2009, but not enthusiastic about it in 2010 and 2011 because of lower crest level," and, finally, "I think they are vigilant during the flood but complacent when it is not flooding."

IQ: 8. Would you Consider Yourself or the Fargo Community as Resilient? (Can You Tell Me More?)

In answering this question, residents evaluated their resilience versus the community's resilience. Their response touched on their individual resilience and the community's resilience as well as added two other themes. These other two themes described what makes resilience natural to the individuals living in the Fargo area and other things they need resilience to accomplish. The responses were, therefore, grouped into four themes: individual resilience, community resilience, resilience naturally, and things that entail resilience.

Table 4.9. Number of Responses and Themes Revealed

IQ 8: Would you consider yourself or the community as resilient? Can you tell me more?

Themes	No. of Responses	Description of themes
Individual Resilience	15	Self-affirmation of resilience by residents
Community Resilience	8	Residents' affirmation of community resilience
Naturally Resilient	10	Residents should be resilient by their nature
Things that entail Resilience	9	Actions only possible by resilient individuals or communities

Individual resilience.

Recorded under this theme were responses that referred to the resilience of the individual Fargo residents as they can affirm for themselves. Some people affirmed it as a matter of fact while others made some statements to show that they are resilient. Those statements appeared 15 times in the transcripts: "I guess so," "yes, I mean you have to be," "I am moderately resilient," "Oh, I think so," "yes , I am," "I am resilient; I do bend," "I guess I am," "Oh yes, I mean because we are fighting the flood for years," "Oh yes, I think so," "Oh I think so Oh sure," "I feel like I am resilient," "absolutely," "Oh yeah, totally resilient," "I am very much so," and "I am resilient."

Community resilience.

In this theme, all the statements referred to the community's resilience. Respondents reported that the community is resilient. They used different statements to report their evaluations which appeared eight times in the data as follows: "Fargo community is amazingly resilient," "As for Fargo community, yeah definitely resilient," "I think resilience is a good attitude for Fargo," "we are very resilient," "the community is quite resilient," "the community is resilient," "Absolutely," and "we are clearly a very resilient community."

Resilience naturally.

Under this theme, the responses of residents who thought that both they and the Fargo community had to be resilient, as a matter of fact, were reported. The residents' perceptions seem to say that it was natural for them, as residents of Fargo, to be resilient. The statements under this category appeared 9 times in the transcript as follows: "to be willing to keep protected, you have to be resilient," "the German in me makes me resilient," "you have to be able to adjust to the situation," "I am a farm girl," "you have to be resilient to survive not just the flood but the

weather," "there is still a settler or a pioneer type spirit in the people," "a bunch of resilience built into the people," "I carry that attitude the whole time," and "optimistic in general."

Things that entail resilience.

The respondents reported many situations and things in which they found themselves that entailed resilience. Under this theme, all those statements about the residents' perception expressed that the actions can only be accomplished by a resilient individual or community. Such statements appeared nine times in the data as follows: "when you get involved in a very exhausting process," "staying awake all night and getting up very early in the morning," "checking the pumps all the time," "to enjoy the beauty of the environment, you have to protect it," "a couple of nights I stay up watching the dikes all night," "I am able to show action," "ability to adapt to situations," " it is not easy to survive in this area," and "struggling with winter."

Additional information was generated from the stories when asking some demographic questions and the data from interview question 1, seeking to discover how much involvement residents had with the flood fights, as well as the extra probes, that asked interviewees to add anything more they may have to say about the flood that had not been covered by the interview questions. These data were also analyzed, and the results which were not specific to any particular research question were applied as extra strength for the entire findings of the study to answer the research questions. These findings are itemized and explained as follows.

The first set of lines is respondents' data from demographic questions and demographic extra probes which generated five themes: 1997 as first choice, 2009 as first choice, matter of fact, bad experience and good experience. The presentation of the themes as well as an individual description of each theme will follow table 4.10.

Table 4.10. Number of Responses and themes Revealed

Themes	No of Responses	Description of themes
First choice as 1997 flood	12	What residents said who started with 1997
First choice as 2009 flood	12	What residents said who started with 2009
As a matter of fact	14	What residents did as if it was just normal
Bad experiences	25	What residents regarded as bad experiences
Good Experiences	18	What residents regarded as good experiences

First choice as 1997 flood.

The statements in this theme were meant to explain what motivated residents to start evaluating their experiences of the repetitive flood crises in Fargo with a particular flood year. Statements in this category appeared in the data about 12 times as follows: "'97 was something different," "it was the worst flood Fargo had seen in over a hundred years," "scary! 1997 was the hardest on me," "after '97, we have taken our precautions," "1997 was traumatic," "in'97, we were surprised by the water level expected," "1997 was probably the second worst," "The flood of '97 was very gradual," "in 1997, every day water rose so slowly," "'97 was such an unknown, all of a sudden, this so-called, 500-year flood was facing the entire community," "1997 was my first opportunity of flooding, it was very scary," and "1997 again was terrifying initially, and then this magnificent bonding of our neighborhood and our community happened."

First choice as 2009 flood.

This theme represents the statements that expressed the residents' reason for starting their discussion with the 2009 flood. There about 11 statements that appeared under this theme: "the 2009 flood was fresh in my memory," "2009, was the biggest thing after '97," "it is 2009, because it was the freshest and most scary," "in 2009, I remember the whole city taking it on together," "2009 was the most memorable; it is the worst flood," "2009 is the one that had the highest crest and the one that probably most stressful," "2009 came up too quick," "2009, it didn't even give us time to sandbag at all," "in 2009, I was most active in sandbagging," "in

2009, the water level was the highest it has ever been in this area; it came pretty fast," and "2009, was really significant personally, because they built a secondary dike with a physical barrier, right beside my house."

Matter of fact.

The statements under this theme reflected what residents did or said that were just business as usual. Statements in this category appeared about 14 times in the transcripts: "we were filling our own sandbags," "we also had weather problem in 1997," "I didn't know how to build the sandbag dike," "I had to go buy a gasoline pump," "I had to keep that balance of the amount of water coming and the amount pumping out," "the neighborhood had 21 pumps going to keep up with the water seeping in," "they weren't sure how much the dike was going to hold," "we had a lot of sandbags in our neighborhood," "a very good effort by everybody involved to do as much as we could as fast as we could to protect the city," "I had 10 thousand sandbags, just in my yard to make a 5-ft dike," "we had so much help from the schools, the volunteers will came from everywhere to help us," "the National Guard and others, we were very fortunate," "flooding was a mixed blessing or a mix bag or whatever you want to say, because it brought the community together. I mean everybody was working and gone their separate ways, but when you sandbagged, everybody was out there, from the judge to the doctors, everybody in the family were fit together," and "flooding was a mixed blessing."

Bad experiences.

The statements under this theme expressed the residents' thoughts about their perceived experiences that were evaluated as bad. Such experiences appeared in 23 statements: "lots of urgency," "lot of emergency," "lots of the unknown," "level of anxiety very high," "there wasn't organized effort on the part of the city in '97," "my sand froze solid," "we were filling by hand,"

"I was building my own sandbag wall," "flood is very time consuming and difficult," "it made my back hurt," "it was a very tense time," "my sandbag wall was licking," "I did not get much sleep," "I didn't have things in place," "my husband had a heart attack," " we lost an older block neighbor," "I think we spent $10 thousand every time we had a flood, just my family, because of all the equipment we had to buy, and people we had to hire"; "we feed volunteers, and people were trooping in and out, and it wasn't home like home normally," "it took a solid week," "2.30 am, the police were at our door, telling us to leave immediately; we evacuated," "we didn't know how to deal with it, nor did the city, so it was a very scary time," "we had nothing," and "we had no experience of this at all till the end; it was really, really unsettling, very unsettling experience"

Good experiences.

The theme of good experiences represented the residents' presentation of the experiences they evaluated as good ones. Statements in this category appeared in the data about 18 times: "just organizing on the part of the city," " they provided sandbags," " they provided volunteers," "they had bags built in '09," "I am pretty good at dike building today," "I had a lot of people coming to help," " I learned a lot about life," "there were people that had built sandbag dikes and they helped with planning the sandbag," "we didn't have to handle the problem of getting people in and sandbagging, because people knew what to do, it went a lot faster," "one good thing is I think we built a lot of camaraderie in the block," "everybody was ready to help everybody else," " we regarded this as a group project," " we were conversing a lot more than we ever did before, and there was that pleasure of living in community," "it was a disaster, but I think it brought out a lot of good in people," "we had people from all over our neighborhood that we didn't even know that were helping us," "it was definitely a team-building effort; I enjoyed the experience,"

"I know it was devastating for a lot of people, but it brought out a lot of good in them"; and "so you got to know everybody on a personal level."

