RURAL EMERGENCY MANAGEMENT:
AN INTER-ORGANIZATIONAL CASE STUDY

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by
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AN INTER-ORGANIZATIONAL CASE STUDY

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DEDICATION

I dedicate this research to my parents, Kenneth and Barbara June Havner. My mother and father migrated from rural towns in Missouri and Arkansas for a better life. Both completed advanced degrees, my mother completed doctoral coursework at the University of Missouri-Columbia, but did not graduate. I am proud to follow in her footsteps. She has always been my role model.

Heartfelt appreciate to my ‘Chief of Staff’ and spouse who takes care of me and often has excellent ideas for research and service projects.

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ABSTRACT

RURAL EMERGENCY MANAGEMENT AN INTER-ORGANIZATIONAL CASE STUDY

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Preparedness, response, recovery, and mitigation are the essential disaster management functions that characterize emergency management. Emergency management is a multi-organizational activity. The connections between these organizations form a network. Members of rural emergency services, often volunteers, may belong to more than one organization in the network. Thus the network is really a network of networks.

This mixed methods research collected empirical data about rural organizations, in one rural county in Missouri, which are part of the emergency management network. Three theoretical frameworks were examined to identify antecedents that produce the four C's of emergency management; communication, coordination, cooperation, and collaboration. A critical analysis of network theory, organizational theory and community field theory revealed the inter-organizational activities that enable each of the four C's.

This study describes the characteristics of a rural emergency management network and seeks to explain the complex inter-organizational relations. The critical inter-organizational relationships; communication, coordination, cooperation, and collaboration, are necessary for community disaster resilience. Organizational social capital is produced from the four C's of emergency management, facilitating future interactions.

CHAPTER 1

INTRODUCTION

The world is a hazardous place prone to geological and meteorological events that can impact the built environment with serious consequences. Human development has contributed technology and infrastructure that are also vulnerable to predictable and unforeseen events (Mileti 1999). Disasters will continue to produce significant economic losses and human suffering (Flynn 2007; Perrow 2007; Redlener 2006; Ripley 2009). The field of emergency management is challenged to reduce these losses through the effective and efficient management of community resources and to foster community resiliency. Geography and demographics explain many of the variables that contribute to disaster vulnerability (Cross 2001). This is especially true of rural areas which have experienced significant population decline and a loss of fiscal resources required to provide for the public safety.

Rural communities, in many ways, are more vulnerable to natural and technological hazards because of economic and social changes (Brown, Swanson, and Barton 2003; Capsambelis 2009; Cross 2001; Flora and Flora 2008). Rural areas rely on the collective action demonstrated by the commitment of volunteers engaged in serving the community in times of need (Wilkinson 1986). In rural communities volunteers fill crucial roles in emergency services (Brudney 1999; Casey and Leger 1996; Perkins 1987; Sanderson 1939; Weisheit, Wells, and Falcone 1995). Addressing these vulnerabilities to natural and technological hazards, as well as building capacity to respond to and recover from disasters, depends on the coordination of multiple agencies and organizations.

Flora and Flora (2008:17) describe how community resources can be “invested to create new resources” and “become capital.” Seven types of capital, “natural, cultural, human, social, political, financial, and built” (Flora and Flora 2008:17) are necessary to a vibrant and resilient community, and are much more difficult to acquire in rural towns and villages. Social capital has been asserted as the hallmark of the closely connected rural community (Flora and Flora 2008). Social capital is a consequence of the interconnectedness of members of the community, and is a product of the network of relations among these members (Murphy 2007; O’Brien 2011; O’Brien, Phillips & Patsiorkovsky 2005). Flora and Flora (2008:18) explain how “community social capital facilitates groups’ working together. Both bonding (multiple linkages to enforce norms and encourage trust) and bridging (single-purpose linkages) forms of social capital are important for community prosperity and sustainability.” Understanding how social capital contributes to the functioning of rural emergency management networks is essential to build capacity and capabilities to effectively respond to emergencies and recover from disasters.

Disasters are characterized as socially disruptive (Barton 1962; Prince [1920] 1968) and the community’s collective response is to organize for the public safety (Auf der Heide 1989; Barton 1962; Waugh 2000). Public organizations, termed first responders, include: law enforcement, fire protection, and emergency medical services (Coe 2009), and are the lead organizations effectively responding to these socially disruptive events. Managing the recovery, mitigating risks, and preparing for additional emergencies and disasters add additional groups to the community resource; public health (Chesser et al. 2006), emergency management (Waugh 1994), and local emergency

planning committees (Lindell 1994; Lindell et al. 1996). The interaction and communication between and among these organizations reveals a network of inter-organizational relations that influence the effectiveness of the response and recovery of the whole community (Dynes and Quarantelli 1968; Edwards 2013).

This case study research (Yin 2003) collected quantitative and qualitative data to provide rich and complex information about the organizations and agencies involved in disaster preparedness, response, and recovery in one rural county in Missouri. This diverse and complex set of organizations and agencies will be referred to as the emergency management network. Networks have been described as “multi-organizational arrangements for solving problems that cannot be achieved, or achieved easily by a single organization” (Agranoff and McGuire 2001:296). Network research has demonstrated that ‘structure matters’ in public management (Berry et al. 2004; Choi and Kim 2007), and “networks create value by acting as important means of bridging multiple organizations and dealing with difficult problems” (Agranoff and McGuire 2001:322).

The “organized activities” (Dynes 1970:4) of emergency management involves multiple organizations communicating, coordinating, cooperating, and collaborating. Organizational social capital is needed to produce the multi-organizational collaboration prized by scholars of public management (O’Leary and Bingham 2009). Institutions also matter, providing leaders and individual members meaning and value in public service (Powell and DiMaggio 1991; Sundeen 1990), and are often “taken for granted” when analyzing organizational effectiveness (Jepperson 1991:147).

Rural communities can become disaster resilient when the network efficiently utilizes limited human resources (Brudney 1993; Brudney and Duncombe 1992),

overcomes barriers to intergovernmental collaboration (Warheit 1970), and maintains a culture of collective action (Vasi and Macy Vasi 2003). Communities need to “develop a means of increasing the capacity of coordinated organizational systems to adapt and respond under extreme stress” (Kapucu 2009:47). An “emergent multi-organizational system” (Drabek 1987b:269) (communicating, coordinating, cooperating, and collaborating) to achieve disaster resilience exemplifies the community field as described by Wilkinson (1970).

This study explores the inter-organizational relations of the emergency management network of a rural Missouri county. The organizational activities that are most relevant to this study are communication, coordination, cooperation, and collaboration. Network theories, organizational theories, and community field theories have identified antecedents to these four types of inter-organizational relations essential to emergency management. The interdependent nature of these relational attributes builds upon each other to produce the emergent community field (Wilkinson 1970) that is the foundation of rural resiliency. The purpose of this study is to understand what supports the formation and function of the network through each relational dimension; communication, coordination, cooperation, and collaboration. Do the organizations in this network communicate frequently, have common goals, and trust each other during disasters? What inputs are needed to enhance network coordination and cooperation, and therefore enhance community resiliency? Are these organizations strengthened or weakened by multi-organizational members who span organizational boundaries? In short, *What are the antecedents to a coordinated inter-organizational emergency management network?*

PAST RESEARCH ON THE PROBLEM

There are unique issues facing rural emergency services agencies that have not been addressed in empirical studies. Very little is known about the structure and characteristics of the emergency management network in rural communities. O'Brien, Raedeke, and Hassinger (1998) studied the networks of leaders in rural communities, including two communities that experienced flooding, but did not examine the subgroup of emergency services leaders. Most emergency management network research has focused on the structure and organization of federal agencies (Kapucu 2009; McLoughlin 1985; Schneider 1998; Sylves 2007; Wamsley and Schroeder 1996), non-governmental organizations (Bunker 1957; Gillespie, Mileti, and Perry 1976; Holcombe 2007; Simo and Bies 2007), and state agencies (Kapucu, Augustin, and Garayev 2009; McGill 1957). Yet, the local network is the one that has the most impact on the disaster response and recovery of the community (Choi and Brower 2006; Choi and Kim 2007; McEntire 2007; Warner 2003).

The local emergency management network in rural areas is responsible for protecting a significant portion of the U.S. energy infrastructure and food system (Cross 2001). Most rural communities are protected by volunteer emergency responders who are already struggling to stay prepared and capable of meeting the everyday emergency needs of their communities (Furbee et al. 2006; McLennan and Birch 2005; Perkins 1989; Simpson 1996; Thompson 1993). Some individuals are members of multiple organizations in the rural emergency management network, and the effect of multi-organizational membership during disasters is uncertain (Killian 1952).

Rural communities are characterized by low density of population, isolation, high incidence of poverty, and multiple transportation challenges, including lack of infrastructure, long travel distances, and poor quality roads (Flint and Brennan 2007; Gamache et al. 2007). Emergency responders and emergency managers responsible for disaster preparedness in rural regions are more likely to be volunteers or part-time personnel than those in urban communities (Gamache et al. 2007; Norris, Mandell, and Hathaway 1993). Although there is a considerable body of empirically-based knowledge about metropolitan area disaster response planning (Berke and Campanella 2006; Britton and Lindsay 1995a, 1995b; Quarantelli 1999), much less is known about the response network engaged in disaster preparation in rural areas.

Murphy (2007:301) asserts that the first step to exploring disaster resiliency at the community level is to “assess the relationships that exist within and among communities and the extent to which local government emergency managers capitalise on existing relational resources and promote their further development.” Specific sub groups within the emergency management network have been studied, such as emergency medical agencies (Garman et al. 2004; Norris et al. 1993; Thompson 1993), law enforcement (Capsambelis 2009; Kennedy 1970; Kuhns, Maguire, and Cox 2007; Weisheit et al. 1995; Wenger, Quarantelli, and Dynes 1989), and fire protection agencies (Gamache et al. 2007; Lozier 1976; Perkins 1990; Warheit 1970; Wenger et al. 1989). However little research (Choi and Brower 2006; Choi and Kim 2007) has been published that describes the local emergency management network in a non-metropolitan county.

Studies on the ties between organizations have focused on formal and informal ties among leaders (O’Brien et al. 1998). Social and kinship connections among

community members in rural communities are complex and multi-dimensional, but little research has focused on how this impacts on each organization to which an individual belongs. Volunteers often are affiliated with multiple organizations and promote inter-organizational linkages (Gillespie 1991; Zakour and Gillespie 1998).

The resources of a community, both human and equipment, are a public good (Ahlbrandt 1973; Brueckner 1981) and common pool resource (Ostrom 1990). The community supports, funds, and depends upon these resources during emergencies and disasters. Emergency management is an application of the local collective action that completes the Wilkinson (1970) definition of community field. The dense personal ties among members of these organizations are a source of social capital (Wilkinson 1991). The emergency management network is enhanced and constrained by institutions that coordinate the flow of information and resources. The common purpose and culture among organizations in the network enables cooperation and sharing of common pool resources before, during, and after a disaster.

DEFICIENCIES IN PAST RESEARCH

The study of networks between and within organizations has been utilized in many disciplines to examine formal and informal connections, information flow, and structure (Provan et al. 2005). Many of these studies do not consider that networks are socially embedded (Granovetter 1985), and analysis needs to include the institutional context that provides incentives which support collective action and coordination, reducing transaction costs. Social network analysis provides a quantitative method to measure the strength and density of network connections (Baldassarri and Diani 2007; Borgatti, Everett, and Johnson 2013; Granovetter 1973,1976; O'Toole 1997; Streeter and

Gillespie 1992; Zakour and Gillespie 1998). Emergent network connections during disaster can be explained using qualitative data which explain how relationships between members of organizations are developed and maintained.

Choi (2004:223) reports that “local emergency management has grown significantly over the last 20 years, but there is little research on the subject.” The focus of most disaster research is what occurs after the disaster impact. Although there are four phases of emergency management (response, recovery, mitigation, preparedness), the response phase is the part of the cycle that attracts the most research. The inter-organizational relations that are identified in the emergency management literature are communication, coordination, cooperation, and collaboration. Inter-organizational relations are established before a disaster and emergency management professionals should understand how to support and enhance each of these relational activities. The emergency management literature is lacking any specificity about antecedents for these inter-organizational activities. Describing the linkages within the local emergency management system in one rural county will explain the complexity of the inter-organizational collaboration at the local level during disasters.

THE AUDIENCE THAT WILL BENEFIT FROM THE STUDY

Emergency management professionals in the United States and throughout the world can enhance collaboration and more efficiently manage public goods with knowledge of the emergency management network. Knowledge of networks contribute to building community capacity when “managers can see exactly where their organization fits within the structure of the network, based not just on their own impressions, but also on the experiences of the other network participants” (Proven et al. 2005:604). Public

managers need to understand the contribution of institutions to coordination and the role of social capital to sustaining collective action. Reducing transaction costs and free riders will improve organization reputation among the other services and the public. Rural communities can become more resilient by building capacity before disasters through stronger collaborations between and among the network of organizations (Dynes 2006; Murphy 2007).

There are public policy implications from this study. Proven and Milward (2001:415) argue that “evaluation of network effectiveness is especially important for those who formulate public policy at local, state, and national levels, so that scarce public funding can be allocated to service-delivery mechanisms that are using resources efficiently while adequately serving public needs.” Enhanced cognition of rural emergency management networks can inform public policies that intend to build local capacity by revealing a process for “knitting the network” (Krebs and Holley 2006:1). Policies can be chosen or adapted that will incorporate appropriate strategies to strengthen network bonds, and create bridges outside of the network which can enhance resource acquisition (O’Brien et al. 2005). The inter-organizational relational network in rural community that provides the emergency management function is a public good; facilitated by social capital, provided through community collective action, constrained by culture and institutions, and sustained through social processes.

RESEARCH DESIGN

The theoretical framework that is essential to this research is community field as described by Wilkinson (1970:318), “as an abstraction, a community field cannot be observed directly, nor can any social field.” This presents a significant challenge to

researchers who want to explore multi-organizational relations from a social field perspective. “In practice, study of a community field involves frequent shifts between inductive and deductive patterns of interpretation” violating some conventional approaches to organizational research (Wilkinson 1970:318). It is this “distinction between descriptive and explanatory analysis of a community field” that poses the greatest challenge to presentation of this research and the “interplay of causal and consequential forces that is the essence of a field” (Wilkinson 1970:318). This researcher has chosen to follow Wilkinson’s (1970:318) advice:

Being social, a community field can and should be described in interactional terms, that is, in terms of the actual occurrence of social interaction. But, as noted above, a social field can hardly be explained in interactional terms only. As befits a field approach in any discipline, the appropriate strategy is one of shifting back and forth between description and explanation.

Thus this paper will shift from description to explanation to find the evidence that the rural emergency management network is a community field.

This study utilized a sequential mixed methods approach (Creswell 2009) consisting of a case study (Yin 2003) and network analysis of leaders of 18 emergency services agencies in one rural county in Missouri to identify and describe the relationships that form the local emergency management system. The resiliency of the community (Murphy 2007) is impacted by the effectiveness of this system in protecting the public before, during, and after a disaster. The emergency management system in this rural, non-metro county consists of a network of emergency medical services, fire, law enforcement, and emergency preparedness/planning agencies. A survey of 24 leaders provided data for analysis of the types and frequencies of interactions between these agencies. Interviews with these leaders gathered information about organizational strategies and challenges of

adapting to emergency and disaster events in a rural community. With the permission of the organizational leaders, 175 members completed surveys about their family, friendship, and membership ties to the other organizations. Multi-organizational members were identified and three multi-organizational members were interviewed to ask about inter-organizational relations at the member level and strategies for adapting to multiple organizational roles.

Research Questions

- 1) What is the network structure of the emergency management organizational field in a rural (non-metro) county?
- 2) What antecedents contribute to member organization collaboration in the network?
- 3) How do the intergovernmental relationships of emergency services agencies in a non-metro county contribute to community resiliency?
- 4) How does overlapping membership in rural emergency services agencies impact the local emergency management network?

Hypotheses

- 1) The network of leaders of emergency services agencies share common goals that foster collaboration.
- 2) The network of leaders of emergency services agencies maintain weak ties to state and national organizations that provide a bridge to outside resources and information.
- 3) Multi-organizational members fulfill a boundary spanning role and understand that they contribute to the flow of information and resources in the network.

4) The public service culture provides incentives to overcome the collective action problem for actors embedded in the emergency management network of rural communities.

Methodology

This mixed methods study collected data through interviews, surveys, observations, and document review about the emergency management network in one rural county in Missouri. A case study approach (Yin 2003) was adopted to study a county level network of organizations involved in local emergency management. Quantitative and qualitative methods (Babbie 2004) were used to collect new information and obtain existing data to explore the inter-organizational relationships within the emergency management network and the institutions that build social capital and sustain the collective action in one rural county. The research location was chosen because the researcher had previously established relationships with many of the organizations, providing access and a foundation of trust to foster data collection.

The methods employed to protect human subjects privacy included informed consent about the purpose of the research and the care taken to protect the confidentiality of research participants. All of the organizations targeted for this research are public organizations, and because the topic of the research addresses the public aspects of the organizations, it is generally considered exempt from the full human subjects review process. An expedited review was sought from the University of Missouri Institutional Review Board and was granted. The informed consent letter, surveys, interview questions, data storage and protection procedures were reviewed by Dr. David O'Brien, faculty advisor, and the University of Missouri Institutional Review Board office, before

approval. Confidentiality is maintained by creating a spreadsheet listing all of the research participants from each organization identified by a random number assigned to each participant. This document is kept in a secure location under the control of the researcher and is the only document that contains the name of the respondent.

The organizations invited to participate in this research are located in the same county in the state of Missouri. Organizations selected to participate have organizational headquarters located in the selected county; local offices or facilities of state or national organizations were not included in this study. The local emergency management network was defined as public sector organizations engaged in public safety activities including emergency response and planning. During initial contacts with the organizations the purpose and scope of the research was communicated in writing and appointments were made for personal meetings with organizational leaders. In the initial meeting with leaders, an informed consent letter requesting research participation was distributed and questions were answered. Access to membership rosters was requested and permission was requested to distribute surveys to organizational members.

Organizational leaders that consented to participate in the research were asked to complete a survey (See Appendix B) about interactions and relationships with the other organizations in the local emergency management network. The leaders were asked to rate the inter-organizational relations on four dimensions; daily interactions, goal alignment, information inflow, and collaboration for service delivery. Brief interviews were conducted with the organizational leaders. During the interviews, these leaders were presented with a large regional disaster scenario and asked which other organizations they would rely upon the most during a response, and what the greatest challenge for

their organization would be responding to the event. The organizational leaders were also asked about anticipated involvement of state and federal organizations. They were asked to identify which organizations would be trusted to do the most good, and which would make the job more difficult. Lastly, these organizational leaders were asked about the impact of multi-organizational members on the function of their organization and any perceived benefit to their organization.

The organizations identified in the county to be surveyed include city police and fire departments, independently governed districts, and county level departments and agencies. Memberships among these organizations include full-time employees, part-time employees, and volunteers. Surveys were provided (See Appendix B) to all the emergency response members of these organizations to inquire about professional memberships, affiliations with other organizations, obligations for military service in active duty, reserve duty, and National Guard. Monthly training (Perkins and Benoit 2004) and other scheduled activities were used as survey opportunities to increase response rate when access was granted.

Interviews with leaders of organizations in the emergency management system provided additional detail and context to the relationships between these organizations. The use of qualitative methods is necessary to elucidate the motivation of volunteers and emergency services personnel and the institutions that are often “taken for granted” by organizational members (Jepperson 1991:147). These institutions are essential to maintain the collective action that is characteristic of organizations staffed by volunteers who provide crucial services during disasters.

Theoretical Frameworks

Theoretical explanations of inter-organizational relations from three fields of study will be reviewed in this paper; networks, organizations, and community. Each theoretical framework is examined to identify antecedents associated with the four key interactions in multi-organizational emergency management networks; communication, coordination, cooperation, and collaboration. Data is presented throughout the paper as evidence of antecedents to demonstrate connections to the literature and applicable theories of inter-organizational relations. Empirical data obtained during this study is presented as evidence for the application of the theory to explain and describe the rural emergency management network. Chapter 1 Introduction briefly describes the purpose of the research and the need for the study, and begins the examination of various disciplinary approaches. Chapter 2 Local Emergency Management provides a comprehensive explanation of the multi-organizational network in the rural Missouri county selected for the research. Emergency management as a public safety function is defined and the antecedents to the emergent multi-organizational network are identified, and the individual organizations that comprise the network are described. Emergency management literature is reviewed and key concepts are discussed. Chapter 3 Networks reviews the literature on network theory and applications to rural emergency management. Empirical data that exemplifies the theoretical network propositions are presented to demonstrate the application of the theory to the study population. Chapter 4 Organizations also presents the theoretical concepts of organizations, particularly inter-organizational relationships. The theory is illustrated with empirical data from the research. Chapter 5 Community explores the meaning of community and the role of

collective action to build local capacity to provide the emergency management function in all phases of disaster. An explanation for the rural emergency management network as a community field is provided. Chapter 6 Discussion and Conclusions summarizes the findings and the implications of this research on understanding local emergency management networks in rural counties.

THESIS STATEMENT

The emergency management function in rural communities is a multi-organizational activity based on communication, coordination, cooperation, and ideally emerges as collaboration. This network of organizations is emergent, interdependent and operates as a community field, contributing organizational social capital to build disaster resiliency.

CHAPTER 2

LOCAL EMERGENCY MANAGEMENT

In the United States, emergency management is primarily a governmental function that addresses the need to prepare for, respond to, recover from, and mitigate losses to everyday emergency events and less frequent disasters (Haddow, Bullock, and Coppola 2014). Numerous governmental agencies at the city, county, state, and national levels share responsibilities for emergency management; the Federal Emergency Management Agency, the State Emergency Management Agency, county emergency management agencies, and city emergency management departments are the key authorities. Local jurisdictional boundaries result in assignment of responsibilities for everyday emergency services; law enforcement, fire, emergency medical, and communications. In the event of a significant emergency or disaster, there are additional roles and responsibilities that often overlap jurisdictions. The four key interactions among these organizations are communication, coordination, cooperation, and collaboration. How these emergency services are organized, staffed, and funded vary at the local level resulting in different capabilities, governance, and structure (Kapucu, Arslan, and Collins 2010). This multi-organizational activity is complex with overlapping boundaries and interactions. This study examines the governmental organizations in one rural county which form the emergency management network. Understanding these inter-organizational relationships is necessary to enhance service to the public and provide for the common good (Ahlbrandt 1973; Brueckner 1981; Ostrom 1990).

DEFINING EMERGENCY MANAGEMENT

Emergency management is a public safety function of government which has been described as a system (Comfort 1999) or multi-organizational network (Drabek, 1985; Tierney, Lindell and Perry 2001). The emergency management function is conceptualized as consisting of four phases of disaster activity; mitigation, preparedness, response, and recovery (Drabek and Hoetmer 1991; Mileti 1999; Waugh and Hy 1990; Waugh 2000). Although city and county emergency managers are important participants in the process, they must engage with all organizations that provide services and resources needed during some phase of a disaster. Each of the phases of emergency management activity is multi-organizational, some activities occur frequently, like preparedness and response. Other phases are less frequent, disaster recovery only occurs after an event that causes significant damage and social disruption; hopefully a rare occurrence. The process is often modeled as a cycle with no beginning and no end. (See Figure 1.)

