AN INVESTIGATION OF THE IMPACT OF SOCIAL VULNERABILITY RESEARCH
ON THE PRACTICE OF EMERGENCY MANAGEMENT

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This dissertation examines the extent to which social vulnerability, as studied by researchers across multiple disciplines, has influenced the practice of emergency management at the local level. This study addresses two major research questions to accomplish this goal. First, how do local emergency managers perceive and define social vulnerability? Second, what strategies do local emergency managers employ to reach and meet the needs of socially vulnerable populations? Semi-structured interviews were conducted in person or by phone with a sample of local emergency managers, city managers, and American Red Cross personnel from the Houston - Galveston and the South East Texas regions as defined by the respective Councils of Government. A modified grounded theory approach was used with a constant comparative method to identify themes for each research question. Triangulation was accomplished through secondary census data and supplemental interviews. The interview data reveal that social vulnerability research has had an indirect influence on the practice of emergency management at the local level. This influence is facilitated through state and federal policy, training, and plans development. Based on the interview data, four themes were identified that capture the various ways in which local emergency management officials perceive and define social vulnerability. These include vulnerability as poverty and culture, vulnerability as a lack of security, vulnerability as a moral imperative, and vulnerability as a lack of awareness and knowledge. In terms of strategies employed to address social vulnerability, the data suggest four themes: leaving it to the professionals, bringing in volunteers, leveraging protocols to build buy-in, and fostering flexibility. The findings reveal the importance in closing the knowledge gap between
research and practice, because increased damage, harm, and death can occur when the social inequalities of everyday life are not addressed in the planning process by emergency managers. The findings also reveal that state and federal policy, training, and plans development are the most trusted sources by emergency managers to transfer knowledge to practice. Additionally, with the proliferation of emergency management degree programs at the undergraduate and graduate levels, higher education can potentially play a more active and visible role in bridging the gap between research and practice, particularly as it relates to social vulnerability.
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CHAPTER 1
INTRODUCTION

1.1 Problem Statement

In many professions, a gap exists between theory and research on the one hand and application and practice on the other (Fothergill, 2000). Throughout its history, the profession of emergency management has also been plagued by such a gap (Neal, 1993). While there are several important areas in which the gap between research and practice is visible, such as the current policy trend toward greater centralization and standardization of emergency management when research has long emphasized the importance of decentralization and flexibility, this study will focus on one important issue – namely, social vulnerability. Specifically, the guiding question of this dissertation is, to what extent has the issue of social vulnerability, as studied by researchers across multiple disciplines, influenced the practice of emergency management?

For decades now, researchers have underscored the role of social vulnerability in terms of shaping people’s exposure to hazards and their experiences with disasters (Blaikie, Cannon, Davis, & Wisner, 1994; Wisner, Blaikie, Cannon, & Davis, 2005). Despite the growing interest in social vulnerability among researchers, disasters continue to impact some groups more severely than others, which underscore the gap between research and the practice of emergency management. In recent years, it is arguable that no other disaster has exposed the importance and consequences of social vulnerability more than Hurricane Katrina, which struck the Gulf Coast of the United States in 2005.

Hurricane Katrina, as a focusing event, exposed weaknesses in the U.S. emergency management system by revealing the social inequalities that existed prior to, during, and after the
disaster (Birkland, 2006, 2009; Rubin, 2012). In its aftermath, several studies have examined the role of social inequalities in the production of the Hurricane Katrina disaster. Many of the studies focus on New Orleans because of the massive political, systematic, and physical failures that highlighted the social inequalities of the city (Nigg, Barnshaw, & Torres, 2006). For example, Sobel and Leeson (2006) attribute local levee repair and retrofit failures to political motivations and political conflicts. The levee system combined with commercial ship channel dredging for political and economic gains led to an expansion of habitable area over marshland (Burby, 2006). These policy decisions prior to the event then produced increased vulnerabilities for many neglected groups, including the poor and racial minorities (Dehler, 2008).

Many of the vulnerable populations, in New Orleans, lacked transportation or were financially unable to evacuate. According to Nigg et al. (2006), although a transportation plan was in place, the plan did not establish a responsible agency to initiate mobilizing city and school buses. Additionally, Amtrak provided free services to evacuate the city, but the last train left New Orleans empty. This resulted in the execution of self - evacuations during and after the event because the mandatory evacuation and response came too late.

While the experiences of socially vulnerable groups in New Orleans have been well documented, some studies have also pointed out the consequences of social inequality in other areas throughout the Gulf Coast region. For example, nursing homes that housed and cared for elderly residents experienced many challenges. In particular, federal protocols resulted in Louisiana and Mississippi gas stations denying fuel to sheltering nursing homes with law enforcement threatening arrest if the nursing home took fuel (Laditka et al., 2008). The Southeast Texas region, including the greater Houston area, which was in the projected path of the storm,
managed to escape severe damage, but Hurricane Katrina nevertheless exposed weaknesses in the Southeast Texas and Houston area ability to address the needs of vulnerable populations.

Besson (2015), in a news article on the 10 year anniversary of Katrina, reminded the public of the more than 100,000 New Orleans evacuees to Southeast Texas and the Houston, Texas area that lay in the path of Hurricane Rita just four weeks after Katrina. Prior existing and ineffective transportation capacities marred the evacuation process in preparation for Hurricane Rita in Southeast Texas. News reports showed traffic moving at rates of one mile in an eight-hour period, which forced unprepared evacuees to leave vehicles on the side of the road because fuel stations along the evacuation routes ran dry. These failures are attributed to the images of Hurricane Katrina as well as the 10,000 Katrina refugees in Southeast Texas along with approximately 250,000 Katrina refugees in Houston, Texas. This resulted in a reported 121 deaths that were not related to the physical characteristics of Hurricane Rita, such as wind, rain, and storm surge.

Since the 1950s, federal regulations and executive orders have strived to reduce the effect of social inequalities in the delivery of all federal services. For example, The Civil Rights Act of 1964 - Title VI protects the public from national origin discrimination. Executive Order 13166 (2000) requires federal agencies to evaluate their programs and ensure improved service provision with meaningful access for limited English proficiency populations (LEP). Subsequently, the Justice Department issued a 2002 LEP Guidance to ensure enforcement of the 1964 Civil Rights Act Title VI for LEP populations receiving federal financial assistance. Though these federal actions occurred separately from the growth of the social vulnerability concept, they provide evidence that the federal government is attuned, to some extent, to the social inequalities that exist in everyday life. For example, the introduction of the FEMA whole
community model and the 2011 Presidential Policy Directive (PPD-8) suggest support of a decentralized community-based problem solving that seeks to include all populations, especially the most vulnerable, in the emergency management process.

While emergency management aims to protect all people from all hazards, the nation’s experience with Hurricane Katrina reminds us that the occurrence of avoidable damage and casualties, largely attributed to social inequalities, continue to occur. Despite decades of theoretical development and empirical research on social vulnerability, many challenges continue to arise when disaster strikes, as shown so vividly during Hurricane Katrina. For example, Phillips (1993) predicted future social vulnerabilities when she warned that we do not need to wait for future disasters to know how special populations will be affected by future events. In order to better address these challenges, which, based on the research literature are to a large extent predictable, we must begin to bridge the gap between research and practice and more fully integrate our knowledge of social vulnerability into the practice of emergency management.

1.2 Knowledge Transfer

Research is expected to provide solutions to practical problems (Hummel, 1997). This is even more applicable for a practice-based field such as emergency management where lives and public safety are at stake. Practical knowledge is assumed to be at least partly constructed from research knowledge (Van De Ven & Johnson, 2006). However, while emergency management has to some extent been influenced by research findings, “far more is known than is ordinarily applied” (Drabek, 1991, p. 3), an observation that has recently been reiterated by Drabek (2010). Quarantelli (1993) argues that it is not possible for practice to operate in the research framework or for research to provide all of the useful information needed in practice. However, according to
Gera (2012), this disconnect between research and practical application can be addressed if research explains to practice what their knowledge means, in understandable language, rather than simply providing what they know.

An understanding of the general aspects of knowledge transfer helps to grasp better, how social vulnerability research has influenced the practice of emergency management. For example, a problem must occur before practitioners will search for information, and the practitioner will apply practical solutions, based upon their and their peers’ experiences, before searching for theoretical solutions (Hummel, 1997). Therefore, when a breakdown occurs in practice, and previous experience does not provide a solution, it is then that practitioners will turn to theory for a solution.

In 1993, the *International Journal of Mass Emergencies and Disaster* (IJMED) acknowledged the need to bridge the gap between researchers and practitioners with a special issue focusing on integrating, converting, and bridging disaster scholarship and professional practice. Several influential scholars contributed articles that addressed the knowledge gap in emergency management as well as impending social vulnerability issues such as cultural diversity in communities. The special issue came out of a 1991 conference at the University of North Texas. The conference was motivated by research that had uncovered widespread belief among emergency management practitioners in the myths of disaster, a lack of disaster plan creation, and a lack of understanding of the realities of sheltering needs, topics which have been thoroughly researched. A primary outcome of the conference, which in part motivated this dissertation, was a call for greater attention to the issue of cultural diversity in disaster planning.

The issues of knowledge transfer are important for this study because barriers can affect which information the emergency management professional receives and thus, the manner in
which emergency managers define and react to problems. This disconnect can subsequently affect how the needs of vulnerable populations are reached and addressed. While there are a number of models that have been identified to explain knowledge transfer as a concept, the most prominent model in public administration and public management is the transfer strategy model (Van De Ven & Johnson, 2006; Vogel, 2010). However, the main issue is that the transfer strategy model requires translation into an understandable form because of institutional, cultural, and language differences between research and practice. While researchers must change their writing style for different journals, institutional requirements do not reward changing writing style for practical application.

Evidence that predictable challenges, such as social vulnerability, continue to plague emergency management highlights the fact that challenges and barriers to knowledge transfer persist. For example, in the hazards community, researchers and practitioners have reported that research and practice have different cultures, restraints, and rewards that require links for translation between research and practice through education and professional organizations (Fothergill, 2000). Cultural differences and institutional factors affect the amount of effort that researchers and practitioners are willing and able to invest in knowledge transfer. Ultimately, this reveals a lack of reward and incentive for researchers to get information to practice and practitioners to seek out new research.

A number of fields and disciplines have attempted to alleviate transfer barriers and challenges by creating independent knowledge transfer areas of study that focus on specialized knowledge transfer needs. For example, the health field developed knowledge transfer professionals, such as the Saskatchewan Health Research Foundation in Canada (Graham, 2008).
Thus, the field of emergency management research is not unique in terms of its need for a mechanism to bridge the longstanding gap between research and practice.

1.3 Research Objectives and Questions

The primary goal of this dissertation is to understand better the impact of social vulnerability research on the practice of emergency management at the local level. As such, it aims to bridge the theory to practice divide for researchers and emergency management practitioners. Toward that end, this study seeks to answer two important questions. First, how do local emergency managers perceive and define social vulnerability? Second, what strategies do local emergency managers employ to reach and address the needs of vulnerable populations?

1.3.1 Understanding How Emergency Managers Perceive and Define Social Vulnerability

RQ1: How do local emergency managers perceive and define social vulnerability?

Practitioner perceptions of what constitutes the challenges or problems of disaster, such as social vulnerability, influence how emergency management operates at the local level. In other words, the way that emergency managers perceive and define the problems they face will determine how problems are solved. Failure can then result, not because the wrong solution was applied but because the wrong problem was addressed (Pavlak, 1988). The issue for practice then becomes identifying the problem correctly in order to address effectively the issues of social inequality.

For example, social, political, and economic policies can result in unintended consequences for certain populations. These underlying societal issues may not be a result of the emergency managers’ actions. However, they are issues that a growing body of research suggests
that emergency managers should be aware of in the planning process to resolve the problems of social inequalities in disaster. In light of recognized failures during focusing events such as Hurricane Katrina, it is important to understand the extent to which local emergency management officials perceive social vulnerability as a problem. By doing so, research can better understand the impact that social vulnerability research has had on the practice of emergency management. This is the first step in moving research into practice and facilitates closing the gap between research and practice.

1.3.2 Strategies for Addressing Social Vulnerability

RQ2: What strategies do local emergency managers employ to reach and address the needs of vulnerable populations?

Understanding local emergency management strategy is vital because, “it must be foolishness or madness to intervene in systems that people depend on without knowing how the systems work (Dombrowsky, 1998, p. 29).” The social vulnerability concept emphasizes the pre-existing social inequalities, which can result in disaster, rather than the traditional technocratic or bureaucratic response of disaster management (Bolin and Stanford 1998). The strategies that emergency management employs can either enhance or diminish the ability to meet society’s needs, and specifically the needs of vulnerable populations. For example, according to the literature, traditional strategies tend to exclude emergent groups that are not official response organizations (Stallings and Quarentelli, 1985). However, when emergency management lacks sufficient economic and personnel resources to address the needs of the entire community, flexibility to incorporate unofficial groups can fill gaps left by the formal and official response.
Society has developed systems to help understand and cope, not only with the risks inherent in hazards, but also with how people experience disaster. Therefore, the strategy that local emergency managers employ can influence the ability to meet societal needs. For example, Harrald (2006) proposes that one reason government exists is to coordinate a federal response to avoid catastrophic failures when state and local resources are overwhelmed. However, recent focusing events, such as Katrina, have increased the public call for more government control in response activities. By understanding the strategy employed, a better understanding about the impact that social vulnerability has had on the practice of emergency management at the local level can be achieved.

1.4 Overview of Dissertation

This dissertation begins with a review of the literature for both knowledge transfer and social vulnerability followed by a methods section, two analysis chapters, and a conclusion chapter. Chapter 2 provides a review of the literature on the knowledge transfer process. The chapter describes the inherent barriers and challenges to the practical application of research, and it identifies the most common models developed by researchers to explain the process of incorporating research for practical application.

Chapter 3 provides a review of the literature on social vulnerability and how the concept has been approached by both the disaster and hazards research communities. The former, predominantly through sociology, emphasizes the lived experiences of people once a disaster strikes, while the latter, predominantly through geography, focuses largely on mitigation by mapping people’s exposure to various natural hazards and applying quantitative measurement.
While other disciplines do address the concept of social vulnerability, the disaster and hazards traditions are predominant and will be the focus of this literature review and study.

Chapter 4 provides a description of the methods and data that are employed to accomplish the research aims of this study. A modified grounded theory approach guides semi-structured interviews with local emergency managers, and other officials, in the Houston – Galveston Council of Government and the South East Texas Regional Planning Commission regions. Interviews are coded for themes through a constant comparative method. Interviews with city managers and American Red Cross officials along with secondary census data provide triangulation.

Chapter 5 provides an analysis of how local emergency managers perceive and define social vulnerability. Perception and definition of a concept is more than simply providing a textbook definition. Therefore, this research employs qualitative methods and in-depth interviews to gain a deeper understanding of what social vulnerability means to a sample of local officials. The definitions and perceptions that emergency managers have of social vulnerability provide a view into the impact of social vulnerability research on emergency management.

Chapter 6 provides an analysis of the strategies that local emergency management officials use to reach and meet the needs of vulnerable populations. While the purpose of the first analysis chapter is to learn about perceptions and definitions, this chapter focuses on actions taken by local emergency managers to address social vulnerability. The results provide insight into the myriad of factors that influence why emergency managers focus on certain problems and challenges, such as social vulnerability, and what they do about them.

Chapter 7 provides concluding remarks on the relationship between social vulnerability research and the practice of emergency management at the local level. It summarizes the major
findings, the theoretical and practical contributions, and the implications of the research. The chapter concludes with a discussion of the limitations of the study and directions for future research.
CHAPTER 2

KNOWLEDGE TRANSFER:

THE RELATIONSHIP BETWEEN RESEARCH AND PRACTICAL APPLICATION

2.1 Introduction

This chapter provides a review of the literature on the knowledge transfer problem. Specifically, the chapter examines the knowledge transfer problem as a relationship between research and practice. Many fields continue to be plagued by a gap between research and practice, and while the term used to describe this problem may vary by field, a number of models have been identified by researchers to explain the knowledge relationship. This chapter will first look broadly at how the research to practice knowledge gap problem has been discussed. Attention will then focus on the issues specific to knowledge transfer models, the barriers and challenges to knowledge transfer, as well as the avenues to overcome these barriers and challenges.

2.2 Understanding the Knowledge Relationship Problem

Many terms have defined the knowledge relationship between theory and practice across many fields. These fields include nursing, public health, management, computer science, public administration, hazards, and disasters (Fothergill, 2000; Graham, 2008; Neal, 1993). Some terms are interchangeable while others have differing definitions and applications; however, the problem has been variously referred to as knowledge translation, knowledge utilization, and knowledge management. Graham (2008) identified these three terms, used to explain the knowledge relationship between research and practice, and identified that different fields of
study use different terminologies when discussing the transfer of knowledge. Knowledge translation, knowledge utilization, and knowledge management are proposed to be interchangeable by definition depending upon the field of study.

Graham (2008) found that the use of the term knowledge translation appears predominantly in health fields such as nursing, health professions, public health, and cardiovascular systems. The phrase first appears in 1980 with peak use in 2006. The use of the term knowledge utilization appears across many fields, however, it is predominantly found in the social sciences. Knowledge utilization first appears in 1988, has two main periods of use in the late 1990s and mid 2000s and reaches peak use in 2005. Knowledge management appears across computer science and information science as well in business fields such as management. The phrase first appears in 1988 and gradually increases to a peak in 2005.

While a number of terms have been used in research to describe the knowledge relationship, the purpose of this chapter is to review the literature specifically on the term knowledge transfer. Knowledge transfer is a term that is used in research to describe the relationship between research and practice. The sections that follow in this chapter will discuss the concept of knowledge transfer as a relationship between research and practical application that can take more than one strategic path, as well as the barriers and challenges that are inherent in the most common form of knowledge transfer. An emphasis is placed on areas such as hazards, public administration, and public management because they are closely related to emergency management.

The sections that follow focus first on the three main knowledge transfer strategies of transfer, parallel, and collaborative. The focus then turns to the barriers and challenges, such as time and cultural differences in research and practice, which interfere in moving knowledge from
the knowledge creation stage to practical application. This chapter concludes with a review of the proposed avenues to overcome the challenges and barriers of knowledge transfer.

2.3 Knowledge Transfer

Gera (2012) proposed that as understanding and trust in information increases, practice is more likely to adopt knowledge for future implementation. Practitioners, who are early adopters, can then transfer the knowledge to other practitioners. However, even though practitioners may adopt knowledge, if the knowledge does not solve an immediate problem it cannot be immediately used or contribute to the creation of new practice. Therefore, when end users preferences and concerns drive knowledge creation, practice can better implement new concepts and ideas and complete the knowledge transfer process.

One proposal is that, to achieve relevance, research needs to socialize with practice to gain insights into the problems that practice faces (Gera, 2012). Socialization with practitioners enables evidence-based policy, and in turn practical application, by producing a narrative with a common language between researchers and practitioners. When research and practice do not speak the same language, knowledge must be translated into practical terms to be useable in practice. This leads to a major challenge in knowledge creation: making research rigorous enough for the research community to accept it and at the same time applicable and useful for practice. However, even if these proposed conditions are present, other challenges may exist.

For example, Hummel (1997) proposed that practitioners must experience a breakdown before academic theory will be viewed as useful. The practitioner will first draw upon their experience to apply practical solutions. If their experience fails to provide a solution, then they will turn to their peers’ experiences before searching for theoretical solutions. Therefore, when a
breakdown occurs in practice, where experience does not provide a solution, it is then that practice will turn to theory for a solution. However, one key assumption is that practical knowledge is at least partly constructed from research knowledge (Van De Ven & Johnson, 2006).

2.3.1 Knowledge Transfer Strategies

Van De Ven and Johnson (2006) proposed that knowledge transfer has taken three paths in defining the knowledge relationship between research and practice. These strategies are the parallel strategy, the transfer strategy, and the collaborative strategy. The parallel strategy best categorizes a relationship that is defined by a lack of interaction between research and practice where streams of knowledge are produced independent of the other. The transfer strategy is defined by the need to use a third party to translate knowledge that has been produced for practice. The collaborative strategy is defined by interaction between research and practice to produce knowledge that is accepted by both research and practice. The next three paragraphs explain the knowledge transfer strategies as observed by Van De Ven and Johnson (2006).

The parallel strategy provides a model where research and practice build knowledge independently of each other, and results in distinct forms of knowledge. The idea is that research and practice will produce specific knowledge that is either general and rules based or customized for experienced based problem solving respectively. This strategy assumes that rigor and relevance are not possible in the same stream of knowledge. While the parallel model exposes a lack of interaction in knowledge creation, the collaboration model provides the exact opposite.

The collaboration strategy provides a model where research collaborates with practice. The collaboration strategy extends the research and practice relationship to all parts of the
research process so that the knowledge gap can be addressed by research and practice in a joint effort. Collaboration shifts the relationship problem from one of transfer to one of production. Collaboration assumes that if research and practice are involved in knowledge creation, then there is no need for transfer. The collaboration strategy provides one avenue for rigorous research that is also relevant and useful to practice. In doing so, practice will be able to understand the relevance and usefulness of research without the need for someone to translate the knowledge into a usable form.

The transfer strategy provides a model where research knowledge is assumed relevant to practice. However, knowledge needs to be translated into understandable language for practical application. Like the parallel model, the transfer model identifies a process that excludes practitioner input from academic research; however, practitioner created knowledge is not part of the relationship. This is a challenge when research and practitioners use different language; not only in the words they use but also in the narrative they form.

In an effort to understand knowledge transfer, as a knowledge relationship, studies have found the transfer strategy model as the most predominantly relied upon by research (Van De Ven & Johnson, 2006; Vogel, 2010). The transfer strategy model requires translation into an understandable form because of differences in language between research and practice. However, researchers reported that while they must change writing style for different journals, most are unable or unwilling to change writing style to accommodate practice in knowledge creation (Vogel, 2010). This is not to say that researchers do not care about practice, simply that there are barriers for research in accommodating practice. While numerous studies have examined knowledge transfer in many disciplines, this review will focus here on knowledge
transfer studies in public administration, public management, and the hazards community, because they are closely related to emergency management.