The second group of data was from interview question 1 that asked residents to "Describe your experience or involvement during the recurrent flooding of the Red River Valley over the past 15 years." This question generated 6.6% of the entire data, and was also analyzed and coded. Themes from this interview question assisted in answering the three research questions. Five themes emerged from this percentage of the data as follows: help to others, help given to the city, protecting my home, I did personally, and general helping. These themes are illustrated in Table 4.11. An itemized explanation of each theme follows.

Table 4.11. Number of Responses and themes Revealed

Interview Question 1: Describe Your Experience or Involvement During the Recurrent Flooding of the Red River Valley over the Past 15 Years.

Themes	No of Responses	Description of themes
Help to Others	9	This describes help residents gave to others
Help to the city	9	This describes help residents gave to the city
Protecting my Home	9	This describes residents protecting self/home
I did personally	10	This describes what residents did themselves
General helping	9	Describes what people did just to help generally

Help to others.

This theme represented the help that residents perceived as applying to others. Statements in this category appeared in the data about nine times as follows: "we prepared food for groups," "we always had hot food to warm workers," "I always volunteered," "every day we got out and we sandbag," "everybody did their part, I was there," "we coordinated with the neighbors," "we may be helped out a few neighbors that needed help," " we got there helping all of our neighbors

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to sandbag their backyards," " and "in '97, I was a volunteer, and I helped to distribute sandbags at one my friends' house."

Help to the city.

Under this theme, the residents recorded statements that they perceived as help to the city and, of course, through the city to themselves. The statements in this category appeared in the data about nine times: "we worked as a group in Belmont Park area," "we were incurring expenses all on our own," " people came from everywhere to help," "there over 50 thousand people working in the Fargo dome," "we are here to watch over things, to keep them from walking up on the dike, unless they were assigned people," "I came down actually to this part of the city, where they needed help and we volunteered," "I would call for sand, and they would send it," "they didn't bring in sandbags already manufactured," and "they came all over the community and all of a sudden, here they were."

Protecting my home.

The theme of protecting my home represented the residents' evaluation of contributions that were aimed at helping the community by helping to protect their own homes. Statements in this category appeared about nine times in the data as follows: "I built a clay dike in my dock," "I provided a canoe, belts, and life jackets," "we spend without waiting for refund, because we want to live on the Red River," "we were protecting our entire neighborhood," "we had a particularly significant battle there," "I put in a permanent levee which was just last year," "I felt bad that all these volunteers were here; I would have liked to help in moving sandbags but it wasn't physically possible," " we started sandbagging in winter time to get ready for the spring," "I helped sandbagging and pumping water."

I did personally.

The statements under this theme described actions that the residents perceived as the things individuals did personally to help with the flood fight. Such statements appeared in the data about 9 times: "I know they are going to return the favor," "Oh, I was involved with the sandbagging," "I took part in feeding the volunteers," "we had all of the sandbags and the pumps going all of the time to keep ahead of the water that seeps in," "I would just walk over to the neighbors and help build sandbags," "I would carry sandbags and the next day, I would build sandbag dikes," "my involvement has always been to give up time and effort and historically always sandbagging," "I have worked mostly at sandbag central, filling or just working on filling and placing sandbags," and " Oh, I had been sandbagging every time we have had a flood."

General helping.

Under the theme of general helping, residents expressed their perceptions about what they observed as helping in general both among them and for the city. Statements in this category appeared about 8 times in the transcripts as follows: "all I gave was physical labor," "we were laying sandbags, because it was a city-wide emergency," "the Fargo dome was a place they assembled sandbags," "we worked hard as a community," "I tried to get over to the Sandbag Central," "I made sandwiches for everybody," "we got ourselves organized, and we were at the Sandbag Central," and "you had a whole team of people with the home neighborhood working."

Table 4.12. Number of Responses and Themes Revealed

1. Data from the extra probes: Anything else to add?

Themes	No of Responses	Description of themes
Stakeholders fight flood	13	Just listing all the people involved in the flood
Root of success	10	Things that contributed to the F. fight success
Self-reliance	8	Statements that show residents self-reliance
Good from it	8	Residents memory of good from flooding
General observations	9	Statements that show residents observations

Stakeholders in the flood fight.

This theme represented the residents' recounting of all the people involved with the flood that may or may not have had something to gain or lose in the fight. Statements in this listing appeared about 13 times in the data: "property owners," "the neighborhoods," "people who came in buses just to help," "city workers," "county workers," "city hall people who were trying to think through the process," "men and women who made sandwiches at church basements," "the National Guard," "the Army Corps of Engineers," "the TV and radio folks," "the police," "fire department," and "the national electric."

Root of success.

The statements under this theme represented the residents' expression of the things that they perceived as having contributed to their success in the flood fight. Statements in this category appeared about 10 times in the transcripts: "the first was a kind of hurried thing, but we learned," "the city was much more organized," "very organized," "super organized," "made you feel that somebody has a plan," "this community is a wealthy community," "after the house was flooded, I was able to hire people immediately," "people say you are on the river, you have a great big house, else, you are wealthy," "my job was not to protect my property, I am also protecting the neighbors who live a block or two away," and "another thing that was extremely important is the mobilization of the neighborhood."

Self-reliance.

The statements grouped under this theme represented the perceptions of the residents suggesting that they were ready to work for their survival, even as they expected help from the city. Statements recorded under this theme appeared about eight times in the data: "I know what needed to be done here, that is my problem," "I know what I needed to do in my backyard," "I

call the city for help, told them where I lived, they send sandbags out," "I call friends, neighbors, and relatives, and we start doing it," "we didn't fold our fingers and wait for help," "I started doing it till help comes," "if the city didn't bring sandbags, I will buy them," and "if the neighborhood is not mobilized as it is, the city can bring all the stuff they want, but they would never have been so successful."

Good from it.

Under this theme, residents' perceptions that presented the good things that came through, despite the devastation of the flood disaster, were recorded. The statements in this category included: "my memory of the events, is the work everybody did on my behalf," "it has been an amazing experience," "we have become very good friends as a result of this," "it is like saying, Oh bring it on we are ready," "the score has been, folks 3 the Red River 0; we won," "besides the help from the city, the neighborhood organization, is the biggest factor in being able to deal with this both on the physical and on the emotional basis," and "communication line between the people in the neighborhoods has been extremely important."

General observations.

The statements recorded under this theme were residents' observations that were just casual and general in nature. The statements under this category appeared in the transcript about 8 times: "I feel the city says, we are here to protect your homes and everybody that lives on the high side of the river," "you first have infrastructure to hold you till the city brings help," "we know what to do and when to do it because of the roles people had had in the previous floods," "we sort of knew how things are going to fit together, if and when it happens again," "in the first flood, I was very anxious," "we did have proper equipment," "we didn't have sub pumps and extension cords," and "I put up a clay dike for $7,000."

Summary of Findings

The answers to the interview questions produced sufficient data to answer the three research questions and also provided additional insight for further study. More than 71% of the data collected were analyzed to produce facts with which to answer the three research questions. The analysis of the interview data showed how the Fargo residents perceived the communication strategies of the city leaders. Details of the analysis are presented in Figures 4.1 to 4.12. In the body of the results, an itemized, thematic description of the findings was given.

Under research question 1, there were three interview questions. The data from each interview question was analyzed individually. As Ryan and Bernard (2003) suggested, "more often than not, however, researchers induce themes from the text itself" (p. 275). The themes from the analysis of each interview question were induced from the transcript's text. The three interview questions generated 20 themes. The themes were recorded in Tables 1 to 5. However, in line with the suggestion from White, Woodfield, and Ritchie (2003) that researchers should make their findings easy to understand, all the generated themes for each interview question were given detailed descriptions.

Under research question 2, there were two interview questions. Those questions generated 10 themes. These 9 themes were recorded in tabular form in Tables 4.6 to 4.7. Each set of themes was also detailed for clearer understanding. The same process was also performed on research question 3 for which two interview questions (5 and 6) were asked. Data from these two interview questions is applied to research question 3.

The study also analyzed extra data that were harvested from three sources not directly related to the three research questions. The data came from stories that surfaced as part of respondents' demographic introductions; data from interview question 1, which was asked to be

sure that interviewees actually participated in the flood fight; and, finally, data that accrued from the additional probes at the end of each interview session. The fruit of the analysis for these extra data are part of the findings of the study that could be applied to answer any of the research questions. Chapter five presents a discussion of these findings and applies them to answer the three research questions for the study.