Figure 1. Emergency Management Cycle

Mitigation activities reduce the occurrence of a disaster or the severity of the consequences. This phase can also involve public policy changes and regulations that limit public exposure to risk and/or structural changes that reduce the negative impact of hazard (Haddow et al. 2014). All levels of government should participate in establishing rules and incentives to reduce vulnerability to disasters through mitigating known hazards (Mileti 1999). Land use zoning, building codes, and insurance programs are some institutions that involve private organizations as well as government. No single organization can reduce community risk; it is a multi-organizational activity.

Preparedness occurs before a disaster through training, emergency planning, evacuation strategies, distribution and positioning of supplies, and other activities (Tierney et al. 2001). The biggest challenge here is the uncertainty of the type, time, and location of an event. Some incidents are preceded by environmental cues, for instance changes in weather might portend a storm; other disaster events occur without warning. Increasing public awareness of hazards, and educating them regarding when and how to take protective action, are important preparedness activities that may overlap multiple organizations emergency preparedness tasks (Tierney et al. 2001).

Response is the activity that garners the most public attention. The actions taken during a disaster, to reduce the impact of the hazard and protect the public, are response (Tierney et al. 2001). Actions taken immediately prior to the incident, like disseminating warnings, or immediately after, such as “providing emergency food and shelter,” are also part of response activities (Tierney et al. 2001:5). The immediate response will be affected by the type of disaster, its severity, its location, and the type of communities affected. This requires dynamic decisions in real time and is quite challenging. First

responder organizations (fire, police, and emergency medical services) are the focus of most research on inter-organizational relations (Barton, 1962; Kennedy 1970; Lozier 1976; Warheit 1970). The implementation of nearly universal 9-1-1 emergency numbers and recent changes in technology and specialized communications systems have led to the consolidation and centralization of emergency call centers and dispatching of calls to first responder agencies (National Emergency Number Association 2013).

Recovery is the process of restoring normal services and infrastructure for a given area. During this phase, mitigation should be incorporated during reconstruction and restoration of the community. Recovery is a community-wide activity and involves public and private sector organizations. Sustaining economic activity and meeting the needs of citizens requires multiple organizations to coordinate and cooperate to address the complexity of issues (Phillips 2016).

In order to perform these four tasks efficiently, an assessment of the service area should be made (McEntire 2007). This includes the consideration of what organizations may respond, the type of response they can provide, communication infrastructure, the available inventories of necessary goods, and the location of personnel and supplies. Rural communities often lack the technical expertise and resources that are commonly available in urban areas (Waugh 2013). The purposive actions of organizations composing the emergency management field must function effectively with changing roles and demands for resources.

Every county and municipality in Missouri has a designated emergency manager charged with organizing the overall mitigation, preparedness, response, and recovery activities within their jurisdiction. Examining the guiding principles for emergency

management provides some insight into the culture and institutions of emergency management. The Principles of Emergency Management (PoEM) are eight guiding perspectives to accomplish the organizing activity essential to providing for the public safety during the four phases of emergency management. The development of PoEM was a collective process initiated by the International Association of Emergency Managers (IAEM) and has been endorsed by organizations around the world (International Association of Emergency Managers 2007). The PoEM document defines emergency management as “the managerial function charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters” (International Association of Emergency Managers 2007:4). The eight principles state that emergency management must be:

1. **Comprehensive** – emergency managers consider and take into account all hazards, all phases, all stakeholders and all impacts relevant to disasters.
2. **Progressive** – emergency managers anticipate future disasters and take preventive and preparatory measures to build disaster-resistant and disaster-resilient communities.
3. **Risk-driven** – emergency managers use sound risk management principles (hazard identification, risk analysis, and impact analysis) in assigning priorities and resources.
4. **Integrated** – emergency managers ensure unity of effort among all levels of government and all elements of a community.
5. **Collaborative** – emergency managers create and sustain broad and sincere relationships among individuals and organizations to encourage trust, advocate a team atmosphere, build consensus, and facilitate communication.
6. **Coordinated** – emergency managers synchronize the activities of all relevant stakeholders to achieve a common purpose.
7. **Flexible** – emergency managers use creative and innovative approaches in solving disaster challenges.
8. **Professional** – emergency managers value a science and knowledge-based approach based on education, training, experience, ethical practice, public stewardship and continuous improvement.” (International Association of Emergency Managers 2007:4)

These principles are an effort to create a professional culture for emergency managers, and also provide some guidance on inter-organizational relations.

The multi-organizational activity, known as emergency management, has been described as a socio-technical system (Comfort 1999; Dynes 1970; Gillespie and Mileti 1979) with characteristics that are organizational, technical, and cultural (Comfort 1999). Early research focused primarily on the response to local disaster events to reveal inter-organizational relations (Baker and Chapman 1962; Barton 1962; Drabek 1985; Dynes 1970). Dynes (1970) developed a typology that classified organizations involved in disaster activities as Type I Established, Type II Expanding, Type III Extending, or Type IV Emergent. This typology described the shifting organizational structure and changing organizational roles and responsibilities as disasters transitioned through the multiple phases to restore normal activity. The changing organizational role set from pre-disaster to post-disaster activities creates resource demands on organizations and opportunities for boundary spanning personnel to bridge relations, particularly for Type II organizations (Dynes 1970). Multi-organizational members are one group of boundary spanners who have established connections that can benefit both organizations and the community during emergencies and disasters (Dynes 1970).

LOCAL

Waugh (1994) has asserted that counties are important units of analysis since the variety of organizations encourage inter-organizational coordination. The coordination and communication within this complex multi-organizational network is also a challenge (Cutter 2001; Simon and Altschul 2007). A single rural Missouri county can contain more than ten police and fire departments. In the 2012 Census of Governments data set

for Missouri, there are 3,768 units of government, and nonmetropolitan counties have as few as 9 or as many as 65, with the study county near the average for nonmetropolitan counties (U.S. Bureau of the Census 2012). As Wilkinson (1991:5) notes, “local society today is comprised in large part of units and branches of regional, national, and multinational organizations.” The organizations that compose local emergency management in Missouri are not merely “units and branches” and instead are local government units comprised of local membership with local leadership. Organizations that did not fit this definition of local were not included in this study.

There are eighteen organizations identified in the county included in the study: city police and fire departments, independently governed districts, and sub-county and county level departments and agencies. Memberships among these organizations include full-time employees, part-time employees and volunteers, and some who get paid a small stipend for each call (paid on call). Coe (2009:38) defines these employment relationships for firefighting personnel:

A volunteer receives no compensation, other than perhaps a stipend for out-of-pocket expenses (such as clothing) or time spent in training. A paid-on-call officer is paid only for the time spent responding to a service call. . . . a permanent full-time firefighter is paid an annual salary and fringe benefits.

The National Fire Protection Association collects data and provides reports on the U.S. fire service. Fire departments with full-time paid firefighters are called career departments, and these fire departments protect the majority of the population of the United States. Career fire departments employ 31 percent of all firefighters in the U.S. (Haynes and Stein 2016). There are over 1.1 million firefighters in the U.S. and 86 percent are volunteers. (See Figure 2)

Figure 2. Fire Department by Type and Population
 Reprinted with permission from NFPA's report, *U.S. Fire Department Profile*
 By Hylton J. G. Haynes, Gary P. Stein, Copyright © 2016, National Fire Protection Association.

Table 1 identifies the leadership and membership of the eighteen governmental organizations that compose the emergency management network in the county studied. To protect the privacy of the agencies, the official names have been generalized and in this paper will be referred to by their geographic and discipline identities. This list is organized by county, then city agencies, then others.

Table 1. Organizations in the Study Population

Jurisdiction Level	Name	Leadership	Membership
County	Emergency Management (EMA)	Director and Deputy (full-time)	Volunteers
	Sheriff	Sheriff (full-time)	Deputies (full and part-time)
	Public Health	Director	Environmental staff (full-time)
	Central Dispatch (Comm)	Director and Operations Chief (full-time)	Dispatchers (full and part-time)
	Emergency Medical Service (EMS)	Director and Deputy (full-time)	Paramedics and EMTs (full and part-time)
	Local Emergency Planning Committee (LEPC)	Chair and Vice-Chair (volunteers)	All members are representatives of other organizations.

			Membership may include media, industry, utilities, NGOs, and interested citizens
Sub-county	County Fire District (CFD)	Chief, Assistant Chief (full-time)	Three Battalion Chiefs, Training Chief, Captains, Lieutenants, and firefighters (paid on call)
	County Fire District #2 (CFD2)	Chief (full-time), Assistant Chief (paid on call)	Training Chief, Captains, Lieutenants, and firefighters (paid on call)
City	Big Town Fire Department (BigTFD)	Chief, Assistant Chief (full-time)	Battalion Chiefs, Captains, Lieutenants (full-time), firefighters (full-time, part-time, and paid on call)
	West City Fire Department (WestFD)	Chief, Assistant Chief (part-time)	Training Chief, Battalion Chiefs, Captains, and Lieutenants (part-time), firefighters (part-time and volunteer)
	East City Fire Department (EastFD)	Chief, Assistant Chief (part-time)	Captains, Lieutenants, firefighters (part-time, paid on call, and volunteers)
	Big Town Police Department (BigTPD)	Chief, Assistant Chief (full-time)	Sergeants, officers (full-time and part-time)
	West City Police Department (WestPD)	Chief, Assistant Chief (full-time)	Sergeants, officers (full-time and part-time)
	East City Police Department (EastPD)	Chief (full-time)	Sergeants, officers (full-time and part-time)
	Little Town 1 Police Department (L1PD)	Chief (part-time)	Officers (part-time)
	Little Town 2 Police	Chief (part-time)	

	Department (L2PD)		
	Little Town 3 Police Department (L3PD)	Chief (part-time)	
Other	College Public Safety (College)	Chief, Assistant Chief (full-time)	Sergeants, officers, and dispatchers (full-time and part-time)

The Missouri county chosen for the research can be characterized as rural. Rurality is a concept that has been defined differently by different federal agencies, by different disciplinary fields, and for different purposes. The most common classification is that of the U.S. Office of Management and Budget (2010) that identifies localities as metropolitan or non-metropolitan; metropolitan is a county with a city of 50,000 or more, and everything that is not metropolitan is rural. The U.S. Department of Agriculture Economic Research Service (2016:para. 2) has “developed multi-level county classifications to measure rurality in more detail and to assess the economic and social diversity of nonmetro America.” The Rural-Urban Continuum codes (U.S. Department of Agriculture 2016) distinguish non metro counties by their population size and proximity to urban areas. The county studied is classified as a 4 in this nine-code system, indicating that it has a population greater than 20,000 and is adjacent to an urban county. The Urban Influence classification consists of twelve codes and the study county is a 3 also because of the population size and proximity to an urban area. The Natural Amenities Code placed this county near the mean with neither high nor low amenities. The Economic Typology code noted that the study county has some dependence on Federal and State Government funds. The focus of this research is rural emergency management, and the economic and social constraints of rurality are important to this inter-governmental function.

When Local is Rural

During the last several decades a large body of research on effective emergency management has been produced, but rural communities have not been the subject of these studies (Coe 2009; Drabek 1987a). Emergency management as an extension of the federal structure and function has been the primary orientation of most studies, and the relationship to local emergency management is primarily high risk urban population centers. The disaster management capabilities of urban governmental systems are often organized into a hierarchal city or county-wide organization that employs an adequate number of full-time career responders, planners, and resource managers.

Effective rural emergency management incorporates an assessment of vulnerability and resilience at community and organizational levels. Rural localities contain higher percentages of people characterized as vulnerable (Waugh 2013). The Hazards and Vulnerability Research Institute at the University of South Carolina has developed and refined a Social Vulnerability Index (SoVI) calculated from population variables associated with vulnerability, based on the work of Susan Cutter and her colleagues (Cutter, Boruff, and Shirley 2003). The key variables identified in the SoVI data that correlate to social vulnerability are race, class, poverty, ethnicity (Hispanic and Native American), residence in nursing homes, and employment in the service industry (Hazards and Vulnerability Research Institute 2016). In the state of Missouri overall, the percent of the population that is over age 65 is 14 percent and 15.6 percent of the population live below the poverty level. (See Table 2) These demographic characteristics directly impact the quality and availability of emergency services when those services are staffed by volunteers (Clay 1998; Ott and Hasanen 1995).

Table 2. Missouri County Characteristics by Quintile

	Missouri	1st 20%	2nd 20%	3rd 20%	4th 20%	5th 20%
Population^a	5,988,927	1,001,876-51,675 ±	45,156-25,195	24,748-15,607	15,566-9,723	9,627-2,171
Population per square mile^a	87.1	5,157.5-81.7	75.9-41.3 ±	40-27.1	26.6-17.4	16.8-8.1
Total government units^b	3768	204-46	46-33	31-25 ±	25-18	18-9
% of Population over 65^a	14	29.6-20	19.8-17.6	17.5-15.9	15.8-14	13.8-7.2 ±
% of Population below the Poverty level^c	15.6	29.7-22.2	22.1-19.4	19.4-17 ±	16.9-14.2	14-6.1

Note: The following symbols ± denotes the study county.

a (U.S. Bureau of the Census 2010).

b (U.S. Bureau of the Census 2012).

c (U.S. Bureau of the Census 2014).

Sanderson and Polson (1939) first identified the potential for volunteer fire departments to function as an organizing mechanism of rural communities. More recently (Perkins 1987, 1989, and 1990; Simpson 1996; Thompson and Bono 1993; Warheit 1970) have studied the challenges of rural volunteer fire departments, particularly recruitment and retention of volunteers. Rural communities rely upon the services of volunteers for a variety of public services. Fire protection and emergency medical services in rural areas are highly dependent on volunteers for staffing and expertise (Perkins 1987; Stinson 1978; Thompson 1993). Expanding the capacity of these services during disaster relies upon the commitment and availability of volunteer members to meet the needs of the community during crisis (Perkins and Benoit 2004; Simpson 1996). Coe (2009:31) described the size of fire departments: “93% are either all or partly volunteer”; police; “of the over 17,000 law enforcement agencies . . . 1,000 have only one

full or part-time officer” (Coe 2009:11); and emergency medical services are “staffed by paid personnel, volunteers, or a combination of the two” (Coe 2009:54).

Emergency medical services (EMS) may be provided by fire departments but are also organized as separate governmental units. Furbee et al. (2006) surveyed over 1,800 rural EMS agencies and reported that 92 percent stated that an incident with 6-10 serious injuries would exceed their service capabilities. There is a need for additional research on the effectiveness of rural response agencies and particularly the network of these organizations that serve political subdivisions of counties, such as towns, villages, or districts.

Emergency services are organized and funded through a variety of ways; either as a local government service, or as an independent nonprofit corporation, or as a special district (Perkins 1990). Nonprofit organizations may rely primarily on donations and fundraising, while special districts and governmental services derive funding from property taxes (Donahue 2004; Duncombe 1992). High levels of poverty among rural populations reduce the number of households paying for emergency services, and pose a free-rider problem (Ahlbrandt 1973; Ott and Hasanen 1995). Thus economic decisions are socially embedded within this network of organizations.

These rural community demographics not only reveal individual and household vulnerabilities, but collectively demonstrate the community vulnerabilities and challenges for meeting community needs in disaster. The vulnerabilities to disaster are compounded by remoteness and separation (Gamache et al., 2007), which limit interactions with organizations outside of central locations. Despite these characteristics of vulnerability,

rural communities are often characterized as self-reliant and rich in social capital (Flora and Flora, 2008).

Community vulnerability also can be measured in terms of potential threats or hazards and the capability of the community to mitigate, prepare, respond, and recover from disaster events caused or complicated by those threats or hazards (Cutter 2006; Davis 2004). For example, communities located next to nuclear power plants are considered to be vulnerable to a potential nuclear accident and Atlantic and Gulf coast communities are vulnerable to the impact of hurricanes.

The emergency planning process begins with a hazard and vulnerability analysis of the jurisdiction engaging in the planning. The State of Missouri hazard analysis characterizes hazards as either natural hazards or man-made hazards, which includes technological hazards like hazardous materials and mass transportation accidents (Missouri State Emergency Management Agency 2011). Missouri ranks in the top third among all states in the number of serious hazardous materials incidents. Serious incidents are those that result in fatalities, evacuations, fires, highway closure, or other serious consequences from the release of hazardous materials to the air, water, or land. Most of these events occur on highways, with an average of 14,828 incidents in the U.S. per year of the last ten years (U.S. Department of Transportation 2009). Technological hazards, including the ethanol fuel production and the production and storage of ammonia-based fertilizers, are not the leading causes of disaster in rural counties, but may contribute to the number of emergencies.

Natural hazards pose a variety of threats: riverine flooding, dam failure, levee failure, earthquake, land subsidence and sinkholes, severe thunderstorms, tornadoes,

severe winter weather, drought, extreme temperatures, and wildfire (Missouri State Emergency Management Agency 2011). The greatest challenge facing rural communities is building resilience to emergencies and disasters through the efficient management of the emergency management common pool resources (Ahlbrandt 1973; Brueckner 1981; Ostrom 1990).

The emergency management network is essentially a collective of organizations that provide services to the public before, during, or after emergencies and disasters. Disasters are events that require resources outside of the local community (Auf der Heide 1989). Smaller communities may constitute and support the minimum organizational set to provide a response to common emergency incidents. Less frequent threats or more complex events activate systems of mutual aid (Warheit 1970) with neighboring communities. Urban communities support a more complex organizational set with many of the essential service areas provided as an extension of local government. Cities have populations thousands of times larger but with geographic areas that may be as large as a rural county. Most rural county emergency management networks consist of some organizations that are city departments from several small city/towns and others that are organized as not-for-profits, private businesses, and extensions of county governments.

In large cities the primary local elected official often has direct authority over most of the local organizations. In a rural county of an equal geographic area, few organizations are under the authority of a single, locally elected official. Organizations may be under the leadership of a chief officer, chosen by the membership or by a locally elected board independent of county or city government.

Rural and urban emergency management organizational networks are not equivalent. Urban emergency management networks are hierarchical with formal organizational relations. In rural counties, the emergency management network is a flatter, multi-organizational environment of independent and interdependent, less complex organizations. Many members of emergency services agencies in rural communities are members of more than one organization in the network. These multi-organizational members are boundary spanners providing an informal pathway for information and resource exchange. Rural organizations composed of volunteer and part-time members welcome additional members and place few barriers to membership. Organizations with full-time employees may place restrictions on these full-time employees to reduce the incidence of multi-organizational membership. Members of rural emergency services organizations have multiple ties to members of other organizations, including family relationships and friendship, presenting other boundary spanning opportunities. Informal organizational relationships in rural counties span boundaries to maintain communication, coordination, cooperation, and collaboration.

FOUR C'S OF EMERGENCY MANAGEMENT

Understanding the complex inter-organizational relationships within the rural emergency management network of organizations necessitates examining the underlying elements, or antecedents, to form and maintain basic interactions, to organize and facilitate interactions, and to enhance the effectiveness of the interactions. In a report prepared for FEMA, Wenger et al. (1989) examined the responses of police and fire departments to eight disasters and offered recommendations to enhance coordination, improve the flow of information, and expand collaboration to include volunteers and

emergent groups. Researchers continue to note that inter-organizational relations before, during, and after an incident are essential and the flow of information is crucial (Drabek 2010). Communication, coordination, cooperation, and collaboration are four elements that are repeated in the disaster research literature (Auf der Heide 1989; Drabek 1987a; Drabek and Hoetmer 1991) and seldom defined.

This study will examine inter-organizational relations within the rural emergency management network in one rural Missouri county as evidence of these four elements. Each of the organizational relational elements (communication, coordination, cooperation, and collaboration) is created when the essential set of pre-conditions, or antecedents, are present. The purpose of this research is to examine the theoretical frameworks of networks, organizations, and community for the antecedents contributing to the interactions of communication, coordination, cooperation, and collaboration. A description of each relational element is provided.

Communication is the most basic form of interaction between two organizations. This activity requires at least two parties to participate for communication to occur. Sending and receiving information across numerous channels, organizations rely upon a communication network to relay requests for support or resources. Communication may be one-way or two-way. It might be a warning to large groups or a discrete message to one specific receiver. Communication that is direct has fewer ambiguities, but communication may also have many intermediaries and a great potential for message distortion or interruption. Without communication there are no inter-organizational relations.

Coordination is necessary for two or more actors to interact and produce some outcome. Communication is essential, but other antecedents are also needed to have coordination. Institutions and norms are essential to provide order and pattern the interactions consistently. Coordination is the foundation of organized activity. Coordination enables predictable and reliable inter-organizational relations.

Cooperation results from communication and coordination, but also requires a willingness among actors to engage in the interaction. Social capital plays a significant role and is an antecedent, but also a product of each type of interaction. Existing social relations among members of organizations facilitates cooperation because the actors involved in inter-organizational relations are not strangers, and “the risk is minimal” (O’Leary et al. 2009). Cooperation is based on trust and reduces transaction costs since both parties are more willing to work together for mutual benefit. Collective action requires cooperation.

Collaboration is the most complex type of inter-organizational relation and requires communication, coordination, and cooperation. According to O’Leary et al. (2009:8), “the internal and external conditions that may affect the formation of collaborative relationships are not yet entirely understood”. Although these four terms are often used in disaster literature, they are rarely defined. Often they are used interchangeably without consideration to the antecedents essential to produce each level of inter-organizational activity. This study attempts to provide a theoretical foundation to explain how these antecedents affect the formation of increasingly complex forms of inter-organizational relations. Along this progression of more complex inter-

organizational activity, the antecedents are also associated with social capital and hence social capital is produced at each level making it an antecedent to the next level.

THEORETICAL APPROACHES TO IDENTIFYING ANTECEDENTS

Model of antecedents to the four C's.

Three theoretical constructs; Network Theory, Organizational Theory, and Community Field Theory contribute to a better understanding of the inter-organizational relations of the rural emergency management network. These theoretical approaches provide explanations regarding the essential ingredients to achieve communication, coordination, cooperation, and collaboration among a set of organizations. Each of these types of inter-organizational relationships is necessary to advance to the next level, so each is an antecedent to the next. Each of the theories examined in this study also identify other antecedents to advancing inter-organizational relations to more complex relations.

Figure 3. Theoretical Model for the Antecedents to Inter-Organizational Relations of the Rural Emergency Management Network.

The model (See Figure 3) identifies some of the antecedents to communication, coordination, cooperation, and collaboration using the terminology adopted in each theoretical realm. Social capital is generated through each of the inter-organizational activities and facilitates the next level of activity resulting in increased social capital. The social capital accrues at the network, organizational, and community level of interaction.

