EMERGENCY OPERATIONS CENTER

ORGANIZATIONAL STRUCTURE DURING DISASTERS

A QUALITATIVE STUDY

By

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The dissertation is dedicated in loving memory of:

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The Honorable Putnam Kaye Reiter
Texas Senior District Judge

and

Josie C. Stanley-Reiter, J.D.

</div>

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ABSTRACT:

This dissertation explores the State of Oklahoma Emergency Operations Center (EOC) organizational structure before and during disaster response. I utilized the lens of contingency theory to review prior EOC research and linked it with mechanistic and organic structures. After the review of literature, I developed the following research question: in what ways is a state-level emergency operations center (EOC) mechanistic or organic, and how do these organizational constructs influence disaster response?

I utilized two methodological analyses to answer this research question. Content analysis is the first methodology I employed. Subsequently I analyzed three training documents from the federal government and one planning document from the State of Oklahoma. My analysis of the four documents revealed: 1) EOC organization swings between mechanistic and organic, 2) there are hidden organic structural elements, and 3) staff networking is essential. To better explore these three concepts, I conducted a second methodology involving semi-structured qualitative interviews. I used grounded theory methodology (GTM) and data driven codes to interpret the interview data. Interview results demonstrated 1) EOCs are dynamic organizations, 2) environmental cues are vital to staff completing their job, and 3) staff networking leads to relationship building and trust.

Utilizing the literature I reviewed and the two qualitative analyses I conducted, I arrived at four suggestions: 1) training documents should illustrate EOC structure as dynamic, 2) networking among staff allows for trust and coordination, 3) staff refine their role during disasters and throughout the next disaster, and 4) staff must learn the hidden organic elements of the EOC. I combined all these elements into suggestions for future scholarly research on EOCs.

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CHAPTER I

INTRODUCTION

A disaster is a sudden shock to a community caused by a low-probability event (Weick, 1988, p.369) and Fritz in 1961, minted one of the original sociological definitions of a disaster "as an event impacting an entire society or some subdivision including the notion of real impact with threat of impact that essential functions of the society [are] prevented" (Perry, 2007, p.6). Impacts from a disaster require action from the community, resulting in many organizations and departments participating in disaster response and recovery. These departments perform search-and-rescue activities, manage convergent behavior, and provide victim support (Fritz, 1957). The community's daily routine is interrupted and, if left unattended, the disaster will disrupt the local economy. Furthermore, disasters cause community resources to be stressed and exceed resource capacity, requiring outside assistance. The shift from routine emergency events to a disaster involves many dynamic factors, though there is a clear difference between everyday emergencies and disasters. Disasters differ from daily emergencies in that they exceed a community's capabilities, requiring outside aid and resources to replenish the community (Comfort, Dunn, et al, 2004). Efficient response to a disaster enables to the community to save lives, restore lifelines, and provide long-term support to survivors. The coordination point for this effort starts at the community's emergency operations center (EOC). The vital role of an EOC in disaster response and recovery is the impetus

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for this research project, looking to update the discussion regarding a state level EOC and its organizational structure and serve a foundation for future research. Many definitions of disasters exists and these require exploration.

Disaster has been defined by sociologists, environmentalists, geographers, and engineers (De Brujine, 2010). The common theme of these definitions is a sudden shift in a community's routine, whether social (sociologists) or systematic (engineers); ecologists focus on a reactive and proactive view (De Brujine, 2010). Disasters have been described as sequence-pattern events (Carr, 1932), as nonroutine social events, and as containing social processes (Dombrowsky, 1981). Whereas Carr and Dombrowsky considered the importance of preparedness, others have focused on the inevitable aspects of disaster and the emergence of a new social structure (Moore, 1956). A fundamental component of disaster is the interruption of social order (Killian, 1954).

Disasters create sudden situations requiring an immediate response from the community to protect lives, restore lifelines, and maintain the economy (Oliver-Smith, 1996). The community's emergency responders cannot wait for the disaster to begin preparing, as precious time will be lost in organizing responders. In the hours after a disaster, a community might suffer from having limited outside assistance, yet all community efforts will be focused on the disaster. Therefore, effectively mobilizing community resources in the hours immediately after a disaster is vital (Quarantelli, 1997). Eventually, outside resources will start to arrive and provide disaster assistance.

Initial disaster assistance in the United States is frequently provided by surrounding communities through mutual aid compacts or state resources, but the impact of disasters normally last a long time. These effects are primarily economic and social,

changing the community's state of being. For example, social-impact studies have revealed that one-quarter of New Orleans residents were displaced by Hurricane Katrina and remained displaced five years later (Deryugina, 2018). Two years after Hurricane Katrina, the economic impact was estimated to be near $200 billion, $96 billion of which was property damage (Baad, 2007 and Holguin-Veras, 2007). Additonally, this does not include ongoing economic impact beyond 2007, as nearly 33% of those displaced have not returned to New Orleans (Deryugina, 2018). To take another example, a fire in Paradise, California, in 2018 caused significant economic and social disruption among impacted communities, who will spend years rebuilding and recovering (Xie, 2019).

Disaster-response organizations are considered paramilitary, much like fire and police departments (Dynes, 1979). These organizational reference relates to the rigid structure most disaster responders employ. These entities utilize hierarchical structures in which commands come from the top and filter down to the lowest levels and questions flow from the bottom up (Chang, 2020). Organizational structures can be hierarchical or flexible, the latter allowing communication between ranks and not necessarily employing a top-to-bottom structure. Even though hierarchical structures are considered the best fit, empirical evidence indicates that they are not necessarily desirable (Powley, 2012). Hierarchical structures do not promote trust and improvisation between responders (Powley, 2012), which, given the fast pace of disasters, may lead to response issues. However, while flexible organizations tend to perform better overall, there is insufficient evidence to determine whether a hierarchical or flexible structure is superior. These discussions on organizational style have influenced modern disaster-management

organizations in their evolution from Cold War entities to using the all-hazards approach to disaster response.