Vogel (2010) investigated the use of the parallel, transfer, and collaboration strategies of knowledge transfer in German public management. Public administration and management is the closest related field to emergency management that has been used for studying the different types of knowledge transfer strategies that define the relationship between research and practice. Vogel’s (2010) purpose was to determine the level of collaboration between research and practice for knowledge production. To achieve its purpose, the study analyzed German public management articles and the professional status of the authors.

Based upon the Van De Ven and Johnson (2006) definition and classification of knowledge transfer strategies, the findings suggest that the transfer strategy is the dominant strategy of knowledge transfer that is found in German public management. Collaboration is found, but the number of articles with collaboration between researchers and practitioners is reported to be negligible. For example, approximately 92 percent of academic articles are found to have only academic authors and approximately 88 percent of practitioner-oriented articles have only practitioner authors. These results are attributed to the many barriers that are inherent in the transfer strategy of knowledge transfer.

2.3.2 Barriers to the Transfer Strategy of Knowledge Transfer

While the previous section described strategies for transferring knowledge, this section focuses on barriers or impediments to the practical application of research based knowledge. The barriers to the transfer strategy of knowledge transfer and the way that research is used is important because decisions made in practice are often found to run counter to the available
research evidence of what works best (Davies, Nutley, & Smith, 2000). Research use can have more than one meaning (Nutley, Walter, & Davies, 2007), such as to review findings for a general understanding, application in decision making, or having a direct impact in practice. However, regardless of how research use is defined, there have been numerous institutional and cultural barriers inherent to the knowledge relationship between research and practice.

Bowman (1978), for example, found that both researchers and practitioners in administration agree that “The three most frequently listed barriers … communication and status problems, inherent resistance to change, and insufficient incentives to develop and implement new ideas (p. 566).” While Bowman’s findings revealed that academics and practitioners in administration might agree on the barriers that exist, interview data reveals a difference in the academic and practitioner perspective of why these barriers exist. For example, Bowman (1978) reported that one academic respondent stated, “we [society] place almost no emphasis upon the value of intellect. Thus most practitioners devalue intellectual development and emphasize the development of practical skills (p. 566).” Alternatively, many practitioners referred to academics as having an “inability to relate to on-the-job situations (Bowman, 1978, p. 566).”

Bowman (1978) found that research and practice in public administration also differed in the importance of sources of knowledge. Twenty-eight percent of academics identified other academics as the most important knowledge source. Academic and professional societies came next, followed by practitioners, then government and private research. Alternatively, thirty-eight percent of practitioners identified other practitioners as the most important knowledge source. Government industry and private industry came next, followed by academic and professional societies, then academics.
Bowman’s finding on how academics and practitioners view the other and the barriers that are inherent in the knowledge relationship still holds true for recent studies in administration. Denhardt (2010) proposed a distinction in how practice uses theory knowledge that is dependent upon the practitioners’ level of education. This distinction appears in the transition from undergraduate to graduate level studies. Prior to and during undergraduate education, public administration practitioners believe that technical skills are what drive administrative function. After entering a graduate level program, practitioners realize that knowledge, skills, and abilities are just the first step because they understand that the context of the environment is the most difficult aspect to deal with in public administration.

The distinction in attitude between research and practice is important when emergency management is considered as a function of public administration and management. However, the Bowman (1978) findings also extend to the hazards community, both in cultural and institutional differences. While attending graduate school, Fothergill (2000) conducted a study in the hazards community that focuses on the transfer strategy of knowledge transfer. Fothergill (2000) identified four categories that effect the transfer of knowledge in the hazards community.

First, research and practice have different cultures. Second, institutional obstacles are the greatest barrier due to restraints and rewards within the individual research and practitioner systems. Third, links that provide translation between research and practice include education and professional organizations. Fourth, there is some interaction between research and practice through interpersonal relationship, such as during conferences, and practitioners would like to see more interaction from researchers. The next three paragraphs will briefly examine the findings from Fothergill (2000).
Cultural factors and institutional arrangements vary between research and practice in the hazards community. For example, cultural differences affect the amount of effort that research or practice is willing to invest in the knowledge relationship. Fothergill proposes that the cultural barriers to knowledge transfer are perpetuated when researchers perceive practice simply as something they study, and when practitioners perceive research as useless and pompous. Additionally, Fothergill (2000) found that both research and practice report a lack of reward for researchers to get information to practice just as there is a lack of reward for practice to seek out new research because of institutional constraints of time and money.

Institutional factors can result in conflicting incentives and include restraints, rewards, and boundaries that define work structure and expectations for success in research and practice. Hazard community researchers acknowledge that journal publications are the least effective in transferring knowledge; however, the tenure system requires journal publication to maintain employment. Fothergill found that tenure requirements, combined with other academic duties, result in little to no time for researchers to engage practice in a more practical manner. As a result, some researchers in the sample do not feel responsible for speaking practitioner language, while others note that proper incentives could motivate them to write in practitioner language. Additionally, many practitioners in the sample say they have limited resources of time, money, and staff to assimilate the massive amounts of research, in order to flesh out remote useful information.

A positive finding from the Fothergill (2000) study, for improving the knowledge relationship, is that respondents identify that some transfer organization linkages and interaction between research and practice does occur. Respondents acknowledge the need for linkage organizations and interpersonal relationships to improve the transfer of hazards knowledge.
Similar findings are reported by Vogel (2010), who found that institutional barriers include tenure and journal requirements for German public management. Tenure requirements focus research efforts on publishing in peer review journals, which requires a specific writing style and use of a specific narrative.

Vogel (2010) suggested that the ability of academics to change writing style for journals indicates a lack of desire or ability to change writing style for the practitioner. This lack of desire or ability is linked to scholarly journal requirements and a lack of incentive to publish in practitioner based journals. To this point, the review has examined knowledge transfer strategies and the barriers that are inherent in the research and practice knowledge relationship. The next section turns to methods of overcoming knowledge transfer barriers.

2.3.3 Overcoming Knowledge Transfer Barriers

The question of the research to practice gap, as to how knowledge can be made with rigorous standards and applicable or useful for practice, is not a new question but is an essential question for applied sciences (Vogel, 2010). One view is that professionalization will serve to bridge the gap between research and practice for emergency management (Neal, 1993). However, dissemination is not enough. This section examines literature that looks at the ways that barriers to knowledge transfer can be overcome. This includes specific methods that researchers can use to overcome barriers, as well as the ability of disciplines to create a field of study that can provide the transition links between research and practical application.

Bowman (1978) found that the preferred methods to overcome knowledge transfer barriers for academics is the use of rewards for developing and implementing new ideas, while practitioners report the need for increased practitioner participation in research decision making.
Since both groups have different cultures with inherent barriers, it is logical the each would have different needs, which would need to be addressed by the institutions that manage each.

Duncan (1980) built upon Duncan (1974) to provide a view of knowledge transfer as a system that places researchers in a knowledge devolvement circle and administrators in a knowledge utilization circle. These circles overlap where linking agents such as professional schools and societies face barriers of value differences, prejudiced attitudes, alternative evaluation criteria, and structural boundaries in a knowledge flow system. The use of systems theory places the responsibility on the linking agents to overcoming the barriers by provide knowledge to practice in a usable form, but also leaves room for academics and practitioners to serve as boundary spanners by reaching across the barriers.

Herzog (1993) continued previous 1970s and 1980s research by Argyris and Schon (1974), Duncan (1974), Bowman (1978), and Denhardt (1984) to develop a practitioner-held theory that has similarities with the collaboration strategy of knowledge transfer, as laid out by Van De Ven and Johnson (2006). The model additionally appears to provide an answer to the problem of making research more rigorous and relevant that is brought up by Vogel (2010). Herzog (1993) used a qualitative theory that was based upon the earlier version of Glaser and Strauss (1967). The idea is to build theory from the perspective of the practitioner that is based upon the problems that practitioners face. The concept is that when research builds theory based upon the public administrators’ perspective, then research can be made rigorous enough to meet academic needs and still be relevant to practical needs. Doing so would increase the chances of overcoming the barriers that are inherent in the knowledge relationship between research and practice, theory and practical application.
Gera (2012) proposed four factors that are required to overcome the barriers to effective knowledge transfer that also aligns with the Van De Ven & Johnson (2006) collaboration strategy and the Hummel (1997) usefulness of theory concept. First, knowledge must be relevant to practice. To achieve relevance, research needs to socialize with practitioners to gain insights into the problems that practitioners face. Researchers should identify practical implications based upon the needs of practitioners as identified by practitioners, rather than from the researchers’ perspective.

Second, knowledge diffusion requires common terminology in knowledge interpretation and presentation. Socialization with practitioners enables research to speak practitioner language. Socialization and understanding of practitioner problems, from the practitioner point of view, enables evidence based policy and implementation. This is because the end users preferences and concerns drive knowledge creation.

Third, practitioner adoption of knowledge leads to experimentation with new practices. When knowledge is created and diffused effectively, practice is more likely to adopt the knowledge created. This is due to increased understanding of and trusts in the information. As the knowledge is adopted by practitioners, it can then be transferred to other practitioners by those that understand the knowledge.

Fourth, for practitioners to implement knowledge, the knowledge should solve an immediate problem. While practitioners may adopt the knowledge, if the knowledge does not solve an immediate problem, the knowledge cannot be used. Knowledge is not considered utilized until it contributes to the creation of a new practice. Therefore, to be considered as creating new practices, new concepts and ideas need to be generated in practice.
Therefore, effective transfer of knowledge requires an engaged scholarship (Van De Ven & Johnson, 2006). Engaged scholarship here means that researchers and practitioners work together, with each contributing to the final product. This enables researchers to incorporate relevant practical needs into a rigorous scientific inquiry. Then practitioners will be able to incorporate relevant research into practical application.

A number of disciplines and fields have tried to overcome these inherent barriers by creating independent knowledge transfer areas of study. These areas of study focus on specialized knowledge transfer needs when translating research knowledge into a usable form for practice. For example, health fields developed an independent field for knowledge transfer professionals, such as the Saskatchewan Health Research Foundation in Canada, that provide three levels of translation (Graham, 2008). Knowledge translation covers clinical improvement in direct patient care, decision making for managerial and policy strategies, and educating medical professionals in evidence-based techniques to improve knowledge application.

However, the effectiveness is questioned. Even with health care knowledge transfer professionals, and research evidence that shows incarceration to be ineffective and harmful, children’s mental health policy dealing with conduct disorders in Canada utilizes few treatment programs and overuses incarceration (Waddell et al., 2005). While independent knowledge transfer fields of study are suggested and employed, the findings suggests that transfer professionals are not an end all solution and produces frustration among researchers because policy decisions are not based upon research.

2.4 Summary

The purpose of this chapter was to review the literature on knowledge transfer as a
relationship between research and practice. The guiding principle expectation is that research is to provide solutions to practical problems, with some predictive ability. As stated before, the major challenge of making research rigorous enough for academia to accept but relevant enough for practitioners to apply is not a new question but remains relevant today. The lack of knowledge transfer studies for emergency management results in the need to examine knowledge transfer for areas that are related to emergency management such as public administration, public management, and hazards. While knowledge transfer has inherent barriers for all fields, studies in public administration, public management, and hazards reveal similar experiences with the same challenges as other fields in improving the knowledge relationship between research and practical application.

The mid 1970s saw a growth in scholarly interest in the relationship between research and practical application for public administration and management, with sporadic interest in the 1990s and into the early years of the 21st century. The usage of terms such as knowledge translation, knowledge utilization, and knowledge management appear throughout the 1980s and they are found to reach peak use in 2005 to 2006. It is at this point that research identifies three main knowledge transfer strategies that include parallel, transfer, and collaborative strategies. Of these three strategies, research has shown that the transfer strategy of knowledge transfer is most prevalent and has barriers that are grounded in cultural and institutional structures across the fields of public administration, management, and hazards. These barriers are found to extend from the 1970s to recent times.

Knowledge needs to be accepted by practitioners to be useful. Therefore, to be considered knowledge transfer, knowledge needs to be implemented. While numerous studies have identified barriers to knowledge transfer in many disciplines, this review has focused on
knowledge transfer studies in public management and the hazards community to provide relevance for emergency management. The literature has revealed that the knowledge relationship between research and practice in administration and management, as well as hazards studies has been marked by barriers of differing culture and institutional arrangements since the 1970s.

The literature has also revealed that there are avenues to overcome the barriers that are inherent in the knowledge gap. For example, some disciplines have created specialized fields of study that focus on the transfer strategy for the field, such as medical and engineering. Other literature has proposed the use of collaboration between research and practitioners to create knowledge that is rigorous and relevant to practical application without needing to be translated into a recognizable format. Understanding the knowledge relationship, the barriers and challenges, and the avenues to overcome the barriers, informs a study on the impact of social vulnerability knowledge on the practice of local emergency management.

The next chapter will review the literature on social vulnerability. The purpose is to provide a better understanding of how social vulnerability has been approached in order to understand the impact that social vulnerability research has had on the practice of emergency management at the local level. First, it reviews how the social vulnerability concept has developed through sociology and the disaster tradition. Then it discusses how the social vulnerability concept has developed through geography and the hazards tradition.
CHAPTER 3
RESEARCH BASED PERSPECTIVES ON SOCIAL VULNERABILITY

3.1 Introduction

The purpose of this chapter is to provide a better understanding of how social vulnerability has been approached by both the disaster and hazards research communities. While each has developed a distinct approach to social vulnerability, a common premise of both approaches is that even among populations that may be equally exposed, people have differing levels of sensitivity to hazards. The concept of social vulnerability has evolved to recognize the complex and dynamic interaction of social and economic marginalization that influences hazard sensitivity and varies from community to community. The importance of socioeconomic and political influences to emergency management are evident when it is understood that everyday conflicts within a community rapidly re-emerge in disaster (Tierney, Lindell, & Perry, 2001).

The disaster and hazards research traditions derive, predominantly, from the disciplines of sociology and geography, respectively. Sociology understands social vulnerability through peoples’ experiences with disaster that occur due to social inequalities in prior existing social, political, and economic environments. The hazards community focuses on the underlying physical and social processes that produce risk and lead to disaster. The hazards community understands social vulnerability as a dynamic and ever-evolving condition constructed from interacting characteristics, which are quantifiable and can be mapped. While the two traditions emerged in different contexts and evolved along separated paths, and there are certainly differences between them, there are also important similarities and points of convergence.
Indeed, the evolutionary path of social vulnerability comes from the blurring of the lines between the hazards and disaster research communities (Cutter, 2001). For example, sociology provides a rich description of special populations affected by social inequalities that the hazards community uses to construct a quantitative measure in a model that includes the vulnerability of place and people. Additionally, while studies of natural and technological hazards have occasionally crossed over, they have predominantly remained two parallel avenues of knowledge development because of individual interests that drive scientific disciplines (White, 1988). Therefore, this chapter will discuss social vulnerability, and its evolution, as pertaining to natural hazard events specifically from the dominant disaster and hazards research perspectives.

3.2 The Disaster Tradition

The disaster tradition originates from practical concerns of the federal government about how people would respond to an attack on the United States. This provided funding for and direction in content and focus of disaster studies. These military concerns grew from government fears of nuclear attack in the 1950s (Kreps, 1984; Webb, 2007). The practices that emerged into post WWII emergency management served a dual use for civil defense and natural threats. Research of the time that focused on natural events during peacetime served as proxies for understanding human response to unexpected military attacks (Fritz, 1961; Webb, 2007).

Several beliefs dominated in practice that the public would: be helpless and dependent upon government, would panic if the threat is known, and would engage in antisocial activities such as looting and criminal behavior (Dynes, 1993). These assumptions of antisocial behavior lead to the belief in conflict and division among the public that must be dealt with by force. However, early disaster studies provide empirical evidence that dispels the pre – 1950s
assumptions of human behavior. Research found that, in reality, disaster minimizes conflict and creates unity through a consensus on value priorities where antisocial and conflict behavior, while they may occur in isolated cases, are not the norm (Dynes, 1970).

3.2.1 The Therapeutic Community

With the 1960s came the theoretical introduction of the therapeutic effects of natural disasters. Research recognized the emergence of altruistic norms where disaster minimizes prior existing community divisions such as race and class. Specifically, research came to view disaster as a unifying force where “Culturally derived discriminations and social distinctions tend to be eliminated in disaster because all groups and statuses in the society are indiscriminately affected: danger loss and suffering become public rather than private phenomena” (Fritz, 1961, p. 685). Accordingly, disasters were proposed to be external to and act upon society, produce a mentality that everyone is suffering from a force that is not part of the social system, and “result, however temporarily, in what may be regarded as a kind of social utopia” (Fritz, 1961, p. 691).

Barton (1970) builds upon the therapeutic effects of disaster through altruistic community actions. Barton introduces a model of the therapeutic community response where “we can have a community where many people perceive the majority as helping, or as believing there is a duty to help” (1970, p. 216). The therapeutic community model relies upon an increased number of affected individuals, a larger social diversification of those affected, a closer proximity to the impact, and an increased mass media coverage. However, the therapeutic community must eventually come to an end because, “The norms of altruistic sharing, mutual identification, and social closeness, which so frequently appear in the disaster – struck community, invariably disappear; otherwise disasters would have left the world scattered with utopian communities”
(Barton, 1970, p. 301).

The therapeutic community is conceptualized in the 1980s and 1990s through the identification of emergent groups in disaster. Stallings and Quarantelli (1985) proposed that emergency management needs to address emergent groups, that result from the therapeutic community, in planning because, “emergence is inevitable before, during, and after disaster (p. 98)”\(^\text{1}\). Thus, emergent groups are those that emerge as a result of disaster, exist for a short period, and are born out of “a perceived need or demand which requires immediate action” (Stallings & Quarantelli, 1985, p. 98). Neal and Phillips (1994) proposed that emergent groups would provide for unmet social and economic needs in the wake of disaster. Neal (1994) provides evidence of such emergence in the wake of Hurricane Andrew in Dade County, Florida, and attributes the massive amount of in-kind donations to a therapeutic community.

3.2.2 The Lived Experience

Sociology-focused disaster studies address social vulnerability by identifying how specific populations experience social inequalities that are driven by the effects of pre-existing policy and protocol. Some studies accentuated the neglect of vulnerable populations or groups of people throughout the disaster management cycle (examples include Bolin & Stanford, 1998; Buckland & Rahman, 1999; Elliott & Pais, 2006; Peacock, Morrow, & Gladwin, 1997). Other studies focused on specific population or group characteristics such as gender (Enarson, 1998; Enarson, Fothergill, & Peek, 2007; Enarson & Morrow, 1997; Morrow & Enarson, 1996), race (Fothergill, Maestas, & Darlington, 1999; Phillips, 1993; Yelvington, 1997), class (Fothergill & Peek, 2004; Phillips, 1996), and age (Fothergill & Peek, 2015; Klinenberg, 2001; Ladjitka et al., 2008; Peek, 2008).
3.2.2.1 Gender

While sociology in the 1980s began addressing the issues women face in a gendered society, Morrow and Enarson (1996) identified, for the same time frame, a lack of gender focus in disaster studies. The assertion was that if social life and social systems use gender as a central organizing principle, then the projection of everyday life into disaster requires addressing gender differences to accommodate more equitable, and thus effective, disaster management (Enarson, 1998; Enarson & Morrow, 1998; Morrow & Enarson, 1996). For example, Morrow and Enarson (1996) found that female headed households are less likely to evacuate due to a lack of resources that results from a lower socioeconomic status. J. Wilson, Phillips, and Neal (1998) proposed that females face more than the hazard when disaster strikes such as an increase in domestic violence.

Enarson (1998) challenged disaster research to address the unanswered questions of gender in disaster, rather than simply using gender as a dichotomous variable of risk awareness. She seeks to address the questions of practitioners, as being different from those of research scholars, and to help students new to the disaster field embrace the concept of the gendered disaster. She also identified three key research areas for future research: the construction of a gendered vulnerability approach to disaster, the shaping of disaster planning and response by gender relations, and the shaping of social experiences of disaster by gender relations.

A number of scholars have done work in these areas. For example, Enarson and Morrow (1998) not only looked at gender and disaster preparedness, but at gender in official response to disaster from multiple countries around the world. Peacock et al. (1997) included a chapter by Enarson and Morrow (1997) that address women’s experiences with disaster and their roles in
preparedness, response, and recovery in the 1992 effects of Hurricane Andrew in Florida. These texts have brought the disaster challenges faced by women, which are due to pre-existing social, political, and economic factors, to the forefront of disaster research.

3.2.2.2 Race, Ethnicity, Language

Phillips (1993) predicted future social vulnerability, and the need to address cultural diversity, based upon the observation that communities had become increasingly more diverse and heterogeneous than in the early days of disaster research. For example, in the wake of the 1989 Loma Prieta earthquake in California, the Federal Emergency Management Agency (FEMA) lacked adequate numbers of trained bilingual workers. This lack of trained bilingual workers at the federal level, combined with policy protocols, reduced the ability of disaster management to reach vulnerable populations.

Additionally, Phillips (1993) found that local government in the Loma Prieta area excluded the local community from planning. This resulted in a Department of Justice (DOJ) investigation of the city of Watsonville, Ca. when Latino leaders claimed discrimination because of the lack of inclusion. The federal investigation eventually cleared the City of Watsonville of cultural insensitivity. However, the DOJ recommended inclusion of the Latino community in disaster planning.

Bolin and Stanford (1990) proposed that federal response actions reinforced marginalization of minority households in the Loma Prieta earthquake. Subervi-Velez and Palerm (1992) found that sheltering protocols resulted in the American Red Cross declining an invitation by community-based organizations to do outreach with low-income and non-English speaking populations. Additionally, Barnecut (1998) found that residents in Piru, California,
were primarily Hispanic laborers and were referred to by outside communities as a hick town in the sticks, both before and in the wake of the Loma Prieta earthquake. These pre-established perceptions of the Piru community in California made it difficult to attract volunteer shelter managers to the area during response and recovery operations.