Communication

Inter-organizational communication has been a subject of disaster researchers (Auf der Heide 1989; Wenger et al. 1989) who have identified the flow of information critical to good decision making before, during, and after an incident. Technological issues are often reported because of physical vulnerabilities in the telecommunication infrastructure. Power outages, such as transmission tower collapses, are a consequence of many natural hazards that impact emergency services as well as the community. The ability of separate organizations to communicate with each other during emergencies and disasters is still the top priority for emergency management (Boin, Comfort, and Demchak 2010).

Coordination

Emergency management is the central organizing unit for community preparedness and recovery from a disaster, but it is a misleading title since it is well accepted that disasters and emergencies are “qualitatively and quantitatively different” (Wenger et al. 1989:175; Quarantelli 2006). One key difference between emergencies and disasters is that during an emergency the response agencies will be known and familiar, but during a disaster there will be other response organizations that are not

familiar to local agencies, and the organizations may have never worked with each other before (Auf der Heide 1989). This presents a challenge for coordination.

When a disaster happens, it produces “a sudden, large, unfavorable change in the inputs of a social system” (Barton 1962:222). The social system is negatively impacted “at the community level, because organizations are not adequately coordinated with one another” (Barton 1962:223). Waugh (1994:256) confirms that “the resources and expertise needed to develop, implement, operate, and maintain an effective emergency management system demand intergovernmental cooperation.” Decades of research have identified weaknesses in coordination among responding organizations, and after the attacks on the United States on September 11, 2001, *Homeland Security Presidential Directive 5 Management of Domestic Incident* prompted the release of the National Incident Management System (NIMS) in 2004. As stated in the FEMA 2008 guidance document (U.S. Department of Homeland Security 2008):

The long-term goal of NIMS is to provide a consistent framework for all aspects of emergency management and incident response. This framework should be sustainable, flexible, and scalable to meet changing incident needs and allow for integration of other resources from various partners through mutual aid agreements and/or assistance agreements.

Essentially, the National Incident Management System institutionalized a process of coordination in all phases of emergency management. Implementation of NIMS for local governments began in 2006 and is an ongoing activity.

The National Incident Management System (NIMS) mandate also included incentives to adoption and implementation, typing eligibility for some grant programs to demonstrated adoption of NIMS at the local and organizational level. Rural organizations

have not accept the NIMS model in its entirety and research revealed that implementation was uneven (Jensen 2009).

Cooperation

Prince ([1920] 1968) was the first to publish a study describing the response of communities to disaster, specifically an explosion in the harbor of Halifax, Nova Scotia, Canada. A hallmark of his study was documenting the outpouring of support and assistance from outside of the community and country. The willingness of strangers to send help displayed a remarkable level of cooperation across distance to make a difference during a disaster. Auf der Heide (1989:77) asserts that the preference for local control and decentralized government in the United States necessitates of model of coordination “based on negotiation and cooperation.” The institutions that establish and support a system of coordination can only be sustained over time and distance by cooperation.

Collaboration

Effectiveness and efficiencies in public management are reportedly a benefit of collaboration (O’Leary et al. 2009). Collaboration is achieved when organizations share common goals, and adopt formal rules and informal norms which “reduce the uncertainty of human interactions and help solve the problem of coordination” essential to effective network performance (Nee and Ingram 2001:21). Communication, coordination, and cooperation are necessary antecedents to collaboration. “Collaborative” is item five of the eight principles of emergency management (International Association of Emergency Managers 2007) and is described as a multi-organizational activity. The full impact of

collaborative emergency management network is associated with enhancing community resilience (Kapucu, Hawkins, and Rivera 2013).

SOCIAL CAPITAL

Social capital is a community asset that can potentially offset vulnerability and thus could contribute to community resiliency (Dynes 2006; Perkins and Benoit 2004). Institutions, the norms and rules that reduce the uncertainty of network actors (Brinton and Nee 1998), are the foundation of the social capital inherent in the emergency management system. Local emergency management needs to include a great deal more “bridging social capital” (Woolcock and Narayan 2000) than is typically the case with more routine emergency response planning insofar as the core challenge is to coordinate disparate organizations with different missions, different personnel, and different cultures. The Principles of Emergency Management (International Association of Emergency Managers 2007) incorporate concepts that are closely aligned with social capital (integrated and progressive), and emphasize trust and relationships.

Social capital is increased through the inter-organizational relations of communication, coordination, cooperation, and collaboration. A multi-organizational network builds social capital. Members of organizations in the emergency management network are connected to other organizations in the network in numerous ways, but most significantly as multi-organizational members. These complex connections between organizations in rural communities, with formal ties between leaders and informal ties of kinship and friendship of members, contribute to the organizational social capital often associated with rural resilience (Brooks 2006; Flora and Flora 2008).

CHAPTER 3

NETWORKS

Exploring the interconnectedness of all living things, and the patterns of the connections, led to the concept of networks, in multiple disciplines. Social scientists, particularly those studying community such as anthropologists, sociologists, and social psychologists, researched interpersonal relations to study ego-networks (Scott 2000). The once dominant social theories of functional structuralism influenced concepts of networks as systems; systems of social relations.

The system theory approach to networks brought a mathematical aspect and embraced “social network analysis as a method of structural analysis” (Scott 2000:33). Alternative theoretical approaches, especially social field theory, posits “a field of forces acting on group members and shaping their actions and experiences” (Scott 2000:11), but according to Scott (2000:12), social field theory, “as a theoretical framework for social analysis, proved an intellectual dead end.” Other theories of network that were not compatible with graph theory mathematical analysis were abandoned by most scholars in pursuit of quantifiable data, illustrating an “excessive focus on structure too often blinds us to process” (Haas and Drabek 1973:viii).

Social network analysis is similar to an x-ray; it reveals the bones of the network, but not the meat. Norms, institutions, motivation, culture, and other environmental influences on multi-organizational relations are considered the backdrop in the background of the nodes and ties of social network analysis. Thus social network analysis, by itself, is inadequate to explain group behavior. Collective behavior and

collective action, and the antecedents to them, are essentially in the background of social network analysis, and not analyzable by those methods. The social field cannot be measured, but it can still be studied. Network theory is a starting place to demonstrate that rural emergency management is a network.

A network theory of organizations is needed; both resource dependence (Pfeffer and Salancik ([1978] 2003) and institutional theories (Powell and DiMaggio 1991) contribute to a deeper understanding of why and how organizations make decisions and rules to deal with their environments. The organizational set can also be studied to better understand exchange, conflict, competition, and inter-organizational relations. In this study, the unit of analysis is the network of organizations itself, not the individual organizations in it. A deeper understanding of each organization and the inter-organizational relations between them provides a better picture of the network (Perrow 1986).

The study of networks spans all disciplines and each discipline has created terminology and concepts to describe the structure and functions of networks applicable to research in each field. Networks are relational (Scott 2000) and show the connections between two or more people or organizations. Most often researched from the perspective of the individual person and their contacts to other people (Fischer et al. 1977), these ego networks are multidimensional. Individuals are connected in many ways to other people, forming layers of connections; each one is a dimension of the relation. The relational connections among organizations, as collectives of individuals, are also a network. In this study the definition adopted by Kapucu (2005:35) is preferred: “the term network is used to describe multiple-organizational relations involving multiple nodes of interactions.”

Alter and Hage (1993:46) assert that “networks constitute the basic social form that permits interorganizational interactions of exchange, concerted action, and joint production. Networks are unbounded or bounded clusters of organizations that by definition are nonhierarchical collectives of legally separate units.” Networks are plural, layered, relations of organizational interactions and exchanges that take place in dyads and triads multitudinously. A network refers to the ties and relations among the nodes (individuals or organizations), multitudes of which are related in multiple dimensions in an interactional field known as a network. Networks are “organizations of organizations” (Van de Ven 1980:296) and have been studied from the sociological perspective (Gillespie and Mileti 1979; Gillespie and Murty 1994; Gillespie and Streeter 1987; Streeter and Gillespie 1992) as inter-organizational relations.

Network studies have been published in sociology (Laumann and Pappi 1976), management, organizational studies, public administration (Choi and Brower 2006) and public management that contribute to the foundation of this study. Public management research has focused on effective delivery of services (Provan and Milward 2001), “and often are presumed to solve an economic problem (either transaction costs or a collective-action problem)” (Berry et al. 2004:548). Organizational and public administration studies (Donaldson 2001; Milward and Provan 1998) emphasize structure and function whereas “sociologists tend to emphasize how socialization and social context provide norms, ideas, and structures that both facilitate and constrain the range of behaviors that individuals exhibit” (Berry et al. 2004:543).

The types of network research are also varied depending on the theoretical viewpoint of the research. The networks of individuals, termed ego networks, are

common in public health, psychology, marketing, management, and even homeland security. Who you know and who knows you, reveals your personal network and have been studied to better understand the flow of information, influence, and anything else that can be shared, including infectious disease. Ego networks are studied to learn about power, conflict, transactions, and benefits that derive from the network and affect the network. It is very common for ego networks to be studied for cause and effect. At the organizational level, network studies examine the same causes and effects on the collective. A third type of network research studies the connections among collectives, essentially a network of networks. It is at this level that the emergency management network exists as organizations connected directly or indirectly to each other.

NETWORKS IN DISASTER

Lindell et al. (1996:239) found that effective disaster planning networks link “vertically to state and federal emergency agencies, horizontally to peers in other jurisdictions, and outwardly to citizens’ groups.” Streeter and Gillespie (1992) applied network analysis to study the connections among social service agencies and emergency management agencies. In another study, Gillespie and Murty (1994) examined how the networks of organizations delivering disaster services revealed that the inter-organizational connections are essential to effective community response to disaster. Tierney et al. (2001) suggested that network analysis could reveal interesting information about emergency response networks. The federal government’s National Response Plan (NRP) and the National Response Framework (NRF) have also been analyzed as networks, and unsurprisingly, are revealed to be highly complex networks and not the flexible and adaptive networks that would exhibit resiliency (Kapucu 2009).

Drabek (1983) sought to explore emergent multi-organizational networks (EMONs) and to discover ways to enhance the communication and coordination within the network. The application of network theory has dominated recent research that has continued to examine disaster events and the organizational activity in response to the social disruption generated during these incidents (Adler 2015; Drabek and McEntire 2002; Ersing and Kost 2012; Kapucu, Arslan, and Collins 2010). The recent study of large complex disaster events has focused on the multi-organizational emergency management network since “public management increasingly takes place in settings of networked actors who necessarily rely on each other” (Kapucu 2005:33). The necessity of inter-organizational coordination before, during, and after disasters is increasingly the focus in the fields of public administration (Choi and Brower 2006; Choi and Kim 2007; Gillespie and Murty 1994; Kapucu 2005; Kapucu 2009) and social work (Ersing and Kost 2012).

ANTECEDENTS TO THE FOUR C’S

Network theory provides a framework to understand the essential elements of the inter-organizational relations of the rural emergency management network: communication, coordination, cooperation, and collaboration. Rural emergency management is an inter-organizational network composed of governmental agencies, nongovernmental organizations, voluntary associations, and not-for-profit organizations. This network is organized to provide essential public safety services. Emergency services, such as fire, law enforcement, and EMS, are interdependent with emergency communications and supported by public health and the local emergency management agency. In a rural county these services could be provided by ten, twenty, or more

individual organizations. From the network perspective, the connections or interactions between organizations are the focus of study.

Communication

A network is composed of nodes and ties. Nodes represent actors, most frequently individuals, but organizations can also be represented as nodes. Social network analysis literature (Borgatti et al. 2013; Prell 2012, Scott 2000) suggests that analytically, organizations can be treated as an actor and represented as a node. However, an organization is a collective, and a network of organizations is thus a collective of collectives and may exhibit different outcomes than posited for individual actors (Brass 2012).

In this study, eighteen local public agencies were identified, but one of the largest, the County Sheriff, refused to participate in the research study. The police agencies in the three smallest towns also did not respond to contacts and did not participate in the study. The research was limited to the fourteen responding organizations, and thus the complete network could not be studied. In social network analysis, it is acceptable to assume reciprocal ties if one actor in the network reports a tie to a non-participating actor, then it is assumed there is a tie. This does eliminate analysis about the direction of the tie. Social network analysis was performed with the UCINET software (Borgatti, Everett, and Freeman 2002) for several types of interaction.

In this study, fourteen organizations agreed to participate. Table 3 catalogs the number of respondents by organizational discipline. Two of these organizations are categorized as health, one public health and one emergency medical service, with a total of 16 members and four leaders responding. Five fire organizations participated with 113

members and eight leaders. Law enforcement includes four organizations with 26 members and seven leaders. The remaining three organizations in Table 3, listed as “Others” include Central Dispatch (COMM), Emergency Management, and the Local Emergency Planning Committee.

Table 3. Participating Organizations

Discipline	Number of Organizations	Leaders	Members	Total
Health	2	4	16	20
Fire	5	8	113	121
Law Enforcement	4	7	26	33
Others	3	5	20	25
All Respondents	14	24	175	199

At the most basic relational level of analysis, communication is the simplest phenomenon of interaction. In network language, the basic unit of analysis is called a “node.” Links between nodes are called “ties.” A dyad involves a tie between two nodes; a triad is a tie between three nodes. The “nodes” in this study are the individual organizations making up the emergency response network. The challenge in developing an effective network is to develop “ties” which enhance communication, and, in turn, improve the ability of the whole network to respond in a timely and effective manner to a disaster. Within an organization, “the direction of work and the information flows between organizational units and levels identifies the network or cluster of relationships within a complex organization. The amounts of work and information flows indicate the intensity of the intraorganizational network” (Van de Ven 1980:247). When the same interaction occurs as ties between nodes that represent separate organizations an inter-organizational network is formed.

One organization, Health, is not tied to any of the other organizations in the network. No other organization agreed that interaction with Health is a regular part of daily activities. The non-participating law enforcement agencies are only connected because the agency that dispatches 9-1-1 calls agreed that regular interaction occurred. Of course if the non-participating organizations had provided responses there would be additional ties between them and other organizations and might change the calculated centrality of the other organizations.

The theoretical explanation for how two or more nodes form a tie is explained by the concept of propinquity. This means that actors in close proximity with multiple opportunities are more likely to form a tie. Network theorists (Brass 2012) emphasize the importance of propinquity and many studies assume ties between actors that have been present at the same event or in the same location. Life in rural communities places people in the same location, engaging in similar activities simply because of the limited availability of places to accomplish routine personal business and engage in social activities. Limited choice of stores, restaurants, banks, schools, churches, and clubs enhances the opportunities for actors to be in the same place at the same time.

The longer an actor lives in the same community, the more likely that propinquity increases. The participants in this study are identified as leaders of the organizations or members of the organization. Figure 5 displays the average length of time in years that the leader and members have been residents of the county; for the study participants overall, and is subdivided by discipline. Leaders of these organizations have lived in the county most of their lives and the members of the same organizations have, on average, lived there for a shorter time.

Figure 5. Length of Residency in the Study County for Leaders and Members of the Discipline

Coordination

Coordination is the patterned interaction among actors. Proximity may explain how ties form and interactions occur, but a sociological explanation is needed to understand why there are inter-organizational ties and the pattern of interaction. Two principles, homophily and transitivity, are fundamental to network theory.

Homophily.

Homophily “structures network ties of every type” (McPherson, Smith-Lovin, and Cook 2001:415). The principle of homophily has been demonstrated in network studies to strengthen ties between individual actors that are similar in age, gender, race and many

other attributes. People prefer the company of others like them and this extends to organizational associations.

When a network is composed of ties between more than two actors, it is a triad or a tie linking two or more dyads. The tie is the pathway. Information and resources can flow along the pathway connecting any actor to another through one or more ties. Ties are formed for various reasons, most commonly to communicate or to obtain resources. Homophily, “a preference for interaction with similar others,” (Brass 2012:12) filters and selects preferred ties and reduces the barriers to the flow of information and resources.

Organizations also experience homophily and tend to attract members who are similar to existing members. Particularly in volunteer organizations, new members may be attracted to join because of relationships with other members. This perpetuation of homogeneity among the membership has been called “homosocial reproduction” (Kanter ([1977] 1993:48). Because personal networks are subject to the principle of homophily, they tend to be homogenous and these personal networks also influence the homogeneity of the organizations composed of these members (Brass 2012). Connections between members provide pathways for information flow between organizations. This informal route will be explored in more detail in Chapter 4 Organizations, so the leader’s perception of importance of information from other organizations in the network does not capture all the information flow that may be occurring. Survey data from the leaders does enable a visual representation of the official flow of information that impacts organizational operations. This is one mode data and the five point Likert scale was dichotomized to convert agree and strongly agree to 1 and neutral or disagree to 0. The node size corresponds to the degree of centrality of the organization to the network.

Figure 6. Network Visualization of the Flow of Information between Organizations.

Organizations that have limited ties to other organizations in the network are called isolates. Gillespie and Murty (1994:640) identify “cracks in interorganizational service network.” resulting from organizations that are isolates in the network.

Organizations that do not participate in planning and preparedness activities that would integrate them in the network can “result in poor coordination and service delivery” (Gillespie and Murty 1994:640).

Transitivity.

The principle of transitivity describes the resources of one actor (node) that are shared through ties to other actors. In a network, actors are connected to other actors through pathways of ties. An actor connected indirectly can benefit by these connections. Many non-academic concepts of networking are based on the principle of transitivity. A connection to a popular actor can provide a connection to many others. The degrees of separation that connect someone to unknown others also conveys social attributes or influence, power, and social capital. The network concept that describes the absence of transitivity is an isolate; a node that is only connected to one other node, or none at all.

In the local emergency management network in this study, centrality in the network is represented by the size of the node, and also corresponds to transitivity as information would flow through to other organizations. The principle of transitivity provides some order and structure to the exchange of resources. Homophily confirms that members of organizations will be similar and that similar organizations will be closer. Transitivity assures that the reduced transaction costs from homogenous relations will extend to others connected to the same actors; friends of your friends are also your friends. These two network principles contribute to coordination by ordering and prioritizing the interactions and resource flow.

Cooperation

Disaster events, by definition, exceed the capacity of individual organizations in the emergency management network to respond alone (Auf der Heide 1989, Quarantelli 1998). Cooperation is needed to share resources and draws on the capacity of the network. It has been suggested (Berry et al. 2004), but rarely studied, that there are

antecedents to network formation. Coordination is an antecedent to cooperation and so are homophily and transitivity which also foster cooperation. Although institutions like the National Incident Management System (NIMS) can be imposed formally to structure coordination, other elements are antecedents for cooperation; “it is not the formal requirements that keeps a network together, but rather the ability to build mutual goodwill and commitment among the participants” (Mandell and Keast 2008:721). Network theory offers two principles that contribute to the building of cooperation; multiplicity (or multiplexity or multistranded) and reciprocity.

Multiplicity.

The principle of transitivity offers an explanation of how resources, and even social processes like influence and power, can flow along ties to nodes along a linear pathway. Connections are layered. Actors have layers of connections; kin, friends, coworkers, acquaintances, and others. A node exists in a 3-dimensional environment with ties in multiple directions on multiple dimensions. This is the principle of multiplicity. There are no simple triad connections since each actor in a triad is also connected to many other nodes on multiple dimensions. Therefore there is a multiplicity of pathways connecting two actors in a complex organizational network.

Reciprocity.

There is a social force that contributes goodwill and fosters cooperation; the principle of reciprocity. Reciprocity is a benefit of connectedness in network theory. At the organizational level of analysis, resources and assistance are expected and provided back and forth between organizations. Different types of ties can generate reciprocity, even weak ties (Granovetter 1973). Bridging ties outside of the network can result in

reciprocity at the regional and national level. One benefit of networking is to create weak ties through professional affiliations in expectation of reciprocity when the actor is seeking resources.

Communication and coordination are antecedents to reciprocity. Demonstrated reliability through coordinated action generates trust, and reciprocity is based on trust (Ostrom and Walker 2003). Organizations and actors reciprocate when they trust the other actor or organization to do likewise. The action of reciprocity also builds trust that engenders cooperation within and even outside the network.

Collaboration

A good working definition is offered by Radin et al. (1996:151): “Collaboration is a method of solving inter-organizational problems that cannot successfully be solved by single organizations, and a network is the organizational arrangement for doing so”. Essentially collaboration is a network activity. Network theory contributes the concept of a network of networks (source) to describe the multi-organizational network that is connected to other multi-organizational network. Other key concepts of network theory that could contribute to an understanding of multi-organizational collaboration are emergence and cognition.

Network of Networks.

A network embedded in other networks is a network of networks. This concept fits well into a systems viewpoint. Of course if multiplicity is an antecedent to cooperation, and cooperation is also an antecedent to collaboration, then a network of networks is layered such that networks are connected to other networks in a multitude of

ways. Every organization is included in a variety of networks, connected in a variety of ways.

Emergence.

Collaboration is not a static network of connections. It is dynamic and arises when needed. Collaboration emerges within a network of networks as a product of communication, coordination, and cooperation. Drabek (1983) studied organizational responses to disaster and coined the term Emergent Multi-organizational Networks (EMONs). The value of collaboration in emergency management is one of the Principles of Emergency Management (International Association of Emergency Managers 2007). In general, however, public managers are less convinced that collaboration occurs because these collaborative experiences are often transient (O’Leary et al. 2009). The emergent nature of collaboration is present as a social field; generated by trust, shared goals, norms, culture, and institutions, rather than existing as a structured system.

Cognition.

Of all the theoretical contributions offered by network research, the most profound for local emergency management network is cognition. An actor’s knowledge of the network and the rules and norms that structure the network empowers those actors to operate more effectively (Choi and Kim 2007). Managing collaborative networks requires that managers “must be cognizant of the types of collaborative structures” (O’Leary et al. 2009:11). Understanding basic network concepts and the importance of propinquity and the influence of homophily can provide leaders of local agencies insight into the significance of inter-organizational activities. Having the tools to develop more durable inter-organizational relations can build capacity.

SOCIAL CAPITAL

Network theorists have sought to measure and quantify social capital by measuring the strength and density of ties, assuming that these are antecedents for social capital. While social network analysis can describe structural properties of networks that are likely to generate trust, it also is necessary to identify network members' subjective perceptions of actual trust levels. Bonding and bridging social capital provide different benefits to organizations. Homophily and propinquity are antecedents to bonding social capital as they both intensify the frequency and durability of the relationships.

In network theory, the connections between actors and their position in the network provides benefits, including social capital, to the actor. These benefits accumulate to the collective and form the basis of organizational social capital. The individual actor may accrue some social capital through affiliation with an organization that is central to the network.

CHAPTER 4

ORGANIZATIONS

Rural emergency management can be considered a system of organizations that communicate, coordinate, cooperate, and collaborate for the public good. Organizations are created and emerge to meet a need, accomplish a goal, or obtain an outcome: “We have organizations to do things that individuals cannot do by themselves” (Hall and Tolbert, 2005:4). Thus this network of organizations provides a solution to the collective action problem as best described by Olson (1965). These emerging or created organizations display a variety of forms, structures, and rules to meet the need of the task or goal appropriate to the environment in which they operate (Thompson [1967] 2003). This study seeks a “practical contextualization of inter-organizational relationships” composing rural emergency management (Benson 1982:139).