Managing human behaviors and their consequences before, during, and after disasters is imperative. Disaster management before the 1980s, however, focused heavily on preparing for, and responding to, emergencies (NGC, 1979). When the National Governor's Conference (NGC) recommended four phases of emergency management in 1979, people began to realize the importance of managing disasters holistically and began including mitigation, preparedness, response, and recovery (NGC, 1979). Holistic emergency-management perspective, known as comprehensive emergency management (CEM), relies on partnerships between all governmental levels, the private sector, and citizens and operates by gathering all community resources post-disaster (NGC, 1979). More specifically, the CEM approach encourages emergency managers to consider the four phases as a whole (NGC, 1979). The strategies for mitigating the impact of disasters guide the development of preparedness measures, response strategies, and recovery policies. Disaster management, consequently, not only focuses on how to prepare for possible hazards and respond to the consequences from these hazards but also on establishing a general picture of how to manage possible risks and create long-term strategies to accommodate human societies to these hazards.

Therefore, researchers have proposed strategies to handle these hazards. By reviewing many disaster-preparedness documents and response activities, Quarentelli (1997) determined that there are two necessary components to disaster preparedness and response. He suggests that emergency managers and responders must satisfy agent- and response-generated demands during disaster preparedness and response. Response-

generated demands are those needs common to all types of disasters, such as marshaling

available resources to assist in the disaster effort. Agent-generated demands relate to a

particular agent, such as stocking up sandbags to stop flooding water (Quarantelli, 1997,

pp.5-6; Perry, 2003). Following this train of thought, response-generated demands can be

prepared before disasters. For example, a disaster-response system can be established and

practiced before disasters so that responders can follow established principles and

organizations to orchestrate response activities. Agent-generated demands, however,

must be met by the cooperation of different departments and organizations during

disasters because it is hard to predict which disaster is going to strike a specific area.

Agent-generated and response-generated demands occur in all disasters, and

distinguishing between these two types of demand is essential to good disaster

management (Quarantelli, 1997, p.6; Perry, 2003). The differences can be looked at as

strategic and tactical. Response-generated demands, being common to all disasters, can

be planned for strategically (Quarantelli, 1997). Strategic planning includes the

preparedness phase where emergency operations plans (EOPs) and standard operating

procedures (SOPs) are developed. Advanced planning enhances coordination among

disparate response teams. Tactical planning occurs during the incident and represents

agent-generated demands (Quarantelli, 1997). Agent-generated demands can be planned

for in advance; however, additional planning is vital during a disaster response, as all

contingencies cannot be accounted for during the planning process. Weak planning has

been identified as a reason for ineffective response (Wenger, 1986, p.8). Managing agent-

generated demands requires extensive coordination before the disaster (Drabek, 2002),

and a central facility is the best fit for the rapid pace of coordination during disaster

response. A coordination center, or emergency operations center (EOC), not only facilitates operations between governmental departments and organizations but also directs volunteers who are willing to help. The EOC manages response-generated demands and provides a location for community leaders to gather.

The processes undertaken to prepare for agent-generated and response-generated demands influence the type of organizational design employed by organization. As previously noted, organizational design can be hierarchical or flexible. Response-generated demands can be outlined in SOPs, and standardized staff positions can be created to fulfill these demands. Response-generated demands are managed through the incident command system (ICS), which is considered a hierarchical structure and establishes a clear chain of command (Chang, 2017). However, the ICS is also a flexible management system able to scale up or down depending on the need (Chang, 2017). In contrast, agent-generated demands cannot be easily predicted and change with each disaster. Hierarchical structures would be undesirable, indicating the need for a flexible response. Emergency support functions (ESFs), in which people work in groups according to their function, are inherently more flexible (FEMA, 2021). ESFs have limitations but are not hierarchical like ICS. ESF utilization in the EOC has increased in recent years due to teams working on similar tasks. The functions of the EOC are similar at the government level, but other characteristics are different.

This pre-event planning means the EOC also plays an important role during non-response periods. The EOC serves as a center to coordinate responder training, exercises, and planning (Ryan, 2012). These processes are meant to ensure responding officials are familiar with the EOC and their role within it (Ryan, 2012) so that they are able to work

together in the EOC during a crisis. However, not all EOC participants are familiar with EOC protocols and equipment. Only a few EOC staff work at the center on a day-to-day basis, and many nonroutine personnel are called to the EOC once it is activated. Diverse participants in an EOC might create communication barriers between state and local EOCs (Drabek, 1985). The diversification of participants and fragmented communication complicate an already chaotic scene as participants struggle to acquire situational awareness, which is a key element in disaster response planning (Ryan, 2012). Consequently, coordinating with nonroutine personnel and helping them work with other responders to form a team is a major challenge for EOC operation (Quarantelli, 1997).

All EOCs generate policy and coordination but also function as a central location to respond to the agent-generated and response-generated demands of a disaster. The difference in EOCs arises from their governmental levels. EOCs are found at the local (city and county), state, and federal levels. Native American EOCs are increasingly common within tribal lands. Differences exist in the size and number of participants in an EOC depending on the governmental level, frequently as a result of funding (Perry, 1995). A local EOC may be a single room, section of a small building, or even a van; state and federal EOCs occupy a much larger permanent space. Community population, geographical size, and resources vary greatly across the country; subsequently, EOC capabilities also vary. Local EOC staff may consist of a single person, such as the community's emergency manager, or include additional paid or volunteer personnel. During disaster response, these EOCs become crowded and noisy as representatives from other communities, departments, and governmental levels arrive (Neal, 1995). Larger communities and the state and federal government have many more people working in

the EOC as part of their daily routine (Perry, 1995). Private entities have also implemented EOCs, especially those vulnerable to weather, such as Walmart and FedEx.

A major function of EOCs is to serve as communication and coordination centers; these functions are meant to establish the EOC as a central link for all disaster-response events (Schrader, 2011). At its core, communication involves a sender and a receiver (Simona, 2018, p.5), whether via phone, radio, e-mail, or web systems or in-person. To serve as communication centers, EOCs have many types of communication equipment and serve as a hub during disasters. Therefore, the EOC plays an important role in the decision-making process during a crisis (Ryan, 2012). Having a communications hub allows disaster responders to improve their situational awareness and facilitates group coordination by providing additional information (e.g., weather and policy documents from other governmental departments) to bridge the coordination gap generated from multi-organizational disaster response (Perry, 1995). Other EOC functions include hosting visitors, managing disasters, providing public information, and making policy (Perry, 1995). EOC functions may be managed by traditional hierarchical or flexible structures, but not all functions will fit neatly into either of these organizational styles.