Yelvington (1997) found that policies existing prior to 1992 resulted in communication failures and ethnic tensions in the wake of Hurricane Andrew in Florida. Early notifications were English-only in a highly ethnically diverse area. This resulted in low numbers of initial shelter applicants. Racial tensions between Latino, African American, and Anglo populations produced a large number of requests for reassignments and highlights previously existing social inequalities. For example, when the needs of minority populations were being addressed by officials, Anglo’s complained about tent city conditions that unfairly favored Latinos, especially undocumented workers (Yelvington, 1997). Additionally, Bolin and Stanford (1998) provide evidence that federal agencies have attempted to learn from past failures by including a large managerial staff with increased multi-lingual skills in the wake of the 1994 Northridge earthquake in California.

Communication methods are important to communities in local disaster management, but they are extremely important for immigrant communities. For example, Mexican decent populations prefer to use Spanish language in the household (Aguirre, 1988), however, Benavides and Arlikatti (2010) identified two barriers for Spanish-language stations in airing disaster warning messages in Spanish. These include a lack of training for local radio and television personnel and a lack of interest in voluntary public service announcements. However, planned communication through disaster warning messages are not the only language barrier issues for vulnerable populations. Ethnic differences manifest through cultural aspects, such as
alternative beliefs and social norms, that can also influence how warnings are received and interpreted (Lindell & Perry, 2003).

Recently, immigrant populations, mainly from non-Caucasian heritage, have been proposed to be the most vulnerable populations in a disaster (Mathew & Kelly, 2008; S. N. Wilson & Tiefenbacher, 2012), with approximately 50 percent of the foreign-born U.S. population being limited-English proficient (LEP) (Whatley & Batalova, 2013). However, the connection between a person’s place of birth and the language they speak is more complex. For example, approximately 81 percent of the LEP population, at the time in the United States, was foreign born. This means that 19 percent of the LEP population was native born to the United States and complicates using national origin rather than LEP for analytical purposes. Whatley and Batalova (2013), propose that limited English proficiency (LEP) populations are more likely than English proficient populations to be poorly educated and live in poverty. This reveals an intersection of poverty, class, and English language proficiency that makes this group vulnerable. Sandovici, Jakobsen, and Strabac (2012) argue that government has a responsibility to integrate first generation and subsequent generation immigrants. This integration includes social, political, and economic aspects.

3.2.2.3 Class

Literature on class, based on socio-economic status (SES), provides a rich explanation of limited access to resources. One major aspect in the literature is that sheltering and housing needs, as defined in official federal protocols, do not account for pre-existing or emergent community needs. A major implication across the literature on class is that the result can over burden the system and exclude some of the effected population from housing assistance, which
can increase the risk of continued harm for some people. For example, short-term sheltering needs in the 1989 Loma Prieta earthquake were massive and unique because of the unexpected existing homeless population and the emergence of self-constructed tent cities (Subervi-Velez & Palerm, 1992).

Bolin and Stanford (1990) found that large existing populations of homeless have overwhelmed Red Cross shelters because the plan only accounted for sheltering based upon the housed population. Phillips (1993) proposed that self-constructed tent cities spread official resources thin because policy and protocols only intended response agencies to cover planned sheltering facilities. Bolin and Stanford (1998) found that hundreds of people used these tent cities and cars for shelter out of fear of aftershocks and deportation. For example, shelter volunteers were unsuccessful in encouraging undocumented immigrants to move into shelter facilities because of the fear that tent city residents had of being arrested which would lead to deportation.

Phillips (1996) examined homelessness with the idea that homeless populations have a right to access public places. While homeless populations do not have traditional physical places of residences in a permanent structure, as defined by protocols, they have a place nonetheless that they consider theirs. Phillips sheds light on the displacement of homeless populations as Santa Cruz police forced homeless people from dangerous public places, such as tent cities established on public school grounds, with no place to go after the Loma Prieta earthquake. Phillips personally observed police escorting one homeless woman from a downtown area as another person tells the officer that “she doesn’t have any place to go sir, where is she supposed to go” (1996, p. 94). The findings suggest that the sentiment of officials was rooted in a lack of concern for housing homeless populations since they were already homeless.
Later, studies of Hurricane Andrew in 1992 and the 1994 Northridge earthquake found that federal policy and protocols made determinations of who could receive response and recovery efforts, which continued to neglect homeless populations. Yelvington (1997) found that military operations quickly mobilized, in the wake of Hurricane Andrew, with the Marine Corps and Army establishing shelter relief centers assisted by the American Red Cross (ARC) administration. However, Internal Revenue Service officers replaced American Red Cross workers when the Federal Emergency Management Agency (FEMA) assumed tent city operations.

With the assumption of responsibilities by the IRS and FEMA, operational goals shifted from the ARC goals of care to those of eligibility. FEMA’s eligibility protocols defined victims as those made homeless because of the event, which excluded everyday homeless populations from sheltering services. Bolin and Stanford (1998) reported that protocols in the 1994 Northridge earthquake did result in streamlined paperwork and expanded financial assistance to mobile home owners; however, previously homeless populations remained excluded from grants and housing assistance. Again, only those made homeless or unemployed due to the earthquake met eligibility for financial assistance.

Dash, Peacock, and Morrow (1997) provide a prime example of unequal consequences that are a result of social characteristics, such as class, rather than physical proximity in the wake of Hurricane Andrew in 1992. In a case study of two Florida communities, Florida City and Homestead, Dash et al. (1997) found that the less economically sound and high minority population of Florida City was devastated with a 52 percent loss in business, while Homestead had only a 2 percent loss one year after the event. The high minority population had less economic and political influence in the region. This resulted in limited resources available for
mitigation and recovery, and the proposal that high risk should be measured by social characteristics and the lack of hierarchical and economic power in minority and poor communities rather than the susceptibility of physical location.

More recently, Fothergill and Peek (2004), in examining the sociological literature dealing with the poor in disaster, found a consensus that poor populations experience a higher proportional physical loss and likelihood of death as well as psychological trauma. This is because resources are needed to prepare and react accordingly, such as with evacuation to a hazard where the poor have less power in influence and money to acquire resources. For example, transportation became a major issue in New Orleans in the path of Hurricane Katrina. As a result, the poor were forced to take unprepared shelter (Nigg et al., 2006). Local government had a transportation plan in place, but implementation of a mandatory evacuation and response came too late to acknowledge the needs of vulnerable populations. Nigg et al. (2006) found that the last Amtrak train, being used for evacuation, left New Orleans empty.

3.2.2.4 Age

Klinenberg (2001) proposed that while social isolation can negatively affect the poor and the elderly, the combination of being poor and elderly in disaster results in devastation because they do not have the ability to buy or physically move out of harm’s way. Additionally, elderly populations perceive a threat to individual independence when they have to seek post disaster aid. Literature covering the circumstances of Hurricane Katrina in 2005 produced a prime example of how social inequalities shape exposure to hazards and experience with disaster for elderly and young populations along the gulf coast region.
Laditka et al. (2008) examined nursing homes in Louisiana and Mississippi. Nursing homes are proposed to provide extended housing for elderly individuals who do not have the means, physically or financially, to care for themselves and can serve as sheltering nursing homes. Laditka et al. (2008) found that government protocols excluded sheltering nursing homes from planning and operations and created a hostile environment between government and nursing facilities. For example, protocols directed gas stations and law enforcement to provide fuel only for hospitals. Laditka et al. (2008) suggested that nursing homes could be a great medical care resource in disaster; however, law enforcement threatened nursing home representatives with arrest if they tried to take fuel. However, elderly are not the only population in the age characteristic.

A recent study by Fothergill and Peek (2015) looked at the experience of children in disaster, specifically in the wake of Hurricane Katrina. Fothergill and Peek begin, in the first sentence, with a vivid illustration of how children experience disaster. “For Cierra, the sound of Katrina is the sound of “people screaming” (2015, p. 1).” The study provides an analysis of the experiences of children in disaster in the words of the children themselves, rather than previous studies, as Peek (2008) proposed, that looked at the effects of disaster on children through adults such as parents and counselors. Fothergill and Peek (2015) proposed that children are capable actors and the child’s voice is important because children influence the same social settings that influence them.

Traditionally, research views children as either having a high bounce back from disaster or as helpless vulnerable victims in disaster, however, Fothergill and Peek (2015) found that children differ just as much as adults when race, class, and gender are considered. The experiences of children in disaster are very complex and dynamic. The findings suggested that
children experience either a declining emotional state, a stable emotional equilibrium, or alternating emotional states between the two because of pre-disaster, post-disaster, and actual disaster circumstances.

3.3 The Hazards Tradition

Early hazards studies grew from the geography tradition with a fundamental focus on risk and mitigation. Risk aspects include, risk perception and risk analysis that focuses on individual response to hazards with the commonly accepted idea that expert analysts and the average individual differ in their method of determining risk. Starr (1969) used the difference in expert analysis and individual perception to reason that societal perceptions determine the level of risk at which individuals are willing to accept technological innovations to mitigate hazard impact. The implication of this research is that as individuals perceive that they are at greater risk of loss or harm, they are more likely to agree to the costs of mitigation.

Fischhoff, Slovic, Lichtenstein, Read, and Combs (1978) found that the costs of acceptable risk include loss of life as well as monetary and physical loss. The difference is based upon the method by which individuals reason. For example, experts rely upon statistical data and facts in an assessment while individuals rely upon perception, where acceptance of risk is filtered through social and cultural factors and personal experiences (Slovic, 1987; White, 1988).

Slovic (1987) proposed that these differences are important, regardless of expert evidence, because established perceptions are difficult to override due to engrained social influences (i.e. friends, family, and coworkers) that affect individual and group response to hazards. This can result in social and cultural factors diminishing the effectiveness of communication between experts and individuals (decision makers). The implication is that when
individuals do not understand information because of differences in risk perception and risk analysis, distrust of government can result (Kasperson & Dow, 1993). In the end, individuals will apply their own cultural and social beliefs when attempting to make sense of the risk in the disaster context (Slovic, 1987; White, 1988).

Individual risk perception informs the decisions that lead to the actions that people take, which can lead to a state of vulnerability that is produced by an interaction between people and the environment. This provides the link from previous studies to facilitate the ability to map people’s exposure to hazards. Burton, Kates, and White’s (1978) groundbreaking work assimilated floodplain research with an attempt to understand individual and collective responses to extreme natural hazards. Their proposal is that if a hazard never interacts with a population then there is no disaster. While previous research viewed natural disasters as acts of God and indefensible, vulnerability as defined by this study is based upon the interaction of a hazard with a human system where actions can be taken to reduce loss or damage.

Burton et al. (1978) proposed that damage and harm increases because of population growth, increased hazard activity, and increased wealth of developing countries. This leads to the concept that social choices, both individual and aggregated, can make the difference between an event and a catastrophic event. Population growth directly affects spatial distribution as wealth increases and populations migrate from rural to urban areas, which have experienced increased hazard activity. Individual choice and collective action can determine the ability of people, also considered a human-system, to make adjustments to reduce loss and damage from the interaction with the hazard, or natural system. Issues of risk, hazards, and disasters gave rise to this concept of vulnerability, or potential for loss, and the mapping of people’s exposure to hazards.
Blaikie et al. (1994) further explore this concept of an interaction between nature and society but proposes a theoretical shift from natural triggering events acting on people to one of social systems and power distribution producing disaster through a pressure and release (PAR) interaction model. The theoretical base of the pressure and release model clarifies and refines the description of physical objects from being vulnerable to being “fragile, unsafe, hazardous” and must “retain the term vulnerability for people only (Wisner et al., 2005, p. 55).” The need to make a distinction between location and people is based on a lack of common definition of vulnerability in the literature. The pressure and release model relies upon the vulnerability of people where prior existing root causes are centered on political and economic systems. Power, structure, and resources are limited to certain populations.

The PAR model relies upon the idea that political, social, economic, and cultural factors are the root cause of dynamic pressures, and that they produce the unsafe conditions of normal life where some are more sensitive to a hazard. These opposing forces of a hazard and societal pressures of normal life interact, and result in avoidable harm and damage of disaster. However, though the PAR model has received support from the research community, it also has its critics. Wisner et al. (2005) explained that on one account, Blaikie et al. (1994) is accused of calling for a social revolution with no practical application in the political implication of the social based theory. This is because the pressure and release model theoretical basis proposes that policy decisions should account for vulnerability to reduce disaster. Others attack the pressure and release model on the basis that it attempts to address practice and ignores the larger scale political actions as creating disaster. The first criticism says that the PAR model goes too far, while the second says that it does not go far enough into political activism.
Cutter (1996) identified the same historical lack of a common definition of vulnerability in the literature, and proposed the use of the hazards of place model (HOP). The HOP model incorporates the biophysical vulnerability, based upon the location of vulnerable places or people, and the social vulnerabilities of who is vulnerable in a specific place, based on the Blaikie et al. (1994) definition of vulnerability. However, the theoretical difference is that, for the HOP model, physical locations (places) are considered vulnerable due to their intersection in space with a potential hazard agent and not just unsafe, fragile, or hazardous as the PAR model proposes. The concepts of risk and mitigation interact with the potential of a hazard affecting society. The result is then applied to geographical and social contexts to create biophysical and social vulnerabilities that are then combined to create the hazard of place.

In addition to a more comprehensive view of social vulnerability in hazards research, the 1990s brought an acknowledgement of the limitations of traditional hazards research as it moved to analysis of social vulnerability using geographic information systems (GIS). Dibble (1996) proposed that GIS, in traditional hazards studies, provides a static view where the geographical framework defines how the results are interpreted through a snap shot. Curry, Harris, Mark, and Weiner (1996) proposed that the complexity of people, space, and environment shape our spaces and societies and requires understanding of locational conflicts that are created through conflicting values, assumptions, and interests in a dynamic view. Therefore, the study of social vulnerability must understand that the static view assumes one reality with one best way to solve the problem (Curry et al., 1996) while dynamic societies involve mobile individuals in a complex phenomenon (Dibble, 1996).

Wisner et al. (2005) and Cutter (1996) also acknowledged the temporal issues inherent within their PAR and HOP models. For example, Wisner et al. (2005) recognized, and sought to
clarify, that the first PAR model, as developed by Blaikie et al. (1994), is a static model that cannot account for the time–space continuum. This is because it addresses a single point in time where pressure is released and disaster follows. An essential function of space and time was needed, and incorporated into the later PAR model, because the theoretical framework functions based upon the idea of prior existing social factors and processes as conditions develop and lead to vulnerability over time. The evolution of the PAR model was intended to provide for practical application with a transition from theory to policy formulation.

“At this policy formulation level, directives are developed on economic, financial, or political grounds… The implementation stage will not necessarily address vulnerable conditions in relation to hazards, and indeed some policies may increase vulnerability. We hope to demonstrate that it is not enough simply to deal with the hazard threat, so that policies will be designed to reduce vulnerability and therefore disasters (Wisner et al., 2005, p. 33).” This statement is a continuation from the first edition by Blaikie et al. (1994).

3.3.1 Quantitative Measurement of Social Vulnerability

With the turn of the 21st century, the hazards tradition established the beginnings of a quantitative measurement of social vulnerability that would allow policy makers and emergency management practitioners the ability to identify, objectively, areas that may require more resources because of social vulnerabilities. Cutter (2003) proposed that disaster is not measurable a-priori because the unknowns, such as hazard strength and impact location, are dynamic in their interaction with society. Therefore, measures of risk and hazard in combination with vulnerability serve the hazards community as proxies to understand an areas’ propensity for
disaster. Two main social vulnerability indices present in the literature, the SoVI and the SVI address both of these proxies. Thus, these two indices are the focus here.

Hazards research applies the same socioeconomic characteristics as sociology, as well as other direct measurements of factors that include housing, employment, and transportation. Cutter, Mitchell, and Scott (2000) established a model of social vulnerability through an interaction with physical vulnerability. The model incorporates socioeconomic variables such as age, race, gender, and housing, as identified from previous qualitative disaster studies. To accommodate the dynamic view required by social vulnerability, quantitative spatial analysis combines the characteristics of vulnerable populations with interactive effects between characteristics in combination with physical vulnerabilities of place. Cutter, Boruff, and Shirley (2003) focus on the intersection of characteristics that make populations more susceptible to loss by calculating an overall composite score from component scores in the social vulnerability index, trademarked as SoVI.¹

Cutter et al. (2003) created component scores through an index of variables that are influenced by socio-economic and political systems. The index is based upon social factors and built environment factors, which interact for a comparative measure. To accomplish this task, 250 socioeconomic characteristics for all U.S. counties are evaluated for multicollinearity. The results provide 85 variables that are then normalized and analyzed through factor analysis. The variables loaded on 11 components that explain 76% of the variation between counties. The findings suggest that, at the time, counties in the western half of the U.S. are more socially vulnerable than counties in the eastern half of the country. Additionally, the states of Alaska and

¹ The term social vulnerability index is not trademarked, just the acronym SoVI.
Hawaii are covered, or are almost completely covered, by counties with extremely high social vulnerability compared to the rest of the United States.

Cutter et al. (2003) acknowledged that the intent of the index is to be a relative measure and not an absolute measure. This is a factor because direct measurement of social vulnerability is not possible. Cutter and Morath (2013) reiterated and stress that the index should not be used as an absolute value, rather, the intent of the social vulnerability index composite score, which is created from the component scores, is to give policy makers and emergency management a way to identify broad spatial distribution patterns. These patterns can then be applied to determine requirements for additional attention and resources for areas that are more socially vulnerable compared to other areas. For example, two areas that have identical social vulnerability scores and percentage of non-Anglo and elderly does not account for the interaction of non-Anglos and elderly characteristics. This can result in policy decisions that determine whether the non-Anglo, the elderly, or the elderly non-Anglo populations need more attention.

The Agency for toxic Substances and Disease Registry (ATSDR), an agency in The Centers for Disease Control and Prevention (CDC), produced a white paper that addresses societal risk to hazards. Keim, Reddick, and Cruz (2007) presented the white paper to create a public health mapping system in an effort to assist state and local public health officials in their preparedness efforts by identifying vulnerable populations across jurisdictions. Flanagan, Gregory, Hallisey, Heitgerd, and Lewis (2011) subsequently created a social vulnerability index (SVI) for the CDC / ATSDR specifically for disaster management, which is based upon but varies slightly from the Cutter et al. (2003) SoVI. However, the theoretical basis is rooted in vulnerable populations being those “whose needs are not sufficiently considered in the planning
of local response and relief organizations (Flanagan et al., 2011, p. 3)” and claims to position the social vulnerability index into practical application at the local level.

There are a number of differences between how the Cutter et al. (2003) SoVI and the Flanagan et al. (2011) SVI are calculated at the county and census tract levels respectively. Methodologically, the SoVI takes an inductive approach while the SVI takes a deductive approach. Additionally, the Flanagan et al. (2011) SVI used fifteen characteristics that are grouped by type of vulnerability: socioeconomic status, household composition / disability, minority status / language, and housing / transportation. The youth factor is based on 17 years of age and younger, rather than 5 years of age and younger. Language is based on less than well rather than less than very well while the institutional factor combines college, military, correctional, and nursing.

Aside from a slight difference in variables that comprise the SVI versus the SoVI, Flanagan et al. (2011) intended the SVI to be an absolute value tool giving local organizations the ability to identify pockets of socially vulnerable populations by characteristic to determine planning and resource allocations and reduce the effects of disaster. To accomplish the purpose of the SVI, the data is collected at the census tract level for the entire United States (ATSDR, 2013). The SVI proposal runs in contradiction to Cutter et al. (2003), who construct the SoVI at the county level and proposed that the social vulnerability index is a comparative measure, as social vulnerability cannot be measured in absolute terms. This is because of the many possible interactions of variables that produce social vulnerability. However, the SVI has similar limitations as SoVI that includes reliance on the knowledge, skills, and ability of practitioners to construct and interpret the results.
3.4 Summary

The purpose of this chapter is to provide a better understanding of how both the disaster and hazards scholarly research communities have approached the concept of social vulnerability. The disaster perspective produces an approach to social vulnerability that provides an acknowledgement of social inequalities and vulnerability that early disaster studies neglect in the therapeutic communities’ ability to negate social and racial distinctions. The disaster tradition approaches social vulnerability from the perspective of how individuals experience disaster due to social inequalities, based upon characteristics that include gender, class, race, and age. The literature acknowledges the dynamics and complexity of the phenomena in findings that reveal interacting effects of characteristics. Social vulnerability compensates for the limitations of early disaster studies by providing an explanation for disaster results, such as Hurricane Katrina, that are unexplainable by the therapeutic community theory.

The hazard perspective reveals an approach to social vulnerability that provides a way to conceptualize vulnerability in an effort to distribute effective mitigation equitably for everyone. The hazards tradition approaches social vulnerability from the perspective that mapping and quantitatively measuring vulnerability allows for identification of a population’s disaster proneness and resource distribution needs to mitigate the effects of hazards. The evolution from a static view to a dynamic view accommodates the dynamics and complexity of the phenomena by analyzing the cumulative effects of vulnerable social characteristics across space.

The common premise of both approaches is that while everyone may be exposed, people have differing levels of sensitivity to hazard exposure. The intent is to help emergency management reduce social vulnerability through disaster planning and hazard mitigation. The extent that emergency management embraces the social vulnerability concept, as seen through
the meaning that emergency managers give to social vulnerability, can reveal the extent that knowledge transfer of social vulnerability research from the disaster and hazards communities is effective.