In this study the local organizations involved in emergency management form a network to provide a community public good that each individual organization cannot provide for itself (Waugh 2000). The community relies on these organizations to communicate and share information, but also expects that they will build relationships within this network for “cooperation, coordination, and collaboration” (Mandell and Keast 2008:718). To be effective they must provide for the public good by mitigating, preparing, responding, and recovering from everyday emergencies and the less frequent disasters. This network of interdependent organizations is a collective that provides a service and function entrusted by the community. This network is invisible to the citizenry, and it is unknown whether the members of the organizations in the network

understand the inter-organizational relations necessary to fulfill the function on a daily basis.

The pervasive and often invisible force in modern human existence is the organization. According to Perrow (1991:728), we are a “society of organizations” and everything we do is based on the presence and function of organizations. “All important social processes either have their origins in formal organizations or are mediated by them; the study of organizations must be at the core of all social science” (Perrow 1986:vii). Turk (1977:6) stated “from the interorganizational perspective, then, contemporary human life is organizational life.” Yet, our understanding of organizations and our roles within them is inadequate to address the emerging threats in local communities (Cross 2001).

Organizational effectiveness and performance are essential to accomplishing our individual and societal goals. The provision of public goods and successful collective action (Olson 1965) necessitates efficient organizational function and performance. Individual action is always embedded within the organization and is heavily influenced by the organization; in many cases the organization constrains individual choice and action. No goal can be envisioned, planned and executed without the involvement and support of organizations.

Although human created organizations have existed for centuries, particularly religious and governmental organizations, the complex organization (Etzioni 1961) is a cooperative system (Barnard [1938] 1961). The sociological study of organizations by Weber ([1924] 2003) characterized the efficient bureaucracy that has been the model for government and for-profit organizations. As organizations assumed more influence and

control over community life in the early 20th century (Perrow 2002), sociologists studied the impact on society and community (Selznick 1949) of these “social structures created by individuals to support the collaborative pursuit of specified goals” (Scott 2003a:11). A thorough definition is offered by Hall and Tolbert (2005:4-5):

An organization is a collectivity with a relatively identifiable boundary, a normative order (rules), ranks of authority (hierarchy), communications systems, and membership coordinating systems (procedures); this collectivity exists on a relatively continuous basis, in environments, and engages in activities that are usually related to a set of goals; the activities have outcomes for organizational members, for the organization itself, and for society.

Understanding these human creations and “its formal system of rules and objectives” (Selznick 1957:5) forms the basis of organizational sociology (Etzioni 1964). We are essentially trapped by organizations and need to better understand how organizations respond to the environment and to change. The defining characteristics of an organization that are key to this study are boundaries, membership, norms and institutions, environment, and goals.

BOUNDARIES

Formal organizations are closed systems that have clearly defined boundaries that delineate what belongs in the organization and who is a member. It is common to “define boundaries of an organization by focusing on its actors” (Scott 2003a:187), but the approach preferred by network analysts “is to establish the boundaries of a system by noting which actors are involved in social relations of a specified type” (Scott 2003a:187). These social relations span the actor-defined boundaries of organizations.

Actors are members of many organizations and may play many roles within those numerous organizations (Laumann and Pappi 1976). Actors change roles as they move through the organization and as they cross boundaries, most commonly when leaving

work at the end of the day and going home to be the parent of a family and again later in the evening when assuming a leadership role in a voluntary association meeting. Of course this is a simplified example since the actor is a member of multiple organizations at all times and does not surrender the role of parent when at work.

Open organizations may not define membership and roles may change depending on the current needs of the organization and the actor. This is particularly true of emerging or expanding organizations that appear during a disaster in response to societal needs (Dynes and Quarantelli 1970). The aspiration for *The Boundaryless Organization* (Ashkenas et al. 2002) is to empower and incentivize organizational members to develop boundary spanning skills. The ability to access and use information and corresponding resources across organizational boundaries to meet organizational goals is rewarded in a boundaryless organization. Permeable boundaries enhance communication, coordination, and cooperation, but are essential to collaboration. Nearly universal access to information and knowledge has promoted more “permeability and flexibility” (Ashkenas et al. 2002:xix) in organizational boundaries, both internal and external.

Thick or thin, the permeability of boundaries is an antecedent to communication, coordination, and collaboration. When communication is formal, boundaries are strictly maintained. Boundaries thin in specific circumstances and for specific purposes to achieve coordination, usually in response to interdependencies. Cooperation results when thin boundaries allow for resource exchange without formal agreements and structure (Halpert 1982). When boundaries fade, and the demand for boundary maintenance to retain power and authority diminish, the antecedents are present and collaboration is

allowed to emerge. Boundaries are maintained by institutions, “the constraints humans impose on themselves” (North 1990:5).

Beyond defining boundaries by actors and role-sets, Pfeffer and Salancik ([1978] 2003) suggest that the focus should be on the interactions or activities of the organization. An organizational-field approach considers social interactions and activities, and “emphasizes behavioral criteria for defining the limits of organizations” (Scott 2003a:188). Evan ([1966] 1971:177) acknowledges that in the organizational field, actors fulfill many roles and should describe them as a set; “systematic inquiry into the role-sets of boundary personnel will shed light on inter-organizational relations as it bears on organizational decisions.” This expanded range of organizational activity accepts that boundaries are dynamic, permeable, and shared. These boundaries are the location of inter-organizational relations where knowledge and information flow. The optimum environment for interaction and the flow of information and resources in an organizational network occurs when boundaries are more permeable, which occurs when members function as boundary spanners.

Boundary Spanners

Members with ties to members of other organizations generally can fulfill a boundary-spanning role during disaster and contribute to cooperation (Dynes and Quarantelli 1970; Gillespie and Perry 1975). Boundary spanner roles may be formal when members serve as organizational representatives or liaisons in multi-organizational associations. Leaders are expected to have existing relations and contact with the leaders of other organization, but during disasters, unofficial ties among members at lower levels

of the organization may provide access to key information and resources (Dynes and Quarantelli 1970).

Spanning the boundaries of organizations during disaster is necessary to mend the community fragmentation that occurs (Thompson and Hawkes 1962). Boundary spanning is important from a resource dependence perspective since they provide access to critical resources and may perform gatekeeper functions. Informal ties, including friendship and familial ties, provide a path for information flow during disasters, although these linkages are not often considered as boundary spanning since they connect persons, not positions (Dynes and Quarantelli 1970). These formal and informal ties are the foundation of social network analysis.

Hall and Tolbert (2005) specify that the first step in inter-organizational relations is an awareness of the inter-dependence among the field of organizations and an understanding of their activities. This awareness goes deeper when “boundary spanners in organizations are knowledgeable about the goals, services, and resources present in other organizations” (Hall and Tolbert 2005:195). The informal connections between organizations in the form of interpersonal ties, in other words kinship, friendship and common membership between members of the organization, greatly increase inter-organizational interactions. People who are members of more than one organization also informally span boundaries by sharing information, culture, and institutional norms across organizations. The normative reference group (Evan [1972] 1976) for boundary spanners that are multi-organizational members may influence institutional change as they bring expectations about organizational roles, norms, and culture from one organization to other organizations in the network with co-membership.

MEMBERSHIP

Each organization in this study is comprised of members. In some organizations the members are full-time employees and members because of the employment relationship. Members of organizations in the emergency management network must meet qualifications for entry into the organization; these qualifications often include a minimum educational attainment, a preference for experience, and completion of training. Other organizations have a voluntary membership. Volunteers also must meet qualifications for membership in the organization. Each organization fulfills a unique role in the county or subdivision of the county it serves. Since they are all public entities, their roles are defined by legislation, ordinance, or charter. The membership process experienced by individuals who join each organization is imbued with institutional rules, values, and culture that clarify the role they are tasked to play. This role assignment is reinforced by titles, uniforms, signage on buildings, and markings on vehicles that emphasize the organizational identity and function.

Volunteers or members who are not “exchanging work for pay” have a different power relationship with the organization and may expect more open access to information and a voice in organizational activities (Ashkenas et al. 2002:xxvii). Volunteers may approach their role as civic service with a long-term commitment to public service, rather than a short-term activity as many volunteer activities are considered (Perry and Thomson 2004). An understanding of roles as “the complexes of organized participation of individuals or categories of individuals in the functioning of collectivities” (Parsons [1960] 1967:171), conveys that organizations have roles in social systems. The potential for conflict exists for the actor and for the organization, and

formal organizations set rules and provide incentives to institutionalize organizational roles (Thompson and Hawkes 1962).

NORMS AND INSTITUTIONS

Institutions provide the rules and norms that facilitate awareness of individual roles within the organization (Dynes and Quarantelli 1986). For the larger society, institutions “reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction” (North 1990:6). Organizations can be very formal with rigid social structures that are hierarchal with centralized power, or they can be informal democratic associations with limited central power or rules that constrain decision making. The complexity and size of the organization may generate a formalized bureaucracy to enable efficient operation (Hall and Tolbert 2005). In this complex field of multiple organizations, individual actors have incomplete information and institutions are essential to reduce transaction costs and solve collective action problems (Nee 2001). Other environmental factors like tradition, culture, and technology also influence structure and form (Thompson [1967] 2003). Institutional arrangements are “adaptive solutions” to the environmental influences that produce “imperfect or asymmetric information” and collective action problems that create “opportunism” that requires “costly monitoring” (Powell and DiMaggio 1991:9).

Meyer and Rowan (1991) assert that institutionalization is linked to concepts of rational decision making that has assumed mythical status. Professions, programs, and technologies all contribute to the institutions that bind organizations to particular structures in an effort to appear “appropriate, rational, and modern” (Meyer and Rowan 1991:45). Complex organizations are a product of these “rationalized institutional

structures in society” (Meyer and Rowan 1991:45). Organizations that operate within the same disciplinary area and similar technologies will share structural and institutional properties. Law enforcement agencies share common rules and norms of membership that are distinct from fire agencies.

Powell and DiMaggio (1991) suggest that the organizational field leads to institutional isomorphism; organizations mimic the structure of other influential organizations in their domain or field. Leaders are often members of professional associations at the state and national level where norms of organizational structure and the cultural institutions of law enforcement, fire protection, public health, emergency management, emergency medical services, and public safety communication are reinforced. Table 4 reports the percentage of leaders and members that are also members of state and national professional associations. Policy and procedures are modeled in training of new organizational members which “all institutions simultaneously empower and control” (Meyer and Rowan 1991:146).

ENVIRONMENT

The degree to which organizations are impacted by, and are a response to, the environment (especially other organizations) is the basis for organizational theory. Early theorists (Parsons [1960] 1967; Weber [1924] 2003) viewed organizations as rational systems “consciously shaped and molded to accomplish given ends” (Scott 2003b:xvii). Organizations are structured with rules and hierarchy appropriate to achieving their outcomes. Examination of social change, new technology, and culture revealed adaptations and variations of organizational form in response to these external influences (Thompson [1967] 2003).

Natural systems analysts view adaptation as the primary influence that shapes organizational form and function. A third construct, open systems, posited that “organizations are indeed open systems, and differences in their structure mirror differences in the environments to which they are attempting to adapt” (Scott 2003b:xvii). Thompson ([1967] 2003) sought to explain how all of these explanations were true at some level for all organizations and developed propositions to test the response of organizations to environmental influences.

Organizations are influenced by a variety of environments, some technical and others institutional. Scott (1991) argues for a differentiated model of environmental impact on organizations that would view technical and institutional organizational environments as a continuum rather than a dichotomy. Certainly both types of environments influence organizations at the same time, but not in concert.

GOALS

Although organizations primarily exist to meet collective goals, the goals of the network of organizations may not always coincide with those of the individual organizations. Yet, in environments of stress and uncertainty, the network provides member organizations another resource for acquisition of information, manpower, and assets. Cooperation and coordination are manifest through mutual interest, interaction, and desire for goal attainment. Members of the organizations must work to resolve conflict and maintain support for the network (Mandell and Keast 2008). The establishment of common goals is important to building trust, which is necessary for cooperation (Ring and Van de Ven 1994). Organizations in “networks do not operate in isolation . . . the members in networks interact with other organizations outside of the

network in order to meet their individual and collective goals” (Mandell and Keast 2008:720). Most organizational research analyzes individual organizations and often the actors within them to understand the outcomes on the members and society.

Organizational theory has developed to explain internal organizational activities and intra-organizational relations. Institutions, norms, and culture within the organization have been examined to understand roles and power that shape and influence effectiveness and efficiency. Knowledge of these organizational attributes allow leaders to manage change within the organization. The network, which is an organization of organizations, is an inter-organizational field of relations occurring on multiple dimensions. Applying organizational theory to understand this complexity begins with the organizational environment.

ORGANIZATIONAL THEORY

Contingency theory became the predominant rationalist organizational theory that supports the adaptive nature of organizations to respond to environmental and social change as open systems. Thompson ([1967] 2003:68) argued that it was rational for organizations with different functions and opportunities to respond to environmental changes in different ways:

What we need are ways of differentiating among the kinds of social environments faced by complex organizations – the individual members, aggregates of individuals, and organizations which constitute task environments.

The rationale of contingency theory “explains organizational change as a functionalist process of adaptation” (Donaldson 2001:161), with the principle goal of improving performance. Contingency theory views the organization itself as “closed off from the outside world” (Handel 2003:227) and has been challenged by theories that seek to

explain the internal workings and external interactions of organizations as open social systems. Powell and DiMaggio (1991) assert that contingency theory fails to recognize the influence of social institutions in shaping how organizations function. Although Thompson ([1967] 2003) considered contingency theory applicable to all types of organizations, contingency theorists have focused on economic performance of organizations and not on public sector organizations (Donaldson 2001). Hence, contingency theory has not been favored by organizational researchers in public administration.

The two additional open systems theories that have application to this research are institutional theory and resource dependence theory. Institutional theory “emphasizes ritual more than rationality” (Donaldson 2001:162) and is more applicable to open, informal, voluntary organizations who maintain motivation and service through incentives and culture of service. Institutions are composed of three elements: regulative, normative, and cultural-cognitive systems (Scott 2014). External pressure for organizational conformity occurs by three corollary processes: coercive, normative, and mimetic (Handel 2003; Powell and DiMaggio 1991), often in combination producing isomorphism. Performance is not the driving force, and in public organizations expectation of performance may vary depending on the constituency (Handel 2003).

Resource dependence theory is compatible with institutional theory, but considers three specific themes; interdependence, constraint, and power. Pfeffer and Salancik ([1978] 2003:xiii) argue that “some organizations had more power than others because of the particularities of their interdependence and their location in social space.” This theory views organizations as embedded in a network of social relationships, and considers the

strategies and adaptations organizations pursue to obtain needed resources. The most extreme need for resources occurs in disasters and the emergence of the coordinated “synthetic organization . . . is in a situation of interdependence and in the face of uncertainty as to where and how the interdependence exists” (Thompson ([1967] 2003:53). DiMaggio and Powell (1983) consider the organizational field to encompass these interdependent organizations and those they interact with in the same functional area. Baum and Rowley (2002:11) conclude that “in contemporary research, the perspectives are less frequently used alone than they are in combination.” The local emergency management network can readily be examined as an inter-organizational field involved in resource acquisition and the flow of information.

ORGANIZATIONS AND DISASTER

The relationship between organizations and disaster is multilevel and complex. According to Hall and Tolbert (2005:14), “organizations can cause accidents and be victims of accidents,” and these accidents can be disastrous. Organizations play many roles in disaster. During crisis and emergencies, individual organizations are challenged to provide services, and in the case of public safety organizations, to protect the public. The uncertain and changing environment of disasters is a unique context for inter-organizational analysis (Benson 1982). Changes in the organizational environment trigger structural and institutional change in response to the changing demands of the disaster impact. Complex emergencies and disasters require organizations to work together, to communicate, coordinate, cooperate, and collaborate to prepare for, respond to, and recover from an event.

In all phases of emergency management, local organizations are engaged horizontally with other local organizations to address the public safety needs of the local community. For many threats, state and federal agencies have resources and expertise to offer, which are accessible through vertical ties outside of the local community. These bonding and bridging ties provide access to additional resources through mutual aid arrangements with organizations with similar role sets. Mutual aid is the flow of resources through bridging connections across organizational boundaries. Organizational isomorphism within disciplinary fields, like law enforcement and fire, create a common operating field which increases the organizational permeability and enhances integration of assisting personnel and equipment.

Multi-Organizational Members

In rural locales, organizations staffed by volunteers recognize that they share these volunteers with other voluntary organizations and the full-time and part-time employing organizations. These multi-organizational members (MoMs) have rarely been the focus of disaster management research (Killian 1952). These MoMs cross boundaries and form a link or bridge between the organizations. This linkage is considered informal since they are not official liaisons between the organizations.

During a disaster, MoMs will not be able to serve with both organizations and will have to choose which agency to report to as a member. Some organizations place formal requirements on members and may even ask them to sign an agreement that they are committed to their career full-time position over any other emergency services position they hold. In some cases, these MoMs may hold higher ranking positions in volunteer organizations, particularly fire organizations, but are asked to consider their

full-time paying position as their primary obligation. Sociologists consider this a role conflict; organizations often refer to it as a conflict of commitment. Institutions and norms may have a significant influence over role prioritization and organizational commitment during disasters. Multi-organizational members interviewed in this study (See Appendix B) were aware of the potential for role conflict and confirmed their commitment to respond to their primary paid full-time position. The MoMs also confided that they might stay on scene with a volunteer or part-time agency if they had been called to an emergency response by them first. They were very aware of the important role they fill as a volunteer.

ANTECEDENTS TO THE FOUR C'S OF EMERGENCY MANAGEMENT

Communication

Inter-organizational relations begin with communication across organizational boundaries. Leaders in hierarchal organizations are the official representatives and communicate with leaders of other organizations. Formal official communication occurs when designated representatives of each organization speak on behalf of their respective institutions. The leader or the designee of the leader is often the organizational representative. This leader-to-leader interaction is evident in the Local Emergency Planning Committee (LEPC).

All of the organizations in this study are required to be represented on the LEPC, which is designated by federal law to engage in local planning for response to hazardous materials accidents during transport. All organizational leaders in the emergency management network should also be members of the LEPC, although data collected in this study does not confirm that to be true in this county. Only six of the twenty-four

leaders who participated in this study identified themselves as members of the LEPC. Seven members of the LEPC participated in this study; five of those also identified themselves as members of one of the eighteen organizations included in this study. The LEPC also includes citizens, social service organizations, and representatives of state and federal agencies.

The Emergency Planning and Community Right-to-Know Act (EPCRA) became law in 1986 to “improve chemical safety and protect public health and the environment” (Environmental Protection Agency 2012). The law established State Emergency Response Commissions (SERC) in every state and requires the formation of LEPCs to include representatives from first responders, public health, facility, media, and the community. As the representative to the LEPC, organizational leaders are there to communicate organizational roles and needs. Lack of participation by organizational leaders demonstrates a breakdown in communication on this important threat to public health and safety.

Informal communication often occurs between members of different organizations and can be organizational in nature, but is considered informal since it is not officially authorized to represent the views or needs of the organization. Classifying communication as formal or informal depends on rules of membership and maintenance of boundaries. These two defining characteristics of organizations establish if the communication is intra-organizational or inter-organizational.

Proximity and interaction between organizational members in a multi-organizational environment leads to boundary spanning. Boundary spanning involves communicating across organizational boundaries. Sharing information and requesting

resources are a fundamental activity during disasters. Constraining this flow of communication to official channels is difficult during disasters because of the interruption of normal communication methods. Boundary spanning members are able to use informal communication channels to redirect official information during disasters.

Coordination

Mulford and Rogers (1982:12) define inter-organizational coordination as “the process whereby two or more organizations create and/or use existing decision rules that have been established to deal collectively with their shared task environment.”

Interdependence is essential to understanding coordination between organizations in the emergency management network that share the disaster management task environment.

Organizations in the study experience multiple types of interdependence, sharing resources, personnel, and relying on other organizations to perform tasks essential to completing other tasks. Norms and institutions facilitate coordination and direct the interactions between organizations in the emergency management network, reducing the uncertainty about decision making. Each organization has a culture that is often heavily influenced by the role-set and task environment. Law enforcement, fire, and emergency medical services all respond to the emergency needs of citizens, but the role of each organization is specific to the task and jurisdiction. Public organizations are often scrutinized for efficiency and effectiveness and inter-organizational coordination is a public expectation.

President George W. Bush ordered the implementation of a National Incident Management System (NIMS) for all domestic incidents which established a structure for

the inter-organizational relations (Bush 2003). This policy institutionalizes an organizational network:

The National Incident Management System (NIMS) provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment. (U.S. Department of Homeland Security 2008:1)

The objective of NIMS is to raise awareness of all organizational members of the complex multi-organizational field and to train members to operate in an inter-organizational network to accomplish information sharing and coordination. This standardization is an antecedent to coordination (Thompson [1967] 2003). More than 50 years ago, Thompson and Hawkes (1962:281) called this inter-organizational network “a super-organization” based on their study of the reintegration of community organizations during disasters. NIMS has institutionalized this integration process to facilitate emergency and disaster response.

The adoption of NIMS by the federal government, and the incident command system (ICS), has been criticized by disaster management researchers (Buck, Trainor, and Aguirre 2006) who identified several weaknesses when coordinating large scale complex disaster events. Rural responders (Jensen 2009) have been slow to adopt NIMS, criticizing the mandate to use NIMS for all emergency and disaster events. Buck et al. (2006) identified local community social institutions as a barrier to full implementation of NIMS and the application of ICS as a comprehensive coordinating mechanism. Rather than expanding to include volunteers and community-based organizations, there are growing concerns that ICS and NIMS will be a barrier to integrating emerging

organizations, particularly during the recovery and mitigation phases of disaster (Buck et al. 2006).

Cooperation

The formality of coordination is contrasted by the informality of cooperation. Easing transaction costs and facilitating interactions is accomplished when two antecedents to cooperation are present, goal attainment and trust. Leadership is needed for the more formal agreements and rules that order coordination, but cooperation must be facilitated by all organizational members. Communication enhances cooperation, significantly so when the communication is face-to-face (Ostrom 2003). Propinquity is an antecedent to communication; communication and coordination are antecedents to cooperation. Cooperation can be achieved by inter-organizational communication and interactions among members. Sustaining cooperation relies upon organizational goal attainment and trust.

Personnel are a resource that is often in short supply during disasters and organizations adopt different strategies to assure that staffing is available when needed. Powerful organizations in the rural emergency management network are those that can secure, through relationships or institutions, the resources that they need to obtain their goals (Pfeffer and Salancik [1978] 2003). Disasters are focusing events (Birkland 1996), and priorities within organizations and communities shift to meet the needs during the crisis. Concern over role conflict (Barton 1962; Killian 1952) has not been confirmed through research. Instead, the shifting of priorities produces role simplification (Dynes and Quarantelli 1986) which then reduces role strain, and allows actors (particularly emergency responders) to minimize demands from their other roles during a disaster

event. According to Thompson and Hawkes (1962:286), “it is as if the multi-purpose community has suddenly set aside all but one goal” and acts collectively with a single purpose.