As disasters expand beyond the capacity of a single community department, more organizations (including various departments, non-governmental organizations, and volunteers) participate in disaster-response activities. Various organizations have different response priorities, organizational structures and policies, and needs. As a result, a coordination gap is common during disasters. To bridge this gap, EOCs establish multi-organizational networks to organize disaster response among multiple entities (Drabek, 2002), develop a collective mind to synchronize different response priorities between

various organizations (Weick, 1993), and mobilize resources and personnel. Consequently, the EOC is a community's primary means of coordination for processing resource requests during disasters (Lindell, 2006). EOCs are where elected officials, department heads, and others gather to coordinate an incident. Above all, the EOC must manage these functions and associated staff. Coordination is essential to disaster response and requires responders to talk to each other. Studies on organizational disaster response have indicated that pre-disaster planning is essential to the overall response effort, if only because building trust and relationships between responders is essential. The coordination effort allows for multiple organizational elements to plan how they will work together and assign roles and responsibilities. Pre-event coordination can also familiarize responders with the organizational style employed by EOC leadership.

EOCs can function under ICS or ESF, and some have utilized both concepts. Having the option between ICS or ESF is important, as ICS is command and control centric (Mignone, 2003), while ESF is non-hierarchical (FEMA, 2010). The EOC functions described above may require the implementation of hierarchical organizational structure due to prior experience and planning, and may implement any given organizational structure (Ryan, 2013). Conceivably, hierarchical may be the most appropriate organizational strategy in the early hours of a disaster and as teams are forming, allowing responders to develop relationships. However, the use of non-hierarchical organizational styles are not necessarily incompatible with the functions of an EOC or the demands placed on responders. In addition, this does not preclude a transition to more flexible organizational styles as the disaster scope and impact becomes

better understood. Utilizing one organizational style for EOC functions is not a requirement.

Following this train of thought, understanding how hierarchical and non-hierarchical structures function in the EOC is critical to facilitating disaster response. As previously discussed, EOCs differ in size, location, authority, and operation among various governmental levels in the United States. Further discussion and research on how people are organized in EOCs are necessary to improve the disaster-response literature.

Purpose of Research and Contributions

The purpose of this study is to investigate how mechanistic and organic organizational designs in a state-level EOC (specifically the State of Oklahoma EOC) influence disaster response. This EOC is the only focal point of the study, and the organizational structure within the EOC will be the primary object of the study. An introductory general understanding of EOCs has already been provided, but further clarification regarding the governmental levels of EOCs is necessary. The intent here is to provide a clear understanding of why there are gaps in the literature and how this study fills some of the voids but also create a path to future research beyond a single state EOC.

This dissertation seeks to do more than update prior EOC research; it will fill current gaps in the emergency-management literature on EOCs. Early EOC research focused on local communities and studied decision-making, functional design, and operational characteristics (Perry, 1995 and Neal, 1995). Early EOC-centric research tended to focus on observational methods, surveys, content analysis, and human response (Carley, 1997). Drabek's (1985) study focused on coordination with field staff, but organizational concepts of team formation and task execution are missing from all of

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these early studies. Furthermore, these early EOC studies examined design and layout that were determined to be conducive for coordination among individuals. Limited discussions exist regarding the organizational style employed within EOCs. Rotating 12-hour shifts is a common feature of EOCs during activation. As disaster response is prolonged to days, changes occur as new staff arrives to manage the disaster. These rotations result in personnel constantly forming new teams. Disaster response is considered a local endeavor with other governmental levels providing support, which account for researchers' focusing on local EOCs.

As the majority of EOC research has focused on local EOCs, this narrow focus serves as a snapshot of their operations, meaning researchers engage for a short time and then leave. In a study of four EOCs across central Alabama, for instance, three were county-level EOCs and the other was based in a military camp; no state or federal EOCs were examined (Neal, 2005). No local EOC studies address organizational design and group development (Neal, 1995; Kendra, 2003; Militello, 2007). Militello's (2007) study did observe participants in a county EOC, but the primary results addressed individual actions, and the secondary results addressed coordination. Shift work during an activation means unfamiliar staff (liaisons) must work closely with EOC staff to coordinate response efforts (Carley, 1997). Consequently, there is little organizational research discussing various approaches to EOC design, implementation, and staffing (Schrader, 2011). Few studies are dynamic in the sense of moving personnel to new environments or changing existing environments by adding personnel. Staff functions, activities outside of response, and the EOC understood as a permanent facility have not been studied. As such, hampering researchers' ability to understand the complex organizational structures

that have emerged, especially when considering the increasingly complicate

technological knowledge required to manage disaster response. Based on previous

discussions, many EOC problems are relevant to organizational problems. Studies

relating to local EOC design, organization, and function are not necessarily transferable

or generalizable to state EOCs.

Although state EOCs operate in a similar fashion to local EOCs, their missions

and responsibilities are fundamentally different. Unlike local EOCs, a state entity may

have multiple independent incidents occurring at once, each requiring coordination. The

State EOCs play a unique role in emergency management, acting as an interface between

local emergency managers and FEMA. Local and state EOCs have vastly different roles,

personnel, authorities, and facility designs. Emerging hazard agents, especially cyber-

attacks, require advanced technical skills that may be lacking at the local level or require

a broad response that only a state-level authority can provide (Winder, 2019). State EOCs

also act as the grantee for all FEMA grants, including disaster grants, pre-disaster

mitigation grants, emergency management performance grants, and hazard mitigation

grants, to name a few. Local communities register as the subgrantee. States manage each

grant program for the current federal fiscal year and prior fiscal years where the grant is

still open. In addition, the state office is audited by FEMA and state auditors to ensure

grant compliance. FEMA requires state and local entities to comply with all federal laws

regarding the procurement and disposition of equipment. Personnel may be engaged in

grant management, human resources, disaster recovery, mitigation, and cybersecurity at

once. These activities do not cease during disaster response. Personnel may be pulled

away from their daily routine and quickly return, or others may continue essential programmatic functions.