The next chapter describes the methods employed in this research. It includes the site selection and study sample selection process. It also includes the data collection process and method of analysis. This is followed by two analysis chapters, which will discuss the findings for each of the two main research questions. The paper will then culminate in the conclusion, which will provide a summary of the major findings, as well as the contributions and implications for research and practice, future research needs, and limitations of the study.
CHAPTER 4
METHODS

4.1 Introduction

The purpose of this chapter is to present an overview of the methods and data that are used to answer the research questions posed by this dissertation. Specifically, the chapter provides details of the study area, study sample, and methods of data collection. The chapter begins with an overview of grounded theory and its importance to this research, then provides a detailed discussion of the study area and research methods, and then discusses the limitations of using a modified grounded theory through naturalistic inquiry.

4.2 Methods

Rather than simply advancing or verifying existing theory through hypothesis testing, Glaser and Strauss (2006) prefer the use of systematically obtained data for theory generation. The purpose is to “develop a theory that accounts for much of the relevant behavior” (Glaser & Strauss, 2006, p. 30). Thus, the use of a modified grounded theory in this research facilitates the creation of diverse, emergent, and conceptual categories and provides relevance to the specific context. The results can then provide comparisons against existing theory and give future research the ability to further theory production.

The use of a naturalistic inquiry provides the ability to uncover the multiple realities that local emergency management experiences. The purpose of this research is to bridge the knowledge gap between research and the practice of emergency management. As such, the need to uncover the multiple realities that local emergency managers experience guides a
methodology that is influenced by the methods employed by earlier researchers in the knowledge transfer literature. This study seeks to provide the ability to build from the perspective of the practitioner, based upon the problems that practitioners face.

4.2.1 Site Selection

Figure 4.1 displays the geographical bounds of the sample area. The complex interactions of characteristics like poverty, education, language, and place of birth make the Houston region of Texas the center of a rich environment to study how the social vulnerability concept has been understood by emergency management. For example, Texas ranks second in the United States for limited English proficiency (LEP) populations with LEP population operationalized as individuals speaking English less than very well. Houston has more than 700K in LEP population, and is in Harris County, which has the most LEP population categories (24) in Texas.2

The sample area is also highly exposed to both natural and technological hazards. Hurricanes, floods, petroleum processing, and the potential for accidental releases from chemical production facilities provide a direct risk to the population while natural hazards can also indirectly produce damage or harm. Terrorism can also increase risk of harm or damage through the technological hazards that already exist in the sample area. These characteristics place the Houston-Galveston Area Council (HGAC) region, as a prime central location for studying the influence of social vulnerability research on local emergency management. A regional level for sample selection is appropriate because the purpose of councils of government is to coordinate

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2 LEP is just one example of social vulnerability characteristics for the area.
local planning in Texas. Therefore, it is assumed that the sample area will have a linking agent in the planning process for emergency management.

Figure 4.1
Site Selection – HGAC and SETRPC Regional Areas

As interviews in the HGAC Region progressed, an observation is made of partnerships with adjacent areas to handle overflow in hospital evacuations for technological hazards. This finding brought to light the need to expand the sample to the South East Texas Regional Planning Commission (SETRPC) three county region. For example, one respondent identified the specific need to have relationships with the SETRPC area to provide hospital and emergency services support, should an industrial event impact the greater portion of the HGAC region.

The social vulnerability index created by Cutter et al. (2003) provides support for purposive sampling in the study. Table 4.1 provides description of the wide range of social
vulnerability by county, as compared by percentile, to all counties in the continental United States (HVRI, 2016). The index score percentiles range from 2.61% for Fort Bend County to 84.03% for Walker county. The county percentile directly corresponds to the SoVI composite score where the higher positive number corresponds to higher levels of social vulnerability and the larger negative numbers correspond to lower levels of social vulnerability. Seven of the sixteen counties fall in the top two thirds of the national percentile, and five counties, Colorado, Jefferson, Matagorda, Walker, and Wharton counties fall above the 60 percentile, reveals the diverse variation of social vulnerability in the sample area on a national comparison.

Table 4.1
HGAC and SETRPC - County Social Vulnerability National Percentile (HVRI, 2016)

<table>
<thead>
<tr>
<th>HGAC Counties</th>
<th>SoVI Percentile</th>
<th>SoVI Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin County</td>
<td>38.31</td>
<td>-0.7077</td>
</tr>
<tr>
<td>Brazoria County</td>
<td>10.72</td>
<td>-3.0679</td>
</tr>
<tr>
<td>Chambers County</td>
<td>4.71</td>
<td>-4.2550</td>
</tr>
<tr>
<td><strong>Colorado County</strong></td>
<td><strong>77.35</strong></td>
<td>1.6541</td>
</tr>
<tr>
<td>Fort Bend County</td>
<td>2.61</td>
<td>-5.2861</td>
</tr>
<tr>
<td>Galveston County</td>
<td>21.92</td>
<td>-1.8321</td>
</tr>
<tr>
<td>Harris County</td>
<td>35.32</td>
<td>-0.8891</td>
</tr>
<tr>
<td>Liberty County</td>
<td>28.89</td>
<td>-1.2628</td>
</tr>
<tr>
<td><strong>Matagorda County</strong></td>
<td><strong>81.16</strong></td>
<td>2.0552</td>
</tr>
<tr>
<td>Montgomery County</td>
<td>5.63</td>
<td>-4.0049</td>
</tr>
<tr>
<td><strong>Walker County</strong></td>
<td><strong>84.03</strong></td>
<td>2.3909</td>
</tr>
<tr>
<td>Waller County</td>
<td>24.50</td>
<td>-1.6280</td>
</tr>
<tr>
<td><strong>Wharton County</strong></td>
<td><strong>73.37</strong></td>
<td>1.3067</td>
</tr>
<tr>
<td>SETRPC Counties</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardin County</td>
<td>13.97</td>
<td>-2.6738</td>
</tr>
<tr>
<td><strong>Jefferson County</strong></td>
<td><strong>62.07</strong></td>
<td>0.5629</td>
</tr>
<tr>
<td>Orange County</td>
<td>22.94</td>
<td>-1.7469</td>
</tr>
</tbody>
</table>
4.2.2 Study Sample

The study uses a purposive sample, which is preferable in grounded theory, because maximizing heterogeneous patterns is preferable to generalizability (Erlandson, Harris, Skipper, & Allen, 1993). This allows for the use of contextual and cultural conditions and norms to identify emerging themes in a specific context. Saturation helps to determine the final sample size with interviews conducted to the point of information redundancy. Redundancy of information is an acceptable method of determining the final sample size when the likelihood of obtaining new information is considered low (Glaser & Strauss, 2006).

The HGAC region has thirteen counties with emergency managers identified on county websites. The region has one-hundred and seventy-six cities, incorporated cities, and census designated places with thirty-five emergency managers identified on city websites. The SETRPC region has three counties, and twenty-six incorporated cities and census designated places from which emergency managers were selected. A LinkedIn search identified four emergency managers through personal accounts. This provides contact information for an initial pool of fifty-two local emergency managers in the HGAC region.

Emails were sent to all of the identified emergency managers across both regions that for whom contact information were available by email and LinkedIn. In addition to emergency managers across the HGAC and SETRPC regions, three city managers and two American Red Cross officials were identified and agreed to be interviewed. The final sample includes two American Red Cross officials, three city managers, and nineteen emergency managers from across sixteen counties of the HGAC and SETRPC regions. The result is 24 completed interviews across the HGAC and SETRPC regions combined.
The sample resulted in a somewhat homogeneous demographic. The sample is predominantly male with four of the twenty-four respondents being female. Race of respondents is not accurately known. Based solely upon my visual observation, the sample is predominantly Caucasian and Caucasian of Hispanic descent. It is understood that this is not an accurate depiction of racial demographics of the respondents. Some respondents do have a higher education and two talked about having an advanced degree.

The majority of respondents hold the position of Emergency Management Coordinator. Other positions included the Assistant Emergency Management Coordinator, the City Manager, Director, and Public Relations. The offices or departments of emergency management location in the local government structure vary with some being a standalone Department of Emergency Management to being housed in the Fire Department or Police Department. Some of the local governments place the emergency manager and assistant emergency manager separated into the fire and police departments while the county offices are all standalone departments.

4.3 Data Collection and Analysis

Two factors were important considerations when conducting interviews. First, ethical considerations required assurance of anonymity for the respondent. For example, the interview sessions for this research are recorded to ensure accurate transcription. Hand written notes were established as a backup strategy in case respondents objected to recording, but all respondents agreed to be recorded. Second, terms that are common to the researcher and respondent are used to ensure clarity and mutual understanding of what is being discussed (Erlandson et al., 1993). For example, the term research was found to have a different meaning to practice, just as Nutley et al. (2007) propose, and had to be specifically explained in different ways such as empirical,
scholarly, and scientific. The most effective communication came with the term scholarly or academic journal articles.

It was very important to gain the trust of the respondents and build rapport. I found that most respondents displayed concern with trust until they were able to find out a little bit about me. This is recognized with the majority of the respondents first telling me about their background, whether they came from the fire service, law enforcement, or military service. Then they would ask me about my background and experience.

One made the comment that they had to give me an interview after seeing my retired military rank on my signature block. Another respondent stated that I would not have gotten the interview if the respondent had not known me. To some extent, the trust issue does stems from a lack of trust that their words will be confidential. It is perceived by the respondents that their words have consequences because political motivations can result in job loss.

A second reason that trust and rapport is needed is visible in respondent sentiment that if you have not been there and done that, why should anyone in emergency management listen to what you have to say. This is attributed to the idea that emergency management operates in a high consequence and high impact environment. This is evident in the fact that respondents would appear more comfortable after the introductions, and some would even relax enough to use profanity during the interview. This is the point that I knew we were on a good common ground and that the information given was factual. A few even let me know at times that if I were to quote a specific statement that everyone would know it was their statement.

A few of the respondents appeared to be so familiar with giving interviews that they were somewhat disconnected from the process and gave what seemed to be the standard operating procedure answer to questions. These few interviews barley made twenty-five minutes with
answers that were short and to the point, with no interest in elaborating. Other interviews lasted as long as two and a half hours. The majority of these interviews, with whom I was able to build rapport, gave in depth explanations with many asking if they had answered my question or had they gotten too far off subject.

4.3.1 Interview Questions

Semi-structured interviews allow for consistency over concepts with the flexibility to present topics when appropriate (Corbin & Strauss, 2015). The interviews in this study are intended to be a conversation with a purpose that allows the interviewer to determine the most appropriate time to ask questions (Erlandson et al., 1993). Participants are free to add anything of relevance to them and the interviewer is able to fully develop a topic and clarify points with additional questions (Corbin & Strauss, 2015). The study uses semi-structured interview questions that are open ended and broad enough to identify sensitizing concepts of how emergency managers perceive and define social vulnerability and the strategies used to reach and address the needs of vulnerable populations.

The participants were free to bring up additional topics that were important to them. No additional topics of a sensitive nature were introduced by respondents. However, it was necessary to alter the follow up questions, from the initial proposal, to a slight degree. As stated by Corbin and Strauss (2015), the construction of follow up questions were found to be necessary to help fully develop a deeper meaning of social vulnerability and the strategies used to reach and address vulnerable populations. Below are the main questions and probing questions that were originally proposed for the interview. The ‘Q’ stands for main question and the ‘PQ’ stands for probing question.
Q1: Can you describe a problem that you have experienced in this job that has defined how you focus planning and resources for disaster management?

PQ1: What other problems define how you focus planning and resources for disaster management?

PQ2: Which problem is the most important?

PQ3: Do you believe that you are able to focus on the right problems?

Q2: How do you get information to help you solve problems?

PQ1: What sources do you trust for information?

PQ2: How much do you rely upon research / training for information?

PQ3: How important is research to helping you solve problems?

Q3: Have you been involved in research studies?

PQ1: What kind of involvement?

PQ2: How much do you think practice should be involved in research?

PQ3: Would you be willing to be involved in research?

Q4: What does vulnerability mean to you?

PQ1: When can vulnerability be reduced?

PQ2: What can be done to reduce vulnerability?

Q5: Who is vulnerable in your area of operation?

PQ1: What makes them vulnerable?

Q6: What does social vulnerability mean to you?

Q7: How do protocols effect your operations?

PQ1: County / State / Federal?

PQ2: How much control do you have in operations?

PQ3: What activates your involvement in solving a problem?
Q8: What effect do non-official or emergent groups have on your ability to handle situations?

Table 4.2 displays the original proposed questions alongside the final forms that the questions took as they evolved during the interview process. The main questions, identified as Q1 to Q8, remained the same with the exception of Q1 and Q6. An additional question was added to the beginning of the interview to explore a specific problem or event that the respondent had experience that has helped shape planning and resources for emergency management in their jurisdiction. The respondent was then asked if that was the main problem that they face, and about any other problems that help shape planning and resources in their jurisdiction. The term disaster management is avoided in favor of emergency management to match the terms that the respondents were using and understood as normal operations in their capacity. PQ2 and PQ3 under Q1 were found to be redundant and some respondents gave odd looks when asked so they were only used after the first few interviews when the response to Q1 did not address them.

Q4 and Q6 may seem to be the same question. However, Q4 asks what vulnerability means to the respondent in order to determine if social vulnerability is part of their meaning of vulnerability. Respondents are then asked if there are populations that are more vulnerable than other populations in a follow up to Q4. Then respondents are then asked if they had heard of the term social vulnerability. This is then followed by Q6 to determine what social vulnerability means to them. The follow up to Q6 is to provide background to what the literature says about social vulnerability and whether their area matches the literature on the concept of social vulnerability.

Rather than simply asking what social vulnerability means to the respondent, it was deemed necessary to ask if the respondent had heard of the term social vulnerability before being contacted about participating in this study. The initial interviews produced uncertainty with
puzzled looks when asked in the original form of what social vulnerability meant to them in their jurisdiction. However, one respondent acknowledged conducted internet research to find out what social vulnerability was before the interview. The probing questions also changed to accommodate the conversation flow.

A description of social vulnerability is added after the respondent gives their meaning of social vulnerability. This description includes how disaster and hazards traditions understand social vulnerability where people experience disaster differently and are more sensitive to hazards with an overarching meaning of social, political, and economic policies that create vulnerability through social inequalities that exist prior to an event. Providing context for social vulnerability allows respondents to provide feedback and alter or confirm their definition of social vulnerability with that of research. The lack of use of social vulnerability terms does not necessarily mean that the respondent does not have an understanding of the meaning of social vulnerability, even if they have never heard the term.

The first few interviews tend to be somewhat mechanical as questions were asked in order. As subsequent interviews were conducted, a conversational flow began to emerge. After the initial question, other main questions were incorporated as respondents spoke about the subject areas in their conversation rather than in a linear fashion. This eventually created a conversation that flowed with a transitional context for each question for the respondent, rather than having a choppy and mechanical feel. This led to more in depth discussion for most of the interviews.

To reduce bias of social vulnerability from other questions, the conversation starts with asking about a problem that focuses planning and resources, where they get information to solve problems, and the meaning they apply to vulnerability and social vulnerability. This helps to
reduce the effect of the conversation leading the respondent to answer these questions from a social vulnerability perspective, if that is not how they normally view their role, to determine if the definition of social vulnerability is a part of their daily operating narrative. The respondents are then asked directly if they have ever heard of the term social vulnerability. This is followed by asking what social vulnerability means to them.

Two questions, Q7 and Q8, are used to understand emergency management strategy regarding vulnerable populations to determine the impact that social vulnerability research has had on local emergency management. Q7 asks how protocols affect planning and operations in their jurisdiction. Protocols are described as rules, regulations, or guidelines from city, county, state, or federal governments. Protocols represent a level of control that is asserted by government officials or higher-level policy makers, which is transmitted at varying degrees to local government, and can affect how vulnerable populations are addressed in local emergency management. Q8 asks how unplanned activity during an event, such as spontaneous volunteers or organizations, affects their ability to meet community needs. Unplanned activity represents a level of flexibility and inclusion that can affect how vulnerable populations are addressed in local emergency management.

Table 4.2 Interview Question Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Proposed Questions</th>
<th>Final Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Can you describe a problem that you have experienced in this job that has defined how you focus planning and resources for disaster management.</td>
<td>Is there a specific problem or event that you have experienced in your present job that has helped to focus planning and resources for disaster management?</td>
</tr>
<tr>
<td>PQ1</td>
<td>What other problems define how you focus planning and resources for disaster management?</td>
<td>Are there any other problems that help to focus planning in your jurisdiction?</td>
</tr>
<tr>
<td>PQ2</td>
<td>Which problem is the most important?</td>
<td>Dropped halfway through interviews.</td>
</tr>
<tr>
<td>PQ3</td>
<td>Do you believe that you are able to focus on the right problems?</td>
<td>Dropped halfway through interviews.</td>
</tr>
<tr>
<td>Q2</td>
<td>How do you get information to help you solve problems?</td>
<td>Where do you go to get information to help you solve the problems you face?</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>PQ1</td>
<td>What sources do you trust for information?</td>
<td>I didn’t hear you say research. Is there a reason you didn’t mention research?</td>
</tr>
<tr>
<td>PQ2</td>
<td>How much do you rely upon research / training for information?</td>
<td>What role does research play in solving problems?</td>
</tr>
<tr>
<td>PQ3</td>
<td>How important is research to helping you solve problems?</td>
<td>Dropped from interviews.</td>
</tr>
<tr>
<td>Q3</td>
<td>Have you been involved in research studies?</td>
<td>Have you been involved in research?</td>
</tr>
<tr>
<td>PQ1</td>
<td>What kind of involvement?</td>
<td>What about when we define research specifically as academic / scholarly research?</td>
</tr>
<tr>
<td>PQ2</td>
<td>How much do you think practice should be involved in research?</td>
<td>How much do you think practice should be involved in scholarly / academic research?</td>
</tr>
<tr>
<td>PQ3</td>
<td>Would you be willing to be involved in research?</td>
<td>Would you be willing to be involved in scholarly / academic research?</td>
</tr>
<tr>
<td>Q4</td>
<td>What does vulnerability mean to you?</td>
<td>What does the word vulnerability mean to you in your jurisdiction?</td>
</tr>
<tr>
<td>PQ1</td>
<td>When can vulnerability be reduced?</td>
<td>Who is vulnerable in your jurisdiction?</td>
</tr>
<tr>
<td>PQ2</td>
<td>What can be done to reduce vulnerability?</td>
<td>Dropped from interviews.</td>
</tr>
<tr>
<td>Q5</td>
<td>Who is vulnerable in your area of operation?</td>
<td>Are there specific populations that are more vulnerable than others?</td>
</tr>
<tr>
<td>PQ1</td>
<td>What makes them vulnerable?</td>
<td>Have you heard the term social vulnerability before this interview?</td>
</tr>
<tr>
<td>Q6</td>
<td>What does social vulnerability mean to you?</td>
<td>What does the term social vulnerability mean to you?</td>
</tr>
<tr>
<td>Q7</td>
<td>How do protocols effect your operations?</td>
<td>When we think about protocols as rules, regulations, and procedures, how do protocols effect you in planning and resources for disaster management?</td>
</tr>
<tr>
<td>PQ1</td>
<td>County / State / Federal?</td>
<td>Dropped from interviews.</td>
</tr>
<tr>
<td>PQ2</td>
<td>How much control do you have in operations?</td>
<td>Dropped halfway through interviews.</td>
</tr>
<tr>
<td>PQ3</td>
<td>What activates your involvement in solving a problem?</td>
<td>Dropped halfway through interviews.</td>
</tr>
<tr>
<td>Q8</td>
<td>What effect do non-official or emergent groups have on your ability to handle situations?</td>
<td>What effect do unofficial or emergent groups, those individuals or groups that just show up to help, have on your ability to handle an event?</td>
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</table>
4.4 Content Analysis

Content analysis of interviews is conducted through a constant comparative method that allows for concurrent coding and analysis (Corbin & Strauss, 2015; Glaser & Strauss, 2006). Categories are established as they emerge in the initial case and each subsequent case is coded with emergent categories and compared to the previous cases. Category saturation was determined at interview 14; however, interviews were conducted until 24 were completed to ensure saturation. Then categories are combined into fewer categories that create themes. One limitation to using the saturation method is that the researcher determines the saturation point and accepts what has not been covered (Corbin & Strauss, 2015). However, saturation helps to define concepts that differ under varying conditions and identify when the definition of social vulnerability takes on meaning and what social vulnerability looks like under different conditions.

Notes were taken during the interview to help guide the conversation and determine when questions should be incorporated into the conversation. Memos were made after the interview and used to determine any changes that may need to occur in subsequent interviews. A line-by-line method is usually employed to determine categories and theme saturation. However, not having the ability to transcribe the interviews fast enough to accommodate the constant comparative method, the voice recordings of the interviews are reviewed and notes are taken to identify categories as the respondent talks.

The notes were then reviewed to identify themes from the categories that are present in the narrative. Four themes are identified for the first research question in how local emergency managers define and understand social vulnerability. The second research question produces four
themes in which strategy local emergency managers apply to reach and meet the needs of vulnerable populations.

4.4.1 Triangulation

It is important that the findings be credible in order to show that the realities found are the realities that exist. The use of multiple sources of data can provide verification of the data, reduce bias, and increase believability of the findings. Triangulation is one tool that provides credibility about the interpretation of constructed realities in naturalistic, non-positivist, inquiry (Erlandson et al., 1993). As such, triangulation serves to relieve concerns of research trustworthiness using multiple sources such as individual statements, observed behavior, and secondary data such as demographic records. Therefore, triangulation can provide credibility about confidence level or believability that the findings reflect realities (Corbin & Strauss, 2015).

This study uses secondary data from the U.S. Census Bureau, through the social vulnerability index, along with interviews from city managers and American Red Cross officials to verify the realities that form about the impact that social vulnerability research has had on the practice of emergency management at the local level.