CHAPTER FIVE. DISCUSSION OF FINDINGS

In this study, the perceptions of the Fargo residents regarding the communication strategies applied by the city leaders to mobilize the community and to combat risk fatigue are presented to further the crisis communication theory that vigilance can be strengthened and sustained by communication strategies in line with the HROs. This study has explored the power of communication in resolving the issue of vigilance decrement arising from mindlessness and complacency.

This chapter will review the findings of the study and use them to answer the research questions. The research questions relate to the evaluations of the communication strategies applied by Fargo's city leaders during the repeated flood disasters that faced the city. The chapter discusses the relationship between the findings about the communication strategies for Fargo's city leaders in relation to the communication strategies used by HROs to maintain vigilance and to mitigate crises.

The chapter also presents findings to address a number of theoretical issues encountered through the literature review. These issues include Novak and Sellnow's (2009) observation that "risk issues in organizations frequently originate in or are complicated by communication" (p. 350); and the question from Wang and Kapucu (2007) which inquires, "How does previous threats experience affect complacency" (p. 58). The failure of previous research to identify any study testing HRO principles in a community context is addressed, and a recommendation is offered. Finally, this chapter presents answers to the research questions and their implications in reference to the existing body of knowledge. The chapter concludes with a summary as well as a brief description about what the next chapter presents, concluding with a summary, as well as a brief description of potential applications to come in chapter six.

Research Question 1: Discussion

Research question 1 asked, "How have the messages during the repeated flood crises affected the resolve of the Fargo residents to engage in ongoing flood-mitigation activities?" To answer this research question, three interview questions were asked of the residents to explore their evaluations about the messages coming from Fargo's city leaders. The findings showed that the residents' evaluation gave the information/messages from the city leaders an overwhelming approval, with 183 positive evaluations versus 17 negative evaluations. The detailed breakdown of the evaluations is used to answer research question 1.

The first interview question related to research question 1 was interview question 2a which asked, "How would you evaluate the information/messages from the city leaders during the management of the repeated flood crises?" Residents' evaluation showed a result in favor of the city: 38 positive and six negative. The details of these evaluations showed eight evaluations saying that information got better, which means that the city's messages had a gradual improvement. Twenty evaluations showed that information was sufficient, which means that the residents got enough messages that were also to the point. Another 10 evaluations stated that messages had positive effects, which means that the messages resonated well and positively with residents. Only 6 of evaluations were negative; they referred to the 1997 flood fight as chaotic. This result shows that the information/messages from the city leaders had an overwhelmingly favorable effect on the residents; and that over the period of time identified by this study, there appeared to be important in how the information strategies were perceived by the residents.

The second interview question (2b), asked, "What kinds of information/messages from Fargo city leaders did you find to be most helpful?' In answer to this question, the evaluation

from residents enumerated 74 favorable response categories, showing that they heard helpful information/messages that covered all necessary aspects of their flood-fight needs.

The details of their responses included "predictions," which had the highest rating. From this response, residents showed that they received prediction information which was helpful because it helped them know what to expect. When they were made aware of what to expect, they were better armed to prepare for it. The second-most helpful information/messages was grouped under general information, telling residents all other things they were supposed to know, had 15 responses. With this response, residents' evaluation showed that they received assorted messages, meaning that they were not left in the dark.

The third-most helpful set of information/messages coming from the city leaders was telling residents what the city was doing for its own part in the flood fight. This evaluation received 13 responses. Being made aware of what the city was doing, residents were encouraged to add their own efforts because they knew what the city was doing and they could cover any noticeable deficits. Organizational information which appeared 10 times was ranked fourth in the residents' evaluation of helpful messages. Through this set of messages, the city helped the residents to be organized in the flood fight.

The remaining sets of evaluations were general knowledge, ranked fifth with seven entries; warnings and preparations, ranked sixth with six responses; and things required of the residents, ranked seventh with four entries. While general knowledge information/messages enlightened the residents about what they had to learn, to be effective in the flood fights, the warnings and preparations information/messages gave the notice about the dangers associated with the flood and how to prepare for them. The remaining category which gave residents information/messages about what they were required to do showed that the city solicited their

cooperation. In all, the residents perceived the information they received from city leaders to play a key role in helping them to protect their homes and fight the flood. A brief summary of findings will precede the analysis and answer to the research questions.

Interview question 3 asked, "What kinds of information/messages from Fargo city leaders did you find to be least helpful?" This question received three sets of responses valued at 15 positive against 11 negative responses, which included 9 negative statements that there were no least helpful information/messages, six positive comments which asserted that all the messages were helpful; and. finally, the comments that asserted the presence of some information/messages were least helpful, which appeared 11 times. This last comment stating that there were some unhelpful messages referred mostly to the 1997 flood fight, with just one statement that referred to a message coming from the city leaders to an individual who talked about the city leaders "being ambiguous when they were trying to buy their house." This comment was not concerned with the actual flood-fight message.

From these findings, the study answers research question 1: "How have the messages during the repeated flood crises affected the resolve of the Fargo residents to engage in ongoing flood-mitigation activities?" After presenting the perceptions from the interview questions, the study uses a synthesis of the residents' perceptions to answer the research question. From evaluating the leaders' messages the residents' perceptions were that they got sufficient, positive, and effective messages which were to the point and really resonated well.

Residents perceived that Fargo's city leaders kept citizens abreast of the flood-fight situation with very helpful messages about predictions, to know the river-crest levels, and the weather; to know what the city leaders were doing to handle it; to give residents general information from different categories, letting them know how organized leaders were and

keeping residents organized. The city leaders also gave residents general information about everything; warned them what to expect; and told them what to do in "moment-to-moment," "second-to-second" and "what-if" scenarios.

As for whether there were least helpful messages, the residents' perception showed that most messages were helpful throughout the flood fights, except in the first flood before experience took over. Residents gave very positive affirmations to show that they got enough and valuable information from the city leaders to know what to do and what not to do, "even health information" and "what not to touch and what not to use." With messages that were encouraging, inspirational, cautious, persistent, and consistent, as well as through a communication strategy that involved the participation of all stakeholders, the city leaders strongly strengthened the resolve of the Fargo residents of Fargo to continue the ongoing flood-mitigation activities.

From the answer to research question 1, implications can be drawn. The first major flood in 1997 was a learning experience for the city and for the residents. The messages improved with each successive flood. The improvement shows that the community acquired knowledge from the disaster, a lesson embedded in disasters as suggested by Novak and Sellnow (2009), as well as expanding the theoretical model of participatory communication practices as a builder of collective mindfulness and community resilience.

Information became better, clearer, and more accurate because the city leaders became more knowledgeable and, therefore, more consistent in targeting the right information to the right people in a timely manner. This action of the city leaders is in line with the suggestion of Wang and Kapucu (2007) that "Pre-disaster preparedness is important to deliver the most accurate information in a timely manner (p. 74).

Most of the messages regarded as least helpful were from the 1997 flood. The few messages evaluated as least helpful in later floods, came from few residents who thought that the city started the flood warnings too early in the flood season, making it hard for people to concentrate on other things. This view seems to be in agreement with the suggestions of Wang and Kapucu (2007) that "government should reduce the frequency of warnings" (p. 72).

Residents received enough valuable information, from the city, city representatives, the media, and neighbors and neighborhood relationships, to know what to do and what not to do. This finding is in line with the suggestion by Van Vactor (2011) that collaborative communications involving many stakeholders help in "creating a feedback loop and to keep an alliance properly aligned" (p. 58). The feedback loop held the community together.

Research Question 2: Discussion

The research question 2 asked, "To what extent are the principles of the HROs evident in the perceptions of community members about how the city leaders managed the flood crises?" To answer research question 2, four interview questions were put to the residents.

Four interview questions were asked of the residents to answer the research question 2. The first interview question is, "Concerning the flow of information from the city leaders to the residents, did you feel that you got enough to know what to do and what not to do?" This question received six response categories with 56 favorable statements. The first theme in this category was "direct affirmations" which had 14 statements showing that residents got enough information. Another theme in this category which affirmed that residents had enough information was the "I think affirmations" which appeared 10 times for this interview question. "Help from others" was a theme that appeared 12 times in this category to represent help from the city leaders' messages but also brought them help through individuals other than the city

leaders. There were also "unsolicited affirmations" which appeared six times, showing that residents' evaluations asserted that they received extra useful messages which were not expected but which were helpful to them. The next theme in this category was "other positive affirmations." This theme appeared nine times in the residents' evaluations to show that they received other uncategorized messages that were helpful to them. The last theme in this category was "pre-1997 affirmations." This theme appeared five times with comments that showed how residents heaved a sigh of relief after the flood of 1997. In their evaluations after the 1997 flood fight, residents received more than enough information from the city leaders to know what to do and what not to do during the other floods. The experience of living through multiple floods appeared to have given the residents sufficient information to know what to do in the event of another flood.