State EOCs occupy a unique space between federal entities and local EOCs. Like federal entities, state EOCs must coordinate with other departments with different organizational structures and enabling legislation. The EOP dictates which agencies are involved in emergency-management services, but state EOCs are responsible for coordinating these departments. Local EOCs operate more closely with their departments, as a common organizational structure is expected under city leadership. State EOCs are not only required to coordinate with federal and local entities but also with other state agencies. To achieve the coordination necessary for disaster response and recovery, state EOCs may need to employ a hierarchical organizational system such that responders operate under a common structure to complete tasks. The common structure closely resembles ICS in the EOC. However, this structure does not preclude non-hierarchical structures but implies a tendency for state EOCs to use hierarchical structures due to the required coordination and low failure tolerance of disaster response. Previous EOC research are rare and fewer studied specifically on State EOC. As I want to deeply understand a State EOC, entering the field is important. Entry into the field also requires access to the location and personnel. My employment with the State of Oklahoma provides this access removing an obstacle many disaster researchers face when conducting qualitative studies (Phillips, 2014). Although I only researched the State of Oklahoma Emergency Operations Center, I understand all EOCs follow FEMA guidelines for preparedness and response, which is required as part of grant funding (CFR 2 and 44, 2019). Using this relationship, I can study a singular state EOC and provide

insights to strengthen Contingency Theory. The project selected a methodology that will allow for deeper investigation into the use of mechanistic or organic designs in EOCs.

Qualitative methods were selected for this dissertation to collect rich and thick qualitative data (Creswell, 2012). I also searched the qualitative textbooks on field entry, which is very difficult. Practitioners are reluctant to talk with outsiders, making qualitative research field entry difficult, representing one of the many challenges of qualitative fieldwork in emergency management (Horsley, 2013). Therefore, I elected to engage in qualitative research, field access is vital. The lack of research on state EOCs limits the generalizability of any data, precluding the use of a quantitative methodologies. Results from this study may or may not be transferable beyond Oklahoma State EOC to other state-level EOCs and, more importantly, will provide a reference point for future research. The following section addresses the limitations and delimitations associated with this project.

Research Limitations and Delimitations

I have been an emergency-management practitioner for 31 years and this may influence this research, even though efforts have been made to limit this influence. Part of my career as a practitioner has been at a state EOC, where I am currently employed and have been since 1998. This is also the state EOC I studied in this project. As a practitioner and researcher, it is important to concisely note my role as an emergency-management professional to frame the larger discussion regarding this project and any possibility of job related influence. These concerns are warranted due to the use of content analysis and interviews as well as framing results, as the data-gathering

methodologies for this project. Each method of data gathering has limitations and these will be discussed in parallel.

Mitigating these limitations is vital and mitigates external influence from being introduced into the project or results. Delimitation involves following established scientific research methods, primarily by clearly defining the research methodology. Each research methodology provided lists the steps necessary to recreate the project. The rationale for selecting each specific method is also discussed in this dissertation and this process is intended to ensure that there is less bias due to methods selection or design. Delimitation strategies consist of at least a two-pronged approach. The first approach involves utilizing the peer review process with fellow academics and practitioners. The usefulness of this approach relates to reviewer feedback, allowing the independent evaluation of the methodology and results. The second approach uses reflexivity, providing a foundation before and during data collection that excludes perspectives from the practitioner's sphere. Reflexivity is a common practice in qualitative research and the available literature provides extensive guidance on maximizing its usefulness.

Furthermore, available literature on this subject is reviewed. Beginning with seminal articles on organizational paradigms and transitioning to more recent studies on management and operations. These concepts are explored alongside emergency-management studies on organizational design, especially as related to the functionality of EOCs. Through this process, any bias should be discoverable by the committee and subsequently corrected. I also have the option of engaging my peers in the process and receiving their feedback. Even though other practitioners may not view this as an academic might, their review would be entirely removed from academia. By using two

independent delimitations, I intend to mitigate the introduction of bias into the research or results. Furthermore, the multiple delimitation strategies used should capture the bias at a juncture that makes appropriate remediation possible. As noted previously, steps have been taken to design the study and conduct research in a manner clearly defined in the methodology section so that a thorough reanalysis can be conducted. Following the guidelines above is intended to yield results that will add to the overall body of literature on emergency management.

Self-reflection is a process inherent to all research and is especially important in qualitative studies because of their complicated nature, requiring greater self-reflection (Yin, 2015). In other words, knowledge is affected by the social conditions under which it was obtained (Hesse-Biber, 2010). Further, this process is distinct from limitations and delimitations, as self-reflection focuses on the researcher's lens and the qualities that make up that lens. As presented in Yin (2015), self-reflection may be presented in different parts of a paper; Liebow prefers the preface and Pedraza the methodology section (p.271). Throughout the project, I used reflective writing to provide clarification on decisions and research progress (Hesse-Biber, 2010). Self-reflection is provided in each chapter on methodology to ensure the research lens and subjective qualities of the research are clarified.

Research limitations and delimitations are included in the methodology chapters of this study. Combined with self-reflection, the overall process strengthens the integrity of the results. The next section provides the structural details of the study and chapter summaries.

Overview of the Study

This dissertation focuses primarily on how people organize during disaster responses at a state EOC (specifically my employer the State of Oklahoma EOC). The time constraints during a disaster response and the various personnel that must be quickly organized create opportunities for inefficiencies, which must be considered in pre-event planning. Chapter Two presents a review of the literature on organizational theory, EOCs, and disaster response. The emergency-management discipline provides the frame for these constructs and the subsequent discussion of their applicability to the profession. The literature review also includes a critical analysis of research on state EOCs and how this dissertation will serve to expand scholarly research on these topics.

Chapter Three introduces the first methodology section of this dissertation, which is a content analysis of disaster-response documents created 1) by the Federal Emergency Management Agency (FEMA) to guide EOC function and design and 2) State of Oklahoma emergency operations plan (EOP). Vital to this methodology is a thorough outline of the process and the decisions utilized. The methodology section expounds the reason certain documents were selected for analysis. Details on code development, coding software, and variables are also noted with sufficient detail to allow reconstruction of the process. Additionally, information on results from the content analysis are discussed. These findings include a discussion of emergent themes and their relationship to the research question.

Chapter Four presents the second methodology section, which outlines semi-structured qualitative interviews of State of Oklahoma EOC participants. The purpose of using interviews is discussed and the process used to select interviewees explained. Data

collected during the interview was transcribed and codes were developed for analysis. Coding software was used to develop themes. Sufficient detail is provided to allow a reanalysis of the processes and decisions made for the methodology. Further, discussions on the findings from the interviews and how they relate to the research question. The emergence of themes and the implications for the State of Oklahoma EOC are reviewed.

Chapter Five presents the conclusion and recommendations of this paper. The section discusses the implication of the findings and how they fit within the larger field of emergency management. Future research recommendations are presented to further the understanding of state EOCs and the role of emergent groups during disaster response.