4.4.1.1 Secondary Census Data and the Social Vulnerability Index

Secondary census data used in the social vulnerability index provides triangulation with data that is retrieved from interviews with emergency managers by identifying which socioeconomic factors align with the factors that local emergency managers’ report in their definition and understanding of social vulnerability. The social vulnerability index is constructed with Census data from the 2014 American Community Survey (ACS) 5 year estimates (Census
Bureau, 2016). The social vulnerability index is created with the social vulnerability index formula created at the University of South Carolina (see Appendix A for a detailed explanation) (Cutter et al., 2003; HVRI, 2016). The 2014 ACS is the most recent data set that provides a comprehensive variable selection with complete data for the target area. The component scores provide identification of specific social vulnerability characteristics for each place and county. Principle component analysis identifies vulnerable populations specific to local emergency managers such as race or class, poverty, elderly, special needs, or Hispanic and limited English proficient.

The component scores are examined for each county and city to determine which contribute most to each locations’ overall vulnerability. For example, county ‘A’ is comprised more by Factor 2, Class / Poverty / African American and Factor 5, Hispanic / LEP. The top two factors are then examined to determine which variables have the greatest impact within the factor. In the case of county ‘A’, percent no vehicle is the most influential, followed by percent poverty, percent less than high school education, and percent female-headed household for that category. Second, Factor 5 shows percent Hispanic to be most influential followed by percent LEP. Therefore, triangulation is confirmed when county ‘A’ identifies with a high poverty and high Hispanic population in their area of jurisdiction.

4.4.1.2 Supplemental / Additional Interviews

Interviews with emergency managers reveal that city managers and American Red Cross officials play a role in the problems that focus planning for emergency management in their jurisdiction, some positive, and some negative. Three city managers and two American Red Cross directors agreed to be interviewed across the sample area. Interview questions remained
the same as asked of the emergency managers. One exception is that triangulation interviews started by asking what the respondent understands as their role in emergency management in their area of jurisdiction. The interview data revealed that interviews with city managers and American Red Cross officials does provide a level of credibility and trust in the realities that are found in the interviews with emergency managers.

4.5 Limitations and the Importance of Trustworthiness

The use of grounded theory in this research provides checks and balances to ensure quality and to help control for bias (Corbin & Strauss, 2015). For example, the constant comparison method requires analyzing new data for similarities, differences, and consistency against previously collected data. Each interview is analyzed for themes, which are then compared to the previous interviews by looking for similarities, differences, and consistency in respondent answers. The wording of questions during the interview is analyzed as well to ensure that it is consistent across interviews. In addition to the constant comparison method, mechanisms of trustworthiness also help to reduce bias.

One major concern in knowledge creation is whether the findings are credible and can be trusted. Most attacks by positivists on non-positivist research focus on a lack of discipline and objective observation (Erlandson et al., 1993). However, these concerns are more with the standards that judge research trustworthiness and the appropriateness of standards for judging research methodology. In response to positivist attacks, many scholars propose evaluation of research methods based on their merits rather than on the merits of other research methodologies (see Corbin & Strauss, 2015; Erlandson et al., 1993; Glaser & Strauss, 2006; Lofland, Snow, Anderson, & Lofland, 2006; Teddlie & Tashakkori, 2009). This perspective applies to both
qualitative and quantitative methods equally. Trustworthiness through factors such as truth-value and applicability provides a check on sloppy and biased research.

To achieve trustworthiness, the use of non-positivist methods, in this research, require different concepts and techniques than does hypothesis testing. While each method has its place, depending upon the purpose of the research, hypothesis testing uses internal and external validity to determine validity (Singleton & Straits, 1999). Alternatively, this study uses credibility and transferability to provide a degree of confidence that what is found is the truth (Erlandson et al., 1993).

4.5.1 Truth Value

Traditionally, positivist methods use internal validity to provide truth-value for trustworthiness and provides a level of certainty that independent and dependent variables are measuring what they are intended to measure during hypothesis testing (Singleton & Straits, 1999). However, positivism assumes that only one reality can exist and is valid. Truth-value helps to establish trustworthiness through credibility in non-positivist inquiry (Erlandson et al., 1993). The difference is that this research assumes that many different realities exist based on the context of the situation and the social position of each interviewee. These realities must be considered credible rather than valid (Glaser & Strauss, 2006). This study uses triangulation to increase the level of credibility and reduce the limitations that exist in truth-value.

4.5.2 Transferability

Transferability or applicability is concerned with the ability to apply findings from one study to another or the use of research findings outside of the context of the research.
Applicability in traditional methods (Singleton & Straits, 1999) and contemporary methods (Erlandson et al., 1993) uses external validity to determine the generalizability of the findings where characteristics do not shift across context. Generalizability provides meaning to the findings outside of the research context under the assumption that only one reality exists with similar contexts based upon specified characteristics. However, the ability to generalize findings decreases as contextual differences increase. Therefore, this study assumes that generalizability is not possible because observations will change from context to context, community to community, and region to region.

Two mechanisms to achieve transferability in this research are thick description and purposive sampling (Erlandson et al., 1993). First, the narrative provides thick description of contextual relationships. In non-positivist research, it is not the responsibility of the researcher to tell how their research is applicable to other contexts. Rather, because of contextual differences, it is the responsibility of other researchers to apply the thick description to their research. Second, using a purposive sampling maximizes relevant information obtained that would be typical of the context for the research questions.

The next two chapters provide analysis for the two main research questions to investigate the extent to which social vulnerability research has influenced the practice of emergency management at the local level. The first analysis chapter addresses the first research question: How do local emergency managers perceive and define social vulnerability? Next, the second analysis chapter addresses the second research question: what strategies do emergency managers employ to reach and meet the need of vulnerable populations? The final chapter provides a discussion of the major findings as well as the implications and contributions of the study followed by future research needs.
CHAPTER 5

EMERGENCY MANAGER PERCEPTIONS AND DEFINITIONS OF SOCIAL VULNERABILITY

5.1 Introduction

In light of events such as Hurricane Katrina, which vividly underscored the effects of social inequality, it is important to understand the impact that social vulnerability research has had on the practice of emergency management. Thus, to answer the guiding question, the first research question asks about local emergency managers’ perceptions and definitions of social vulnerability. The way that decision makers define the problems they face will determine how the problem is solved. In other words, the perceptions and definitions that guide a decision maker’s problem solving process will determine the priority that is placed on an issue such as social vulnerability and is influenced by where they get their information.

In order to understand the impact of social vulnerability research on the practice of emergency management at the local level, it is first necessary to understand how practitioners perceive and define the concept. Given that those definitions are likely based on some combination of experience and research-based findings, this chapter sheds light on the knowledge transfer process as it relates to social vulnerability. The analysis presented here identifies four different ways in which local emergency managers perceive and define social vulnerability. The four themes, as depicted in figure 5.1, are vulnerability as poverty and culture, vulnerability as a moral imperative, vulnerability as a lack of security, and vulnerability as a lack of knowledge.
5.2. Vulnerability as Poverty and Culture

The most common way in which local emergency managers define social vulnerability is in terms of culture and social class. This definition says that barriers are created based on national origin and economic means when distinctions in social mores between groups of people create a lack of ability, access, and economic capacity. These distinctions are visible in the social networks that that form based upon ethnic cultures as well as socioeconomic cultures. Although many respondents did not use the actual term “social vulnerability”, and in fact, some were not even familiar with the term, it is clear that they had a guiding notion of what the concept means. For many it is primarily an issue of social class.

As one respondent said:

Lower income people are in a circle that are sometimes different than higher up folks.
And another:

No. I can assume what it means. It would mean that as by your status in society. You’re going to be more vulnerable in some shape, form, or fashion to a certain type of event. That’s what I assume it means.

While most respondents view social class as an underlying constant, one perspective focuses on being economically distressed prior to an event. In this case, the most vulnerable are understood from a physical boundary perspective where individuals of the same economic class live in the same geographical bounds rather than as an issue of race. However, it was not until after a discussion of the concept of social vulnerability that that the issue of economic/geographical bounds was presented, as one stated:

No (never heard the term) . . . I see it as more of an area. There seems to be more of the people that are, maybe not have vehicles, are not as well off, not have the financial means to evacuate. Kind of in this downtown area. It’s not a race thing, it’s a boundary. That’s what I see.

Included in the culture of social class is the idea that people from different cultures may have different backgrounds, family values, or languages that can produce barriers and result in vulnerability, based upon social class. While the majority of respondents had not heard the term, even though some had heard the term vaguely but may not have a clear understanding of what the term means, the definition for most is understood as social circles and cultural issues that are not isolated to economic factors. Social and cultural circles produce barriers to communication and education as a meaning of social vulnerability. One respondent has had it explained or illustrated to them as pockets of a community with different social mores that may place them in a secondary or tertiary status in evacuation or preparedness efforts because of their culture.

Cultural differences are also seen as communication barriers that result from different languages, other than English, being spoken in the home. One respondent is a prime example of
communication barriers and the lack of tools available for effective communication before, during, and after an event:

… if you’ve got a pocket of, let’s take Vietnamese. For example, you’ve got a Vietnamese community and you’ve got a certain portion of that Vietnamese community that does not speak English. They rely on their kids and grandkids to translate everything for them. If you’re trying to get an emergency notification out to that pocket of people, if you’re not transmitting that stuff out there in multimedia format in Vietnamese, as well as Spanish, and all those other areas, that’s going to be a blind spot. And therefore, they are going to be more vulnerable to the effects of whatever the disaster or emergency is because they’re not gonna be part of that communication. Or it’s not going to be effectively communicated to them.

Cultural differences are also viewed as the fulcrum that tips immigrant populations over the social vulnerability threshold.

This fulcrum includes differences in language, customs, social mores, social expectations, and trust in government. While one view is that cultural aspects can result in placing populations in a second or third priority for the evacuation process, some respondents perceive that underlying barriers are inherent in culture that block effective communication. This is not to say that specific populations are, or are not, placed in a secondary or tertiary position, in evacuation, because of overt actions on part of local government. Rather, this suggests that cultural aspects can provide challenges, as laid out by Lindell and Perry (2003), to getting information to vulnerable populations on the level that they can understand. For example, particular populations may never receive the information while others may simply not understand or may misinterpret the information.

The cultural barrier to communication is not isolated to non-English speaking communities. For example, some people that live along the river are identified as not having the education to understand technical terms that experts use for gauging flood levels. However, people on the river do understand what it means when the river is going to be higher than it was
two years ago when their neighbors’ car was washed away. One sentiment relays the importance of refraining from classifying poor people or those with a lower education as mentally susceptible; rather, they just have less resource available to them. As one respondent states:

I would say those people that have less resources available to them are definitely less able to cope with that situation, particularly financially. Mentally it makes an impact as well. Now it doesn’t say a poor person doesn’t have the mental fortitude to have a survival mentality. Just means they have less tools in which to survive. And, same thing with elderly.

The main point that is derived from vulnerability as poverty and culture is that emergency managers acknowledge that there is a lack of ability, lack of access, and more predominantly a lack of economic capacity. The lack of economic capacity that people experience as part of a lower economic class plays a vital role in the ability to evacuate. For example, this is addressed as an issue where those in lower social circles have fewer tools for communication, such as iPad and social media access. As such, belonging to a lower economic class can lead to a communication barrier that can reduce the ability of local government to implement effective protective orders. This type of cultural barrier is viewed as a social policy, which is rooted in economic factors, and which can create unintended consequences because of pre-existing social inequalities.

While the discussion of vulnerability as poverty and culture focuses on the resources that are available, or rather the lack of resources available, to specific populations based upon income, the underlying issue is embedded within the cultures of social class. The second aspect to this theme is rooted in the cultures that immigrant communities bring to an area that can not only reduce trust in government but also provide language barriers that are difficult to overcome for all but the most common languages spoken, other than English. This leads to a definition of social vulnerability as a cultural aspect, which incorporates economic class and societal norms in
the United States and Texas with culture that is imported from areas outside of Texas and the United States in general.

Vulnerability as poverty and culture, as it emerged from the interview data, is consistent with much of the research on the issue (Fothergill & Peek, 2004; Nigg et al., 2006; Phillips, 1993; Yelvington, 1997). There is also the reference among respondents to language as a cultural issue, predominantly in immigrant communities, which is also consistent with the research literature (Benavides & Arlikatti, 2010; Mathew & Kelly, 2008; S. N. Wilson & Tiefenbacher, 2012). Interestingly, while they viewed culture, class, and language as important factors, respondents in this study did not associate race, and few associated gender with social vulnerability. While there was some mention of the elderly and nursing homes, such as bedfast people confined to a bed because of a disability, which includes elderly populations, a majority of respondents did not incorporate age into this understanding of social vulnerability.

5.3 Vulnerability as a Moral Imperative

For some respondents, social vulnerability is less about the characteristics of groups and people and is instead viewed simply as the right thing to do. This definition says that society has the responsibility and obligation to care for the most vulnerable in society because it is the right thing to do. When the term social vulnerability was explained to some respondents, they took the stance that it is just the right thing to do, as humans and as members of society. According to them, those who have the ability to take care of those who are most vulnerable in our society, have the obligation to do so. This is a point of compassion to live by. As one respondent states:

I think you also have to have a manager that has compassion for the poor or the victims in it.

And as another calls it, the golden rule:
I think a lot of it boils down to the Golden Rule. Sometimes, it just, try to do the right thing and you’ll probably do okay.

For example, one respondent tells about a single mother that lived in a relative’s house during Hurricane Rita. The house sustained major damage and was not habitable and the resident had no financial means to repair the house or find alternative living arrangements. The resident could not receive federal aid to repair the house because the house was still owned by the relative who was deceased and the living relatives do not get along well enough to update the title. Federal protocols outlined that only the homeowner could receive recovery funds. The respondent worked to get the single mother in a tax credit home, which she was eligible for, because it was the right thing to do. This is evident when the respondent said:

Because I’m under no obligation to help them…. But from a social obligation, yea they needed help…

Another respondent best illustrates the compassion that is necessary to provide a true atmosphere of care for everyone in the community, when talking about an event that occurred in preparation for Hurricane Rita. Time was running short for the hurricanes landfall and the C-130 airplane broke down during evacuation. The story paints a picture of the most vulnerable at the point when they need someone to help them the most. However, the only ones that can help at the time are those public servants that are running evacuation operations for the community.

The respondent goes on to tell about the disabled C-130, and the extremely vulnerable people that were dependent upon it for transportation to get out of the path of Hurricane Rita. The plane remained stationary for three days with no movement toward repair. The respondent talks about the need to take steps to help the people that they have tried to care for in the hanger. Finally, an active duty Air Force C-17 landed to drop off supplies, nurses, and a physician for the
disabled C-130. The following quote tells of the compassioned plea that is made for the active duty Air Force Officer to help them evacuate the hanger:

… and it breaks your heart when you realize, you’ve got all these people, they’re vulnerable, they have no way out… An active duty C-17 came in and they did what’s called a touch and go… Well I’m standing there out on the runway, they introduce the pilot to me, and I shake his hand. I won’t let his hand go. And he looks at me and says man it’s nice to meet you. I said you don’t understand man, I can’t let you leave. And he’s a Colonel and I’m a muckity muck, a nobody… I’m serious, I can’t let you leave… And he tells me, I understand your situation. And I said – No, you don’t. I said - You go in there and you look at these people that are laying on this concrete, sweatin’, miserable conditions, elderly, and you tell me it’s okay for me to let you go. And man he looked at me and he said - you’re serious aren’t you. I said - yes sir. I said - I can’t in my own conscience let you leave. And I’ve grabbed his hand. And I’ve said help me. And he looked at me and he said hold on a little bit.

The fact that the community or area of jurisdiction is wealthier than other communities does not relieve them of their responsibility to address social vulnerabilities for demographics such as low income, limited English speaking populations, and single parent households. While homelessness is not considered a problem by emergency managers in the sample area, it is identified as one kind of social vulnerability. Regardless of the wealth of the community, it is identified that every community has some form of social vulnerability based upon specific demographics. As one respondent states:

We’re a (jurisdiction) that’s better off than others, but we do obviously have people that are in poverty, low income people that have the lack of ability to respond to multiple stressors… And like every (jurisdiction), we have a lot of people, about 10 – 15 percent of the population, probably has some degree of access and functional needs issue… We do have what I think a lot of folks have across the United States, we have a lot more single parent households than we used to, which leads to vulnerability when it comes to major disasters and potentially care giving and stuff. Obviously there’s gonna be poor people…

Vulnerability as a moral imperative captures the perception of some respondents that we all have a responsibility as people and members of society to help those in need. In defining social vulnerability this way, some respondents provide an understanding that is based upon
moral obligations as a member of society to those that are truly needy and cannot care for themselves. This theme reveals the idea that regardless of a lack of having heard the term social vulnerability, emergency managers do understand that those who fall in the demographics of the most vulnerable are the most important consideration of compassion. As one respondent said:

I’m always thinking about how to get the most vulnerable out of harm’s way the quickest and efficient. And sometimes the fickle finger of fate does not comply.

And another:

…they would be in dire straits. I’ll be real honest with you, I go through weeks that I don’t sleep at night thinking what have I not covered, what have I not opened my eyes, situational awareness, have the big picture of?

And a third:

You don’t want to think about it, but you know, some of those people aren’t coming back. Cause they died… Just the sheer trauma… That’s what I worry about. It may sound silly, but it worries you because your in the middle of that evacuation and your trying to get all these people out… It’s those individual people that you worry about.

The main point of discussion here focuses on the responsibility of the emergency manager, as a public official, to ensure that the needs of the most vulnerable are met. For some, the perception and definition of social vulnerability focuses on the responsibility to do the right thing; however, respondents do identify the most vulnerable by demographics, such as the elderly, poor, or single mothers. In this case, the right thing is to have compassion for the most vulnerable who truly have no ability to protect themselves from disaster. Words like compassion, heart breaking, and social obligation dominate some discussions and are indicative of the passion that is observed in the responses of some respondents.
5.4 Vulnerability as a Lack of Security

The next theme that emerges from the interview data is that some respondents define social vulnerability as a lack of security in the community. For some, vulnerability is defined by security issues that exist before, during and after an event and result in elderly populations choosing not to self-identify out of fear of being victimized. This view was particularly noticeable when talking about unplanned or spontaneous organization and volunteer activity in the immediate aftermath of an event. The focus here is primarily on law enforcement and the reduced physical security that people in society experience. For example, one respondent talks about hearing the term social vulnerability as part of the criminal justice community:

Yeah, well they talk about that in law enforcement a lot. It may not be in the same term that you are, but society is vulnerable constantly. You know, you take, you can go on the internet and put your name in and find a hell of a whole lot about you. That’s why we have identity theft. Cause there’s so much about you out there. So you’re vulnerable to some fool that thinks you got a lot of money.

A number of interviews talk about individuals who may not have the ability to evacuate, but also refuse to accept transportation. This refusal is born out of a need to protect themselves and their property from others. For example, respondents report that people perceive the need to protect their property from others who would steal from them during or immediately after an event such as a hurricane, which is consistent with the research literature (Drabek, 2010; Dynes, 1993). Others may prey on victims by charging high rates on construction services or supplies as well as basic needs like ice or water. As one respondent stated:

Well let me rephrase that. It may be that they just choose not to. Cause there’s people that don’t have a vehicle, and for whatever reason, and the invitation is there – here’s the bus, and if they say no... even though it’s mandatory... We’re not gonna go arrest somebody and tell them - no you’re evacuating, were pulling you out of your house. That’s not going to happen. So, it’s a never ending cycle of thinking.

And another:
… The good lord may take me but I’m gonna be with my stuff… I’ve worked here all my life, I’m not vacating. This is all I have now… And some of them look at you say - I’m 80 years old. If I die, I’m dying with my stuff.

Another aspect to vulnerability as a lack of security is identified by some respondents as elderly individuals who are unwilling to identify themselves as needing transportation, in the event of an evacuation, out of fear that others will know that they are vulnerable and will take advantage of them. The perception among some emergency managers is that mechanisms of identification and transportation are available but some elderly choose to not self–identify out of fear of immediate loss in everyday life along with the possibility of future loss during and after. The elderly believe that criminals will discover that they are vulnerable and will take advantage of them in daily life. Therefore, respondents believe that vulnerability lies in the perception of a lack of security, because the public is provided the resources to evacuate.

A number of respondents view this as a personal choice because the government has provided the 211 system, at the state level for Texas. This system provides an avenue for all individuals to notify government that they need transportation during an evacuation. Some respondents talk about comparing the information from the 211 system with local outreach efforts from the previous year, on an annual basis, to confirm the identity of those in need. As one respondent states:

More or less the ones that that are in their own homes, ‘cause the nursing homes are gonna have contracts with ambulance services. So they have to have their own plan, and they have to have it in place. It’s the ones that choose to have their loved ones at home and take care of by their selves, but they are confined to a bed that need the most help now. Now we do have, when it’s used right, a safe gap, and that’s 211.

However, some respondents acknowledge that the system only works when individuals are willing to sign up and identify themselves as being in need.
Interestingly, for respondents who define vulnerability as a lack of security, age is a focal point of their definition. For them, the elderly in particular are vulnerable. However, it is not due to their health, lack of mobility, or psychological wellbeing as found in the research literature (Klinenberg, 2001; Laditka et al., 2008). Instead, it is because of their actual and perceived susceptibility to being victimized by crime.

5.5 Vulnerability as a Lack of Awareness or Knowledge

The knowledge gap between research and practice is not the only knowledge gap that exists. Interviews reveal that respondents perceive that a knowledge gap also exists between emergency management and the communities they serve. Because of a knowledge gap between practice and the public it serves, decisions are made by government personnel and the public without the knowledge of what the true hazards are or out of political motivation. For some respondents in this study, the definition of social vulnerability is defined as a lack of public knowledge about the true hazards in the community. One respondent provides a good example by specifically listing a lack of knowledge on the part of the community when asked directly about social vulnerability:

People in this community have no earthly idea what travels through this (jurisdiction), at any given day, up and down this interstate.