The second interview question to answer this research question 2 is, "What were your perceptions about the confidence flowing from the city leaders themselves who were presenting the information/messages during the flood crises?" This interview question produced 4 themes with 49 comments. The responses in this category evaluated the confidence flowing from the city leaders as they delivered messages to residents. The first theme in this response category was "confidence in themselves," which had 12 comments. The comments for this theme showed that residents perceived that the city leaders as having confidence in their ability to control the situation. This confidence appeared to bolster the residents' commitment to do what was necessary to be part of a successful flood fight.

The second theme under this category was "confidence to residents." Statements under this theme appeared 14 times, with comments saying that, through the information/messages coming from Fargo city leaders, residents were more confident that the flood fight was not too

much for them to fight and win. They felt confident through the messages that they could handle the floods. The next theme was "other assurance messages," the messages strengthening the residents' confidence in the city leaders. The final theme for this category was "confidence personified." This theme appeared with 12 comments. These comments presented the evaluations of residents who were expressing confidence in Fargo mayor, Dennis Walaker. They saw a motivating leaders who "exuberated confidence" in himself and helped to strengthen the residents in their decision to join the in flood fight and to put in their best, knowing that they have a man who was "strong as a rock" behind them. To evaluate the confidence of the leaders, residents' belief that the leaders had confidence in the willingness of the residents to fight the flood, and the assurance that the city could be successful against the crisis, contributed to the resolve of the community to work together.

The third question (which is interview question 5) was as follows: "Did you ever think that the Fargo community would fail to control the flood?" The fourth was as follows: "How did your experiences in previous floods affect the way you responded to each new flood crisis?" These questions generated 8 themes with 43 statements. A detailed explanation of these themes follows.

Under the third interview question, three themes were generated to describe residents' perceptions about whether they had any fears that Fargo would fail to control the flood. The first theme, "yes in 1997," expressed residents' perceptions that there existed some fear of failure in their ability to control the flood in 1997 but not for the subsequent years. The second theme was "yes as a possibility" which means that, in their perceptions, there was no reason to fear, but as humans living with probabilities, anything could happen. One of the statements under this theme put it so well, "you have to have that fear to keep you vigilant." The remaining theme, which

appeared 10 times, was a simple negation that there was any fear of failure. The theme showed how residents were confident that they would continue to fight and defeat the flood.

The next interview question, which was connected with how much the experience of past floods, affected the way new floods were perceived, generated five themes. The first theme, which had nine comments, suggested that general learning, which was helpful in attending to new flood crises, was acquired. The second theme, learning in software, which will be treated along with the third theme, learning in hardware, generated 10 statements. The comments under these themes showed that residents perceived that they had learned new things to do, as well as how to do them, in order to survive the flood crises. Despite the positive statements there were still residents who said they neither learned anything new nor transferred any worthy experience from earlier flood fights. Finally, the last theme was a positive assertion that residents were made stronger, through their past experiences, to fight new flood disasters.

To answer research question 2, "To what extent are principles of the HROs evident in the perceptions of community members about how the city leaders managed the flood crises?" this study first identifies those HRO principles evident within the management of the Fargo community as the people were fighting the flood. The process of identifying these principles is followed by a statement to answer the research question.

Community Vigilance through HRO Principles

The Fargo community seemed to have, through its years of fighting the floods, demonstrated all of the HRO principles. Evidence abounds from the findings of this study to prove the point. The first principle, *preoccupation with failure,* describes a situation of "adopting the mindset that anything can go wrong at any time" (Bogue, 2009, p. 22). Adopting such a mindset instills in members an orientation to maintain vigilance at all times. In relation to this

principle, the findings of this study show that residents, as well as city leaders, were preoccupied with failure as seen in statements such as, "it was really helpful that we could all be coordinated, because if one neighbor fails, we all fail," and "the city realizes the impact of what happened to Grand Forks, that you cannot afford to have that kind of an event happening to this community; they are very vigilant and very diligent, making sure we keep protected." Again, "you have to have that fear (of failure) to keep you vigilant." These findings show that the principle of preoccupation with failure is already present in the Fargo community. The findings of this study, however, revealed a marked difference in the understanding and operationalization of this principle of preoccupation with failure, between the HROs and the HRCs. For the HROs, much top-down emphasis is placed on the preoccupation with failure during the training and enculturation process of prospective staff, so that it becomes part of their lives on the job. Employees are repeatedly reminded to expect a failure in the system. Among the HRC, the principle of preoccupation with failure is not repeatedly stressed during times of no crisis. Rather, preoccupation with failure is cultivated as a cultural awareness of the past. The fear of failure becomes a collaborative learning process from past experiences of near catastrophe associated with the least sign of failure.

The next HRO principle is *reluctance to simplify.* Under this principle, HROs endeavor never to treat any operation as if it has been done before. They strive for "a balance between components such as principles and experience, anticipation and resilience, input and demand, routine and non-routine, flux and order" (Weick, 2011, p. 22). The findings of this study show that the Fargo community had this principle already in place, through the constant drilling of residents, to maintain that balance between principles and experience, such as "preliminary planning," "early warnings," "things to help us prepare," and "warned us to get our houses in

order." There was also continuous training to add to the experience: "engineering information," "neighborhood engineers whom we can approach to find out what we are to do," "how to build the sandbags, where to lay them, and how to lay them," "the city engineers were always available to us," and "communications between neighbors themselves, keeping each other up to date." There is also an examination for "a more complex understanding of their environment and operating conditions" (Barrett, 2006, p. 27). This aspect of the principle is available in the findings as "they put everything in perspective," "they did certain dikes at certain times," and "after each flood, they got together and went over the things they failed to see, in the previous flood." This part of this very principle may not have been there in exactly the same form as it was described, but it exists in the Fargo community, albeit in a small form, as shown by these statements.

The next HRO principle is *sensitivity to operations.* The application of this principle comes through when the HROs treat every operation with "a widespread concern for, if not awareness of, the granular details of routine operations" (Bogue, 2009, p. 24). In the Fargo flood fight, this principle is visible, as can be seen in findings, such as; "a couple of nights I stay up watching the dikes all night," "getting very little sleep some nights, up early in the morning checking the pumps," "making sure things are working well," " the city and the engineering department had been so proactive in flood protection," and "the engineers told us how to lay the sandbags and how to use the plastic wrap and how to secure that also." All these statements represent sensitivity to operations.

Deference to expertise is the next HRO principle. This principle describes the HROs' dramatic shift in operational decision making. When the unexpected occurs, decision making shifts to the experts, regardless of status (Frankel et al., 2006). This principle is also present

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among the Fargo community as shown with these statements: "when in the Oak Grove School, they had sandbagged and their dike went down," the city engineers gave way to the Army Corps of Engineers. The city engineering department was in control of all dikes but and they take major decisions but when the unexpected happens, the Army Corps of Engineers as experts usually intervene. This principle was also in place with Fargo community.

The next HRO principle is *Commitment to resilience*. This principle is one that makes the HROs give a quick and complete attention to the minutest sign of error. Bogue (2009) referred to this principle as "'informed gumption' on the part of the staff" (p. 25). He explains that staff "frequently learns from their errors" (p. 25). This principle can also be said to be prevalent in the process of vigilance maintenance in the Fargo community during the flood fight. From the findings of this study, staff error recording and correction were observed in the perceptions of the residents. One such example is as follows: "they had a list and after each flood they got together and went over the things that they failed to see in the previous flood." This quotation is evidence to show that the principle was observed in Fargo's flood fight.

The answer to research question 2, drawing from the foregoing demonstration, is that while the residents were not aware of HRO principles a priori, those principles were evident in the perceptions of the community members through their evaluations of the communication and organizational strategies of city leaders during the management of the repetitive flood crises. Along with the presence of these HRO principles as has been suggested in answer to research question 2, there could also be evidence that the initial base on which HRO principles is built is also observed to exist in the Fargo community.

The findings gleaned through the data from this study show that the base on which the HRO principles were built also was seen during the management of the repetitive floods by

Fargo city leaders. Findings from interview questions answering research question, give support

to the following claim: The findings show that residents feared failure in 1997, yet the city was

able to handle the flood then. The next perception is that residents learned so much from that

flood crises and were so encouraged, that they were determined to fight the subsequent floods

and win. This finding shares a resemblance with the HRO tenets which advocate continuous

learning. Presenting shared knowledge as culture, Bierly and Spender (1995) affirmed, "Theories

of culture are incomplete without collective learning" (p. 643). This assertion seems to be

suggesting that the Fargo community is reflecting vigilance, with the fear of failure as well as

continuous learning, in line with the HRO method of maintaining vigilance. However, there may

be some adverse consequences, in that this assurance may, if not checked, breed complacency in

the future, making fewer people ready to join the fight.