Understanding how the organizational structure of a state EOC forms under the unique conditions of disaster response are germane to the field of emergency management. Staff members are tasked with accomplishing disaster-response objectives, which requires rapid decision-making with imperfect information. Disaster-response represents a complex problem that allows for little time to gather and analyze data. To develop these ideas, the next chapter frames these concepts within the emergency-management literature.

CHAPTER II

LITERATURE REVIEW

Emergency-management organizations in the United States are concerned with preparing for and responding to disasters. A rather simplistic description that understates the bureaucracy that has developed since the 1979 National Governor's Conference's recommendation to use mitigation, preparedness, response, and recovery as the phases of emergency management (NGC, 1979). The shift of emergency-management focus from preparation and response only to a more comprehensive system including all phases increases the complexity of missions. For example, federal financial-compliance rules apply to all who receive grants from the Department of Homeland Security, which includes state and local emergency-management entities (2 CFR, 2014). The added administrative requirements necessitate staff with the technical knowledge to implement these requirements. The need to add staff follows the organizational theorist's stance relating to the allocation of functions and responsibilities (Selznick, 1948). Consequently, as the missions become more complex, a traditional military command-and-control organizational may be insufficient to accommodate all the needs related to emergency management (Harrald, 2006). An approach focusing on cooperating with different organizations and reaching consensus should be included in EOC design and

operation. Furthermore, disaster response normally creates unique challenges that require modifications in EOC routine and function (Williams, 2017). In this situation, EOCs rely not only on the established plans to guide the response with tactical decisions being made as the disaster unfolds (Quarantelli, 1997) but also on ad hoc teams and organizations to handle unexpected events. Following established plans is similar to the military decision-making style mentioned above yet working with ad hoc teams is close to the second approach, which focuses on reaching consensus between organizations. As these are two separate organizational types, different organizational structures can emerge. Consequently, it is imperative to utilize organizational theories to understand how EOCs' structural and organizational characteristics influence disaster response.

EOCs respond to disasters that are external to the organization yet impact its functioning. How disasters impact the organizational structure of the EOC and how said structure influences disaster response can be studied within Contingency Theory. The following section further explores Contingency Theory, followed by an examination of mechanistic and organic EOC structures. The chapter concludes with the research question and a brief introduction to the methodologies employed for this project.

Contingency Theory

Contingency theory holds that an organization and its structure are influenced by the external environment and that there is no one best organizational form (Alexander, 1995). Alexander (1995) has noted that the success or failure of an organization relates to its adaptation to the external environment. Originating in the sociological school, contingency theory evolved out of rational theory in the 1960s (Onday, 2016). The relationship to emergency management is clear, as disaster occurs in the external

environment and influences the responding organization. The severity of the disaster greatly influences the organizational structure required to manage agent- and response-centric demands. Yet it is not only the disaster that influences how emergency management organizations structure their response; there are also policy and legal implications. Furthermore, other organizations (e.g., FEMA) can set policies, and all of these are part of the external environment for any given emergency-management entity. Organizational theorists argue that there are limitations in considering external influences (Onday, 2016), hence the need to use contingency theory to study disaster-response organizational structures.

Organizational theorists have long postulated the influence of the external environment on a given organization and that no single organizational approach works best (Powley, 2012). Modern information technology companies must continually monitor externalities that may impact their business. Examples include social media companies being called before the United States Senate and threatened with the imposition of government regulations. EOCs must also monitor the external environment for changes that may impact operations. These changes may include policy or legal changes, technology, or jurisdictional differences, not simply disaster impacts.
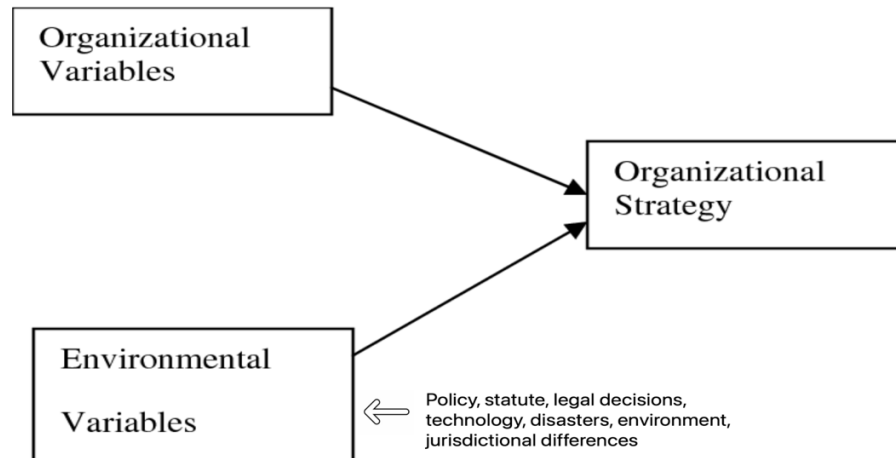
Figure 2.1: Contingency Theory & EOC Environment
(Adopted from Vinekar, 2006, p.183)

To accommodate these changes, organizations must alter their structures, whether by

adding staff positions and employees or modifying existing duties. Recent policy changes

by FEMA require extensive financial reporting and adherence to 2 Code of Federal

Regulations (CFR). Organizations that can adequately adjust to external influence have

the best chance of surviving regardless of whether they are public or private. How these

changes occur in the external environment relates directly to contingency theory.

The operational outcome of contingency theory relates to how organizations

implement coordination and interaction. Alexander (1995) presented the coordination

strategies and tools available for engaging in inter-organizational communication, the

idea here being that to apply contingency theory to an organization necessitates that the

organization interacts with its external environment, hence with other organizations. In

the abstract sense, contingency theory is a way of explaining how organizations respond

to design challenges (Jones, 2013). Jones (2013) has stated that management choices

influence organizational design. Implying that there is a conscious act that leads

organizations to be either mechanistic or organic. Alexander (1995) has referred to these as mandated structures but has also noted that this creates a paradox by referencing a single organization as a coordination structure. The concepts of mechanistic and organic organizational structures developed from contingency theory to explain the management and structure of organizations relative to the external environment (Onday, 2016); these concepts are explained in more detail later in this subsection. Contingency theory has been criticized by some, and a few of these complaints are discussed next.