Related to this, some respondents felt that individuals are vulnerable because they chose to build homes in a flood or hurricane prone zone without understanding the hazards and risk that they face. While some people may continue to live in a hurricane or flood prone area and have previous experience, other people move from other states for higher incomes and do not understand the risk that hurricanes pose because they have never experienced a hurricane. This is compounded by the idea that money can buy protections and insurance will fix the problems.
after the fact. For example, one respondent talks about new money moving into the area from California as Texas incentivizes business to relocate:

When I think of social vulnerability, I think of what the community thinks and reacts to... I may be way off on this. They don’t understand the vulnerability that they are in. And that’s part of an education process that us as emergency managers, I don’t think, reach out enough to. I don’t think we educate the new residents as much as we should. You have a lot of new money coming in to South Texas. And you’ve got people selling their home in California, coming down here, getting bigger houses that are locations for half the price. But they don’t realize. That’s what I think social vulnerability is. They don’t understand what the impacts of the disaster could have and what the effects on the community.

A few of the respondents talk about how the public focus remains on natural hazards such as flooding and hurricanes; however, a large web of pipelines, rail lines, and interstates crisscrosses both the Houston-Galveston region and the Southeast Texas region. This creates a transportation hub that centers on the area. While the pipelines, for the most part, are hidden under ground, the roadways and rail lines are visible. All of these avenues carry materials that are produced at the many chemical plants and petroleum refineries but are viewed as money rather than as a hazard by most of the public. Some respondents perceive public attitude that government is there to protect the public and that the public expects the government to protect them. A high level of frustration is observed when one respondent states:

And people don’t want to know. They don’t want to know. You just take care of me. You take care of the problem. People don’t realize.

Other respondents talk about government personnel, elected and appointed, having the ability to retard or even counteract the process of educating the public on the hazards they face as well as what they can expect when disaster strikes. For example, political motivations may lead an elected official to make promises to the public that are not realistic. Others may make evacuation decisions that counter information given to the public by emergency management and may not align with the actual needs of the situation. As one respondent states:
Educate them. That takes support from your leadership. It depends on the political climate. If its re-election time for a particular person in a particular precinct, and it happens in their precinct, sometimes that particular person can make your job a lot harder. They want you to take things to those people that you’ve already said we can’t bring those things to you. So it sort of blocks your educational process. There are politics involved in everything. It’s no different in our business. Sometimes, your politicians, they don’t listen.

And another:

So every time you have a major declared disaster, it’s gonna be dependent on the personality, the demeanor, and the expertise of the chief elected official… In the time of a declared disaster, that elected official becomes the person running everything, but in fact, it’s that emergency manager. They are the ones with that expertise and training in the context. Depending on their personality or philosophy, they [the elected official] may choose to ignore and go another way.

Some respondents perceive that policy can create vulnerability when elected officials lack the knowledge of the true risks to the community. As one respondent states:

Elected officials have no clue of the risks they face, and are the ones making policy…

Yes, policy can create vulnerability.

The interview data is highlighted by respondents who perceive that social vulnerability is a lack of public knowledge on the true hazards they face because of where they live. The first point is that an influx of residents to Texas produces social vulnerability because they do not understand natural hazards such as hurricanes and the impacts they can have because new migrants have not experienced the hazards that exist along the Gulf Coast region of Texas.

For respondents who define social vulnerability primarily as a lack of knowledge, the key to reducing vulnerability lies in greater outreach to and education of the public. From this perspective, respondents felt that residents, particularly those new to the area, must become more knowledgeable of the true hazards they face, which include hurricanes and the web of petrochemical rail lines, highways, and pipelines. In order for outreach and education efforts to
be successful, respondents believe that there must be trust between public officials and the communities they serve.

5.6 Discussion

It is important to understand where respondents’ definitions originate to understand better the influence of research on the practice of emergency management. The interview data reveals that very few respondents use a definition that is directly driven by research. However, this does not mean that the literature has no impact on the practice of local emergency management; simply that it is not a direct influence. As the data reveals, previous experience plays a major role in shaping how respondents perceive and define social vulnerability.

The results of interviews with emergency managers in the Southeast Texas and Houston – Galveston regions suggest that the definition emergency managers give to social vulnerability fit into four themes. The theme narratives deal with social class and culture, a moral obligation, a lack of security, and a lack of knowledge. The themes show that emergency managers are aware, although not always explicitly, of the social vulnerability concept. The findings show that most emergency managers, in the sample area, do have an understanding that there are populations that are more vulnerable based upon demographic characteristics.

While many of the emergency managers in the sample may not have heard the exact term social vulnerability before, it is clear that all of them have a well-developed sense of what social vulnerability means to them. In some cases, these meanings arise from personal experiences, while in others they were based more on intuition and fundamental beliefs about right and wrong. For some respondents, their definition of social vulnerability aligns with the hazards and disaster research traditions. Additionally, few respondents had the ability to give a textbook
definition of social vulnerability, which leads to the finding that research has had an indirect affect through experience such as training, state and federal policy mandates, and collaboration with other emergency managers.

The interview data also reveals that emergency managers may not perceive or define social vulnerability in a manner that suggests that the concept is a high priority as a problem for emergency management. However, this does not diminish the salience that emergency managers hold for social vulnerability. Rather, the data shows that issues other than directly addressing specific demographics may take precedence in order to reach the needs of vulnerable populations. This is not to say that social vulnerability is unimportant to them, rather, other problems and issues demand their attention and must be addressed in order to reach and address the needs of vulnerable populations. The next chapter discusses the strategies that emergency managers employ to reach and meet the needs of vulnerable populations.
CHAPTER 6
STRATEGIES FOR ADDRESSING SOCIAL VULNERABILITY

6.1 Introduction

The primary aim of this dissertation is to gain a better understanding of the impact that social vulnerability research has had on the practice of emergency management at the local level. To achieve this purpose, the previous chapter found that emergency managers perceive and define social vulnerability in a manner that is somewhat consistent with research-based definitions, but that is also shaped largely by experience, institutions, and moral values. The findings of the previous chapter uncover that there are issues other than the need to address specific demographics as a focusing problem for emergency managers. The purpose of this chapter is to identify the strategies that emergency managers use to reach and meet the needs of vulnerable populations.

This chapter analyzes the interview data by focusing on external influencers, based upon the perceptions and definitions of social vulnerability in the previous chapter. In conducting the analysis, four themes emerge from the interview data. The four themes, as depicted in figure 6.1, are the strategy of leaving it to the professionals, the strategy of bringing in volunteers, the strategy of leveraging protocols to build buy-in, and the strategy of fostering flexibility. Each is described in detail in the sections that follow and direct quotes are used to illustrate each of the themes.
6.2 The Strategy of Leaving it to the Professionals

As described in the previous chapter, some respondents in the study viewed vulnerability primarily as a lack of security. Based on that definition, the preferred strategy for addressing and reducing vulnerability is one that emphasizes increased security and control. This strategy is defined by an increased need for security and control that is governed by the need to account for opportunistic crime and the unintended consequences of good intentions by excluding all persons or organizations that are not part of the official emergency management plan. Physical security provides protection from further damage and harm caused by unplanned activity in the wake of a hazard interacting with society. Areas that are land locked and accessible only by main roads can be secured to maintain public order while response actions are being conducted. As soon as the area is secured and stable, then the area can be opened to the public, and anyone who wishes to come and help are free to do so. As one respondent stated:
In the event there is a hurricane and we evacuate the community, you’ve got to have an ID to get in... Even a VOAD has to have the right clearances to get in…

However, other areas are impossible to control because of unlimited avenues of access. Some areas may have numerous back roads and waterways that inhibit a complete lock down of physical access. In the event of a flood, the public may have access to personal watercraft, which can provide unlimited avenues of access, while others may be able to use one of the many back roads that are not blocked to gain access to the area. Uncontrolled watercraft are problematic because they can produce a wake that floods unaffected houses and can result in increased harm and property damage. As one respondent stated:

During Ike… We had about three and a half foot of water and it got deeper as you went further to the water. There were people on jet ski’s and in boats just running around here... They were doing rescues but it created the problem for us… Number one, how do we keep up with these people? And then you have areas that are not as flooded, but as they are effecting these rescues, they are making wake big enough to get water in the house. Our own guys, we can control that…

These unintended consequences are not relegated to the actions of individuals. Most respondents do acknowledge the need for volunteer organizations; however, while most non-official groups are faith based and really want to do a good deed, they are not able to handle operations such as sheltering. This results in the stretching of jurisdictional resources from planned activities to handle behavioral problems at unplanned sheltering operations. For this reason, government discourages smaller organizations from provide sheltering services in an effort to cut down on opportunist criminal activity.

This is not to say that antisocial behavior is inevitable in the wake of disaster. It is simply that some respondent’s associate smaller non-government organizations with price gouging. Additionally, smaller faith based organizations are viewed as having a lack of expertise in sheltering and associate them with behavioral problems. Therefore, unplanned activity that is not
coordinated with local emergency management has been observed as resulting in increased vulnerability.

While it is perceived by respondents that control is needed, but sometimes unattainable, they also believe that it is problematic to tell the public that they cannot help. As one respondent said:

It’s political suicide to tell people they can’t help.

Many respondents talk about the need to ensure that response decisions that possibly limit spontaneous volunteer action do not appear in the media. The solution applied by a number of respondents is to refrain from giving locations for individuals to help. Rather, they redirect spontaneous volunteers and groups to other agencies. For example, when dealing with recovery operations, some respondents report sending volunteers to agencies such as the American Red Cross for donations and case management, after response operations have stabilized the situation.

Many respondents discuss the American Red Cross as a recognized and official voluntary organization that is active in disaster. Additionally, the American Red Cross has a congressional mandate to be involved in local events during disaster. One sentiment is that the city could not handle donations and case management because that is not what the city does in the event of a disaster. Other respondents also report that recovery is the domain of nonprofits, and those organizations are welcome into the area once the scene has been stabilized.

However, respondents do identify a number of official nonprofit organizations in addition to the American Red Cross, such as the Salvation Army, the Baptist Men’s Group, and the Methodist Group. Most respondents discuss the inclusion of these larger volunteer organizations that bring resources to the table in the planning process to meet the needs of vulnerable populations. However, churches that decide on their own to open their doors as a shelter are
identified by respondents as producing the most disruption, which hinders the ability to reach vulnerable populations and creates additional vulnerability. This is attributed to small churches not having the resources or experience to operate a shelter within the bounds of the law. Respondents report that this results in city or county governments having to dispatch police to settle disputes, which spreads resources to cover the negative effects of unplanned activity that is produced by the lack of capacity to provide services.

Respondents perceive that churches set up unplanned shelters with the expectation that the city will provide the resources once the doors are open, even though no coordination effort was made prior to the event. This is the main reason that respondents believe that emergency management should be left to the professionals. When untrained volunteers act without guidance, the result, more often than not, makes people more vulnerable and produces more harm and damage than the actual disaster. Respondents believe that creating professional, expedient, and cost effective emergency management provides the necessary tools to meet the needs of vulnerable populations. One respondent best expresses this idea:

… can make it so cost efficient because you’re not wasting manpower, time, you’re not wasting equipment being somewhere it doesn’t need to be anymore. I think it’s done wonders for public responder operations. Because I’ve seen how it was before and it wasn’t very effective.

The main point of leaving it to the professionals is that uncontrolled volunteer activity can result in increased harm and damage while professional requirements provide a more efficient emergency management operation, and thus reduce vulnerability. Most respondents identify populations that are more vulnerable than others are and that there are measures in place to reach and address those needs, such as transportation for evacuation. However, the government will not forcibly remove someone from an area even when a mandatory evacuation is ordered. As one respondent states:
A mandatory evacuation, even though it’s mandatory, what that does is that releases us from the liability of response. We’re not going to go arrest somebody and tell them no you’re evacuating. That’s not going to happen… Once you have those people that decide no I’m staying, once the water starts coming up and they start dialing 911…

Vulnerability is reduced through this strategy by providing transportation for those with reduced capabilities; however, to receive services, self-identification is required. For example, transportation is made available to the public and nursing homes are required by law to have evacuation plans and transportation contracts on file with the state. This leads emergency managers to perceive vulnerability as a choice. Based on the respondents experience, people create their own vulnerability by refusing help to prepare for and execute evacuation as well as when untrained volunteers choose to act without understanding the consequences of their good intentions.

Respondents believe that control is necessary to reach vulnerable populations, but some discuss the need for control because of the good intentions of unplanned activity that result in increased damage and harm. Respondents perceive protocols as a positive thing but protocols require that local emergency managers receive ongoing state level training on changes to higher-level rules. While respondents do have the interests of the most vulnerable in mind, the perception is that individual social choices produce the need for increased security and control. The interview data also provides evidence opposite to the traditional view that people will panic and are dependent upon the government for rescue (Dynes, 1993; Quarantelli, 1960; Tierney, 2003). To the contrary, while control is needed to account for opportunistic crime, more importantly, respondents believe that control is needed to account for the inevitable actions of spontaneous volunteers and organizations that can produce unintended consequences for those that refuse to evacuate, because resources are made available to evacuate.
6.3 The Strategy of Bringing in Volunteers

While still maintaining a belief in the need for control as part of the strategy, this strategy is defined where control is needed and executed by bringing all possible spontaneous organizations into the planning process to counter the negative effects of unplanned activity. As such, plan development provides a structure of response activities that account for and accommodate the coordination of unplanned activity, and is accomplished in three ways. First, volunteer organizations in the area are invited and encouraged to be part of the planning and training process. Second, the organizational structure of command provides for a position in the Emergency Operations Center (EOC) that is responsible for coordinating spontaneous individuals, groups, or organizations during an event. Third, respondents identify the use of a unified command to provide experts in their fields, who are not part of the organizational hierarchy, an avenue to influence planning, training, and response activities.

Some of the respondents talk about the positive impact that unplanned activity can have on reaching and meeting the needs of vulnerable populations. However, in order to make sure that the needs of the most vulnerable are met while avoiding unintended consequences, such as discussed in the previous theme, the activities of unplanned individuals, groups, or organizations need to be controlled and focused through official operations. In order to accomplish this, some respondents talk about creating a position in the Emergency Operations Center that is assigned the responsibility of coordinating unplanned activity during response operations. As one respondent stated:

…Katrina, every church group wanted to be a shelter. There was no immediate coordination to establish shelters. We actually have now in our operations, we have someone dedicated to handle that. One of the spots in there handles that. So, it does [unplanned activity] play a problem. Hopefully we’ve addressed it, but if you have a situation on the level of Katrina where there’s that much engagement by the population, you can plan for it, but I don’t think you’ll ever be ready for it.
Others talk about creating a phone bank to gather information on who is in need in the community, as well as to channel volunteers to the correct department or agency for assistance as well. As one respondent stated:

We actually created another annex for our emergency operations plan that specifically deals with the phone bank.

Second, to reduce the need to coordinate unplanned organizational activity in the midst of an event, some respondents discuss the need to identify possible spontaneous organizations and include them in the official plan so that everyone will know what to expect from government during an event. Emergency managers believe that they can reduce uncertainty during an event by incorporating organizations and community representatives, such as religious leaders. The idea is that effectiveness can be achieved when everyone in the community that could participate in the response is involved in the planning process. This can occur because the public knows what they can expect during an event, and government can better know what to expect from the public. As one respondent states:

Number one, again, we do everything based on NIMS National Incident Management System. The ICS protocol. We have a command and control center that we setup for any event. Whether it’s a drill or the real thing. Our emergency operations center is activated... If the problem or the situation gets bigger than us then we'll move outside the county So we're very strong on protocol... and, so that anybody and everybody that comes into town to help or aide us... We're all on the same page and all on the same, protocol statements.

The third aspect is to operate under a unified command in order to incorporate and coordinate unplanned activity when other jurisdiction comes to help. Respondents report that the use of a unified command allows experts in each field to provide input into the planning and response execution. Some respondents talk about how effective the use of a unified command is when experts from outside the jurisdiction arrive to help. Others discuss the need to include
experts from adjacent jurisdictions when there is the possibility that adjacent jurisdiction may pull response personnel from their area to respond to the same event.

Some respondents talk about the benefits of using a unified command which brings in outside organizations and provides a voice to all organizations in the decision making process. The goal is to incorporate external agencies because the response force may lose their response personnel to other jurisdictions during an event. This results from some areas not having a full time response force such as fire and rescue; however, they may have a volunteer force that works full time for an adjacent jurisdiction. One respondent exemplifies this need to incorporate unplanned activity to fill gaps when resources are scarce:

With volunteer fire departments, I can tell you about half of them, or more, are firemen in other areas. They are paid firemen. What that does, if you start getting something in your area, it automatically eliminates their ability because their job is gonna have them.

Bringing in volunteers acknowledges the importance of unplanned activities as being able to contribute to the larger mission of meeting the needs of the community. This strategy is unique, in that, while respondents identify the need for spontaneous activity, some respondents believe that unplanned activity and organizations should be planned for and incorporated into operations, rather than being excluded from planning and operations like in the leaving it to the professionals strategy. This aligns with the literature which proposes that emergency management operates more effectively when everyone in the community is on the same page and knows what to expect (Jensen & Waugh, 2014). This provides a community the knowledge of what to expect from government and reduces uncertainty by providing government with information on what they can expect from the community.
6.4 The Strategy of Leveraging Protocols to Build Buy-In

The strategy of leveraging protocols to build buy-in is based upon the emergency managers’ perception that protocols provide the emergency manager an advantage to meet and reach the needs of vulnerable populations. This strategy is defined by a lack of buy-in by elected and appointed officials along with the existence of unfunded and unsupported mandates that block the ability to reach vulnerable populations and create vulnerability. The first aspect is that federal, state, and local protocols help to provide an incentive, and at times a mandate, for local government departments, agencies, and political authorities to place emergency management as a priority in planning, training and funding. The second aspect is that a lack of protocols can produce barriers, especially when federal training does not match the specific community needs or when voluntary organizations active in disaster (VOADS), such as the American Red Cross, have a congressional mandate to provide services but do not coordinate with local emergency management. Third, respondents report the need to control for county and state agencies that try to keep funds designated for cities and unfairly distribute them to other areas for political reasons.

These three aspects show that emergency managers experience barriers in reaching and meeting the needs of vulnerable populations other than the need to address directly the specific demographics. These barriers include of political motivations and a lack of what is termed “buy in” from other department heads in local government. This is combined with the need to be aware of unplanned official organization activity and state efforts that may interfere because of budgetary motivations.
On the first account, protocols are perceived as a positive aspect because they can enhance local emergency management capabilities by ensuring that there are official personnel available to respond when needed. Respondents identify a lack of “buy in” on the part of elected officials and other department heads as one of the main problems that help to shape planning and resources for emergency management in their jurisdiction. Some respondents also report that state and local political interests will attempt to “drive the train” in a direction that may not align with the needs of the community. This leads to the need to remove the ability of political motivations to determine when a mandatory evacuation needs to be enacted. As one respondent states:

It is necessary to build in triggers. How do you decide you’re going to evacuate? While political considerations are a very important aspect, getting personnel from other departments to prepare and train for an event is perceived as a critical aspect for emergency management.

Many respondents talk about needing to have support from the city manager, which provides the authority to require other departments to participate in planning, training, and other preparedness activities. This is important to them because respondents’ perception is that their job is not to perform the functions of response and recovery, but to coordinate the efforts and resources in the emergency management process. For example, one respondent talks about their daily experience when visiting other departments and the need for “buy-in”:

And the emergency manager is faced with, you know, oh, here comes the emergency manager again. Oh, I bet you he wants us to take time out of our schedule to practice some silly simulated thing, and I got asphalt to lay, and I’ve got HR resumes to look at, and I’ve got budgets to put together. And I am cutting into their time of what they do in real life, and there is this issue of trying to get them to be part of the planning process. Sometimes I’m lucky enough to get them to show up during activation.
And another respondent stated:

City manager, county administrator, these people have to support emergency management because if they don’t you’re not going to get the buy in or cooperation from the other departments. Yes, most of your emergencies are heavily fire dependent, heavily PD dependent, but when the emergency passes trying to rebuild the community, this is a public works driven monster. If you don’t have a sewer, you don’t have a community.

On the second account, a lack of protocols can result in increased harm to vulnerable populations. For example, official and voluntary organizations such as state agencies or the American Red Cross may refuse pets or require separating families for medical accommodations in sheltering. Some respondents talk about individuals in their jurisdiction who will not evacuate because they cannot take their pets with them to the shelter. Other respondents talk specifically about a special medical shelter being established to meet medical requirements. However, this may require family members to shelter at different locations because the medical shelter may be established for medical needs only.

While these protocols are intended to meet the needs of vulnerable populations, emergency managers believe that they may increase vulnerability, because the stress of the evacuation alone can result in death for elderly populations. These factors compounded by a separation from family or pets in sheltering can thus create vulnerability. While most of the respondents view protocols as providing an avenue of maintaining order and effectiveness that is consistent over time, protocols with unfunded mandates can also increase requirements. For example, protocols requiring more personnel and resources without providing a source of finance are viewed as detrimental to the process of meeting community needs.

This produces the need for more protocols to balance the negative effects of unfunded mandates. As one respondent states:

There is nothing in the law that requires any community to be a sheltering community.
Respondents report that because sheltering is not mandatory, if a jurisdiction decides to provide sheltering it has to meet extensive legal requirements that aim to reduce social inequalities. This results in a lack of ability for jurisdiction to find enough volunteers, with the expertise, to staff shelters and keep from being sued. One avenue suggested is to make collaboration mandatory for activities such as sheltering. One respondent best describes this:

There’s nothing in the state law that gives the state the authority to tell a community that you will be a sheltering community. It’s done strictly on a volunteer basis… The law says that you have to have a plan, and we have a plan… We have to have a way to get people out, but there is no requirement for somebody to provide the shelter.