Vigilance through HRO Tenets

A brief history of the gradual development of the HRO tenets, which perpetuates the

theory of the maintenance for continuous vigilance, is presented as follows. The study now

compares the process through which the Fargo city leaders sustained vigilance during their

repeated flood crises, and the HRO process of maintaining vigilance, developed through the

HRO tenets. Each tenet is considered to discover relationships with the activities perceived in the

Fargo community during its flood crises.

One of the first attempts at solving the problems for the maintenance of order and

vigilance in complex systems was from Williamson (1975) who suggested a focus on the self-

interest of the actors in a complex system (Bierly & Spender, 1995). Looking through the

transcripts of this study, evidence abounds to show that one of the factors that motivated the

Fargo residents in the flood fight was self-interest. Examples of self-interest include; "because I

have my own home to protect as well as the rest of the city," "we have to maintain about five

homes in a row here, because some people abandoned their homes, we had to fight the flood

fight in those homes, to save my home also," "you are just yourself and your property and you

felt that you needed to do the best job you could" (to protect it), "We are on the frontline of

defense and they realize that if our home floods everybody goes," and "Calm deliberate message

process really helped us, because we didn't panic as property owners and city defenders." These

findings show that the foundation for developing a high-reliability system was already in place in

the Fargo community.

According to the history of the development of high-reliability systems, the introduction

of culture played a very significant role (Bierly & Spender, 1995). Ouchi (1980) introduced

culture Wilkins and Ouchi (1983) introduced the cultural modes that will control such systems

as, "long history and stable membership; absence of institutional alternatives; and interaction

among members" (Bierly and Spender, 1995, p. 643). Matching these three cultural modes to the

community of Fargo residents seems to show that most members had been part of the

neighborhood for at least 15 years, which is a long enough history. The second mode, absence of

institutional alternatives, also applies because the only possible alternative for remaining a

member of the group is to sell out and park off, which many had done but most refused to do.

The people said; "Absolutely, we will fight the flood because we enjoy living here." The third

mode, interaction among members, is noticeable in the formation of neighborhood teams that

met regularly. The existence of these cultural modes among the Fargo residents seems to affirm

the presence of the base on which a reliable system can be built.

Wieck (1987) and Wilkins and Ouchi (1983) held that culture and learning are the bases

on which high reliability is built, stating that "the existence of culture indicates shared

knowledge" (Bierly & Spender, 1995 p. 644). There is evidence from the transcripts to show that

shared learning has built a culture of shared knowledge among the residents of the Fargo community. One such confirming statement is as follows: "just keeping everybody together on the same page, is what needs to be done, in making us have a unified front." The residents have been through many floods together, "then this magnificent bonding of our neighborhood and our community happened: we got ourselves organized." A situation that was initially horrific "turned out to be a wonderful bonding experience." With every major flood, there is an understanding among the residents, such as:

> It has been a really amazing experience, getting to know the people in my neighborhood and we have all become very good friends, as a result of this and we know what to do and when to do them, because of the roles that people had had, in previous floods, we sort of know how things are going to fit together, if it happens again.

Another person said, "we have worked as a group of people in the Belmont Park area very close." Finally, "one good thing is, I think we built a lot of camaraderie on the block. Everybody was ready to help everybody else." The community lived a shared culture with a way of life that was learned together.

Residents learned from experience to live what Smart et al. (2003) described as individual's personal concern where "personnel are trained and cultured to accept and perpetuate the view that when they see a problem they 'own it' until they solve it or until somebody else who can solve it, takes responsibility" (p. 736). The common feeling among the residents is as follows: "I know what needed to be done here, that is my problem," and "I knew what I needed to do in my backyard so I . . . called the city and told them where I lived and what I needed. They send sandbags out and I call friends, relatives, and neighbors and we start doing it." These facts

show that the key features of high-reliability organizations were already developing in the Fargo community.

Another important finding from this study, which can be seen as a correlation between the Fargo community and HROs, is in the use of communication. In their study of the components of HROs, Iverson and Spradley (2007) observed that, "although the role of communication is highlighted in some HRO principles, communication is perceived of in very instrumental means, as a conduit of information" (p. 3). From this observation, the findings of this study show that at least two basic facets on which the HRO principles were built would not be possible without the instrumentality of communication. Collective mind and heedful interrelations are indispensable conditions for high-reliability systems (Weick & Roberts, 1993). Interrelation and collective mind cannot work without communication. This view is supported by Bierly and Spender (1995) who observed that "the communication behaviors this training produces are absolutely central to keeping the submarine operating" (p. 648). Communication was indispensable in the success of Fargo's community flood fight as it is in building HRO principles.

The findings of this study show that a collective mind and interrelatedness were built within the Fargo community through the instrumentality of communication. Examples abound in the data to include "city officials always on air talking about it," "we got up-to-the-second information," "we got all the information we needed," "we got a lot of communication," "we have community meetings," and "we have neighborhood meetings." With so many statements like this, only a few in the findings are enough to show that communication got the community together in an interrelationship that can work together and be effective. With good, helpful, constant, and necessary communications, Fargo city leaders were able to build a high-reliability

community, a community in which, "when you sandbagged, everybody was out there, from the judge to the doctors, everybody fit together," "so you got to know everybody on a personal level." These statements show that communication can turn a community into a reliable community as has been shown by the findings of this study.

Theoretical Implication of These Findings

Vigilance maintenance and continuous sustenance is a process that involves constant fine tuning. The literature has shown that the HROs, through their principles, have maintained and sustained this process of remaining vigilant better than any other set of principles. From these findings, this study has demonstrated that the tenets, on which the HRO principles were built, are present in the Fargo community. The tenets include, culture, which is shared learning, along with its cultural modes; interrelation or interconnectedness, which acts as a cog that holds the wheels of communications together.

Second, the findings of this study can also identify each of the five HRO principles, preoccupation with failure, reluctance to simplify, sensitivity to operations, deference to expertise, and commitment to resilience, as present in the Fargo community, The theoretical implication of these findings is that, if these principles are found in the Fargo community, they can be found in other communities. Consequently, if these principles exist in Fargo, then the community would have been running a high-reliability system, which would make it a high-reliability community. Therefore, if the Fargo community can run a high-reliability system, other communities can also run high-reliability systems. This study has, therefore, shown that the HRO process can be transferred to communities to make them high-reliability communities (HRCs). However, the ability to become an HRC may be dependent upon the commitment of the

community leaders and residents to be vigilant and the structural capacity to do what is needed to mitigate the effect of the impending crisis.

Research Question 3: Discussion

Research question 3 asked, "How were complacency and vigilance reflected in the perceptions of the residents of Fargo who had experienced repeated flood crises?" To answer this research question, two interview questions were asked, seeking to explore how to characterize the Fargo community and residents, as complacent or vigilant during the flood crises. The findings generated through the first questions show that 20 statements illustrate the Fargo community being vigilant, and only four stand for being both vigilant and complacent. The second interview question, inquiring whether the individuals or the community were or were not resilient generated 42 comments. All the statements claim that both the individuals and the community are resilient. Details of these responses will follow.

To break down the findings further, the first response categories were divided into two themes. While the first theme has 20 statements, all affirming that the community is vigilant, the second theme had four statements, claiming that the community was both vigilant and complacent. These findings can also be buttressed by the responses from the second interview question. In this response category, which had 42 statements affirming resilience for both the community and the individuals, respondents had some important points to make in support of the vigilance of the community. The two important points highlighted by the findings were that the Fargo community should be both vigilant and resilient because it possesses "a settler or a pioneer type spirit" that makes it possible for residents to survive under very tough situations such as "struggling with winter." Another important determinant is that, to be able to do what they do,

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such as making a choice of, "being willing to keep protected you have to be vigilant and resilient,"

According to the residents' evaluations, complacency and vigilance were reflected in the perception of the Fargo residents who experienced the repeated flood crises. While vigilance was perceived overwhelmingly among most residents, as well as in the leaders, complacency was perceived in only in few residents, and neither in the city leaders nor in most residents.

The answer to research question 3 (which states that the Fargo community is, naturally, a vigilant community with some minimal complacency) is in agreement with the observation of Magis (2010) who concluded, "resilient communities hence, learn to cope with, adapt to and shape change" (p. 404). The Fargo community is resilient enough; to survive in a naturally inclement climate, residents must be more vigilant than complacent.