Trust is an antecedent to cooperation. Trust and reciprocity are linked because trust entails an expectation of reciprocal treatment in future interactions (Ostrom 2003). Organizations cooperate with the expectation of reciprocal cooperation: “The capacity to engage in mutually beneficial relationships based on trust and reciprocity extends the reach of institutionally supported activities” (Cook and Cooper 2003:209). Every interaction is not mutually beneficial, but the long term nature of cooperation ensures future opportunities for every participating organization to benefit from cooperation. Trust is an “essential social lubricant” (Cook and Cooper 2003:209).

In this study, leaders were asked who they trusted to do the most good in a disaster. All leaders responded that they trusted local organizations the most. The first organizations they mentioned were the organizations most similar to them; for example law enforcement agencies mentioned other law enforcement agencies, and fire organizations mentioned other fire organizations. Homophily and propinquity appear to be antecedents to trust in the rural emergency management network.

Organizational leaders in this study were asked to identify the organizations whose goals were closely aligned with their own organization. The organization that was identified in their responses was Emergency Medical Service (EMS). This organization is the only organization in the study which mutually responds to emergencies with all of the other responder agencies because they are a county-wide organization. Emergency

response agencies, such as fire and police, are interdependent with the EMS since they treat and transport all sick and injured in the county.

Collaboration

Collaboration at the organizational level is about boundary spanning and flexibility. This is especially true for rural emergency management; “modern disasters are complex enough to require the utmost flexibility in their management” (Alexander 2002:211). Complex social problems require a collaborative network of organizations to address and resolve them (Mandell and Keast 2008). Modern public management embraces networks as “self-organizing entities” that employ regularized cross-agency communication systems, and have distinct internal power structures along with a set of internal arrangements” (Agranoff 2007:83). Agranoff (2007:83) calls these networks of public agencies “collaborarchies.” Attributes of these “collaborarchies” are flexibility, permeability, boundary-spanning, emergent, and interdependent. This changing landscape of public management is a challenge for managers and leaders oriented to bureaucratic hierarchies.

O’Leary, Gerard, and Bingham (2006:7) describe the new paradigm facing public managers to engage in an emerging form of collective action:

Collaborative public management is a concept that describes the process of facilitating and operating in multi-organizational arrangements to solve problems that cannot be solved or easily solved by single organizations. Collaborative means to co-labor, to cooperate to achieve common goals, working across boundaries and in multi-sector relationships. Cooperation is based on the value of reciprocity.

Public managers must be a bridge between their organization and the network to foster collaboration that serves the needs and meets the goals of both entities. Fostering communication and interaction within and among the organizations in the network is the

foundation of collaboration. The antecedents of communication, coordination, and cooperation are all necessary to enable collaboration; norms, institutions, trust, and goal attainment. Collaboration is not the beginning, but the culmination of achieving the other phases of inter-organizational relations. Ultimately, “networks must go beyond the formalities of officers and rules in order to devolve a collaborarchy that holds the group together and provides means that support its actions” (Agranoff 2007:123).

Accomplishing each phase of networked activity is communication, coordination, cooperation, and collaboration, which involves increasing permeability of organizational boundaries to achieve complex organizational goals, particularly in uncertain environments such as disaster.

McGuire (2009:93) concluded that local emergency management collaboration is most likely to occur with knowledgeable, educated emergency managers. The professional emergency manager will need skill to overcome the organizational barriers posed by “strong, well-established cultures defined more in terms of command and control, such as police officers and firefighters.” Rural emergency management may be disadvantaged by the lack of professional emergency managers (Waugh 2013) who are able to bridge organizational boundaries.

SOCIAL CAPITAL

Organizations can possess, build, and use social capital. Social capital is defined many ways and across many disciplines. An intangible asset, social capital can be attributed to an organization or an individual member. It might be an incentive for membership if the organization has prestige, and membership entitles individuals to social benefits by association. According to Nahapiet and Ghoshal (1998), three key

components constitute organizational social capital: structural social capital which refers to the connections among actors; relational social capital which refers to trust among actors; and cognitive social capital which refers to the level of shared goals and values among actors. According to Leana and Van Buren (1999:543): “Organizations strong in social capital will exhibit resilient trust, even among individuals connected generally rather than personally. Organizations weak in social capital, conversely, will be characterized by fragile trust (if any), even among individuals who directly and frequently interact.”

Social capital and the associated trust is an antecedent to cooperation and collaboration. Bonding social capital can facilitate coordination. Nee (2001:8) asserts that institutions generate social capital, “conforming to norms of a social group is what renders the norm a form of social capital.” Reducing uncertainty and facilitating transactions and exchanges, social capital is the collective earnings from the saved cost. Organizational members adhering to institutions and norms derive some collective benefit from mutual support and maintenance of the norms. Members of the rural emergency management network are interconnected through family and friends that are also members of the network. These other relationships enhance trust between organizations through the involvement of these boundary spanning members. The social capital obtained through the close-knit network is bonding social capital and is produced through the numerous overlapping relationships of its members.

The other form of social capital, bridging social capital, expands the reach of the organization outside of the local community to access information, resources, and assets at reduced cost. These bridging ties are not as strong or as dense and are often referred to

as weak ties (Granovetter 1973), yet these weak ties provide access to new information, resources, and assets. Social capital is expended to establish and maintain these less frequent and less durable ties. However, using these ties also produces more social capital. The essential forms of inter-organizational relations in the rural emergency management network (communication, coordination, cooperation, and collaboration) produce social capital.

Table 4. State and National Professional Association Membership of Local Organization Leaders and Members.

Membership in Professional Associations	Organizational Leaders	Organizational Members
State Professional Association	71%	53%
National Professional Association	42%	35%

In this study, leaders and members reported membership in state and national professional organizations (See Table 4). Ties to professional associations provide access to new knowledge, organizational strategies, and policy initiatives to enhance organizational effectiveness. More than half of the organizational members completing the survey reported membership in a state professional association, and 71 percent of leaders are also members of at least one state professional association. Some leaders are members of more than one state level association. Membership in national professional associations is lower, 35 percent for members and 42 percent for leaders. This level of professional membership is also evidence of the professionalization of emergency management. Advancements in policy, practice, and management are shared through association membership and provide opportunities for professional development.

Organizations can access bridging social capital to leverage support for organizational change and collective action within their communities.

The antecedents to communication, coordination, cooperation, and collaboration include social capital. Social capital facilitates all inter-organizational relations. Social capital is generated through the engagement in activities and interaction. When these activities are based on trust and goal achievement, coordination leads to cooperation and enable collective action to occur. Social capital is generated through the process of collective action.

CHAPTER 5

COMMUNITY

A community is the place where interactions occur. It is a location, but it can also describe the quality and impact of the interactions. Wilkinson (1991) describes community as an interactional field. Thompson and Hawkes (1962:269-70) choose a system approach and state that “community is a *multi-purpose system*” that “belongs to a class of system whose boundaries are somewhat fluid.” Galaskiewicz and Krohn (1984:527) describe “community structure as a network of inter-organizational linkages” at the organizational level of analysis.

COMMUNITY FIELD THEORY

Community is composed of three elements: “a locality, a local society, and a process of locality oriented collective actions” (Wilkinson 1991:2). The focus of this study is on this definition of “community field” (Wilkinson 1970:317) where collective action takes place. Many descriptions of community omit this necessity; for collectivities in a local setting to organize to produce some common good or public good. Wilkinson (1991) asserts that without this element there may be a local society involving some social activity, but without the collective action it falls short of the full meaning of community. Wilkinson (1970:314) clarifies that what is critical “is a distinction between field as a method and field as a phenomenon, or, stated another way, between a field theory approach to study and a theory of fields.”

Frequently, the multi-organizational emergency management network has been studied structurally (Kapucu, Arslan, and Demiroz 2010) and as a system (Kapucu and Hu 2014), but not as a community field. A key difference is “the assumption of an inherent maintenance tendency, which is essential to the concept of system but

extraneous to the concept of field” (Wilkinson 1970:315). Certainly rural emergency management could be viewed as a static structured system which inherently requires maintenance. This is consistent with social network analysis and the emphasis on structure and function.

The emergent multi-organizational network is flexible and multiplex; a social field in which it is being created at each moment. As Wilkinson (1970:315-316) explains: “The unique strength of the concept of field in sociological theory is that it deals directly with the emergent, variable and contrived aspects of social life”. The strength of community field theory is “the idea of a local society with multiple social fields differentiated along institutional-interest lines and related to one another through a coordinating process, which itself is part of an emergent field, is clearly consistent” with rural emergency management (Wilkinson 1970:318). Drabek (1987b) has researched the emergence of organizations in disaster and the formation of emergent multi-organizational networks, and asserts that multiplex relationships stabilize these networks. The complex and multi-layered relationships of members of organizations characteristic of the rural emergency management network produces a more robust community field.

Each organization in this study is composed of members engaged in social activity constrained by “cultural norms” of the “interest area” (Wilkinson 1970:318). The importance of “descriptive research is to determine the degree to which the social fields in various interest areas converge or overlap to form a community field” (Wilkinson 1970:318). Even though all of these organizations are part of the local community, “continuity and unity through time” demonstrate the existence of a social field (Wilkinson 1970:318). The inter-organizational relations are initiated through

communication, fostered by coordination, developed with cooperation, and emerge as collaboration to meet a society need for emergency management.

RURAL

Rural sociology blossomed through the study of community institutions and organizations that constituted rural life (Gillette 1913; Hawthorn 1926; Sanderson 1923; Sanderson and Polson 1939; Vogt 1922). Rural communities have developed capabilities to respond to routine emergencies by cultivating a volunteer base committed to public service (Brown 1999; Brudney 1999; Perkins 1989). These capabilities are common pool resources managed by the emergency management network. As a common pool resource, rural emergency management is vulnerable to the free rider problem (Olson 1965), where some network members derive a benefit without making a contribution. The nature and explanations for collective action are closely tied to concepts of community as a system (Coleman 1973) or as a social field (Wilkinson 1991).

Rural areas would seem, in general, to possess both advantages and disadvantages in developing inter-organizational cooperation to respond to natural disasters. Rural agricultural communities have a long history of ‘cooperatives’ that solve collective good problems in purchasing inputs, selling agricultural products, (Cook 1995) and even in delivering electricity and insurance to households, farms and businesses (Cook 1993). At the same time, however, these co-operatives were organized with the critical assistance of government agencies and legislative initiatives (Olson 1965). Moreover, rural areas face unique problems that are not found in metropolitan areas because of physical distance, poor infrastructure, and dependence on volunteers to deliver services (Brown, Swanson, and Barton 2003; Gamache et al., 2007). These disadvantages may be assets if the

“limitation on the number of potential social relations available to individuals leads to more communal social relations” (Fischer et al. 1977:12). Achieving cooperative inter-organizational relations in rural communities builds on individual communal social relations and the organizational social capital embedded within the individual organizations and the rural emergency management network.

Voluntary civic service in the fire service or emergency medical service is unique to rural life. In urban areas these services and functions are provided by paid, career professionals. Scholars of public service define it differently, but some assert that true service “lies primarily in volunteerism” (Perry and Thomson 2004:xiv). Accordingly, civic service is surely a significant aspect of rural communities, where most often fire and emergency medical services are provided by volunteers. The institutional and cultural norms for civic service of volunteers are apt to be different from the institutional and culture norms for full-time, paid employees of local governmental agencies. The full-time, paid positions in rural communities are almost exclusively law enforcement, emergency dispatching, and public health. The actions and outcomes of emergency services organizations staffed by volunteers are a pure form of collective action.

COMMUNITY AND DISASTER

Concepts of disaster are intertwined with community and society. Early researchers described disasters as socially disruptive (Barton 1962; Prince [1920] 1968). The impact on local society was the focus of disaster research, and the application of the research was intended to reduce the disruption when disasters occurred. The term “community in disaster research” refers to the geographic location of the event and the corresponding individuals who are impacted by the incident. Researchers with an interest

in rural communities have studied disaster (Flint and Brennan 2007; Green, Gill, and Kleiner 2006; Kleiner, Green, and Nylander 2007) from a community perspective and have explored rural challenges and assets. Disaster is studied as something that happens to communities, and the subsequent consequences of the impact and struggle for recovery (Barton 1969).

Barton (1969) observed, however, that some community relations improved after a disaster and that disasters might produce “therapeutic communities.” Picou, Marshall and Gill (2004) examined the impact of different disaster agents on community, identifying litigation originating from a disaster as contributing to a corrosive community. The perspective of this research is on community; not just the place, but the quality and frequency of human interaction and relationships. Disaster research that seeks to understand the impact of disasters on the community field (not just the community location), explores how to develop and enhance resilience. The study of community resilience has expanded beyond disaster recovery to development of community relations that prepare and support robust preparedness, response and recovery activities.

COMMUNITY RESILIENCY

Community resilience (de Bruijne, Boin and van Eeton 2010; Green et al. 2006) is not well defined and has different meanings depending on the aspect of community under study. Weick and Sutcliffe (2007:14) succinctly describes resiliency as “a combination of keeping errors small and of improvising workarounds.” A goal of this study is to learn how to develop resilience in rural emergency response organizations, but first rural response resilience must be described. Weick and Sutcliffe (2007:71) characterizes resilience as composed of “three abilities: (1) the ability to absorb strain and preserve

functioning despite the presence of adversity; (2) an ability to recover or bounce back from untoward events; and (3) an ability to learn and grow from previous episodes of resilient action.” Knowledge of the emergency management network will contribute to building resiliency and illuminate actions that can be taken toward that goal.

Kapucu (2005:37) states: “Organizations can contribute to resilience in a society by incorporating other emergency response organizations and by integrating volunteers into emergency operations as appropriate.” The actors in the multi-organizational network have many ties within the network, but also outside the network to the state and national level. This bridging social capital provides access to knowledge and resources that will benefit the local community to adapt and recover from crisis. Communication, coordination, cooperation, and collaboration are antecedents to community disaster resiliency, which is a public good (Atkinson 2013).

ANTECEDENTS TO THE FOUR C’S OF EMERGENCY MANAGEMENT

Communication

The strength of rural communities is often reported to be the social capital (Flora and Flora 2008) generated through frequent and rich social interaction that builds trust and reduces transaction costs, enabling effective collaboration and coordination in resource poor communities. Communication is most effective when interaction between organizations is routine. Interactions are more frequent when the organizations operate within the same locality, since proximity enhances the potential for interaction.

Community field theory advances that proximity matters in enhancing interaction and that familiarity contributes to working together for a common good. Organizations that share a common purpose and goals interact to achieve those goals. Communication is

essential to accomplishing collective action. The local emergency management network is structured first by the pattern of communication between the local organizations.

Coordination

Local emergency management is engaged in collective action to guide the local society to achieve disaster resilience. As Thompson and Hawkes (1962:271) note: “Since the community is both a multi-purpose system and an open system, it is constantly in the process of reallocating and reintegrating.” This weakness from an organizational viewpoint may contribute to resiliency since the community is always working toward more complete integration.

Multi-organizational coordination requires identifying natural and man-made hazards that pose a threat to local society, and to prepare, respond, and recover effectively. Organizations composing the rural emergency management network are increasingly interdependent when confronting complex hazards that require the collective action of multiple organizations. The emergent nature of disaster resulting from “a collision between planned and intended actions with unplanned and unintended side-effects” (Dombrowsky 1987:347) presents coordination challenges. Every organization possesses a piece of the capability that must be coordinated with all the other pieces to achieve and effective collective action.

However, this rural emergency management network does possess a social advantage over other efforts at multi-organizational coordination because of the common culture of service. The norms, institutions, and culture of these organizations foster coordination to achieve the common purpose (Nee and Ingram 2001). All of the local organizations in this study only exist to provide for the public good during emergencies

and disasters. The common commitment to public services and public safety unify the efforts facilitating coordination and enabling cooperation.

Cooperation

Rural communities possess “the social networks that organize life and the importance of trust and familiarity to the operation of these networks” (Gamache et al. 2007:2). This trust and familiarity present in small groups reduce transaction costs and minimize collective action problems (Olson 1965). This study focuses on the “social action system” of local emergency management which displays collective behavior to achieve common goals (Van de Ven 1980:299). The bonded social capital of the rural emergency management network facilitates the transition from coordination to cooperation essential to collective action.

In the development of conceptual approaches in rural sociology, emergency services were not studied as units of government, but as collective action (Sanderson 1923) emerging only when mobilized to respond to a specific, but temporal need, as a bucket brigade responding to a house fire (Vogt 1922). The provision of public safety and emergency services is one way the “community field” is achieved (Wilkinson, 1991). Collective action has continued to be the focus of rural community studies given the reality of limited resources, especially human resources.

Previous research (Augustine and Schoettmer 2005; Buckland and Rahman 1999; Pigg and Bradshaw 2003) has shown that rural communities vary widely in the way that they engage in collective action and the extent to which their efforts are effective. Coleman (1973) demonstrated the validity of the influence of large and small groups as presented by Olson (1965) on collective action, and that small groups have greater power

to enforce the provision of public good. The organizations in the rural emergency management interact with each other frequently and need the cooperation of the other organizations to achieve their goals in everyday activities, but particularly during disaster.

Collaboration

Collaboration is the highest order of the four C's of emergency management and is only achievable after the other three are accomplished. Rarely defined from an operational perspective, it is frequently used interchangeably with coordination and cooperation. Failure to grasp the full meaning of collaboration might be caused from a general lack of research to identify the underlying causes and contributors. Efforts to understand disaster resiliency, which is the lessening of the social disruption of hazards, have identified community level attributes that are leading back to the conditions or vulnerabilities that correspond to disaster consequences (Atkinson 2013). Collaboration may be viewed as an organizational activity, but the growing literature on disaster resiliency identifies collaboration as an essential ingredient.

A full understanding of what collaboration means may continue to evade disaster researchers unless they incorporate more robust concepts of community. Wilkinson (1991:7) explains: "Community emerges in the local society when the latent bond of common interest in the place – the shared investment in the common field of existential experience – draws people together and enables them to express common sentiments through joint action". Collaboration as a means to achieve goals would exist merely as cooperation, without the inclusion of community field.

The first element necessary to develop collaborative relationships within the emergency management network is to develop trust and respect (Waugh 2009).

Organizations have to want to work together, and trust is essential to cooperation and ultimately collaboration. These essential ingredients to collaboration produce social capital. Therefore, social capital built on trust and respect is an antecedent to collaboration. Collaboration requires willingness on the part of the organizations in the emergency management network to remove boundaries or at least to have boundary spanning members that operate in a boundary-less multi-organizational network.

SOCIAL CAPITAL

The rural emergency management network is the foundation for a community field encompassing the structure shaped by institutions, and boundaries that moderate the flow of communication and ultimately coordinate the interactions to achieve organizational goals. Inter-organizational interaction establishes the structure of the network. This interaction is patterned by organizational boundaries, trust, and propinquity. Norms, sanctions, and mutual obligation facilitate coordination that yields desirable outcomes: social capital and culture. From this dynamic process, the inter-organizational network serves as an organizing system operating under a predictable set of institutional, cultural, and social constraints enabling organizational collective action. Community social capital is the product of the emergent community field resulting from the communication, coordination, cooperation, and collaboration of the local emergency management network to achieve disaster resiliency.

CHAPTER 6

DISCUSSION AND CONCLUSION

Local emergency management contributes to community disaster resiliency when the organizations that provide emergency services, planning, and communication collaborate to form an integrated network. This study has sought to describe and understand the rural emergency management network and the relations among the organizations that communicate, coordinate, cooperate, and collaborate to protect local communities. Dombrowsky (1987:347) defines disaster as “a collision between planned and intended actions with unplanned and unintended side-effects” and asserts that “disaster research . . . should analyze the total of interactions leading towards this collision rather than the actions enforced by the collision.” This is a novel approach since the primary focus of disaster research over the last 80 years has been to study the response to and recovery from disaster. Few researchers (Turner 1976; Turner 1994; Turner and Pidgeon 1997) have focused on the antecedents to disaster, which turns our attention more clearly to the organizational level of analysis at the local level.

THEORETICAL FRAMEWORK

Research on emergency management arises from several different disciplinary perspectives; sociology, geography, public administration, public management, and many others. The multi-disciplinary origin of research contributes to confusing terminology and ill-defined concepts that are a barrier to practitioner application of the research. Emergency management practitioners are often presented with directives detailing what to do, but little clarification of how to accomplish the goal, or why it should be accomplished at all, or in a specific fashion. Academics and researchers recognize that

the desire for community resiliency requires research and theory development that can be communicated to and applied in the field by practitioners. This research reviewed literature in multiple disciplines to understand the broader theoretical frameworks of networks, organizations, and community that can be applied to the inter-organizational relations of the emergency management organizational field in one rural county in Missouri. Another challenge to understanding rural emergency management as an inter-organizational activity is to clarify the underlying essentials to the four primary inter-organizational activities identified in the emergency management literature: communication, coordination, cooperation, and collaboration. It is evident from this research that the four C's of emergency management are a continuum wherein each is an antecedent to the next. Each of the three theoretical frameworks chosen for this research reveal essential antecedents as displayed in Figure 3.

Antecedents to the Four C's of Emergency Management				
Theoretical Approaches	Communication	Coordination	Cooperation	Collaboration
Network Theory	Nodes Dyad Interaction Propinquity	Triad Homophily Transitivity	Multiplicity Reciprocity	Network of Networks Cognition Emergent
Organizational Theory	Boundaries Membership	Norms Institutions	Goal Attainment Trust	Boundary Spanning Flexibility
Community Field Theory	Locality Proximity Interaction	Local Society Interdependence	Collective Action Culture	Emergent Boundless Community Field

Figure 3. Theoretical Model for the Antecedents to Inter-Organizational Relations of the Rural Emergency Management Network.

The inter-organizational relations of rural emergency management are multilayered and the model reveals other attributes. (See Figure 7) Many of the

antecedents are identified in the social capital literature as contributors to increasing social capital. The outcome of the continuum of communication, coordination, cooperation, and collaboration is to increase the organizational social capital of the rural emergency management network.

Figure 7. The Four C's and Social Capital

Exploring the contributions of each of the theoretical frameworks to the inter-organizational relations of the rural emergency management network is analogous to examining a complex living entity from the inside out. Network theory describes the structural aspects of the rural emergency management entity, connecting the bones of organizational ties into a skeleton revealing the shape of the network. Organizational theory adds the viscera; organs, muscle, flesh, and skin adding understanding of norms, institutions, and rules that establish processes and boundaries that give the entity motive power. Community theory contributes meaning, purpose, character, and identity which is the unifying force of the mind to the entity. Viewing the model from top to bottom, we layer the meat to the bones and add the mind to form the complex living entity that is rural emergency management.

Network Theory

Organizational effectiveness is equated to goal attainment, and in a complex organizational network collective action is needed to attain the goals. This occurs along a continuum of inter-organizational relations from communication, coordination, cooperation, and collaboration. Each stage of this process requires inputs like social capital, strategies, institutions, and interactions to develop inter-organizational relations. These are the antecedents for the formation of networks. Network theory embraces the communication to collaboration continuum and the evolution of inter-organizational relations.