Scholars have criticized contingency theory for being overly broad and not having quantifiable elements or clarity (Schoonhoven, 1981). Some have even gone as far as to say it is obsolete (Donaldson, 2006). However, Donaldson (2006) has posited that contingency theory is not being made obsolete by new technology. Scholars also argue over the conceptual models created using contingency theory (Schoonhoven, 1981). As a modern theory, contingency theory is still very rational and may not completely address externalities (Onday, 2016). Van de Ven (2013) demonstrated how contingency theory can be expanded using an inductive approach to enhance the theoretical framework. Burns and Stalker (1961) did seminal work on the concepts of mechanistic and organic structures, and a brief introduction to their work and ongoing research is presented next.

Mechanistic organizations emphasize functional roles, supervisors, and staff isolated to their specific task, along with authority and control (Kessler, 2017). Mechanistic organizations tend to be more conservative and fit within a stable environment (Kessler, 2017). Furthermore, there is some empirical evidence that low-trust environments benefit from a mechanistic structure (Powley, 2012). Mechanistic

structures are considered old and are the primary structure in government organizations (Kahn, 2016).

Organic organizations, on the other hand, emphasize knowledge contribution, reassessment of individual tasks, lateral communication, and advice (Kessler, 2017). Disaster response represents a complex environment, necessitating the need for flexible organizations driven by trust (Powley, 2012). Organic organizations are more flexible than mechanistic ones (Powley, 2012), and this structure should benefit disaster-response organizations that use it. Disaster-response organizations need to be situationally oriented (Kuykendall, 2020) so that staff focus on problem-solving rather than on fulfilling functional roles. As part of his research on heedfulness, Weick (1993) found that those within organic organizations have more fully developed minds. Importantly, organic organizations are efficient at modifying the environment (Onday, 2016), a key component of contingency theory. These different organizational systems influence EOCs and how staff accomplish their function during disaster response.

The prior discussion on mechanistic and organic systems is connected to how EOCs function during disaster response. Disasters are inherently complex if for no other reason than a lack of situational awareness in the EOC. The totality of required information for a decision cannot be known when a given decision must be made. Staff who do not already have trusting relationships must quickly develop a working relationship to solve these complex problems. A traditional EOC structure is mechanistic and was inherited from the civil defense period. Mechanistic structure emphasizes the delegation of specific tasks to individuals, authoritative hierarchy, overall knowledge restricted to leadership personnel, and vertical communication (Onday, 2016). Traditional

EOCs rely on command-and-control concepts to manage disasters. Vital field information reaches only a few people, and decisions are made by the leadership. Lower-level employees are not empowered to make decisions or improvise to solve problems; they are expected to rely on established SOPs and forms and, most importantly, to follow an established chain of command (Harrald, 2006). Traditional EOCs operate mechanistically, but modern requirements have pushed organizations to change and adapt.

Research into organizational response to disasters is not new and has existed since the mid-1960s, when research shifted from people to organizations (Webb, 1999). The organizational typology was published by the Disaster Research Center (DRC) using organizational task and structure as framework (Webb, 1999). Part of this framework involved role improvisation. Important to emergency response is the "uncertain nature of response activities" (Mendonca, 2001, p.31). However, much of this research focused on field emergency responders as one of the studied cognitive dimensions is 'observation of the environment,' which is not possible from an EOC (Mendonca, 2014). Later studies divided role improvisation into two categories focusing on 1) same role improvisation involving previous training and 2) different role improvisation with no training (Rankin, 2011). Rankin focused on the latter, finding that role adaption is possible and can be enhanced by prior training on a broad range of complex disaster management topics (2011).

Modern disasters are too complex and require a different approach than traditional organizational structures. Staff must be able to improvise with guidance provided by SOPs but without overly rigid structures (Carley, 1997). External events should cause an

organization to shift from a mechanistic to an organic structure as the environment because unstable (Donaldson, 2006). Organic structures emphasize lateral communication, group efforts in problem solving, and the spread of knowledge throughout an organization (Onday, 2016). Modern EOCs use a host of technology systems for disaster response, including incident logging, damage reports, and tasks. These systems allow more people to share information and coordinate with a larger group than was previously possible. The use of cell phones and text messaging also means the traditional chain of command is not required. These systems exist because disaster response has become more complex in modern times. Complexity has increased due to increasing population density, increasing hazards, technology, vulnerable populations, and additional government regulations. Managing these changes requires EOCs to evolve and develop disaster-response characteristics that are more organic than traditional EOCs or civil defense organizations. As such, this study hypothesizes that compared to traditional EOCs that utilize many mechanistic characteristics, EOCs in modern societies must incorporate more organic characteristics to cope with complex situations. There is no mechanistic is better than organic, vice versa, and they can co-exist (Burns and Stalker, 1976). The point is organic not better than mechanistic, the point is people focus on mechanistic, which is also important. The discussion here does not propose organic is the only organizational structure but does propose in the past people focused only on mechanistic structures and they may not be appropriate in all situations. Organic structures have a place in EOC disaster. Response and may need to be incorporated into EOC operations.

By using contingency theory as a lens and resulting data, one can study EOC organization looking to determine how the Oklahoma SEOC functions along the continuum of mechanistic and organic organizational structures. Furthermore, one can assess whether EOCs shift their organizational structure to meet agent-generated demand and is important because response-generated demands can be planned but agent-generated demands shift during each disaster. The literature on EOCs is extensive, especially their function and design, and this is discussed in the next section.

EOC-Centric Literature

EOCs were developed as a central location for community-disaster response. Their mission emerged from the Cold War years when civil defense and nuclear preparation were the primary focus of communities. Usually, a single location acts as the community's EOC, although some scholars have argued for multiple community EOCs (Perry, 2003). Traditionally, in the United States, there is a single EOC that coordinates community disaster response and recovery. These facilities serve as a central point for disaster needs beyond response and coordination—for example, as a place where the community's strategic and tactical disaster-response initiatives are formulated. To better qualify the characteristics of EOCs, their functions should be discussed.

EOCs have six primary functions, but there are additional functions that EOCs do not routinely perform. The functions of an EOC are to manage coordination and collaboration, host VIPs, disseminate public information, and serve as a central gathering location (Perry, 1995). These are the macro-functions of EOCs in managing disasters. EOCs are not a command-and-control entity (Mignone, 2003) and do not engage in the tactical planning (Lindell, 2006) commonly occurring at an incident. Several other

functions occur in the EOC, for example: planning, geographic information system (GIS), technology support, public warnings, and policy development. Even though EOCs are not a pure command-and-control system, they are not necessarily immune from the mechanistic structures that dominate many EOCs. Disaster planning before and during a disaster provides a glimpse into the organizational structure that is meant to exist during disaster response.