If the Fargo community has been perceived to be a very vigilant community throughout the flood crises, the theoretical implication is that, as was reflected in the answer to research question 1, the communication strategies applied by the Fargo city leaders have contributed to the continued sustenance of that vigilance. These communication strategies should be further explored to determine their relationship with strategies which the literature presents as most effective, such as the strategies used in the maintenance of high-reliability systems.

The Contrast of Complacency

From the literature review, this study examined the existence of complacency. Desensitization and risk fatigue were the first constructs discussed as partial causes of complacency. Desensitization was seen as "a process involving changes in the emotional responsiveness, a gradual reduction in responsiveness to an arousal-eliciting stimulus as a function of repeated exposure" (Krahé et al., 2011, p. 631). Another presumed cause of

complacency was repeated threat warnings. According to Wang and Kapucu (2007), public

complacency is defined as the "public's propensity to believe that a threat would not happen and

therefore the public ignores the threat and is unwilling to prepare for it" (p. 58). A discussion of

these concerns in relation to the findings of this study will add to the existing literature.

In discussing the problem of complacency, Wang and Kapucu (2007) affirmed that "a

clear definition of public complacency and theories on what may cause complacency under

repeated emergency threats have yet to be developed" (p.58). They, however, suggested that

"public complacency is a complex psychological state of human beings that is augmented during

repeated threat warnings" (p. 74). The findings of this study, although silent about the nature of

public complacency, reorganized the existence of complacency not in the public sense, but in a

few individual residents within the Fargo community, during the repeated flood disasters and

warnings. Such complacency was noticed mostly among people who were not immediately on

the flood frontlines. This presence of complacency can be explained as follows: "people next to

the river are vigilant not complacent, but people a distance away from it, become more

complacent." Complacency within the frontlines, which was very minimal, seemed to reflect the

disposition of the people who did not care about fighting the flood, such as described by

statements such as, "some people were selfish or not thoughtful and consequently made up their

minds not to help in the flood," and "I didn't want to do it any more, flood is taking a great deal

of focus." From the findings, what was noticed was not actually public, but individual,

complacency considering the definition by Wang and Kapucu (2007). There was, therefore, the

complacency of individuals, but not public complacency in these findings.

Resilience

Another construct worth considering in this discussion is resilience. As Magis (2010) concluded, "resilient communities hence, learn to cope with, adapt to and shape change" (p. 404). In the findings of this study, there was an overwhelming expression of resilience. Resilience was perceived to be very much visible among both the city leaders and residents. Three very important statements that call for further exploration of the resilience found that, among the residents of the Fargo community, "there is still a settler or a pioneer type spirit in the people," "you have to be resilient to survive not only the flood but the winter," and "there is a bunch of resilience built into the people."

The explanation for this phenomenon may have some significance with the statement from Tidball, Krasny, Svendsen, Campbell, and Helphand (2010), who suggested that, "interacting with nature . . . offers a means of resistance and resilience" (p. 592). The statement has not been tested; however, it may have some significance in explaining the resilience found among the Fargo residents because the result may be because of residents' interaction with nature. Some statements from the findings of this study support this opinion as follows: "I am getting older, and it is getting harder but the beauty of God's environment" (I have to be resilient) and "I am a farm girl." These two statements, as well as the fact that residents enjoy living along the river, confirm that Fargo residents interact with nature, which may have contributed to their resilience.

Summary of Theoretical Implications

Vigilance maintenance and continuous sustenance is a process that involves a constant fine tuning. Literature has shown that the HROs, through their principles, have maintained and sustained this process of remaining vigilant better than any other set of principles. From these

findings, this study has demonstrated, through the thematic examination of both, that HRO principles and base tenets existed in the Fargo community. These base tenets developed through culture, which is shared learning, along with its cultural modes, interrelation or interconnectedness, which act as a cog that holds the wheels of communication together

Second, the findings of this study also identified each of the five HRO principles (preoccupation with failure, reluctance to simplify, sensitivity to operations, deference to expertise, and commitment to resilience) as present in the Fargo community. The theoretical implication of these findings is that, if these principles are found in the Fargo community, they can be found in other communities. Consequently, if these principles existed in the Fargo community, then the Fargo community would have been running a high-reliability system which would make it a high-reliability community. Therefore, if the Fargo community can run a high-reliability system, other communities can also run high-reliability systems. This study has, therefore, shown that the HRO process can be conveniently transferred to communities to make them, high-reliability communities (HRCs).

Summary of Chapter Five

This chapter has discussed the findings of this study and used the findings to answer the three research questions. Before answering the research questions, however, some issues raised through the study's literature review were revisited to assess the successes of the findings about the study in discovering solutions to such issues. One of the issues explored was testing the power of communication to solve risk issues raised or complicated by communication. Another issue was the exploration of some psychological constructs that militate with crisis-mitigation efforts. Such psychological constructs were complacency and resilience. These constructs were then fit into the findings to show how they were addressed. After the presentation of the issues

encountered through the literature review, the findings of the study were then used to answer the research questions.

Finally, the study presented theoretical implications for the presence of HRO principles in the Fargo the community, as a possibility that HRO tenets and principles can be transferred into communities to make them high- reliability communities (HROs). Chapter six presents the conclusions for the study.

CHAPTER SIX. CONCLUSIONS, LIMITATIONS, AND DIRECTIONS FOR FUTURE

RESEARCH

In this study, the communication strategies applied by Fargo city leaders to help residents combat risk fatigue in disaster mitigation and management were explored. The city leaders were perceived by residents to have applied communication strategies that were encouraging, inspirational, cautious, persistent, consistent, and helpful to confront the risk fatigue brought about by a repetitive natural disaster, the yearly flood events. The communication strategies applied by Fargo city leaders corresponded with recommendations of the study done by Van Vactor et al. (2011): collaborative communications involving many stakeholders help in "creating a feedback loop and to keep an alliance properly aligned" (p. 58). The neighborhood organizations in Fargo formed a dependable feedback loop that contributed to the communication of the city leaders in bringing about success.

The study also shed light on some of the issues often raised by or compounded by communication in the process of crisis management. These issues included the psychological constructs such as complacency, vigilance, and resilience. The study also showed how these constructs can affect the community during natural disasters as well as the effect communication strategies have in making disasters easier to manage. This chapter explores the research questions asked and answered to determine their contributions to the literature. The limitations of the study and the directions for future research are also reviewed in this chapter.

Answers to Research Questions

The research questions examined how the messages coming from the city leaders affected the resolve of the residents to continue the ongoing mitigation activities of the repeated flood disaster, the perception of the HRO principles within the Fargo community, as well as how

complacency and vigilance were reflected in the residents' perceptions. The communication strategies applied by the Fargo city leaders were perceived to be so effective that, despite the presence of minimal complacency noticed among some residents, vigilance was assured. All these concerns are assigned to the research questions.

Answers to Research Question 1

The first research question expanded the notion of the theoretical model of participatory communication as a builder of collective mindfulness and community resilience. This exploration was advocated by Novak and Sellnow (2009) who suggested further research into ways in which a participatory model of communication practices can help to build a collective mindfulness and community resilience. The residents of Fargo have given the information/messages from the city leaders such an overwhelming approval that the communication strategy applied must have been very effective. The findings show that the communication was collaborative because it utilized all stakeholders, such as neighbors, neighborhood meetings, and engineering personnel, as suggested by Van Vactor (2011). He suggested that communication which involves multiple stakeholders helps to create a "feedback loop and maintain an alliance properly aligned" (p. 58).

Answers to Research Question 2

In answering research question 2, the findings showed that the perceptions and the evaluations of Fargo residents confirmed the existence of all the HRO principles in the Fargo community. The study examined all the HRO principles in detail to support this claim. These HROs principles -- preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise -- were found in the Fargo community.

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Preoccupation with failure is the principle that forms staff into, "adapting the mindset that anything can go wrong any time" (Bogue, 2009, p. 22). The fear of failure keeps staff on a perpetual vigilance, as can be seen among Fargo residents: "Oh vigilant, absolutely" and "the community is always vigilant." Why are the residents and leaders staying vigilant? "The city realizes the impact of Grand Forks that you cannot afford to have that kind of an event happening to this community," and "you have to have that fear to keep you vigilant." From these findings, the city of Fargo is already living the first principle.

Reluctance to simplify is the next principle. This principle strives to maintain "a balance between components such as principles and experience, anticipation and resilience, input and demand, routine and non-routine, flux and order" (Weick, 2011, p. 22). In line with this principle, the findings of this study confirm, "That's quite a balance, you have to be able to adjust to the situation. Something will go out of balance and that happens over and over again." In addition, the community had "preliminary planning" and "early warnings," "city engineers were available to us" and taught us "how to build the sandbags, where to lay them and how to lay them," we have "neighborhood engineers whom we can approach to find out what we are to do." There are no half measures because everything has to be done the right way or there will be "a lick or a seep" through the dikes. This principle is present in the Fargo community.