Respondents experience negative effects because of a reduction in the number of sheltering partner jurisdictions. This reduction in sheltering partners is because of the extensive requirements that have resulted from legal cases over issues such as disability (access and functional needs) access, pet access, medical needs, and special religious accommodations. Some respondents report that all of these legal requirements are now mandated by federal sheltering protocols that require meeting certain standards if a shelter is established. The increase in requirements results in an increased need for volunteers and resources that jurisdictions are no longer able to meet. Therefore, jurisdictions are terminating sheltering partnerships. This results in the need to create more protocols that require certain jurisdictions to accept evacuees for sheltering but also provides the jurisdiction with the funds to meet federal legal requirements.

Additionally, the American Red Cross is considered an official response organization by federal policy and has a federal mandate to provide disaster relief services, but they have no requirement to coordinate with local government. For example, one respondent talks about the population along the river being self-sufficient while another respondent talks about rural populations that live where they do because they do not want to have everything “at the touch of the hand”. The American Red Cross may dispatch into an affected area to provide services to
those that fit the description of vulnerable populations based upon socioeconomics, but the population can actually take care of themselves. However, once services are provided for one, everyone will want the service whether it is needed or not. This results in an overwhelmed agency that requires help from the local government.

However, even when official or volunteer organizations are involved in planning, the ideas they provide may not be the best strategy to reach and meet the needs specific to the community. One respondents provides an example of this when talking about the American Red Cross wanting to set up contract services for food preparation for future sheltering operations. From the perspective of the American Red Cross, a lack of volunteers coupled with the ability to pay someone for a service makes logistical sense. The jurisdiction chose instead to plan for providing prepared meals out of their budget because there is no guarantee that the contract service will be able to access the area immediately after an event. This would result in people going hungry because the jurisdiction is not self-sufficient. The same respondent also reports setting up an animal shelter next to the evacuation shelter so that people are not separated from their pets when the American Red Cross denies pet access in shelters.

Third, respondents perceive that all emergency management is local. However, some respondents report that county and state agencies may try to control operations in order to control the flow of funds or to acquire some of the funds for state agencies. As one respondent states:

Politics is a dirty animal. I mean, politics and disaster recovery is a dirty animal… Certain funds that are used for the 2015 floods. Well it's supposed to be administered by the GLO (General Land Office). So, they've never really done this before. So they reached out to the COGs and the COGs reached out to the counties... So now this money… is being funneled through… county… Wait a second. Why is the county putting their foot in the same funds that I'm going to get. So I guarantee you those little agencies aren't going to get a dime.
Another example is that state agencies may cut off funding for points of distribution if the state representatives observe a spontaneous food distribution and determine that the local population can handle things.

Leveraging protocols to build buy-in projects a positive view of protocols as providing an advantage to local emergency managers that counteract political motivations, a lack of “buy in”, or even the negative effects produced by a lack of protocols at the local, state, and federal levels. Some respondents perceive that the actions of elected officials, other government employees at the local and state level, and nonprofit agencies need to be controlled in order to meet the true needs of the community without creating more vulnerability. Protocols provide the advantage needed to encourage other key players or stakeholders to acknowledge and support the specific needs of local emergency management so that they can reach and meet the needs of their specific vulnerable populations. To meet the needs of vulnerable populations, protocols are necessary to ensure others collaborate, in an environment where emergency management is synonymous with the term collaboration.

6.5 The Strategy of Fostering Flexibility

Fostering flexibility, for many respondents, is the key to addressing the needs of vulnerable populations while meeting the many other demands generated by disaster. This strategy is defined by flexibility through guidelines rather than procedures that provides greater control to respond to the unexpected. They recognize both the positive and negative aspects of protocols and the important role they play in emergency management, just as in leveraging protocols to build buy-in, but many respondents also stress the importance of flexibility. Unplanned activity is going to happen, and if the job is to plan for the unexpected, then
unplanned activity should be incorporated into the plan. One respondent told of a conversation they had with their emergency management director where they had made the comment about the task providing uncertainties and the directors’ response was:

So, out of all my department heads, I would think the one department that would be the best at dealing with multiple things and unexpected things would be my Emergency Management Department. Am I understanding that wrong? No sir!

However, for some respondents, protocols, defined as rules, regulations, or procedures at the local, state, or federal level, are not viewed in a negative or positive manner. The idea is that, as one respondent states:

They are what they are.

Respondents have the ability to operate within the spirit of the protocols. A common terminology used by many respondents is that they operate under standard operating guidelines rather than procedures. Respondents state that procedures require that every step be followed in the order that they are laid out. Guidelines provide the ability to choose the step that works best for the context of the situation.

The use of guidelines helps to protect from liabilities while supporting the ability to reach and meet the needs of vulnerable populations. For example, there may be six steps in a procedure; however, step six may not match the needs of the situation. While executing step six would waste resources and funds, not executing the step may result in a legal suite against the jurisdiction because the plan says that the step should be executed. This is perceived as an inefficient process to meet the specific needs of the community. Rather, respondents incorporate guidelines into planning for local level operations that work within the spirit of state and federal protocols. As one respondent said:

I can pick and choose guidelines to apply in a hybrid situation where the spirit of ICS and NIMS is combined with the old ways of experience.
Protocols, when defined by respondents as guidelines, provide the flexibility to handle the unexpected. One respondent talks about the need for flexibility because FEMA rules change monthly and federal interpretation of the rules may not match local interpretations. Additionally, protocols provide a written record for institutional knowledge that is needed to make future decisions.

Fostering flexibility views unplanned activity as providing a purpose and that unplanned activity is expected to happen, to some extent. Therefore, while planning should not rely upon unplanned activity to provide a source of resources to meet community needs, unplanned activity should be expected and included in planning. People are going to want to help, but they need to be protected. Respondents talk about the environment being hazardous, which requires that unplanned activity be organized for the protection of those who volunteer as well as those who are in need. One respondent best describes the need to organize and protect unplanned organizations and people:

Somebody decides to self-dispatch… and days go by and somebody calls and says you know my brother went up there with his friends and we ain’t heard from ‘em in two days… Guess what, we ain’t heard nothing about them… they end getting themselves in a place, they knew nothing about the place, and they end up getting there self in trouble…

In summary, fostering flexibility means recognizing the need for spontaneous volunteers and organizations as well as understanding that unplanned activity is going to happen. This aligns with the literature that suggests that strategy should include flexibility that incorporates coordination rather than command and cooperation rather than control into planning (Dynes, 1994). Respondents believe that federal protocols need to be adhered but this can occur through guidelines at the local level. The result of operating guidelines rather than procedures can provide the flexibility needed to address the unexpected and specific needs of each event within
the context of the needs of the community. This approach is consistent with the long line of disaster research that emphasizes the need for improvisation, flexibility, and creativity in emergency management (Kreps & Bosworth, 1993, 2007; McEntire, Kelly, Kendra, & Long, 2013; Webb, 2004; Webb & Chevreau, 2006).

6.6 Discussion

The concept of control is a common element throughout the interview data on the strategies employed to reach and meet the needs of vulnerable populations. Interview data suggests that the strategies employed by emergency managers can fit into four themes. The theme narratives include the strategy of leaving it to the professionals, the strategy of bringing in volunteers, the strategy of leveraging protocols to build buy-in, and the strategy of fostering flexibility. The majority of respondents have a perspective that focuses on reaching and meeting the needs of vulnerable populations. While control is a common element for all of the themes, the reasons that control is necessary varies by theme.

Some respondents talk about mechanisms that are in place and are mandated by state and federal protocols to help those that lack the resources to evacuate. The contention is that while there are those that do not have the means to evacuate, there are systems in place. The narrative leads to an understanding that the most vulnerable populations, such as the elderly, are addressed by mechanisms set in place by protocols. For example, one mechanism is that nursing homes are required by the state of Texas to have their own evacuation plan and this allows the official plan to focus on those who live in their own homes by encouraging them to register with the statewide 211 State of Texas Emergency Assistance Registry (STEAR) Program.
While leaving it to the professionals’ advocates excluding unplanned activity because of the unintended consequences of individual actions, bringing in volunteers acknowledges the same negative results but advocates the inclusion spontaneous activity in the planning process. Hence, possible unplanned organizational activity needs to be identified and brought into the official organization before something happens in order to reach the needs of those who are more vulnerable. It is important to identify all possible organizations that could become spontaneous volunteer organizations and invite them to be part of the official plan. Some respondents include a position in the command structure that is responsible for coordinating the efforts of spontaneous groups. Others talk about a unified command that allows experts to have input while mandatory protocols get everyone on the same page so that the response can effectively reach vulnerable populations.

Leveraging protocols to build buy-in is based on respondents’ perceptions that vulnerable populations are placed at increased risk because of political motivations, lack of official personnel motivation and interest for emergency management. Some populations who may be classified in a lower socioeconomic status may actually be self-sufficient because they have learned how to and prefer to live in rural areas where they do not have everything instantly available. Therefore, meeting the needs of vulnerable populations can be counteracted by state and federal policies that do not match the needs of the community. To combat this, protocols that mandate training for government employees that have responsibilities in response activities are necessary. However, a problem still exists when training is not mandatory for VOADs, such as the American Red Cross, that have a congressional mandate to be involved in emergency operations.
Leveraging protocols to build buy-in proposes that protocols are needed in order to counteract the negative effects of some existing protocols. Protocols can have good intentions in their efforts to minimize the effects of social inequalities. However, unfunded mandatory protocols, such as sheltering requirements, increase vulnerability because it is very difficult to find enough staff and resources to implement the sheltering requirements in a way that does not make people more vulnerable. Individuals may have to be separated from family members to receive proper medical care in separate facilities, or they may refuse to be separated from their pets and thus are excluded from adequate shelter. The idea is that it is impossible to provide all of the requirements, at one location, because of an increased amount of facilities and personnel required to meet all federal protocols without creating new vulnerabilities.

Fostering flexibility advocates creating general guidelines rather than procedures so that legal bounds are not the guiding factor of whether action is taken or withheld. This allows the inclusion of unplanned activity or groups that provide services specific to community needs. Finally, flexibility is necessary in order to account for continuously changing rules that can be interpreted more than one way at the state and federal level. Flexibility is incorporated into planning where protocols are followed within the spirit of the law.

While the themes above may vary in the reason why control is needed, the narratives have a common emphasis on reaching and meeting the needs of vulnerable populations through controlling the actions of volunteer and official personnel. The findings suggest that the need for greater control in the strategies employed by emergency managers is based upon the anecdotal knowledge or experiences of each emergency manager. However, the need for control, regardless of the reason, does not project the perception that society needs to be controlled because of widespread panic and antisocial behavior in the manner that traditional disaster
research found. Rather, the four realities require control in order to reach and meet the needs of vulnerable populations because of an environment that is dominated by political motivations and a rampant de-emphasis on the importance of emergency management.

The next chapter provides a summary of the major findings for both analysis chapters. The final chapter then discusses the contributions this research makes as well as the implications of the findings on research and practice. The chapter concludes with limitations of the study and recommendations for future research.
7.1 Summary of Major Findings

While there is an extensive body of knowledge on social vulnerability, especially from the disaster community and the hazards community, social inequalities continue to result in damage and harm to specific populations. The social vulnerability concept proposes that social inequalities should be an important consideration in emergency management planning in order to meet the needs of the entire community. This is based upon evidence of focusing events such as Hurricane Katrina in 2005. As such, this study places the problem of knowledge transfer within the salient context of social vulnerability knowledge.

To uncover the extent that social vulnerability research has influenced local emergency management, two research questions were investigated. First, how do local emergency managers perceive and define social vulnerability? Second, what strategies do local emergency managers employ to reach and meet the needs of vulnerable populations? Analysis of the interview data brought to the surface the understanding that social vulnerability research has had an indirect influence on local emergency management, but the experiences of emergency managers provides a major influence in how social vulnerability is perceived, defined, and addressed.

Respondents in this sample reported receiving no information directly from reading academic journals; however, this is not to say that research has had no direct impact on the practice of emergency management. Research influence comes predominantly through state and federal plans, training, and policy design. However, respondents did report the use of a network of peers to gather information to solve the problems they face. The reality is that few respondents
had heard the term social vulnerability before the interview, and of those that had, none report exposure from reading academic journal articles.

Vulnerable populations are important to emergency managers; however, few respondents talk about socioeconomic or demographic characteristics of vulnerable populations when discussing the problems that help to focus planning and resources for emergency management. All of the respondents did acknowledge that some populations are more vulnerable than others are, regardless of how respondents define vulnerability. However, it is not until the majority of respondents are asked about those who are more vulnerable or specifically about social vulnerability that the characteristics of social vulnerability emerge.

The first question is answered through the emergence of four themes that describe how emergency managers perceive and define social vulnerability. These themes are vulnerability as poverty and culture, vulnerability as a moral imperative, vulnerability as a lack of security, and vulnerability as a lack of awareness or knowledge. Table 7.1 provides a depiction of each theme and a summary definition of that theme.

**Table 7.1**
Emergency Manager’s Definition of Social Vulnerability

<table>
<thead>
<tr>
<th>Vulnerability As:</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty and Culture</td>
<td>Barriers are created by national origin and economic means when distinctions in social mores between groups of people create a lack of ability, access, and economic capacity.</td>
</tr>
<tr>
<td>A Moral Imperative</td>
<td>Society has the responsibility and obligation to care for the most vulnerable in society because it is the right thing to do.</td>
</tr>
<tr>
<td>A Lack of Security</td>
<td>Security issues exist before, during and after an event and result in elderly populations choosing to not self-identify because out of fear of being victimized.</td>
</tr>
<tr>
<td>A Lack of Awareness or Knowledge</td>
<td>Because of a knowledge gap between practice and the public it serves, decisions are made by government personnel and the public without the knowledge of what the true hazards are or out of political motivation.</td>
</tr>
</tbody>
</table>
The perception and definition themes reveal that while emergency managers view the most vulnerable by demographics, race is not one of the categories. A point is made by respondents that vulnerability is not about race, rather, for some it deals specifically with the cultures of economic class and locality. While demographics such as gender, language, and education are individually associated with specific themes, discussion of elderly populations spans across most themes, to some extent. The theme of vulnerability as a lack of knowledge is the exception, and is concerned with the knowledge gap between practice and the public regardless of demographics.

The second question is answered through the emergence of four themes that describe the strategies that emergency managers utilize to reach and meet the needs of vulnerable populations. These themes are the strategy of leaving it to the professionals, the strategy of bringing in volunteers, the strategy of leveraging protocols to build buy-in, and the strategy of fostering flexibility. Table 7.2 provides a depiction of each strategy and the corresponding definition.

Table 7.2
Strategies to Reach and Meet the Needs of Vulnerable Populations

<table>
<thead>
<tr>
<th>Strategy Of:</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaving it to The Professionals</td>
<td>An increased need for security and control that is governed by the need to account for opportunistic crime and the unintended consequences of good intentions by excluding all persons or organizations that are not part of the official emergency management plan.</td>
</tr>
<tr>
<td>Bringing in Volunteers</td>
<td>Control is needed and executed by bringing all possible spontaneous organizations into the planning process to counter the negative effects of unplanned activity.</td>
</tr>
<tr>
<td>Leveraging Protocols to Build Buy-In</td>
<td>A lack of buy-in by elected and appointed officials along with the existence of unfunded and unsupported mandates blocks the ability to reach vulnerable populations and can create vulnerability.</td>
</tr>
<tr>
<td>Fostering Flexibility</td>
<td>Flexibility through guidelines rather than procedures that provides greater control to respond to the unexpected.</td>
</tr>
</tbody>
</table>
While the need to maintain a level of command and control spans all of the strategy themes, the reasons vary as to why control is needed to reach and meet the needs of vulnerable populations. Most respondents acknowledge that mechanisms exist to ensure that vulnerable populations have the assistance needed in the event of an evacuation. The crux of the strategies is that the actions of others in the public, or inaction of those in government, can produce increased vulnerability through the unintended consequences of good intentions as well as the negative effects of political motivations and complacency, respectively. There are some overlaps between the perception and definition themes and the strategy themes.

An important point about the themes is that the themes are not mutually exclusive and are not intended to be mutually exclusive. Analysis of the interview data provides for all possible themes for both questions without isolating a respondent to a particular theme, because we do not know what social vulnerability knowledge looks like in local emergency management. As many of the respondents expressed, emergency management must address the unexpected because the needs of the community can be different when addressing the same type of hazard at different points in time much less across different types of hazards. This means that one respondent can provide a discussion address multiple themes.

For example, a respondent may talk in a context that falls in the poverty and culture theme and then talk in another part of the discussion in a context that aligns with the lack of security theme. It would be incorrect to assume that the definitions conflict with each other. Rather, it is simply that the themes may be applied by the same respondent in different situations. Additionally, linkages can be seen between the perception and definition themes and the strategy themes.
As Table 7.3 depicts, the interview data reveals that social vulnerability perceptions and definitions translate into the strategies employed to reach and meet the needs of vulnerable populations. Some respondents view vulnerability as cultural issues that span ethnicity and economic status through social networks with barriers that require differing strategies that include bringing in volunteers, leveraging protocols to build buy-in, and fostering flexibility. Some respondents view vulnerability as a lack of security, which leads to a strategy that emphasizes increased security and control. However, a lack of security manifests through leaving it to the professionals and bringing in volunteers.

Some respondents view vulnerability as the right thing to do. In following the golden rule and providing for the most vulnerable, emergency managers must foster flexibility, but more importantly, they must be able to leverage protocols to build buy-in. Emergency managers, must be able to get others to work within the spirit of protocols to support the needs of the most vulnerable in a way that addresses the specific situation. Some respondents view vulnerability as a lack of awareness or knowledge of the true hazards that requires not only fostering flexibility, but also leveraging protocols to control for political motivations and a lack of concern on the part of elected officials, appointed officials, and the public at-large.
Table 7.3
Definition and Strategy Theme Linkages

<table>
<thead>
<tr>
<th>Perception and Definition</th>
<th>Strategy to Address Vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty and Culture =&gt;</td>
<td>Bringing in Volunteers</td>
</tr>
<tr>
<td></td>
<td>Leveraging Protocols to Build Buy-In</td>
</tr>
<tr>
<td></td>
<td>Fostering Flexibility</td>
</tr>
<tr>
<td>Lack of Security =&gt;</td>
<td>Leaving it to the Professionals</td>
</tr>
<tr>
<td></td>
<td>Bringing in Volunteers</td>
</tr>
<tr>
<td>Moral Imperative =&gt;</td>
<td>Leveraging Protocols to Build Buy-In</td>
</tr>
<tr>
<td></td>
<td>Fostering Flexibility</td>
</tr>
<tr>
<td>Lack of Awareness or Knowledge =&gt;</td>
<td>Fostering Flexibility</td>
</tr>
<tr>
<td></td>
<td>Leveraging Protocols to Build Buy-In</td>
</tr>
</tbody>
</table>

The findings of the two research questions first reveal that emergency managers do perceive social vulnerability as a salient issue regardless of the definition they provide. The strategies employed reveal that it is necessary to control the actions of others through a control element of protocols in order to reduce vulnerability and reach the most vulnerable. This reveals that emergency managers report that they must address issues other than specific demographics, such as the actions of volunteer and official personnel, so that the needs of specific demographics can be addressed. The sections that follow discuss the contributions and implications for research and practice. This is followed by the limitations of the study and suggestions for future research based upon the findings and limitations.

7.2 Contributions

The findings of this study contribute to theory by describing what knowledge transfer looks like in emergency management for social vulnerability knowledge. The findings contribute
to practice by exposing emergency managers to the scholarly concept of social vulnerability. As such, this study provides a better understanding of how knowledge transfer of the social vulnerability concept works for emergency management and provides practice with a better understanding of the social vulnerability concept. The study also helps us to understand that emergency managers perceive social vulnerability as the need to control the actions of others in order to reach and meet the needs of vulnerable populations, rather than as actions that need to be taken because of inherent demographics. If the Tierney (2014) proposal is accurate, that social vulnerability is the social, political, and economic policies that create social inequalities in daily life, and ultimately disaster, then the responses of emergency managers suggest that they operate in a social vulnerability environment. This assumption is accentuated by the identified need to get “buy in” to reach and meet the needs of the community, where a lack of control, a lack of “buy in”, and a lack of knowledge on the part of government and the public at-large produces vulnerability.

From a knowledge transfer perspective, the context for this study, the findings reveal that the social vulnerability concept has influenced the practice of emergency management through a mix of the transfer and parallel knowledge transfer strategies. Respondents assume that research has an impact, on the field of emergency management, through state and local policy, training, and plan design. It can then be assumed that the social vulnerability concept has influenced the practice of emergency management, to some extent, through the transfer strategy of knowledge transfer.

Additionally, emergency managers are creating knowledge parallel to research from best practices through peer networks that are informed by experience. Emergency managers do identify demographics of social vulnerability but report no direct interaction with research in the
creation of knowledge. Respondents identify experience as the sole source of information to solve problems, which results in knowledge that is also created through best practices in the field. This produces an effect where social vulnerability research is being transferred to practice through state and federal training, plans, and policy design, while practitioners are also creating social vulnerability knowledge based upon experience.

The data reveals a distinction between the broad understanding of vulnerability and an understanding of social vulnerability as a vulnerability. When first asked what vulnerability means to them, few respondents discuss issues of social vulnerability that would align with the disaster tradition. Rather, the majority of respondents provide a meaning based on proximity, exposure, and geographic location, which aligns more with the hazards tradition. Mitigation efforts that include government buy-out of homes in low lying areas and relocating residents to elevated areas is mentioned only by one respondent.

Other vulnerability perceptions that align with the hazards tradition focus on proximity where everyone is at risk, regardless of demographics. No distinction is made based upon demographics when risk is viewed in terms of proximity and exposure to a hazard. When respondents are asked specifically if there are populations that are more vulnerable than others are, and then directly asked about social vulnerability, the disaster tradition becomes more prevalent than the hazards tradition. This reveals that emergency managers’ perceptions and definitions align more with the disaster tradition rather than the hazards tradition for social vulnerability. This reveals that the hazards tradition has had a much larger impact on the practice of emergency management for vulnerability as a larger concept.