Disaster planning in the EOC emphasizes a hierarchical approach with functions detailed through SOPs. Many of the EOC functions follow this approach for incident planning, public information, and public warnings. These rigid SOPs limit staff improvisation (Carley, 1997) and problem solving. If staff broadly follow SOPs, there is an opportunity for organic systems to develop, although this is not always planned for during preparedness phase. Organic functions relate to the coordination and collaboration functions of the EOC. These functions involve staff communicating to manage the response-oriented disaster demands. Leadership must encourage these relationships and not enforce a paramilitary structure. To a certain degree, this paragraph demonstrates the importance of this research; EOCs are structured in both mechanistic and organic ways, which echoes Burns and Stalker's assumption that there is no purely mechanistic or organic system (Kuykendall, 1982). These organizational structures coexist in a system and an EOC decides to use one structure more than the other based on the external environment. However, EOCs can operate in vastly different ways in normal times than during disaster response.

EOCs during non-disaster times may be similar to any other government office. Staff work on projects, and some of the more visible activity entails the continuation of

disaster recovery and hazard mitigation. These activities do not cease during a disaster, although they slow down as EOC staff coordinate response activities. In this respect, local and state EOCs are similar. State EOCs have a much larger workload but have additional staff to manage it because of their funding (Perry, 1995). Even as disaster response ends, preparations for the next disaster begin. After-action reviews (AARs) are conducted and reports issued on what went right during the disaster and on what needs improvement (Savoia, 2012). Staff may also use this time to upgrade technology, improve facilities, conduct training and exercises, and propose statutory modifications. A calm daily routine can quickly give way to a much more complex situation when a disaster strikes.

Disasters quickly change a calm day into a complex situation for emergency responders. EOC staff must quickly shift from routine work to nonroutine duties (Quarantelli, 1997) as they respond to the disaster, frequently while lacking situational awareness (Comfort, 2006 and Militello, 2005). At the same time, non-EOC staff report to represent their department; they are called liaisons. The initial hours after a disaster is a critical time for EOC staff to organize and begin managing the situation. Several factors combine to make this a complex situation, notably lack of situational awareness, new staff in the EOC, noise level, time pressure, and emerging threats. Even though this situation is best described as complex, we must understand what is meant by this early disaster response organizing and why is it significant in emergency management.

Complex situations are not to be confused with complicated systems. The latter may be complicated when viewed as a whole but can be reduced to relatively simple parts, which can then be studied. (Kurtz, 2003). Complex situations, in contrast, have

unknown variables that interact with known variables to change the situation; these cannot be reduced to simple parts. Furthermore, few methods exist to predict complex situations (Kurtz, 2003). Disasters present complex situations (Comfort, 2004) where unknown variables interact with preparedness plans. Emergency managers must gather and assess data, modify plans, and shift strategies. Rapid pace or battle rhythm is a constant feature of disaster response, but not all disasters require this level of effort. FEMA has classified emergencies and disasters into types. Emergencies are referred to as Type 5 or Type 4 events, which include daily fire, police, and medical responses for most jurisdictions (Altay, 2005). Crises are categorized as Type 3 when the event becomes a disaster that requires external assistance. Type 2 events have a greater impact on the community and often require federal assistance. Type 1 events are rare and have a devastating impact on the community. Hurricanes Katrina (2005) and Sandy (2012) are examples of Type 1 events. As previously discussed, daily EOC routines change depending on the disaster type, but the EOC functions are consistent and separate.

EOC functioning during normal and disaster periods are not equivalent. Daily functions quickly give way to disaster functions when an event occurs. Liaisons and VIPs responding to the EOC are just one function that changes. Other functions include long-range planning, such as shifting EOPs and SOPs to an incident action plan (IAP), which is updated twice a day, daily, every other day, or weekly. Staff cease daily functions and assist with resource requests, coordination, collaboration, and support. EOC staff also work to gain situational awareness of the event, its scale, and immediate incident objectives. The sudden shift in operational tempo creates difficulties for EOC management.

As noted previously, EOCs tend to operate in a paramilitary structure and are primarily mechanistic. The paramilitary structure may work for routine operations because staff report to their immediate supervisors and the chain of command is clear. Yet when a disaster occurs, daily routines shift to nonroutine duties and liaisons arrive, creating difficulties in organizing an EOC, whereby a separate social system develops with among EOC staff and arriving liaisons (Quarantelli, 1997). The chain of command becomes distorted because liaisons do not have an immediate supervisor in the EOC, which thus resembles an ICS (Schrader, 2011). Furthermore, supervisors for EOC staff may be absent because they have been impacted by the disaster or they are at the scene. In this situation, purely mechanistic systems struggle, while organic systems favor improvisation and coordination. Organic systems do not require a chain of command for communication and allow staff to interact and collaborate. People interacting encourages trust, relationship building, and decision-making. Furthermore, this process increases response efficiency, as EOC organizations shift to organic structures.

Contingency theory provides a method to understand mechanistic and organic functions in an EOC during routine intervals and disaster response, as researched for the ICS (Chang, 2017). Contingency theory allows for investigation into how liaisons, staff, and those with limited experience interact to develop trust and relationships. Importantly, these staff must also complete unfamiliar work tasks, potentially without supervision. The purpose of gathering in the EOC is to coordinate; the other functions occur alongside coordination. To this end, the EOC is the community's gathering place.

EOC as a Gathering Place

Disasters require increased interorganizational coordination (Stevenson, 2014) as well as increased information exchange and communication to cope with the complexity of the event (Comfort, 2011). The coordination is based on the establishment of networks, which represent ties between organizational actors, and these act as conduits where collectively held resources are coordinated (Knoke and Young, 2008). The establishment of groups among these networks is essential to disaster response and beyond, encompassing any profession that requires coordination. Using qualitative methods, Uzzi (1999) found that social relationships are important to developing trust and that this results in communication that consists of more than just basic "cold facts" (p 488). Networks also tend to be more durable and stable when trust is achieved, and this can decrease resource costs (Stevenson, 2014). The durability of these networks is essential to interorganizational coordination, which has previously been shown to involve inadequate disaster-response communication (Drabek, 1985). As trust and relationships are essential to network durability, these components are essential to interorganizational coordination. During disaster response, organizations shift their usual routines, resulting in collective stress within the organization as part of a crisis response (Kapucu, 2006). These policies and procedures are artifacts of communication, meaning human thought expressed through conversation and writing (Leont'ev, 1978). Conversation and writing are necessarily products of team interaction through which workplace knowledge is created (Boreham, 2004). The knowledge creation is a result of the organization's culture and the social processes that develop said culture (Lammont and Boreham, 2002). In operational terms, this implies SOPs are not simply instructions on how to do something

but, more importantly, an expression of workplace culture (Boreham, 2004). Moreover, they serve as a functional guide for all staff but should not be so rigid as to impair operations.