The literature has documented the consequences of network ties, but far fewer studies have sought to identify the antecedents. Social network analysis provides a mathematical process for measuring and visualizing how the network is influenced. The effects of these variables can have a positive or negative impact on collective action and goal attainment. The processes of adaptation and isomorphism, more often than rational choice, moderate organizational choices to build inter-organizational relations and enhance collective action.

Response agencies need to plan for the changes in normal emergency operations that are anticipated in the event of a disaster, and avoid the “trained incapacity” that occurs with the expectation that every event will be like the last (Drabek 2010:149). Emergency response agencies need to incorporate expanding and emergent groups (Dynes and Quarantelli 1968) that are not present for everyday emergencies. All of these requirements demand the establishment of social networks between responder

organizations and personnel. Multiplex relations between organizations increase the stability of the network (Drabek 1987b).

Organizational Theory

Understanding inter-organizational relations, and the networks that are formed from those ties, requires knowledge of the boundaries of organizations and the rules and institutions that constitute the boundaries. This study is about boundaries of organizations. During a disaster; organizations expand, extend, and emerge to meet the needs of the community (Dynes 1970). Organizations must operate in uncertain conditions with incomplete information, a special condition of ‘bounded rationality’ that has not been well described in the disaster management literature. Organizations must coordinate, cooperate, and collaborate in new and different ways since many of the normal pathways of interaction are not available, most due to infrastructure damage or congestion.

Many rural organizations that are active during disaster are regularly staffed with volunteers. Institutions provide the incentives to maintain the collective action of these volunteers (Lozier 1976; Simpson 1996). The benefits of volunteering are tangible and “volunteer firefighters know the meaning and social context of their product” (Thompson and Bono 1993:330). In this complex field of multiple organizations, individual actors have incomplete information and institutions are essential to reduce transaction costs and solve collective action problems (Nee 2001). Institutional arrangements are “adaptive solutions” to the environmental influences that produce “imperfect or asymmetric information” and collective action problems that create “opportunism” that requires “costly monitoring” (Powell and DiMaggio 1991:9).

The boundaries overlap between organizations involved in emergency management before, during, and after a disaster. This is especially true when the boundaries of organizations are defined by the interactional field and activities; these interactions and activities take place in the boundary zone. This boundary zone is the location of all inter-organizational relations. These boundary relations have been described as bridges or boundary spanning, as if the boundary is an obstacle or barrier. The boundary is often seen as an area of potential conflict and competition over resource needs. Open systems models accept that organizational boundaries are permeable and porous, and functionally take advantage of these open boundaries to enhance inter-organizational relations and facilitate resource acquisition and information transfer. Institutions provide an important process for maintaining boundaries: regulative mechanisms are needed to maintain closed boundaries, and normative and cultural-cognitive processes in open systems. Boundaries are spanned continuously in the most porous organizations as multi-organizational members simultaneously occupy positions in more than one organization in the same field (Miller 2000).

Boundary spanning.

In rural communities, the resources to staff and equip organizations are limited, and most fire protection organizations are staffed primarily with volunteers. Some of these volunteers are employed full-time by other emergency services agencies in the same community. As members of more than one organization, these multi-organizational members span the boundaries of both organizations. This overlapping membership is perceived by many organizational leaders as posing a conflict of commitment that may threaten organizational capacity and the ability to achieve organizational goals during

disasters. When leaders were asked specifically about the advantages these multi-organizational members bring to the organization, skills and qualifications were mentioned most, but the boundary-spanning benefits to resource acquisition was apparent to many leaders in the network. This tension is resolved for some organizations by formalizing boundaries through membership rules that prohibit dual membership in other emergency services organizations. Other organizations benefit from cultural-cognitive institutions to bond members, and leaders acknowledge that these institutional ties might be weaker than the obligations of employment and benefits of pay and job security. Barriers to multi-organizational membership may weaken the individual organization and inhibit collaboration.

Boundary-spanning members provide resource knowledge, additional skill sets, and policy and procedural acumen that enhance the ability of both of their member organizations to adapt and respond to unanticipated events. This enhanced capability expands resource acquisition opportunities and communication pathways to accomplish organizational goals as well as immediate tasks. Boundary spanning behavior during disaster reveals the autonomy (Drabek 1983) and decentralized decision-making that is necessary, “when most of the important information needed to compete effectively is found at the boundaries of the organizations rather than at the core, then centralized command/control structures become dysfunctional and obsolete” (Scott 2004:12).

Community Theory

Emergency management research has focused on the aftermath of disaster and the impact on society, often viewed as the locality of the incident. Disaster recovery literature often examines subsets of society to document unequal impact of disasters on select

populations (Adler 2015; Phillips 2016). As with most disaster research, the focus has been on the impact on community, not community as a mitigating factor in disaster. Community field theory as presented by Wilkinson (1970) embraces the emergent nature of social relations and the essential elements of locality, local society, and collective action to meet local needs. Wilkinson (1970) describes the antecedents to the community field which is boundless and emergent, and achieves the ideal of collaboration. The four C's of emergency management are a continuum from communication to collaboration, which is the idealized form of inter-organizational relations. Before, during, and after disasters, inputs are required to produce the four C's of emergency management. The disaster literature is full of case studies of failures in communication, coordination, cooperation, and collaboration. What is missing from this literature is an understanding of community field as defined by Wilkinson (1970).

Collective action.

For the community field to exist there has to be collective action at the local level. The unifying power of multiple organizations working together to achieve a common goal is collective action. The achievement of this goal builds social capital for the organizations and the network that they operate within. This collective action also fosters disaster resiliency. The community field is an antecedent to community resiliency. A growing body of literature on community resiliency (Aldrich 2012; Atkinson 2013; Comfort, Boin, and Demchak 2010; Kapucu et al. 2013) identifies that the same elements are necessary as those identified succinctly by Wilkinson (1970; 1991).

Building resilient communities requires collective action and overcoming the free-rider problem. The multi-organizational environment of rural communities must embrace collaboration in a network environment that is emergent and boundary-less.

How has this research answered the original Research Questions?

Research Questions

- 1) What is the network structure of the emergency management organizational field in a rural (non-metro) county?
 - The organizations in the rural emergency management network interact frequently to exchange information. The central organization in the network is Comm, the one organization that communicates directly with each organization during emergencies. Comm is connected to every organization in the network. The organizations that did not provide responses to the survey were all law enforcement organizations, so complete data about the network structure was not available and these organizations appear to be isolated on the periphery of the network. (See Figure 6, p.51)
- 2) What antecedents contribute to member organizations collaboration in the network?
 - The antecedents to collaboration were identified from the examination of three theoretical frameworks, Network Theory, Organizational Theory, and Community Field Theory and a model developed.
- 3) How do the intergovernmental relationships of emergency services agencies in a non-metro county contribute to community resiliency?

- The multiplex relationships of members of organizations in the rural emergency management network form complex layers of interaction that contribute to trust and enhance resource acquisition.
- 4) How does overlapping membership in rural emergency services agencies impact the local Emergency Management network?
- The overlapping membership among organizations in the rural emergency management network is characteristically rural with multiple fire organizations that are primarily volunteers. Paid firefighters of the small municipalities are also volunteers for the two county fire agencies that are primarily volunteers. Multi-organizational members are boundary spanners who increase the permeability of organizational boundaries that contributes to cooperation and collaboration.

Hypotheses

1. The network of leaders of emergency services agencies share common goals that foster collaboration.
 - Common goals among organizations in the rural emergency management network contributes to collective action and builds social capital which fosters collaboration.
2. The network of leaders of emergency services agencies maintain weak ties to state and national organizations that provide a bridge to outside resources and information.
 - Leaders of organizations in the rural emergency management network belong to multiple state and national professional organizations. Members also belong to state and national professional organizations, although less frequently than leaders. These ties provide access to resources and professional development.

3. Multi-organizational members fulfill a boundary-spanning role and understand that they contribute to the flow of information and resources in the network.
 - Multi-organizational members recognize that they span the boundaries of the organizations they belong to and often have knowledge about one organization that benefits the other organizations to which they belong. Leaders also recognize these benefits, but do not take advantage of the liaison potential of boundary spanning members to develop collaborative relationships.
4. The public service culture provides incentives to overcome the collective action problem for actors embedded in the emergency management network of rural communities.
 - Observations of members and review of organizational materials confirmed that recruitment of members appeals to civic service, community service and belonging to a vital community organization that protects the safety of the public.

These summary conclusions to the Research Questions and Research Hypothesis were derived from examination of the four C's of emergency management; communication, coordination, cooperation, and collaboration from three theoretical frameworks.

SOCIAL CAPITAL AND COMMUNITY RESILIENCY

Social capital, both organizational and personal, is the principle capital at work in organizational boundaries. Bridging boundaries vertically outside of the local organizational field is important to access support and resources not available locally. Spanning boundaries horizontally is necessary for communication, cooperation, coordination, and collaboration. Social capital reduces organizational barriers and

engenders the trust that enables information and resource sharing. Social capital is potential until it needs to be spent to achieve organizational goals. Barriers to inter-organizational relations are reduced by social capital. Multi-organizational members contribute social capital to their organizations by increasing the number of ties and paths across the boundaries to the other organizations in the field. The available pathways are expanded when organizational actors provide an additional pathway due to their dual membership. Access to information and resources are enhanced.

Cognition is essential to collaboration. Organizational leaders and members need to possess knowledge of the network, appreciate the value of multi-organizational members, build and leverage social capital to enhance information and resource acquisition, and permeate boundaries to work collaboratively. Leaders need to understand the emergent nature of the network of networks and also the emergent nature of community field to increase flexibility and eliminate structural barriers to disaster resiliency. Atkinson (2013:153) describes organizational barriers:

Even skilled professionals can be limited by an institution that ignores warning signals and dissuades staff members from responsible action out of a need to address other organizational priorities. This sort of institutional constraint can turn a hazard event into a disaster. When institutional actors are unable to make sense of a rapidly shifting situation, make adjustments, use resources to greatest advantage, and feel empowered to act on behalf of the institution to do so, the quality of the institution's response will be lower.

Application of knowledge acquired through research is essential to enable practitioners to more effectively utilize local resources to address unplanned and unanticipated disaster events.

BIBLIOGRAPHY

- Adler, Kevin F. 2015. *Natural Disasters as a Catalyst for Social Capital: A Study of the 500-Year Flood in Cedar Rapids, Iowa*. Lanham, MD: University Press of America.
- Agranoff, Robert. 2007. *Managing Within Networks: Adding Value to Public Organizations*. Washington, DC: Georgetown University Press.
- Agranoff, Robert, and Michael McGuire. 2001. "Big Questions in Public Network Management Research." *Journal of Public Administration Research and Theory* 11:295-326.
- Ahlbrandt, Rogers Jr. 1973. "Efficiency in the Provision of Fire Services." *Public Choice* 16:1-15.
- Aldrich, Daniel P. 2012. *Building Resilience: Social Capital in Post-Disaster Recovery*. Chicago: The University of Chicago Press.
- Alexander, David. 2002. "From Civil Defense to Civil Protection-and Back Again." *Disaster Prevention and Management: An International Journal* 11(3):209-13.
- Alter, Catherine, and Jerald Hage. 1993. *Organizations Working Together*. Newbury Park, CA: SAGE Publications.
- Ashkenas, Ron, Dave Ulrich, Todd Jick, and Steve Kerr. 2002. *The Boundaryless Organization: Breaking the Chains of Organizational Structure*. 2nd ed. San Francisco: Jossey-Bass.

- Atkinson, Christopher L. 2013. *Toward Resilient Communities: Examining the Impacts of Local Governments in Disasters*. New York: Routledge.
- Auf der Heide, Erik. 1989. *Disaster Response: Principles of Preparation and Coordination*. St. Louis: C. V. Mosby.
- Augustine, Jim, and John T. Schoettmer. 2005. "Evacuation of a Rural Community Hospital: Lessons Learned from an Unplanned Event." *Disaster Management and Response* 3(3):68-72.
- Babbie, Earl. 2004. *The Practice of Social Research*. 10th ed. Belmont, CA: Wadsworth Thomson Learning.
- Baker, George W., and Dwight W. Chapman, eds. 1962. *Man and Society in Disaster*. New York: Basic Books, Inc.
- Baldassarri, Delia, and Mario Diani. 2007. "The Integrative Power of Civic Networks." *American Journal of Sociology* 113:735-80.
- Barnhard, Chester I. [1938] 1961. "Organizations as Systems of Cooperation." Pp. 14-8 in *Complex Organizations: A Sociological Reader*, edited by A. Etzioni. New York: Holt, Rinehart, and Winston.
- Barton, Allen. 1962. "The Emergency Social System." Pp. 220-67 in *Man and Society in Disaster*, edited by G. W. Baker, and D. W. Chapman. New York: Basic Books, Inc.
- Barton, Allen H. 1969. *Communities in Disaster: A Sociological Analysis of Collective Stress Situations*. Garden City, NY: Doubleday.

- Baum, Joel A. C., and Tim J. Rowley. 2002. "Companion to Organizations: An Introduction." Pp. 1-34 in *The Blackwell Companion to Organizations*, edited by J. A. C. Baum. Malden, MA: Blackwell Publishing.
- Benson, J. Kenneth. 1982. "A Framework for Policy Analysis." Pp. 137-76 in *Interorganizational Coordination: Theory, Research, and Implementation*, edited by D. L. Rogers and D. A. Whetten. Ames, IA: Iowa State University Press.
- Berke, Philip R., and Thomas J. Campanella. 2006. "Planning for Postdisaster Resiliency." Pp. 192-207 in *Shelter from the Storm: Repairing the National Emergency Management System after Hurricane Katrina. Annals of the American Academy of Political and Social Science. Vol. 604*, edited by W. L. Waugh Jr. Thousand Oaks, CA: Sage.
- Berry, Frances S., Ralph S. Brower, Sang Ok Choi, Wendy Xinfang Goa, HeeSoun Jang, Myungjung Kwon, and Jessica Word. 2004. "Three Traditions of Network Research: What the Public Management Research Agenda Can Learn from Other Research Communities." *Public Administration Review* 64(5):539-52.
- Birkland, Thomas A. 1996. "Natural Disasters as Focusing Events: Policy Communities and Political Response." *International Journal of Mass Emergencies and Disasters* 14(2):221-43.
- Boin, Arjen, Louise K. Comfort, and Chris C. Demchak. 2010. "The Rise of Resilience." Pp. 1-12 in *Designing Resilience: Preparing for Extreme Events*, edited by L. K. Comfort, A. Boin, and C. C. Demchak. Pittsburgh, PA: University of Pittsburgh Press.

- Borgatti, Stephen P., Martin G. Everett, and Linton C. Freeman. 2002. "UCINET for Windows: Software for Social Network Analysis." *Harvard Analytic Technologies* 6. Retrieved June 1, 2014 (<https://sites.google.com/site/ucinetsoftware/downloads>).
- Borgatti, Stephen P., Martin G. Everett, and Jeffrey C. Johnson. 2013. *Analyzing Social Networks*. London: SAGE Publications Ltd.
- Brass, Daniel J. 2012. "A Social Network Perspective on Organizational Psychology." Pp. 667-95 in *The Oxford Handbook of Organizational Psychology*, edited by S. W. J. Kozlowski. New York: Oxford University Press.
- Brinton, Mary C., and Victor Nee, eds. 1998. *The New Institutionalism in Sociology*. New York: Sage.
- Britton, Neil R., and John Lindsay. 1995a. "Demonstrating the Need to Integrate City Planning and Emergency Preparedness: Two Case Studies." *International Journal of Mass Emergencies and Disasters* 13(2):161-78.
- Britton, Neil R., and John Lindsay. 1995b. "Integrating City Planning and Emergency Preparedness: Some of the Reasons Why." *International Journal of Mass Emergencies and Disasters* 13(1):93-106.
- Brooks, Kathryn Janet Lamb. 2006. "Rural Resilience and Prosperity: The Relevance of Government and Community Networks." PhD dissertation, Department of Sociology, The Australian National University.
- Brown, David L., Louis E. Swanson, and Alan W. Barton, eds. 2003. *Challenges for Rural America in the Twenty-First Century*. University Park: Pennsylvania State University Press.

- Brown, Eleanor. 1999. "The Scope of Volunteer Activity and Public Service." *Law and Contemporary Problems* 62(4):17-42.
- Brudney, Jeffrey L. 1993. "Volunteer Involvement in the Delivery of Public Services: Advantages and Disadvantages." *Public Productivity and Management Review* 16(3):283-97.
- Brudney, Jeffrey L. 1999. "The Effective Use of Volunteers: Best Practices for the Public Sector." *Law and Contemporary Problems* 62(4):219-55.
- Brudney, Jeffrey L., and William D. Duncombe. 1992. "An Economic Evaluation of Paid, Volunteer, and Mixed Staffing Options for Public Services." *Public Administration Review* 52(5):474-81.
- Brueckner, Jan K. 1981. "Congested Public Goods: The Case of Fire Protection." *Journal of Public Economics* 15(1):45-58.
- Buck, Dick A., Joseph E. Trainor, and Benigno E. Aguirre. 2006. "A Critical Evaluation of the Incident Command System and NIMS." *Journal of Homeland Security and Emergency Management* 3(3):Article 1. doi:<https://doi.org/10.2202/1547-7355.1252>.
- Buckland, Jerry, and Matiur Rahman. 1999. "Community-Based Disaster Management During the 1997 Red River Flood in Canada." *Disasters* 23(2):174-91.
- Bunker, Ellsworth. 1957. "The Voluntary Effort in Disaster Relief." Pp. 107-17 in *Annals of the American Academy of Political and Social Science*, Vol. 309, *Disasters and Disaster Relief*, edited by D. Smith. Philadelphia, PA: American Academy of Political and Social Science.

- Bush, George W. 2003. "Homeland Security Presidential Directive/HSPD 5 Management of Domestic Incidents. February 28, 2003." Retrieved September 10, 2012 (<http://www.gpo.gov/fdsys/pkg/PPP-2003-book1/pdf/PPP-2003-book1-doc-pg229.pdf>).
- Capsambelis, Chris. 2009. *Policing in Rural America: A Handbook for the Rural Law Enforcement Officer*. Durham, NC: Carolina Academic Press.
- Casey, Daniel, and Ellen Leger. 1996. *Rural Emergency Response: A Guide to Coping with Stressors in Rural Emergency Services Delivery*. Becker, MN: Crisis Management Counseling & Consultation.
- Chesser, Amy, Elizabeth Ablah, Suzanne R. Hawley, Deborah Wolfe, Theresa St. Romain, Carole D. Grube, and Craig A. Molgaard. 2006. "Preparedness Needs Assessment in a Rural State: Themes Derived from Public Focus Groups." *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 4(4):376-83.
- Choi, Sang Ok. 2004. "Emergency Management Growth in the State of Florida." *State and Local Government Review* 36(3):212-26.
- Choi, Sang Ok, and Ralph S. Brower. 2006. "When Practice Matters More than Government Plans: A Network Analysis of Local Emergency Management." *Administration & Society* 37(6):651-78.
- Choi, Sang Ok, and Bok-Tae Kim. 2007. "Power and Cognitive Accuracy in Local Emergency Management Networks." *Public Administration Review* 67(S1):198-209.

- Clay, Franklin. 1998. "Managers and the Volunteer Fire Service: Sharing Common Ground." *Public Management* 80(7):16-20.
- Coe, Charles K. 2009. *Handbook of Urban Services: A Basic Guide for Local Governments*. Armonk, NY: M. E. Sharpe.
- Coleman, James S. 1973. *The Mathematics of Collective Action*. Chicago: Aldine Publishing Co.
- Comfort, Louise K. 1999. *Shared Risk: Complex Systems in Seismic Response*. New York: Pergamon.
- Comfort, Louise K., Arjen Boin, and Chris C. Demchak, eds. 2010. *Designing Resilience: Preparing for Extreme Events*. Pittsburgh, PA: University of Pittsburgh Press.
- Cook, Karen, and Robin M. Cooper. 2003. "Experimental Studies of Cooperation, Trust, and Social Exchange." Pp. 209-44 in *Trust and Reciprocity: Interdisciplinary Lessons from Experimental Research*, edited by E. Ostrom and J. Walker. New York: Russell Sage Foundation.
- Cook, Michael L. 1993. "Cooperatives and Group Action." Pp. 154-69 in *Food and Agricultural Marketing Issues for the 21st Century*, edited by D. I. Padberg. College Station, TX: Texas A & M University.
- Cook, Michael L. 1995. "The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach." *American Journal of Agricultural Economics* 77(5):1153-59.
- Creswell, John W. 2009. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3rd ed. Thousand Oaks, CA: Sage.

- Cross, John A. 2001. "Megacities and Small Towns: Different Perspectives on Hazard Vulnerability." *Environmental Hazards* 3(2):63-80.
- Cutter, Susan L. 2001. *American Hazardscapes: The Regionalization of Hazards and Disasters*. Washington, DC: Joseph Henry Press.
- Cutter, Susan L. 2006. *Hazards, Vulnerability, and Environmental Justice*, Sterling, VA: Earthscan.
- Cutter, Susan L., Bryan L. Boruff, and W. Lynn Shirley. 2003. "Social Vulnerability to Environmental Hazards." *Social Science Quarterly* 84(2):242-61.
- Davis, Ian. 2004. "Progress in Analysis of Social Vulnerability and Capacity." Pp. 129-44 in *Mapping Vulnerability: Disasters, Development, and People*, edited by G. Bankoff, G. Frerks, and D. Hilhorst. Sterling, VA: Earthscan.
- de Bruijne, Mark, Arjen Boin, and Michel van Eeton. 2010. "Resilience: Exploring the Concept and Its Meanings." Pp. 13-32 in *Designing Resilience: Preparing for Extreme Events*, edited by L. K. Comfort, A. Boin, and C. C. Demchak. Pittsburgh, PA: University of Pittsburgh Press.
- DiMaggio, Paul J., and Walter W. Powell. 1983. "The Iron Cages Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48(2):147-60.
- Dombrowsky, Wolf R. 1987. "Critical Theory in Sociological Disaster Research." Pp. 331-56 in *Sociology of Disasters: Contribution of Sociology to Disaster Research*, edited by R. R. Dynes, B. de Marchi, and C. Pelanda. Milano, Italy: Franco Angeli Libri.