Sensitivity to operations is the HRO principle in which staff treat every operation with "a widespread concern for, if not awareness of, the granular details of routine operations" (Bogue, 2009, p. 24). From the findings of this study and as seen in the perceptions of the Fargo residents, this principle already exists in the community. The fact can be proven by statements such as "a couple of nights, I stay up watching the dikes all night," "maintain pumps," "to do that was a 24-hour-day job, and each property in the neighborhood had a minimum of two pumps,"

"the city engineering department had been so proactive in flood protection," and "the engineers told us how to lay the sandbags and how to use the plastic wrap and how to secure that also." All the continuous watching and all these details witness the existence of this principle among the residents of Fargo.

The principle of deference to expertise makes the HROs take a dramatic shift in the operational decision-making process. When the unexpected happens within the HRO system, decision making shifts to the experts, regardless of status (Frankel et al., 2006). This principle was identified to be present among the residents of the Fargo community as the study findings have shown. The engineering departments and the Army Corps of Engineers were set up to handle decision-making when the unexpected erupts.

Commitment to resilience is the HRO principle that makes the HROs give quick and complete attention to the minutest sign of error. Bogue (2009) referred to this principle as "'informed gumption' on the part of the staff" (p. 25). He explained that staff "frequently learns from their errors" (p. 25). The perceptions of the Fargo residents during the flood disaster were that this principle is reflected. From the findings of this study, staff error recording and corrections were observed in the residents' perceptions. One such example was as follows: "they had a list and after each flood they got together and went over the things that they failed to see in the previous flood." This quotation is evidence to show that this principle was observed in the flood fight of the Fargo community. The five HRO principles were shown to be evident in the Fargo community during the repetitive flood disasters.

Answers to Research Question 3

This research question explored how complacency and vigilance were reflected in the perception of the Fargo residents as they experienced the repeated flood crises. The

overwhelming perception for the presence of vigilance among by residents showed that disaster preparedness and awareness were high. Another observation that can be drawn from this finding was that there exist some qualities inherent both in the residents and in the leadership. One of those inherent qualities can be identified in the leadership as the ability to apply a communication strategy that was able to instill vigilance in the residents. The same inherent quality can also be identified in the residents themselves which might have made them so vigilant.

To identify this inherent quality, the findings showed that the residents of Fargo possess "a settler or pioneer type spirit" which makes it possible for them to survive under very tough climatic conditions such as "struggling with winter." To be able to survive, the people must be watchful and vigilant. Tidball et al. (2010) offered an explanation that "interacting with nature . . . offers a means of resistance and resilience" (p. 592). The affirmation is buttressed by Magis. (2010) who concluded that resilient communities hence learn to cope with, adapt to and shape change" (p. 404). For the Fargo community to be able to adapt to its ever-changing and tough climatic conditions, residents must naturally be very vigilant. With a natural resilient spirit supported by a leadership that uses a motivating communication strategy that "exuded" and "exuberated confidence," any community will maintain vigilance and resilience.

The findings of this study that complacency was perceived among the residents, not in the leaders has implications. Wang and Kapucu (2007), in their study of complacency, queried "How does a previous threat experience, affect complacency?" (p. 58). The answer here is that the minimal complacency perceived among a few members was aggravated by their previous experiences with statements such as "very stressful," "extremely disturbing to me," and "I can't

take it any more so I sold out." These statements confirm that previous experiences with disasters and disaster warnings can aggravate complacency.

Other Conclusions

This study has other conclusions to draw from the findings besides the answers to the three research questions. The first conclusion is that the findings showed that, while the HRO principles were proven to be present in the Fargo community, the tenets through which these principles developed were also present. These tenets included shared learning, which is culture; collective mind, which produces collective mindfulness; and interrelation/interconnectedness.

The first of these tenets is culture. The evidence that there were several shared learning experiences among the Fargo community members as they repeatedly engaged in fighting the flood disaster for many years showed that a culture was developing. The proof of this shared learning can be drawn from residents' evaluation in statements such as "we have more experience in fighting the flood," "the community work together," "yes we learned what to do and how to do it," "every year you are more efficient," "the more we have been having this occur, the more knowledge everybody has," "the sequence became easier," and "working with proper equipment and to provide all you will need." These statements witness to the existence of a shared experience.

According to the literature, a shared experience can easily interchange with culture as was stated, "The existence of culture indicates shared knowledge" (Bierly & Spender, 1995, p. 644). Willcoxson and Millett (2000), made it clear, "culture determines what a group pays attention to and monitors in the external environment and how it responds to this environment" (p. 91). Culture, therefore, is the indispensable base on which high reliability is built.

The collective mind normally gives rise to collective mindfulness. The findings of this study reveal that the collective mind built among the residents of Fargo through their flood fights was the function of communication. Evidence is as follows: "just keeping everybody together on the same page is what needs to be done, in making us have a unified front," "lots of communications between neighbors," "city officials are always on air, telling us what to do," "we got enough information to know what to do and when to do them," and "one thing is, I think we built a lot of camaraderie on the block." The camaraderie built was a function of communication, and only communication could maintain it and mold it into a high-reliability system.

Interrelatedness and interconnectedness were also seen to have developed among the Fargo residents as a way of life. In the study's findings, evidence abounds from the perceptions of the residents that there exists a chain of interrelationships and interconnectedness in the Fargo community. Such statements are "we work well together," "we had community meetings ahead of time," "we had neighborhood meetings," and "there were lots of communications between neighbors keeping each other updated." The existence of these perceived relationships has theoretical implications.

Theoretical Implications

Answers to research question 1 showed that the collaborative and participatory communication strategy applied by the leaders of the Fargo community during the management of the repetitive flood crises was very effective. The residents were able to persevere in flood-mitigation activities. Answers to research question 2 illustrated that, through their communication strategy, Fargo's city leaders were able to build a community where all the principles of the HRO existed and were practiced. Answers to research question 3 showed that

the residents of Fargo were vigilant and resilient. There was also minimal complacency observed in a few of the residents. Finally, additional findings from the study showed that shared learning, which grew through the continuous fighting of the repetitive flood disaster, developed into a culture. Through a systematic communication strategy that combined participation and collaboration, the city leaders built the community into a collective mind that was interrelated and interconnected.

According to Weick and Roberts (1993), this interrelation is a base for building a collective mind, and a collective mind is built and sustained through communication. They confirm that "people in close relationships enact a single transactive memory system, complete with differentiated experience" (p. 358). This collective mind gives rise to a collective mindfulness. This collective mindfulness which has been produced and sustained by a collaborative and participatory communication has become the culture of the Fargo community.

This study contends that the Fargo community, through a collaborative and participatory communication strategy, has become a community where all the principles of the HROs, as well as the three foundational tenets of the HRO principles (interrelation/interconnectedness, collective mind, and culture) exist. The Fargo community must be running a high-reliability system, making it a high-reliability community. If Fargo can run with high reliability, the HRO principles can be transferred to communities. If there can be high-reliability communities, then Fargo is a high-reliability community (HRC). The study has added to the literature, including the possibility that communities can operate high-reliability systems to become high-reliability communities (HRCs).

Summary of Conclusions

The findings of this study have been applied to answer many crisis-communication concerns, to respond to some crisis-communication queries, to support and advance some crisis-communication theories, and to propose a new crisis-communication hypothesis. These study achievements were all presented in these conclusions as follows.

Communication can solve many of the communication-induced and/or aggravated psychological constructs as complacency induced by desensitization and risk fatigue. The problem was raised by Novak and Sellnow (2009) who observed that, "risk issues in organizations frequently originate in, or are complicated by communication" (p. 350).

The power of collaborative communication was verified and supported by this study. The proposal stated, "collaborative communication involving many stakeholders helps in creating a feedback loop and keep an alliance properly aligned" (Van Vactor et al., 2011, p. 58). The collaborative communication which involved all stakeholders in the Fargo flood fight created and maintained the feedback loop.

The query proposed by Novak and Sellnow (2009) suggested further research to test "the theoretical model that supports the implementation of participatory communication practices for enacting and supporting collective mindfulness" (p. 369). The findings of this study showed that the perceptions of Fargo residents revealed that the communication strategy applied by the Fargo city leaders which got everybody involved in communicating, person to person, neighbor to neighbor, neighborhood to neighborhood, leaders to residents, and residents to leaders was a test of the model. This communication model helped to build the Fargo community into a collective mind and a collective mindfulness.