When given an academic concept of social vulnerability, many respondents react as if social vulnerability is common sense, where there are obviously special populations that require,
and are given, special attention in planning. However, even when social vulnerability demographics are a focus of the emergency managers’ perception and definition of social vulnerability, a larger focus is that vulnerability is a matter of choice rather than structural factors. With the exception of the perception of vulnerability as a moral imperative, emergency managers predominantly perceive social choice as a major factor of vulnerability, in both their definition and in the strategies that they employ.

In vulnerability as poverty and culture, while certain people may have a lack of ability, access, and economic capacity, resources such as 211 and transportation during an evacuation are made available. Therefore, the choice not to evacuate is what creates vulnerability. When vulnerability is perceived as a lack of security, resources are available and it is the choice of elderly populations not to self-identify that creates vulnerability. Both government and the public make choices because of a lack of awareness or knowledge that places populations at risk and creates vulnerability through political motivations, a lack of buy-in, and housing location. This reveals that language matters when discussing vulnerability, and speaks to the ability of research to impact local emergency management.

The most common terms used by respondents include special populations along with access and functional needs. These two terms describe populations that are disabled, sick, elderly, and poor. Many respondents talk about how the term access and functional needs has evolved from describing populations with disabilities to include elderly populations as sick, weak, bedridden, and susceptible to criminal victimization. What is visible in the interview data is that while vulnerability as a larger concept is based more upon the hazards tradition, state and federal policy and training has directed the language used by emergency management with terms
like special populations and access and functional needs as a focus for planning. More importantly, the data reveals what vulnerability does not mean to local emergency management.

While there is some mention of gender in the theme of vulnerability as a moral imperative, gender is absent from all other discussions. Additionally, while children are not mentioned, the analysis assumes that children are part of the gender aspect because the discussion focuses on single mothers. Outside of this reference, children are not mentioned as a vulnerable population. Race is specifically mentioned in the theme vulnerability as poverty and culture. However, this is only to say specifically that vulnerability is not a race issue.

Therefore, the interview data does reveal a great deal about what social vulnerability means to local emergency management. However, the data also reveals a great deal about what vulnerability does not mean to local emergency management. These two aspects of what vulnerability means or does not mean to emergency management provides insight into the impact that social vulnerability research has had on the practice of emergency management. The contributions, as discussed above have a number of implications for both research and practice as well as for emergency management higher education.

7.3 Implications

7.3.1 Research

For the implications on research, the results suggest that any attempt of scholarly research to speak directly to local emergency managers about social vulnerability would be an exercise in futility. This is not an admonition of academia or practitioners of emergency management. This is simply an observation of the challenges, faced by practitioners and academics, which are built into the origins and intergovernmental structure of emergency management. However, an
overwhelming majority of participants do believe that practice should play a role in the research
process, and would be willing to participate in academic research.

The overall perception among respondents is that they do not need to go to research for
answers because they have always been able to solve problems through their network of peers.
Some respondents who have a higher education, and some with an advanced degree, see the
importance of research to practice. However, they perceive that there is nothing in a readily
available source, specific to them, which can solve the problems that are unique to their
jurisdiction.

The perception of experience being required for the position, regardless of individual
levels of academic knowledge, is prevalent throughout the interviews. For example, one
respondent talks specifically about emergency managers needing to have an emergency
management common sense versus book knowledge. Emergency management common sense
cannot be acquired by reading books as it comes only from experience. Respondents believe that
the emergency manager must look at a situation, identify the problem, and apply a solution that
makes sense within the context of available resources and personnel.

Emergency manager dependence upon their experience, predominantly from fire and
police, to make decisions and guide the source of information to solve problems, produces a
culture that is not immediately trusting of outside influences. Legal requirements can also
produce a lack of trust in untested outside information. For example, one respondent talks about
being limited by what is allowed by either state or federal government. Whether the idea is good
or bad is irrelevant. If it has not been tested through experience and approved by higher
authorities then it is not going to be used.
7.3.2 Practice

For the implications on practice, the study provides a better understanding of social vulnerability to practice as well as an understanding that they operate in a social vulnerability environment. However, social vulnerability as a demographic characteristic is not the major concern discussed for planning because there are mechanisms in place to address vulnerable populations. The major challenge identified by emergency managers is to create buy-in that produces collaboration before an event so that coordination can occur during an event. Therefore, the findings suggest that it is imperative that state and federal plans, training, and policy development address the challenges of management and collaboration in the political environment that emergency managers must navigate to reach and meet the needs of vulnerable populations.

This reveals that the major challenges of social vulnerability are the same challenges of the political environment within which public administrators operate. Specifically, the major challenges to local emergency management are those of management of collaborations and coordination, rather than the specifics of response and recovery activities in order to reach and meet the needs of vulnerable populations.

The narrative that forms is that other challenges, such as getting “buy in” from politicians and other department heads, take precedence in planning considerations while the actions of unplanned volunteers can result in further harm and damage to vulnerable populations when not controlled. These challenges take precedence because, reaching and meeting the needs of vulnerable populations requires the appropriate personnel and resources in a direction that is
effective. The need to control the actions of others is central to the strategies employed by respondents, not because of the assumptions of antisocial behavior, but because of a lack of “buy in” for political, economic, and social responsibility for emergency management to meet the needs of vulnerable populations. However, respondents do observe and plan for opportunistic actions of crime.

7.3.3 Higher Education

For the implications on higher education, the study reveals that social vulnerability needs to be incorporated into the already widely accepted definitions of vulnerability. Social vulnerability is generally taught as a distinct subject and separated from the concepts of risk and vulnerability. With the recent growth in the number of degree programs in emergency management, it is important that the next generation of emergency managers be taught about the implications of the social vulnerability concept from all perspectives. More importantly, it is important for the next generation of emergency managers to understand that when issues of social vulnerability are not addressed, increased injury and damage can occur because of social inequalities that exist in everyday life.

While some of the respondents in this study have a post-secondary education, most respondents talk about their peer networks that include others who do have a higher education. While none of the emergency managers’ report a higher education in emergency management, some spoke specifically about peers in their network that do have an emergency management degree. The University of North Texas in Denton, Texas was specifically mentioned as source of this degree. However, even with the indirect influence of higher education and scholarly research, social vulnerability is a foreign term to all but a few emergency managers in this study.
The interview data reveals that emergency managers perceive that social choices, made by government and the public, are a major factor that produces vulnerability. This perception does align with the concept of social vulnerability as the social, political, and economic policies that create vulnerability through social inequalities. However, we must be careful not to interpret this as blaming the victims of disaster for the reason they experienced increased harm and damage compared to the rest of the community. This enhances the need to teach the next generation of emergency managers that social vulnerability is a type of vulnerability that is dynamic and includes more than just functional and access needs, the elderly, the poor, and immigrants.

7.4 Limitations

While the study has a number of mechanisms built into the design to account for researcher bias and to increase credibility, there are two identifiable limitations in the sample size and the site selection. First, the sample size contains 24 total interviews. While the sample size may be considered low, theme saturation began to occur early in the process. However, interviews were conducted until 24 were accomplished in order to confirm that the possibility of uncovering new themes was unlikely.

Second, the geographical area is confined to two regions in Southeast Texas. However, the location of the study site is ideal to study the impact of social vulnerability research on emergency management. The area is exposed to numerous natural and technological hazards, such as hurricanes, tornadoes, floods, marsh fire, and chemical and petroleum refineries. These hazards occur on a continuous basis, which suggests that emergency management would be a high priority for the area. The regions also have a diverse range in population for social
vulnerability demographics that makes it an ideal area for this study.

7.5 Future Research

This study provides a needed step to move social vulnerability beyond research and into practical application. To continue closing the gap between research and practice, future research first needs to focus the implications of research in a manner that speaks to those individuals that design state and federal plans, training, and policy. This will encourage decision makers to incorporate research findings into a usable form that is trusted by emergency managers. More importantly, the content of research should focus on trusted sources of peer networks in emergency management at the local level to understand better, how information is incorporated by the field. Additionally, research needs to focus on the meaning that emergency managers give to command and control, concerning social vulnerability, and the way that their meaning may differ from the meaning projected by research.

Van De Ven and Johnson (2006) propose that research should address a big question that is grounded in reality and is of interest to research and practice. Behn (1995) proposes that big questions should focus on the day-to-day affairs of management and should answer how public managers can accomplish something or deal with decision-making risks and uncertainties. Of the findings, two stand out as issues that are grounded in the realities of local emergency managers in the sample area, which should be of concern for future research.

Studying emergency management peer networks will help to understand better, how information is transmitted within the peer network for knowledge transfer. Second, studying the issue of control will help to understand better, how social vulnerability in practice requires the use of a mix of control and flexibility in the strategies employed to reach and meet the needs of
vulnerable populations. The problems of emergency management, as identified in the interview data, are the problems of coordination and management skills. These issues require a trusted network of peers combined with the control of individuals to increase participation and salience in order to address social vulnerability and social vulnerability knowledge transfer. The next section will discuss the need for research to understand better, why emergency managers perceive the need for control and its effect on meeting specific community needs. The last section discusses the issue of peer networks and the need of future research to investigate how information is passed through peer networks to understand better, how the parallel and transfer strategies are used to transfer knowledge in emergency management.

7.5.1 The Need for Control in Emergency Management

The findings in this dissertation suggest the need for research to rethink the concept of command and control. This is because emergency managers identify operating under a command and control strategy to be able to meet the needs of vulnerable populations. This is due to a lack of “buy in”, knowledge, and security. These findings differ from the body of literature that views practice as operating under the command and control strategy because of the assumptions that antisocial behavior in the public will be widespread. Respondents view command and control as necessary to protect vulnerable populations from increased harm or damage that results from well-meaning spontaneous volunteers, because people will help one another.

Additionally, respondents perceive that elected officials and staff need motivation to take emergency management serious and to help override political motivations that can place specific populations at increased risk. Therefore, emergency managers view the use of protocols to provide the ability to be flexible through standard operating guidelines, rather than procedures,
which will provide the needed resources and personnel to reach and meet the needs of vulnerable populations. A number of respondents discussed the need for physical security and control of emergent groups in order to protect the community from opportunistic crime, but more importantly from unintended consequences of good intentions.

Outside of the need to control for opportunistic crime, the bulk of respondents talk about the use of protocols in ways that help to control the behaviors of elected officials, staff, and emergent activity in order to ensure adequate resources and personnel. Traditionally, research has viewed emergency management as operating through a command and control strategy, based upon the pre-1950s military model and assumptions of human behavior as antisocial and fragile when disaster strikes. The command and control strategy under this traditional perspective says that people need to be controlled for theirs and others safety and wellbeing. However, a large body of research has found the opposite to be true.

Scholars have found that the pre-1950s command and control assumptions of human behavior do not match reality and that individual behavior in response to disaster is predominantly prosocial. For example, evidence shows that individuals will not react in an incapacitated and helpless state and that individuals will help one another rather than wait for outside help in the wake of disaster (Tierney, Bevc, & Kuligowski, 2006). When looting has been observed in the aftermath of disaster, such as in New Orleans with Hurricane Katrina, it has been concentrated in low-income neighborhoods (Alexander, 2007). Wenger, Dykes, Sebok, and Neff (1975) found that looting is only significant when the conditions favoring crime are pre-existent, while looting that is observed, is often for essential supplies for those that did not evacuate.

This is not to say that antisocial activities such as looting and other criminal activities and
panic have not and do not emerge in disaster, but simply that they are not widespread actions that occur in the average disaster. According to Jensen and Waugh (2014), the federal system continues to be dominated by the command and control strategy. However, a debate has continued over greater centralization and standardization in emergency management versus decentralization and flexibility.

In the literature, the command and control model and the flexible model represent two emergency management strategies of each perspective respectively. Advocates of the flexible model maintain that the bureaucratic model creates fragility in society by excluding resources and treating individuals as helpless and incapable of coping with the realities of disaster (Dynes, 1994). Command and control model advocates propose that management tools like the Incident Command System (ICS) are flexible with the ability to expand the structure and include more participants as resource needs increase in the response phase and can be scaled down as needed in the recovery phase. However, while the flexible model is proposed to fit better with pre–disaster operations, Kreps (1991) proposes that neither the bureaucratic model nor the flexible model are adequate in isolation for effective or efficient emergency management.

Kreps (1991) proposed that pre–disaster operations should set the stage for disaster operations with a mix of strategies available to address the context of the situation, because no single strategy has the ability to address all situations in a dynamic and unpredictable environment. For example, in a predictable and stable environment, a more structured and controlled strategy can provide effectiveness in meeting community needs (Neal & Phillips, 1994). Harrald (2006) proposes a mixed agility and discipline approach to meet the needs of a dynamic environment. The terms discipline and agility are synonymous with command and control, and flexibility respectively.
The importance of the Harrald (2006) typology lies in its emphasis on integrating both command and control as well as flexibility by emergency management organizations. This is because they operating in a dynamic and unpredictable environment. The combination of discipline and agility enables large organizations to change rapidly and adjust to the actions and needs of other organizations in response to complex events. A central point that Harrald (2006) makes is that the assumptions of the command and control strategy are not found in reality.

The findings of this study suggests that the agility and discipline typology is more representative of the realities found, rather than a one or the other command and control versus flexible model. Control is needed to ensure that the needs of the most vulnerable can be met and that the negative effects of good intentions do not increase vulnerability. However, flexibility is necessary to ensure that response activities have the personnel and resources to address effectively the specific and unexpected problems that arise during an event. The final note here is that control is perceived as necessary but not for the same reasons that research proposes.

7.5.2 Networking That Builds Knowledge Parallel to Research

From the emergency managers’ perspective, networking with peers provides a vital aspect to gaining the right information to solve the problems they face without reinventing the wheel. The sentiment among respondents is that, on the rare occasion, when a problem has never been experienced, practice may have to turn to research for a fix. However, responses from emergency managers in this sample reveal the need to collaborate in a network of their peers to build knowledge that solves problems. Collaboration occurs during normal operations so that emergency managers can coordinate activities and resources during an event to meet all community needs. In the literature, the terms collaboration and network have been used as
 interchangeably where networks are defined as multi-organizational arrangements to solve a problem that cannot be solved or cannot easily solved by a single organization (Agranoff & McGuire, 2001a).

This dissertation reveals that research needs to separate the terms collaboration, network, and cooperation. The findings show that emergency managers talk about needing to collaborate in a peer network before an event so that they can effectively coordinate during and after an event with the cooperation of those with whom they collaborate. Agranoff (2005) proposes that managing networks has become the public managers’ greatest challenge in achieving performance outcomes. Additionally, Agranoff and McGuire (2001b) propose that the big questions of managing networks are not the same as the management of a single organization.

The term network is more commonly used in the literature as a verb and metaphor in the analysis of public networks where individuals and organizations engage in networking and inter-organizational relationships to facilitate and strengthen collaborations (Berry et al., 2004; Kapucu, Hu, & Khosa, 2014). Hence, network is used as a peripheral term in defining collaboration rather than as a noun and the focus of study based upon collaborations. This is different from the use of network as a system such as is found in the sociological perspective (Coleman, 1988; LeRoux, Brandenburger, & Pandey, 2010; Putnam, 1993). From a sociological perspective, research questions should stem from the embeddedness of relationships in the social structure (Agranoff & McGuire, 2001b; Berry et al., 2004; Feiock, 2007; Frederickson, 1999; Uzzi, 1996).

This literature is relevant to this study because peer networks are an important part of how respondents gather information for problem solving and decision-making. This plays a large role in informing how emergency managers define and understand social vulnerability and the
strategies they employ to reach and meet the needs of vulnerable populations. Most emergency managers talk about having a network of peers that help fill in the knowledge gaps, even for those that have an extensive experience in emergency management. The sentiment is that those who are unable to learn to network will eventually sink under the weight of an event. However, the light bulb will eventually start to kick on and the information will begin to make sense as ideas are bounced between friends, peers, senior and new emergency manager coordinators.

In some cases, respondents in this study reveal that their network consists of cities that are geographically connected. Other instances reveal county networks and even regional networks. However, the ties that respondents report having in the emergency management community also extends to state and federal agencies. One sentiment in the interview data is that there has not been a problem that could not be answered within the regional network because they all work together to solve their unique problems. This is an essential part of the experience factor to understand how experience drives perception and definition, especially for social vulnerability. The sentiment is that there is no time to learn how to make decisions on the job in a high impact – high consequence situation where emergency managers must trust the source of information.

Social capital is important to the source that emergency managers in this study use to gather information to solve problems because of the issue of trust. Additionally, the strength of peer networks can explain why experience and peer networks take precedence over directly searching academic research. People form relationships based upon opinions and the ability to trust and depend on others, but once trust is broken it is hard to rebuild. This places the peer network at the center of knowledge transfer and as one concern for future research.
During the interview process, I found that it takes time for emergency managers to get comfortable with someone from the outside before they will open up and talk freely without using guarded words. For example, one emergency manager conveyed that after seeing my retired military rank on my signature block, they had to give respect for someone who had served the country and give an interview. A sentiment that is shared by many of the respondents, in this study, is that they have no reason to listen to what research has to say unless the researcher has experienced the stressors of emergencies or disaster. This sentiment is not intended as a slight or insult, or as an air of superiority. It is intended as a legitimate question from a practical field where lives and property are at stake. This is because emergency management operates in a high impact – high consequence environment where decisions must be made with little to no information at times and too much information at other times.

Therefore, many respondents say that there is no time to reinvent the wheel. There is no time to determine who can be trusted to correct the situation. In a sink or swim position, trust in the experiences of others plays a large role in the ability of emergency managers to understand the challenges they face and how to solve them. If the emergency manager is unable to make the needed connections and become part of an information network, even on a peripheral basis, then the emergency manager is going to fail. As such the experiences of others rather than academic research take precedence in planning and operations in the interview data.

Network structure and the strength of the relationship between emergency managers can serve to predict how research can focus findings and implications in order to close the research – practice gap. The findings of this study suggest that studying peer networks in local emergency management is important because the structure and function of networks may result in varying outcomes. Effectiveness, in an environment that requires multi-organizational involvement, is a
challenge to management, especially in carrying out their day to day operations (Granovetter, 1985; Wasserman & Faust, 1999). This study produces a hypothesis that social vulnerability research comes predominantly through state and federal plans, training, and policy development as well as through networks because of the high impact – high consequence environment in which emergency operates. This results in emergency managers needing to focus on issues other than specific demographics in order to reach vulnerable populations because of a social vulnerability environment.
APPENDIX

SOCIAL VULNERABILITY INDEX FORMULA
The social vulnerability formula is located on the Hazards and Vulnerability Research Institute website (HVRI, 2016), which is operated through the Department of Geography at the University of South Carolina. Thirty components (see Table A.1) are used for this social vulnerability formula and deviates from the original social vulnerability formula for seven items. Two items are removed from the list. The percent of population living in nursing and skilled-nursing facilities is not available for 2014 census data at the time of data collection. The hospitals per capita variable is a county only measurement for 2014 census data at the time of collection and is excluded to maintain analysis across county and city level.

Table A.1
Social Vulnerability Index Formula Variable Descriptions

| Percent Asian | Percent Less Than High School Education |
| Percent African American | Percent Unemployed |
| Percent Hispanic | People Per Unit |
| Percent American Indian Alaskan Native | Percent Renter |
| Percent Under 5 and 65 or Over | Median House Value |
| Percent Married Couple Family | Median Gross Rent |
| Median Age | Percent Mobile home |
| Percent Households With Social Security | Percent Employment in Extractive Industries |
| Percent Poverty | Percent Employment in Service Occupations |
| Percent Household Income with $200,000 and up | Percent Females In Labor Force |
| Per capita Income | Percent Housing No Vehicle |
| Percent Limited English Proficiency | Percent Unoccupied Housing |
| Percent Female | Median Household Income |
| Percent Female Headed House | Percent Foreign Born |
| Percent No Health Insurance | Percent Disability |

Percent of population without health insurance is put back into the formula. It is listed as county level only on the HVRI formula 2006-2010 data, but is available for the 2014 county and city data. Percent less than high school education is the same variable as percent less than 12th grade education. Percent disability, percent foreign born, and median household income are included because data is available at county and city level for 2014 and was unavailable for previous versions of the social vulnerability formula.

A growth analysis is conducted in ArcMap 10.3 to determine the counties and cities that need to be included in the social vulnerability analysis to determine the comparative scores to be used for triangulation of data. The initial sample included the 13 counties of the Houston – Galveston Region and all one-hundred and seventy-six cities, incorporated cities, and census designated cities. With 30 variables, it was determined that a multiplier of three is necessary for proper analysis and requires 90 cases minimum (See Figure A.1).
The first county growth analysis produced 13 counties that border and is added to the original 13 county region. The second county growth resulted in 69 total counties. The third county growth yielded 98 total counties to meet the needed minimum 90 cases for analysis. The first city growth produced 210 cities for analysis. Thirteen cities are removed from the analysis due to incomplete data. The removed cases do not have identifiable emergency managers and will not affect the pool of prospective interviewees. This results in 197 cities for the final analysis.

A factor analysis was performed in SPSS to determine the impact of each of the 30 variables. Factor loading was performed separately for county and city. For the 30 variables, eight factors resulted for both county and city populations. The categories for county and city were similar, but the influence of each category was different for county when compared to city. Factor loading was conducted for all counties in growth four and all cities in growth one. Table A.2 displays that factor results for the final sample of interviewees. A negative mark in the factor category means that the factor as a category reduces the level of social vulnerability while a positive mark means that social vulnerability is increased by that factor category. Positive or
negative marks in the factor category for each county or city mean that the positive or negative impact is reduced or increased accordingly.

Table A.2  
Factor Loading for County and City in the Final Sample

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<th>County</th>
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<td>Extractive / Primary Sector Employment</td>
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REFERENCES


Alexander, David E. (2007). Misconception As A Barrier To Teaching About Disasters. Prehospital and Disaster Medicine, 22(02), 95-103.