- Donahue, Amy K. 2004. "Managerial Perceptions and the Production of Fire Protection." *Administration & Society* 35(6):717-46.
- Donaldson, Lex. 2001. *The Contingency Theory of Organizations*. Thousand Oaks, CA: Sage.
- Drabek, Thomas E. 1983. "Alternative Patterns of Decision-making in Emergent Disaster Response Networks." *International Journal of Mass Emergencies and Disasters* 1(2):277-305.
- Drabek, Thomas E. 1985. "Managing the Emergency Response." *Public Administration Review* 45(Special Issue January):85-92.
- Drabek, Thomas E. 1987a. *The Professional Emergency Manager: Structures and Strategies for Success*. Boulder: University of Colorado, Institute of Behavioral Sciences.
- Drabek, Thomas E. 1987b. "Emergent Structures." Pp. 259-90 in *Sociology of Disasters: Contribution of Sociology to Disaster Research*, edited by R. R. Dynes, B. de Marchi, and C. Pelanda. Milano, Italy: Franco Angeli Libri.
- Drabek, Thomas E. 2010. *The Human Side of Disaster*. Boca Raton, FL: CRC Press.
- Drabek, Thomas E., and Gerard J. Hoetmer, eds. 1991. *Emergency Management: Principles and Practice for Local Government*. Washington, DC: International City Management Association.
- Drabek, Thomas E., and David A. McEntire. 2002. "Emergent Phenomena and Multiorganizational Coordination in Disasters: Lessons from the Research Literature." *International Journal of Mass Emergencies and Disasters* 20(2):197-224.

- Duncombe, William D. 1992. "Costs and Factor Substitution in the Provision of Local Fire Services." *The Review of Economics and Statistics* 74(1):180-84.
- Dynes, Russell R. 1970. *Organized Behavior in Disaster*. Lexington, MA: Heath Lexington Books.
- Dynes, Russell R. 2006. "Social Capital: Dealing With Community Emergencies." *Homeland Security Affairs* 2(2):1-26.
- Dynes, Russell R., and E. L. Quarantelli. 1968. "Group Behavior under Stress: A Required Convergence of Organizational and Collective Behavior Perspectives." *Sociology and Social Research* 52(4):416-29.
- Dynes, Russell R., and E. L. Quarantelli. 1970. "Interorganizational Relations in Communities under Stress." Preliminary Paper No. 2. Columbus, OH: Ohio State University. Retrieved September 18, 2012 (<http://udspace.udel.edu/handle/19716/372>).
- Dynes, Russell R., and E. L. Quarantelli. 1986. "Role Simplification in Disaster." Article #183. Newark: University of Delaware Disaster Research Center. Retrieved September 18, 2012 (<http://udspace.udel.edu/handle/19716/1122>).
- Edwards, Frances L. 2013. "All Hazards, Whole Community: Creating Resiliency." Pp. 21-47 in *Disaster Resiliency: Interdisciplinary Perspectives*, edited by N. Kapucu, C. V. Hawkins, and F. I. Rivera. New York: Routledge.
- Environmental Protection Agency. Office of Solid Waste and Emergency Management Response. 2012. "The Emergency Planning and Community Right to Know Act. EPA 550-F-12-002." Retrieved September 7, 2016

(https://www.epa.gov/sites/production/files/2015-05/documents/epcra_fact_sheet.pdf).

- Ersing, Robin L., and Kathleen A. Kost, eds. 2012. *Surviving Disaster: The Role of Social Networks*. Chicago: Lyceum Books.
- Etzioni, Amitai. 1961. *Complex Organizations: A Sociological Reader*. New York: Holt, Rinehart, and Winston.
- Etzioni, Amitai. 1964. *Modern Organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Evan, William. [1966] 1971. "The Organizational-Set: Toward a Theory of Interorganizational Relations." Pp. 173-91 in *Approaches to Organizational Design*, edited by J. D. Thompson. Pittsburgh, PA: University of Pittsburg Press.
- Evan, William. [1972] 1976. "An Organization-Set Model of Interorganizational Relations." Pp 78-90 in *Interorganizational Relations: Selected Readings*, edited by W. M. Evan. Harmondsworth, England: Penguin.
- Fischer, Claude S., Robert M. Jackson, C. Ann Stueve, Kathleen Gerson, Lynne M. Jones, and Mark Baldassare. 1977. *Networks and Places: Social Relations in the Urban Setting*. New York: The Free Press.
- Flint, Courtney G., and M.A. Brennan. 2007. "Rural Communities and Disasters: Research from the Southern United States." *Southern Rural Sociology* 22(2):1-5.
- Flora, Cornelia Butler, and Jan L. Flora. 2008. *Rural Communities: Legacy and Change*. 3rd ed. Boulder, CO: Westview Press.
- Flynn, Stephen. 2007. *The Edge of Disaster: Rebuilding a Resilient Nation*. New York: Random House.

- Furbee, Paul M., Jeffery H. Coben, Sharon K. Smyth, William G. Manley, Daniel E. Summers, Nels D. Sanddal, Teri L. Sanddal, James C. Helmkamp, Rodney L. Kimble, Ronald C. Althouse, and Aaron T. Kocsis. 2006. "Realities of Rural Emergency Medical Services Disaster Preparedness." *Prehospital and Disaster Medicine* 21(2):64-70.
- Galaskiewicz, Joseph, and Karl R. Krohn. 1984. "Positions, Roles, and Dependencies in a Community Interorganization System." *Sociological Quarterly* 25(4):527-50.
- Gamache, Sharon, John R. Hall Jr., Marty Ahrens, Geri Penney, and Ed Kirtley. 2007. *Mitigation of the Rural Fire Problem: Strategies Based on Original Research and Adaptation of Existing Best Practices*. Emmitsburg, MD: United States Fire Administration.
- Garman, Aaron, Thomas Kaspari, Jacinta Klindworth, Edward T. Schafer, Lori Zeller, Christopher McLean, Gregory Rohde, Carla Anderson, and Mary Niles. 2004. "The Golden Rule: Do Unto Rural as You Do Unto Urban." *JEMS: A Journal of Emergency Medical Services* 29(12):48-50, 52-67.
- Gillespie, David F. 1991. "Coordinating Community Resources." Pp. 55-78 in *Emergency Management: Principles and Practice for Local Government*, edited by T. E. Drabek, and G. J. Hoetmer. Washington, DC: International City Management Association.
- Gillespie, David F., and Dennis S. Mileti. 1979. *Technostructures and Interorganizational Relations*. Lexington, MA: D. C. Heath and Company.
- Gillespie, David F., Dennis S. Mileti, and Ronald W. Perry. 1976. *Organizational Response to Changing Community Systems*. Kent, OH: Kent State University.

- Gillespie, David F., and Susan A. Murty. 1994. "Cracks in a Postdisaster Service Delivery Network." *American Journal of Community Psychology* 22(5):639-60.
- Gillespie, David F., and Ronald W. Perry. 1975. "The Influence of an Organizational Environment on Interorganizational Relations." *American Journal of Economics and Sociology* 34(1):29-42.
- Gillespie, David F., and Calvin L. Streeter. 1987. "Conceptualizing and Measuring Disaster Preparedness." *International Journal of Mass Emergencies and Disasters* 5(2):155-76.
- Gillette, John M. 1913. *Constructive Rural Sociology*. New York: Sturgis and Walton Company.
- Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78(6):1360-80.
- Granovetter, Mark. 1976. "Network Sampling: Some First Steps." *American Journal of Sociology* 81(6):1287-1303.
- Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91(3):481-510.
- Green, John J., Duane A. Gill, and Anna M. Kleiner. 2006. "From Vulnerability to Resiliency: Assessing Impacts and Responses to Disaster." *Southern Rural Sociology* 21(2):89-99.
- Haas, J. Eugene, and Thomas E. Drabek. 1973. *Complex Organizations: A Sociological Perspective*. New York: Macmillan.
- Haddow, George. D., Jane A. Bullock, and Damon P. Coppola. 2014. *Introduction to Emergency Management*. 5th ed. Waltham, MA: Butterworth-Heinemann.

- Hall, Richard H., and Pamela S. Tolbert. 2005. *Organizations: Structures, Processes, and Outcomes*. 9th ed. Upper Saddle River, NJ: Pearson Prentice Hall.
- Halpert, Burton P. 1982. "Antecedents." Pp. 54-72 in *Interorganizational Coordination: Theory, Research, and Implementation*, edited by D. L. Rogers, and D. A. Whetten. Ames: Iowa State University Press.
- Handel, Michael, ed. 2003. *The Sociology of Organizations: Classic, Contemporary, and Critical Readings*. Thousand Oaks, CA: Sage Publications.
- Hawthorn, Horace B. 1926. *The Sociology of Rural Life*. New York: The Century Company.
- Haynes, Hylton J. G., and Gary P. Stein. 2016. "U.S. Fire Department Profile." Quincy, MA: National Fire Protection Association. Retrieved July 22, 2016 (<http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/the-fire-service/administration/us-fire-department-profile>).
- Hazards and Vulnerability Research Institute. 2016. "Social Vulnerability Index." University of South Carolina. Retrieved August 30, 2016 (<http://artsandsciences.sc.edu/geog/hvri/hvri-resources>).
- Holcombe, Emily. 2007. "Understanding Community-Based Disaster Response: Houston's Religious Congregations and Hurricane Katrina Relief Efforts." Pp. 107-19 in *The Sociology of Katrina: Perspectives on a Modern Catastrophe*, edited by D. L. Brunson, D. Overfelt, and J. S. Picou. Lanham, MD: Rowman & Littlefield Publishers.
- International Association of Emergency Managers. 2007. *Principles of Emergency Management Supplement*. Retrieved July 22, 2016

(www.iaem.com/document/Principles-of-Emergency-Management-Supplement.pdf).

- Jensen, Jessica. 2009. "NIMS in Rural America." *International Journal of Mass Emergencies and Disasters* 27(3):218-49.
- Jepperson, Ronald L. 1991. "Institutions, Institutional Effects, and Institutionalism." Pp. 143-63 in *New Institutionalism in Organizational Analysis*, edited by W. W. Powell, and P. J. DiMaggio. Chicago: University of Chicago Press.
- Kanter, Rosabeth Moss. [1977] 1993. *Men and Women of the Corporation*. New York: Basic Books.
- Kapucu, Naim. 2005. "Interorganizational Coordination in Dynamic Context: Networks in Emergency Response Management." *Connections* 26(2):33-48.
- Kapucu, Naim. 2009. "Interorganizational Coordination in Complex Environments of Disasters: The Evolution of Intergovernmental Disaster Response Systems." *Journal of Homeland Security and Emergency Management* 6(1, Article 47):1-26.
- Kapucu, Naim, Tolga Arslan, and Matthew Lloyd Collins. 2010. "Examining Intergovernmental and Interorganizational Response to Catastrophic Disasters: Toward a Network-Centered Approach." *Administration and Society* 42(2):222-47.
- Kapucu, Naim, Tolga Arslan, and Fatih Demiroz. 2010. "Collaborative Emergency Management and National Emergency Management Network." *Disaster Prevention and Management* 19(4):452-68.
- Kapucu, Naim, Maria-Elena Augustin, and Vener Garayev. 2009. "Interstate Partnerships in Emergency Management: Emergency Management Assistance Compact in

- Response to Catastrophic Disasters." *Public Administration Review* 69(2):297-313.
- Kapucu, Naim, Christopher V. Hawkins, and Fernando I. Rivera, eds. 2013. *Disaster Resiliency: Interdisciplinary Perspectives*. New York: Routledge.
- Kapucu, Naim and Qian Hu. 2014. "Understanding Multiplexity of Collaborative Emergency Management Networks." *American Review of Public Administration* 46(4):399-417.
- Kennedy, Will C. 1970. "Police Departments: Organization and Tasks in Disaster." *American Behavioral Scientist* 13(3):354.
- Killian, Lewis M. 1952. "The Significance of Multiple-Group Membership in Disaster." *American Journal of Sociology* 57(4):309-14.
- Kleiner, Anna M., John J. Green, and Albert B. Nylander, III. 2007. "A Community Study of Disaster Impacts and Redevelopment Issues Facing East Biloxi, Mississippi." Pp. 155-72 in *The Sociology of Katrina: Perspectives on a Modern Catastrophe*, edited by D. L. Brunsma, D. Overfelt, and J. S. Picou. Lanham, MD: Rowman & Littlefield Publishers.
- Krebs, Valdis, and June Holley. 2006. "Building Smart Communities Through Network Weaving." Retrieved February 13, 2017 (<http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/article-krebs-holley.pdf>).
- Kuhns, Joseph B. III, Edward R. Maguire, and Stephen M. Cox. 2007. "Public-Safety Concerns Among Law Enforcement Agencies in Suburban and Rural America." *Police Quarterly* 10(4):429-54.

- Laumann, Edward O., and Franz U. Pappi. 1976. *Networks of Collective Action: A Perspective on Community Influence Systems*. New York: Academic Press.
- Leana, Carrie R., and Harry J. Van Buren III. 1999. "Organizational Social Capital and Employment Practices." *Academy of Management Review* 24(3):538-55.
- Lindell, Michael K. 1994. "Are Local Emergency Planning Committees Effective in Developing Community Disaster Preparedness?" *International Journal of Mass Emergencies and Disasters* 12(2):159-82.
- Lindell, Michael K., David J. Whitney, Christina J. Futch, and Catherine S. Clause. 1996. "The Local Emergency Planning Committee: A Better Way to Coordinate Disaster Planning." Pp. 234-49 in *Disaster Management in the U.S. and Canada: The Politics, Policymaking, Administration, and Analysis of Emergency Management*. 2nd ed., edited by R. T. Sylves, and W. L. Waugh Jr. Springfield, IL: Charles C. Thomas.
- Lozier, John. 1976. "Volunteer Fire Departments and Community Mobilization." *Human Organization* 35(4):345-54.
- Mandell, Myrna P., and Robyn Keast. 2008. "Evaluating the Effectiveness of Interorganizational Relations Through Networks." *Public Management Review* 10(6):715-31.
- McEntire, David A. 2007. "Local Emergency Management Organizations." Pp. 168-82 in *Handbook of Disaster Research*, edited by H. Rodríguez, E. L. Quarantelli, and R. R. Dynes. New York: Springer.
- McGill, William L. 1957. "How a State Prepares for Disaster." Pp. 89-97 in *Annals of the American Academy of Political and Social Science*, Vol. 309, *Disasters and*

- Disaster Relief*, edited by D. Smith. Philadelphia, PA: American Academy of Political and Social Science.
- McGuire, Michael. 2009. "The New Professionalism and Collaborative Activity in Local Emergency Management." Pp. 71-93 in *The Collaborative Public Manager: New Ideas for the Twenty-First Century*, edited by R. O'Leary, and L. B. Bingham. Washington, DC: Georgetown University Press.
- McLennan, Jim, and Adrian Birch. 2005. "A Potential Crisis in Wildfire Emergency Response Capability? Australia's Volunteer Firefighters." *Environmental Hazards* 6(2):101-7.
- McLoughlin, David. 1985. "A Framework for Integrated Emergency Management." *Public Administration Review* 45(January Special Issue):165-72.
- McPherson, Miller, Lynn Smith-Lovin, and James M. Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27:415-44.
- Meyer, John W., and Brian Rowan. 1991. "Institutionalized Organizations: Formal Structure as Myth and Ceremony." Pp. 41-62 in *The New Institutionalism in Organizational Analysis*, edited by W. W. Powell, and P. J. DiMaggio. Chicago: University of Chicago Press.
- Mileti, Dennis S. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, DC: Joseph Henry Press.
- Miller, David L. 2000. *Introduction to Collective Behavior and Collective Action*. 2nd ed. Long Grove, IL: Waveland Press.
- Milward, H. Brinton, and Keith G. Provan. 1998. "Measuring Network Structure." *Public Administration* 76(2):387-407.

- Missouri State Emergency Management Agency. 2011. "State Hazard Analysis."
Retrieved September 16, 2013
(http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%20&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/2012-State-Hazard-Analysis/TOC_intro.pdf).
- Mulford, Charles L., and David L Rogers. 1982. "Definitions and Models." Pp. 9-31 in *Interorganizational Coordination: Theory, Research, and Implementation*, edited by D. L. Rogers, and D. A. Whetten. Ames: Iowa State University Press.
- Murphy, Brenda L. 2007. "Locating Social Capital in Resilient Community-Level Emergency Management." *Natural Hazards* 41(2):297-315.
- Nahapiet, Janine, and Sumantra Ghoshal. 1998. "Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review* 23(2), 242-66.
- National Emergency Number Association. 2013. "NENA's Mission." Retrieved September 13, 2017 (<https://www.nena.org/?page=Mission>).
- Nee, Victor. 2001. "Sources of the New Institutionalism." Pp. 1-16 in *The New Institutionalism in Sociology*, edited by M. C. Brinton and V. Nee. Stanford, CA: Stanford University Press.
- Nee, Victor, and Paul Ingram. 2001. "Embeddedness and Beyond: Institutions, Exchange, and Social Structure." Pp. 19-45 in *The New Institutionalism in Sociology*, edited by M. C. Brinton, and V. Nee. Stanford, CA: Stanford University Press.
- Norris, Donald F., Marvin B. Mandell, and William E. Hathaway. 1993. "Volunteers in Emergency Medical Service: A Case Study from Rural America." *Public Productivity and Management Review* 16(3):257-69.

- North, Douglass C. 1990. *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press.
- O'Brien, David J. 2011. "Formal Institutional Solutions to the Development of Social Capital." *International Social Science Journal* 62(203-204):217-28.
- O'Brien, David J., John Phillips, and Valeri V. Patsiorkovsky. 2005. "Linking Indigenous Bonding and Bridging Social Capital." *Regional Studies* 39(8):1041-51.
- O'Brien, David J., Andrew Raedeke, and Edward W. Hassinger. 1998. "The Social Networks of Leaders in More or Less Viable Communities Six Years Later: A Research Note." *Rural Sociology* 63(1):109-26.
- O'Leary, Rosemary, and Lisa Blomgren Bingham. 2009. *The Collaborative Public Manager: New Ideas for the Twenty-First Century*. Washington, DC: Georgetown University Press.
- O'Leary, Rosemary, Beth Gazley, Michael McGuire, and Lisa Blomgren Bingham. 2009. "Public Managers in Collaboration." Pp. 1-12 in *The Collaborative Public Manager: New Ideas for the Twenty-First Century*, edited by R. O'Leary, and L. B. Bingham. Washington, DC: Georgetown University Press.
- O'Leary, Rosemary, Catherine Gerard, and Lisa Blomgren Bingham. 2006. "Introduction to the Symposium on Collaborative Public Management." *Public Administration Review* 66(Supplement):6-9.
- Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA.: Harvard University Press.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action* Cambridge: New York: Cambridge University Press.

- Ostrom, Elinor. 2003. "Toward a Behavioral Theory Linking Trust, Reciprocity, and Reputation." Pp. 19-79 in *Trust and Reciprocity: Interdisciplinary Lessons from Experimental Research*, edited by E. Ostrom, and J. Walker. New York: Russell Sage Foundation.
- Ostrom, Elinor, and James Walker, eds. 2003. *Trust and Reciprocity: Interdisciplinary Lessons from Experimental Research*. New York: Russell Sage Foundation.
- O'Toole, Laurence J. Jr. 1997. "Treating Networks Seriously: Practical and Research-Based Agendas in Public Administration." *Public Administration Review* 57(1):45-52.
- Ott, J. Steven, and Mohammed M. Hasanen. 1995. "Emergency Medical Services: Yet Another Developing Crisis in Rural America." *State and Local Government Review* 27(2):159-68.
- Parsons, Talcott. [1960] 1967. *Structure and Process in Modern Societies*. New York: Free Press.
- Perkins, Kenneth B. 1987. "Volunteer Fire Departments: Community Integration, Autonomy and Survival." *Human Organization* 46(4):342-348.
- Perkins, Kenneth B. 1989. "Volunteer Firefighters in the United States: A Descriptive Study." *Nonprofit and Voluntary Sector Quarterly* 18(3):269-77.
- Perkins, Kenneth B. 1990. "Volunteer Fire and Rescue Corporations: Structure, Process, and Survival." *Nonprofit and Voluntary Sector Quarterly* 19(4):359-69.
- Perkins, Kenneth B., and John Benoit. 2004. "Volunteer Satisfaction and Serious Leisure in Rural Fire Departments: Implications for Human Capital and Social Capital." Pp. 71-86 in *Volunteering as Leisure/Leisure as Volunteering: An International*

- Assessment*, edited by R. A. Stebbins, and M. Graham. Cambridge, MA: CABI Publishing.
- Perrow, Charles. 1986. *Complex Organizations: A Critical Essay*. 3rd ed. New York: McGraw-Hill.
- Perrow, Charles. 1991. "A Society of Organizations." *Theory and Society* 20(6):725-62.
- Perrow, Charles. 2002. *Organizing America: Wealth, Power, and the Origins of Corporate Capitalism*. Princeton, NJ: Princeton University Press.
- Perrow, Charles. 2007. *The Next Catastrophe: Reducing Our Vulnerabilities to Natural, Industrial, and Terrorist Disasters*. Princeton, NJ: Princeton University Press.
- Perry, James L., and Ann Marie Thomson. 2004. *Civic Service: What Difference Does It Make?* Armonk, NY: M.E. Sharpe.
- Pfeffer, Jeffrey, and Gerald R. Salancik. [1978] 2003. *The External Control of Organizations: A Resource Dependence Perspective*. Stanford, CA: Stanford University Press.
- Phillips, Brenda, D. 2016. *Disaster Recovery*. 2nd ed. Boca Raton, FL: CRC Press.
- Picou, J. Steven, Brent K. Marshall, and Duane A. Gill. 2004. "Disaster, Litigation, and the Corrosive Community." *Social Forces* 82(4):1493-522.
- Pigg, Kenneth E., and Ted K. Bradshaw. 2003. "Catalytic Community Development: A Theory of Practice for Changing Rural Society." Pp. 385-96 in *Challenges for Rural America in the Twenty-First Century*, edited by D. L. Brown, L. E. Swanson, and A. W. Barton. University Park, PA: Pennsylvania State University Press.

- Powell, Walter W., and Paul J. DiMaggio, eds. 1991. *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press.
- Prell, Christina. 2012. *Social Network Analysis: History, Theory & Methodology*. Los Angeles: SAGE.
- Prince, Samuel Henry. [1920] 1968. *Catastrophe and Social Change: Based Upon a Sociological Study of the Halifax Disaster*. New York: AMS Press.
- Provan, Keith G., and H. Brinton Milward. 2001. "Do Networks Really Work? A Framework for Evaluating Public-Sector Organizational Networks." *Public Administration Review* 61(4):414-23.
- Provan, Keith G., Mark A. Veazie, Lisa K. Staten, and Nicolette I. Teufel-Shone. 2005. "The Use of Network Analysis to Strengthen Community Partnerships." *Public Administration Review* 65(5):603-13.
- Quarantelli, E. L., ed. 1998. *What is a Disaster: Perspectives on the Question?* New York: Routledge.
- Quarantelli, E. L. 1999. "Implications for Programmes and Policies from Future Disaster Trends." *Risk Management* 1(1):9-19.
- Quarantelli, E. L. 2006. *The Disasters of the 21st Century: A Mixture of New, Old, and Mixed Types*. Newark, DE: Disaster Research Center, University of Delaware.
- Radin, Beryl A., Robert Agranoff, Ann O'M. Bowman, C. Gregory Buntz, J. Steven Ott, Barbara S. Romzek, and Robert H. Wilson. 1996. *New Governance for Rural America: Creating Intergovernmental Partnerships*. Lawrence: University of Kansas Press.