The findings of this study supported the proposition that "interacting with nature . . .

offers a means of resistance and resilience" (Tidball et al., 2010, p. 592). The perception of the

Fargo residents suggested that the source of their resilience was their closeness to nature. The

study also provided an answer to the query "How does previous threats experience affect

complacency?" (Wang & Kapucu 2007, p. 58). This query was answered by the findings of this

study which showed that the minimal complacency found among the residents of Fargo involved

in the repeated flood warnings and crises was a product of their previous flood warning

experience.

The findings of this study reveal that the perception of the Fargo residents affirmed that,

from their shared experience, developed into a community culture of flood fighting. The

community has a culture, and culture is a strong base for building high-reliability systems. A

community can develop into a high-reliability system. Another finding of this study that adds to

the literature of crisis communication is that the collective mind and the subsequent collective

mindfulness which are necessary for HROs start through interrelations and interconnectedness as

verified by the perception of the Fargo residents. Finally, from the study's findings, all the five

principles of the HROs were seen to have been developed among the Fargo community, to make

it a high-reliability community (HRC). Communities can develop into a high-reliability system

to become HRCs.

Limitations and Directions for Future Research

This exploratory study has ventured into two areas of study that have not received very

much attention in crisis communication: exploring the presence of complacency during repetitive

natural hazards with the potential to become disasters and exploring the possibility of

transferring the high-reliability organization's tenets and principles into communities resulting in

their transformation to high-reliability communities. The nature of this kind of exploratory study opens the door for a new line for future research to validate or refine the findings of this study.

One of the limitations of this study is that it explored a natural hazard where the frequency of potential disaster was limited to a yearly occurrence. This yearly frequency makes it hard to determine whether complacency was caused by the media-induced causes, such as desensitization, or by the burnout arising from the fatigue of fighting the floods. Future researcher in this area of study should endeavor to study a more frequent disaster occurrence to identify the true cause of complacency. For example, multiple tornadoes experienced by a community during a single year or season will make an interesting study.

Another limitation placed on this study is that it was conducted among residents living along the Red River in one community. The source of this limitation is that most of the people who can afford to live along the Red River are individuals who are wealthy enough to afford enough resources to be able to bounce back after a potential flood hazard. Testing their resilience presents some difficulties of identifying the true source of their resilience. The findings have facts to doubt the source of the community's resilience such as, when told to evacuate, one respondent said:

> "even though it was the worst feeling I have ever possibly experienced, I knew that I could go to the bank and write out a check and stay in a motel or that I could write out a check when the flood was over and may be start fixing the house back up. What kept me going was the fact that I had some cash in the bank."

Other such statements are as follows: "this community is a wealthy community," "you live on the river, you have a very great big house and else you must be wealthy,' and "currently, we put our own money in to ensure the safety of Fargo, without getting any funding back, because we

want to live on the Red River." Statements like these prove the point of the limitation. Future research that explores resilience during disasters should target a more mixed-income sample of participants.

Despite these limitations, this exploratory study makes several contributions to the existing literature of crisis communication. Although communication may be responsible for some issues that arise in organizations, communication still remains the best tool to rectify them. Another contribution of this study is that HRO tenets and principles can be effectively applied to communities to make them high-reliability communities (HRCs). The research on this topic should be ongoing to strengthen these findings and to fully extend high reliability to community life.

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A Red River Flood Study Calling!!

Kindly come and participate in a very important study. The study will explore how Fargo residents' have successfully contained the repetitive flood disaster. The title of the study is: Vigilance versus Complacency: The Use of Communication Strategies During Natural Disasters to Confront Risk Fatigue. We are looking for residents who have lived in the flood zones of Fargo for the past 15 years especially through the 1997, 2006 and 2009 floods. We are looking for residents from the FEMA designated danger zones along the Red River. These zones include from North to South: Trollwood, Longfellow, Washington, Horace Mann, Downtown, Hawthorne, Clara Barton, Lincoln, River Drive, Rose Creek and Bennett. We need at least two volunteers from each of these zones.

Participation in the study will not cost you more than just an hour of your time, but you will have contributed to the advancement of knowledge and to a better understanding of how the Fargo community has sustained their resilience through so many years of repetitive flood crises. Yes: you will have helped other people to learn from Fargo how to stay vigilant.

The choice of the place and time of the interview will be between you and the interviewer. The interview will be tape recorded. However, we will keep confidential any research records that identify participants. There is no anticipated risk for participating. Come and share your personal experiences with the world. The appropriate number of participants/interviewees needed will be 20 to 30 individuals.

You can reach the researcher at:

Matthew Attansey, Dept. of Communication, North Dakota State University. Phone: 701-490-5848 or by email at, matthew.attansey@ndsu.edu

Note: This advertisement will handed to people who live within the FEMA designated danger zones and also pasted around those danger areas, which include: Trollwood, Longfellow, Washington, Horace Mann, Downtown, Hawthorne, Clara Barton, Lincoln, River Drive, Rose Creek and Bennett. See the maps below.

APPENDIX B. PARTICIPANT INFORMED CONSENT

<u>NDSU</u>   **<u>North Dakota State University</u>**   701.231.7783
Fax 701.231.7784

Department of Communication #2310
P. O. Box 6050
Fargo, ND 58108-6050

Vigilance versus Complacency: The Use of Communication Strategies during Natural Disasters to Confront Risk Fatigue

You are invited to participate in a research study conducted by Professor Robert Littlefield, professor of communication and Matthew Attansey, a doctoral student at North Dakota State University. In order to participate, you must have lived in Fargo from 1996 through 2009, or at least 1997, 2006 and 2009 when Fargo experienced three flood crises.

The purpose of this study is to explore and evaluate the communication strategies used by Fargo city leaders to persuade residents to work together as a community to withstand the repetitive flood disaster that threatened the city especially in 1997, 2006 and 2009. You will be asked to identify general demographic information about yourself and to discuss your level of involvement in flood fighting activities during those three most recent flood crises in Fargo.

If you agree to participate, you will agree with us for your convenient time and place for an hour interview on your contributions during the flood fights. The interview will be tape recorded and the tapes stored securely in sealed cabinet until 02/29/2014 when they will be destroyed. The risks from participating are minimal, but be assured that the researchers have taken reasonable safeguards to minimize any possible risks to you. There are no tangible benefits from participation. However, the benefit to society in general will be the advancement of knowledge and better understanding of how the Fargo community responded during recurring flood crises.

There is no cost for participation, other than your time and contribution to the discussion. We will keep confidential any research records that identify you. Your individual comments will be combined with those from other people taking part in the study. When we write about the study, we will write about the combined information that we have gathered, keeping your name and other identifying information private.

If you have questions or concerns about the study, you can contact the researchers, Dr. Robert Littlefield at 701-231-7783 or Matthew Attansey at 701-490-5848. You have rights as a participant in the research and you may talk to or contact NDSU Human Research Protection by Telephone (701-231-8908), E-mail (ndsu.irb@ndsu.edu), or USPS (NDSU HRPP Office, NDSU Dept. 4000, P. O. Box 6050, Fargo, 58908). The role of the Human Research Protection Program is to see that your rights are protected in this research; more information about your rights can be found at www.ndsu.edu/research/irb.

If you are freely making a decision to be in this research study, signing this form indicates that: (1) You have read and understood this consent form; (2) you have had your questions answered and (3) you have decided to be in the study. You will be given a copy of this consent form to keep.

_____   _____   _____

Your Signature   Your Printed Name   Date

_____ _____ _____
Signature of Researcher   Printed Name of Researcher   Date

APPENDIX C. IRB APPROVAL

NDSU   NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

Office of the Vice President for Research, Creative Activities and Technology Transfer
NDSU Dept. 4000
1735 NDSU Research Park Drive
Research 1, P.O. Box 6050
Fargo, ND 58108-6050

701.231.8995
Fax 701.231.8098

Federalwide Assurance #FWA00002439

IRB Certification of Exempt Human Research Project   **February 23, 2012**

Protocol #HS152138
**"Vigilance Versus Complacency: The Use of Communication Strategies During Natural Disasters
     to Confront Risk Fatigue"**

Robert Littlefield
Dept. of Communication, 202 Ehly Hall

Co-investigator(s) and research team: **Matthew I. Attansey**

Study site(s): **Fargo**   Funding: **n/a**

It has been determined that this human subjects research project qualifies for exempt status (category #
<u>2b</u>) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of
Human Subjects*). This determination is based on the revised protocol application received 2/22/2012.

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the
  research after <u>2/22/2015</u>, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make
  changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to
  eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is
  available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or
  unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported
  in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance
  with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,

Teryl Grosz, MS, CIP
Manager, Human Research Protections Program

NDSU is an EO/AA university.