- Redlener, Irwin. 2006. *Americans at Risk: Why We Are Not Prepared for Megadisasters and What We Can Do Now*. New York: Random House.
- Ring, Peter Smith, and Andrew H. Van de Ven. 1994. "Developmental Processes of Cooperative Interorganizational Relationships." *Academy of Management Review* 19(1):90-118.
- Ripley, Amanda. 2009. *The Unthinkable: Who Survives When Disaster Strikes—and Why*. New York: Three Rivers Press.
- Sanderson, Dwight. 1923. "Community Organization for Rural Social Work." *Journal of Social Forces* 1(2):156-61.
- Sanderson, Dwight, and Robert A. Polson. 1939. *Rural Community Organization*. New York: Wiley.
- Schneider, Sandra K. 1998. "Reinventing Public Administration: A Case Study of the Federal Emergency Management Agency." *Public Administration Quarterly* 22(1):35-57.
- Scott, John. 2000. *Social Network Analysis: A Handbook*. 2nd ed. London: Thousand Oaks, CA: SAGE Publications.
- Scott, W. Richard. 1991. "Unpacking Institutional Arguments." Pp. 164-82 in *New Institutionalism in Organizational Analysis*, edited by W. W. Powell, and P. J. DiMaggio. Chicago: University of Chicago Press.
- Scott, W. Richard. 2003a. *Organizations: Rational, Natural, and Open Systems*. 5th ed. Upper Saddle River, NJ: Prentice Hall.
- Scott, W. Richard. 2003b. "Introduction to the Transaction Edition: Thompson's Bridge over Troubled Waters." Pp. xv-xxiii in *Organizations in Action: Social Science*

- Bases of Administrative Theory*, by J. D. Thompson. New Brunswick, NJ: Transaction Publishers.
- Scott, W. Richard. 2004. "Reflections on a Half-Century of Organizational Sociology." *Annual Review of Sociology* 30:1-21.
- Scott, W. Richard. 2014. *Institutions and Organizations: Ideas, Interests, and Identities*. 4th ed. Los Angeles: SAGE.
- Selznick, Philip. 1949. *TVA and the Grass Roots: A Study in the Sociology of Formal Organization*. Berkeley, CA: University of California Press.
- Selznick, Philip. 1957. *Leadership in Administration: A Sociological Interpretation*. Berkeley, CA: University of California Press.
- Simo, Gloria, and Angela L. Bies. 2007. "The Role of Nonprofits in Disaster Response: An Expanded Model of Cross-Sector Collaboration." *Public Administration Review* 67(Special Issue):125-42.
- Simon, Neil, and Sanford Altschul. 2007. "Challenges to Regionalization of Emergency Management." *Journal of Emergency Management* 5(1):11-14.
- Simpson, Charles R. 1996. "A Fraternity of Danger: Volunteer Fire Companies and the Contradictions of Modernization." *American Journal of Economics and Sociology* 55(1):17-34.
- Stinson, Thomas F. 1978. "Household Allocation of Voluntary Labor in the Production of Fire Protection: Minnesota Evidence." *American Journal of Agricultural Economics* 60(2):331-7.

- Streeter, Calvin L., and David F. Gillespie. 1992. "Social Network Analysis." Pp. 201-22 in *Quantitative Methods in Social Work: State of the Art*, edited by D. F. Gillespie, and C. Glisson. Binghampton, NY: Haworth Press.
- Sundeen, Richard A. 1990. "Citizens Serving Government: The Extent and Distinctiveness of Volunteer Participation in Local Public Agencies." *Nonprofit and Voluntary Sector Quarterly* 19(4):329-44.
- Sylves, Richard T. 2007. "Federal Emergency Management Comes of Age: 1979-2001." Pp. 111-60 in *Emergency Management: The American Experience, 1900-2005*, edited by C. B. Rubin. Fairfax, VA: Public Entity Risk Institute.
- Thompson, Alexander M. III. 1993. "Volunteers and Their Communities: A Comparative Analysis of Volunteer Fire Fighters." *Nonprofit and Voluntary Sector Quarterly* 22(2):155-66.
- Thompson, Alexander M. III, and Barbara A. Bono. 1993. "Work Without Wages: The Motivation for Volunteer Firefighters." *American Journal of Economics and Sociology* 52(3):323-43.
- Thompson, James D. [1967] 2003. *Organizations in Action: Social Science Bases of Administrative Theory*. New Brunswick, NJ: Transaction Publishers.
- Thompson, James D., and Robert W. Hawkes. 1962. "Disaster, Community Organization, and Administrative Process." Pp. 268-303 in *Man and Society in Disaster*, edited by G. W. Baker, and D. W. Chapman. New York: Basic Books.
- Tierney, Kathleen J., Michael K. Lindell, and Ronald W. Perry, eds. 2001. *Facing the Unexpected: Disaster Preparedness and Response in the United States*. Washington, DC: Joseph Henry Press.

- Turk, Herman. 1977. *Organization in Modern Life: Cities and Other Large Networks*.
San Francisco, CA: Jossey-Bass Publishers.
- Turner, Barry A. 1976. "The Organizational and Interorganizational Development of Disasters." *Administrative Science Quarterly* 21(3):378-97.
- Turner, Barry A. 1994. "Causes of Disaster: Sloppy Management." *British Journal of Management* 5(3):215-19.
- Turner, Barry A., and Nick F. Pidgeon, eds. 1997. *Man-Made Disasters*. Oxford, England: Butterworth-Heinemann.
- U.S. Bureau of the Census. 2010. "2010 Census Interactive Population Search."
Retrieved July 10, 2016
(<https://www.census.gov/2010census/popmap/ipmtext.php>).
- U.S. Bureau of the Census. 2012. "ORG014 – Local Governments in Individual County-Type Areas: 2012." Retrieved July 10, 2016
(https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=COG_2012_ORG014&prodType=table).
- U.S. Bureau of the Census. 2014. "2010-2014 American Community Survey 5-Year Estimates." Retrieved July 10, 2016
(<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>).
- U.S. Department of Agriculture. Economic Research Service. 2016. "Rural Classifications." Retrieved December 20, 2016
(<https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/>).

- U.S. Department of Homeland Security. 2008. "National Incident Management System."
Retrieved September 10, 2013
(http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf).
- U.S. Department of Homeland Security. Federal Emergency Management Agency. 2008.
"FY 2008 NIMS Compliance Objectives and Metrics for Local Governments."
Retrieved December 16, 2016 (https://www.fema.gov/media-library-data/20130726-1626-20490-5195/fy_2008_nims_compliance_objectivesmetrics_local_march_2008a.pdf).
- U.S. Department of Transportation. 2009. "Ten Year Hazardous Materials Incidents."
Retrieved April 21, 2011
(<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/tenyr.pdf>).
- U.S. Office of Management and Budget. 2010. "Standards for Delineating Metropolitan and Micropolitan Statistical Areas; Notice." Retrieved October 10, 2014
(https://www.whitehouse.gov/sites/default/files/omb/assets/fedreg_2010/06282010_metro_standards-Complete.pdf).
- Van de Ven, Andrew H. 1980. *Measuring and Assessing Organizations*. New York: Wiley.
- Vasi, Ion Bogdan, and Michael Macy. 2003. "The Mobilizer's Dilemma: Crisis, Empowerment, and Collective Action." *Social Forces* 81(3):979-98.
- Vogt, Paul L. 1922. *Introduction to Rural Sociology*. New York: D. Appleton and Company.

- Wamsley, Gary L., and Aaron D. Schroeder. 1996. "Escalating in a Quagmire: The Changing Dynamics of the Emergency Management Policy Subsystem." *Public Administration Review* 56(3):235-44.
- Warheit, George J. 1970. "Fire Departments: Operations During Major Community Emergencies." *American Behavioral Scientist* 13(3):362-68.
- Warner, Mildred E. 2003. "Competition, Cooperation, and Local Governance." Pp. 252-61 in *Challenges for Rural America in the Twenty-First Century*, edited by D. L. Brown, L. E. Swanson, and A. W. Barton. University Park, PA: Pennsylvania State University.
- Waugh, William L. Jr. 1994. "Regionalizing Emergency Management: Counties as State and Local Government." *Public Administration Review* 54(3):253-58.
- Waugh, William L. Jr. 2000. *Living With Hazards*. Armonk, NY: M. E. Sharpe.
- Waugh, William L. Jr. 2009. "Mechanisms for Collaboration in Emergency Management: ICS, NIMS, and the Problem with Command and Control." Pp. 157-75 in *The Collaborative Public Manager: New Ideas for the Twenty-First Century*, edited by R. O'Leary, and L. B. Bingham. Washington, DC: Georgetown University Press.
- Waugh, William L. Jr. 2013. "Management Capacity and Rural Community Resilience." Pp. 291-307 in *Disaster Resiliency: Interdisciplinary Perspectives*, edited by N. Kapucu, C. V. Hawkins, and F. I. Rivera. New York: Routledge.
- Waugh, William L. Jr., and Ronald John Hy, eds. 1990. *Handbook of Emergency Management: Programs and Policies Dealing with Major Hazards and Disasters*. Westport, CT: Greenwood.

- Weber, Max. [1924] 2003. "Bureaucracy and Legitimate Authority." Pp. 17-23 in *The Sociology of Organizations: Classic, Contemporary, and Critical Readings*, edited by M. J. Handel. Thousand Oaks, CA: Sage Publications.
- Weick, Karl E., and Kathleen M. Sutcliffe. 2007. *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*. San Francisco, CA: Jossey-Bass.
- Weisheit, Ralph A., L. Edward Wells, and David N. Falcone. 1995. *Crime and Policing in Rural and Small-Town America: An Overview of the Issues*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.
- Wenger, Dennis, E. L. Quarantelli, and Russell R. Dynes. 1989. *Disaster Analysis: Police and Fire Departments*. Newark: University of Delaware Disaster Research Center.
- Wilkinson, Kenneth P. 1970. "The Community as a Social Field." *Social Forces* 48(3): 311-22.
- Wilkinson, Kenneth P. 1986. "In Search of the Community in the Changing Countryside." *Rural Sociology* 51(1):1-17.
- Wilkinson, Kenneth P. 1991. *The Community in Rural America*. Middleton, WI: Social Ecology Press.
- Woolcock, Michael, and Deepa Narayan. 2000. "Social Capital: Implications for Development Theory, Research, and Policy." *World Bank Research Observer* 15(2):225-49.
- Yin, Robert K. 2003. *Case Study Research: Design and Methods*. 3rd ed. Thousand Oaks, CA: Sage.

Zakour, Michael J., and David F. Gillespie. 1998. "Effects of Organizational Type and Localism on Volunteerism and Resource Sharing During Disasters." *Nonprofit and Voluntary Sector Quarterly*, 27(1):49-65.

APPENDIX A

METHODOLOGY

This mixed methods study collected data through interviews, surveys, observations, and document review about the emergency management network in one rural Missouri County. A case study approach (Yin 2003) was adopted to study a county level network of organizations involved in local emergency management. Quantitative and qualitative methods (Babbie 2004) were used to collect new information and obtain existing data to explore the inter-organizational relationships within the emergency management network and the institutions that builds social capital and sustains the collective action in one rural community. The research location was chosen because the researcher had previously established relationships with many of the organizations providing access and a foundation of trust to enable data collection.

This study utilized a sequential mixed methods approach (Creswell 2009) to obtain data in multiple ways from multiple sources to produce this case study (Yin 2003). The organizations invited to participate in this research are located in the same county in the state of Missouri. Organizations selected to participate have organizational headquarters located in the selected county. Therefore local offices or facilities of state or national organizations were not included in this study. The local emergency management network was defined as public sector organizations engaged in public safety activities including emergency response and planning. The organizations identified in the county to be surveyed include city police and fire departments, independently governed districts, and county level departments and agencies.

An initial survey of the two positional leaders of 18 emergency services agencies in one rural county in Missouri provided data for network analysis using UCINET software (Borgatti, Everett, and Freeman 2002). The 24 organizational leaders that consented to participate in the research were asked to complete a survey about interactions and relationships with the other organizations in the local emergency management network. The leaders were asked to rate the inter-organizational relations on four dimensions; daily interactions, goal alignment, information inflow, and collaboration for service delivery (See Appendix B).

Interviews were also conducted with the participating leaders adding descriptive information about the relationship ties identified in the survey, that form the local emergency management network. Interviews with these leaders gathered information about organizational strategies and challenges of adapting to emergency and disaster events in a rural community. During the interviews, these leaders were presented with a large regional disaster scenario and asked which other organizations would be relied on the most during a response and what the greatest challenge for their organization would be responding to the event. The organizational leaders were also asked about anticipated involvement of state and federal organizations and they were asked who they would be trusted the most to do the most good and which organizations would make their job more difficult. Lastly these organizational leaders were asked about the impact of multi-organizational members on the function of their organization and any perceived benefit to their organization (See Appendix B). Permission was requested to distribute surveys to organizational members (See Appendix C).

With the permission of the organizational leaders, 175 members completed surveys about their family, friendship, and membership ties to the other organizations. Memberships among these organizations include full-time employees, part-time employees and volunteers. Surveys were provided to all the emergency response members of these organizations to inquire about professional memberships, affiliations with other organizations, obligations for military service in active duty, reserve duty, and National Guard (See Appendix B). Monthly training (Perkins and Benoit 2004) and scheduled agency activities were used as survey opportunities to increase response rate when access was granted. Multi-organizational members were identified and three multi-organizational members were interviewed to ask about inter-organizational relations at the member level and strategies for adapting to multiple organizational roles (See Appendix B).

The methods employed to protect human subjects privacy included informed consent about the purpose of the research and the care taken to protect the confidentiality of research participants. All of the organizations targeted for this research are public organizations and because the topic of the research addresses the public aspects of the organization it is generally considered exempt from the full human subjects review process. An expedited review was sought from the University of Missouri Institutional Review Board and was granted. The informed consent letter, surveys, interview questions, data storage and protection procedures were reviewed by Dr. David O'Brien, faculty advisor, and the University of Missouri Institutional Review Board office, before approval. Confidentiality is maintained by creating a spreadsheet listing all of the research participants from each organization identified by a random number assigned to

each participant. This document is kept in a secure location under the control of the researcher and is the only document that contains the name of the respondent.

During initial contacts with the organizations the purpose and scope of the research was communicated in writing and appointments were made for personal meetings with organizational leaders. During the initial meeting with leaders an informed consent letter requesting research participation was distributed and questions were answered. Access to membership rosters was requested. Interviews with leaders of organizations in the emergency management system provided additional detail and context to the relationship between these organizations.

The use of qualitative methods is necessary to elucidate the motivation of volunteers and emergency services personnel and the institutions that are often “taken for granted” by organizational members (Jepperson 1991:147). These institutions are essential to maintain the collective action that is characteristic of organizations staffed by volunteers who provide crucial services during disasters.

The survey and interviews of organizational leaders and members provides the data descriptive of the rural emergency management inter-organizational network. Explaining the relationships required a critical review of the literature in four disciplinary areas to construct a conceptual theoretical framework. The discipline of emergency management has identified four essential inter-organizational relations; communication, coordination, cooperation, and collaboration. A critical review of the literature about networks, organizations, and community was conducted to identify antecedents for these four types of inter-organizational relations. Identifying antecedents to match with the

empirical data informed the explanations of the theoretical foundation for the four C's of emergency management in a rural community.

APPENDIX B

Network Survey of Leaders

This survey is one component of a research project on the interactions between first responder organizations in the emergency management network of a rural County Missouri.

Organizational Network

As a person in the leadership of the organization identified on the label, you are asked to respond on behalf of your organization. This section of the survey will ask about the frequency of interactions, shared goals, information sharing and collaborations with other organizations. Answer these questions for each organization on the list. Please place the number that corresponds to the value that most closely matches your response into the box next to the organization for each of the types of organizational relations.

Interaction with this organization is a regular part of our daily activities.

- 1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree

The goals of this organization are closely aligned to the goals of our organization.

- 1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree

This organization provides information that is important to the effective operation of our organization.

- 1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree

Our organization collaborates with this organization to enhance our service delivery.

- 1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly Agree

Organizations	Interactions	Goals	Information	Collaboration
Example	2	3	1	5
County EMA				
County Sheriff				
County Public Health				
County Ambulance District				
County Central Communication				
County Local Emer Plan Comm				
County Fire #1				
County Fire #2				
West Town Fire				
Big Town Fire				
East Town Fire				
College Police				
West Town Police				
Big Town Police				
East Town Police				
Little Town #1 Police				
Little Town #2 Police				
Little Town #3 Police				

Personal Network

This survey is one component of a research project on relations between first responder organizations in the emergency management network of a rural County Missouri. You are asked to complete this survey because you are a member of the organization on the label.

This survey will ask about your personal relationships with members of the other organizations in the emergency management network. Answer these questions for each organization on the list.

Please enter into the table the number that corresponds to your answer for each organization. Please include your own organization in your responses.

I am closely related (ie spouse, parent, child, in-law, cousin, uncle/aunt, niece/nephew) to this many members of the organization.

1. None 2. 1-2 3. 3-5 4. 6-10 5. more than 10

I am close friends (ie do things together, talk often) with this many members of the organization.

1. None 2. 1-2 3. 3-5 4. 6-10 5. more than 10

I am a member of this organization.

1. Yes 2. No

If you answer **Yes**, also answer this question.

How long have you been a member of this organization?

1. 0-1 year 2. 1-3 years 3. 4-8 years 4. 9-15 years 5. more than 15 years

Organizations	Related	Friends	Member	How long have you been a member?
EXAMPLE	2	3	2	
County EMA				
County Sheriff				
County Public Health				
County Ambulance District				
County Central Communication				
County Local Emer Plan Comm				
County Fire #1				
County Fire #2				
West Town Fire				
Big Town Fire				
East Town Fire				
College Police				
West Town Police				
Big Town Police				
East Town Police				
Little Town #1 Police				
Little Town #2 Police				
Little Town #3 Police				

Professional and social affiliations

1. How long have you been a member of this organization?
2. What is your relationship with this organization?
 - Full-time employee
 - Part-time employee
 - Volunteer
 - Other – Please describe:
3. Do you belong to a state professional association? Yes or No
 If yes, how many state professional associations to you belong to? _____
4. Do you belong to a national professional association? Yes or No
 If yes, how many national professional associations to you belong to? _____
5. Are you a member of the military? Yes or No
 If yes, which service?
6. Are you a member of a church? Yes or No
 If Yes, which?
 - Catholic
 - Mormon
 - Baptist
 - Methodist
 - Lutheran
 - Presbyterian
 - Episcopal
 - Community of Christ
 - Pentecostal
 - Seventh Day Adventist
 - Other

Demographic questions

1. How long have you lived in this County, Mo?
2. What is your sex? Male or Female
3. What year were you born?
4. What is your marital status?
 - Currently married
 - Widowed
 - Divorced
 - Separated
 - Never married
5. What is the highest degree or level of school you have completed? If currently enrolled, mark the previous grade or highest degree received.
 - Some school, did not graduate
 - High school graduate
 - Some college, no degree
 - Associate degree
 - Bachelor's degree
 - Master's degree
 - Professional degree
 - Doctorate degree
6. Please describe your work. Select all that apply.
 - Employee of a for-profit company, business or individual, for wages, salary, or commissions.
 - Employee of a not-for-profit, tax-exempt, or charitable organization
 - Local government employee
 - State government employee
 - Federal government employee
 - Self-employed in own not-incorporated business, professional practice, or farm
 - Self-employed in own incorporated business, professional practice, or farm
 - Working without pay in family business or farm
7. What is your household income?
 - Less than \$20,000
 - \$20,000 to \$49,999
 - \$50,000 to \$99,999
 - \$100,000 to \$149,999
 - \$150,000 or more
8. May I contact you for a follow-up interview? Yes or No

Interview Questions

Organizational Leaders

1. If a large natural disaster occurred in this county, for instance an EF5 tornado like the one in Joplin in 2011, which organizations would you rely on the most during the response?
2. What is the greatest challenge that your organization would face in responding to this event?
3. Anticipating that state and federal organizations would be added to the full complement of local organizations responding to such an event;
 - a. Who would you trust to do the most good?
 - b. Who do you think would make your job more difficult?
4. Assuming that there are members of your organization who are also members of other emergency services organizations and/or the military;
 - a. How do you think this would impact on your organizational function?
 - b. Could you foresee any benefit to your organization?

Interview Questions

Multi-organizational Members

1. If a large natural disaster occurred in this county, for instance an EF5 tornado like the one in Joplin in 2011;
 - a. Which organization would you respond with?

 - b. Why?

2. What are the greatest challenges you face as a multi-organizational member?

3. Do you think your multi-organizational membership provides you with special knowledge, skills, or abilities that benefit the organizations you serve?

4. If so, can you provide an example?

APPENDIX C

Division of Applied Social Sciences

College of Agriculture, Food and Natural Resources

University of Missouri-Columbia

Agricultural Economics – Agricultural Education – Agricultural Journalism – Rural Sociology

May 2, 2012

Greetings,

I am asking for your participation in a research study to identify the relationships and interactions between organizations in the emergency management network in this county in Missouri. This research will be reported in a dissertation for completion of a PhD in Rural Sociology/Community Development from the University of Missouri.

This research is only interested in the network of organizations and the responses of members of those organizations helps to explain the strength and nature of the relations between them. There are no published studies of rural emergency management networks.

It is my hope that the research findings of this survey will be helpful to public service organizations and that this information will be used to enhance emergency preparedness and response. A summary of the results will be available later this year after the survey is completed and the data analyzed.

You must be at least 18 years of age to participate in the survey. Your participation in this survey is completely voluntary and you may decline to answer any question or the entire survey. Your name will not be identified with your answers to the survey and your name will not appear any place in the reporting of the findings. All survey responses are confidential. You will be assigned a code and all of your responses will be catalogued by the code to maintain the confidentiality of your responses.

A 4-page survey will ask about the nature of relations with the study organizations, affiliations, public safety motivation, organizational commitment and some basic information used to catalogue responses. Some participants will be asked for a brief interview that will last no more than 30 minutes.

If you have questions or comments about the survey please contact me at dhb7v7@mail.missouri.edu, or by cell phone at 816-914-6571. If you have any questions regarding your rights as a research participant, please contact the Campus IRB at the University of Missouri, by phone at 573-882-9585 or email at umcresearchcirb@missouri.edu

Thank you for your time.

Sincerely,

Dianna H. Bryant

PhD Candidate

Department of Rural Sociology

University of Missouri

VITA

Dianna Havner Bryant, CIH, CSP is an Associate Professor of Crisis and Disaster Management at the University of Central Missouri. Her interest in rural emergency management led to the creation of the Institute for Rural Emergency Management at the University of Central Missouri. A certified industrial hygienist and certified safety professional with a background in hazardous materials and environmental hazards, she is a recovering technologist embracing sociology in search of better explanations for the root causes of technological failures.

Rural Sociology is a perfect intellectual home residing at the intersection of environment, organization, social change, and community. Protecting rural communities from disasters, building capacity for recovery and community disaster resilience provides an abundance of research and public service opportunities.