Developing an environment to compensate for this deterioration of workplace division of labor in disaster response is essential, and three types of control are proposed by Boreham (2000). Paraphrasing Boreham (2000), these are 1) SOPs, 2) social control, and 3) self-control. The latter two are more likely to provide an appropriate response to unpredictable situations (Boreham, 2000, and Reason, 1998), whereas SOPs may not provide sufficient employee guidance. Because SOPs cannot provide answers to all situations an individual or group may face, the development of "ground knowledge" (Boreham, 2000) provides individuals with the power to work with others and solve joint problems. Boreham's (2000) empirical study revealed that empowering all employees and workgroups provided benefits through collective competence. The concept of collective competence involves the development of a shared mental model of an organization's operating procedures (Boreham, 2000), thereby allowing for a collective sense of challenges in the workplace (Boreham, 2004). Collective competence is clearly beyond the individual worker and requires a team, but the organization must foster this approach through its policies and workplace processes.

The location and design of an EOC are essential and speak directly to its function as a community-response center from which policy directives originate (Perry, 1995). The EOC must be designed for its intended functions and the operational requirements of these functions. EOC design must incorporate visitors, redundant power and water, noise level (Neal, 1995), and separate areas for incompatible tasks. Physical and personal

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security is also important for protecting the EOC and the people within it (Bliss, 2013, p.15). Computer equipment, phones, tables, chairs, food, sleeping areas, restrooms, showers, and meeting spaces (Schrader, 2011) are all necessary components of an operational EOC. The design of these centers is quite varied, and some communities use a multiuse facility, while others use a dedicated EOC (Perry, 1995 and Schrader, 2011). Modern technology allows video conferencing to replace in-person meetings and phone calls and can reach people in most locations; this has given rise to the virtual EOC concept.

Recent advances in technology have made virtual EOCs possible, which have similar functions related to community-policy directives but also involve collaboration through Internet systems. These may be simple video-conferencing systems or more complex incident-management systems, such as Ensayo (Mecerra, 2008 and Nikolai, 2009). These systems are designed to scale up or down according to a disaster's complexity. They also allow disaster responders to coordinate even if they are not located at the EOC. Virtual EOCs are integrated into physical EOC operations and serve to enhance their function but do not replace physical EOCs. Some communities have used virtual EOCs as a replacement for physical implementations, although this is not ideal. A very useful aspect of virtual EOCs is the ability to simulate real-world events (Wright, 2008 and Nikolai, 2009). Virtual EOCs and physical EOCs will both continue to have a place in modern disaster response, as both have their challenges and benefits. Despite these disparate operational systems, the organizational structure remains essential.

EOC staff may work under an ICS or ESF structure (Neal, 1995). ICS and ESF groups are based on their function, whereby ICS is grouped into five components (Chang,

2017) and ESF eighteen (Akitomi, 2020). ICS and ESF are frameworks for managing

personnel, and EOCs implement one or the other; there is no standard management

structure among all EOCs. The use of either an ICS or ESF structure in the EOC is based

on leadership preference. Hybrid structures may also be used in the EOC, in which ICS

forms and documentation are used with ESF groups working to solve agent- and

response-generated demands. As mentioned in Chapter 1, the formation of these groups

has been empirically demonstrated to require trust and relationships (Chang, 2018).

However, creating an environment favorable to the formation of relationships in an EOC

prior to emergency management is difficult. These organizational structures exist to

encourage information flow, team development, problem-solving, and decision-making.

The design of an EOC and its functional structure (ICS/ESF) are implemented to

encourage efficient collaboration and ultimately decision-making. Information flowing in

and out of the EOC and between participants facilitates this decision-making. The

configuration of tables and chairs is meant to facilitate communication, and many EOCs

use a "U-shaped" or "pod-shaped" layout that allows leadership to oversee operations

(Neal, 1995, p.30). These setups are meant to ensure information flow where field reports

are received by EOC staff and relayed to liaisons at other tables, and the process is

reversed as needed (Militello, 2007). An ideal configuration ensures the efficient

reception and processing of resource requests and policy decisions. Empirical research

shows that this is not the case when information remains with EOC staff and is not

relayed around the office while liaisons coordinate with their agencies (Militello, 2007).

Asymmetric information flow causes issues with processing resource requests and policy

decisions. Modern computer infrastructure provides new tools to solve these issues and improve coordination.

The people that gather at the EOC come from various organizations that help during disasters but do not necessarily work in emergency management on a daily basis (McEntire, 2006 and Ryan, 2012). Local departments in small and medium communities operate under a single organizational structure, but the state level is more complicated and includes independent organizations. State departments have narrow mission statements and employees may interact during the non-disaster period, but employees and organizations must shift into nonroutine job functions when a disaster occurs. These changes in organizational structure and employee functions influence state EOCs' disaster response.

Community EOCs function as gatherings places during disaster response. These centers serve the community by bringing policymakers (Perry, 2003 and Lindell, 2006) together with staff that can execute policy directives. The gathered staff are from different departments and may not have established relationships (Lutz, 2008); indeed, it is likely that they barely know each other. Staff turnover and the high number of community employees leads to a situation where people must meet and immediately start solving disaster-related problems. Understanding the functions of an EOC within contingency theory is the focus of this research.

Study Purpose and Research Question

The purpose of this study is to investigate how mechanistic and organic organizational designs in state EOCs influence disaster response using Contingency Theory as a lens. As discussed previously this project will update research relating to

State EOCs and provide a unique foundation by conducting an in-depth study into a singular State EOC. The researcher's employment with the Oklahoma State EOC enables field entry and access to staff, resulting in this facility being a perfect candidate to study. The constructs of mechanistic and organic structures are used as a baseline to evaluate organizational function. Additionally, there is limited empirical data indicating how local EOCs operate; most such data primarily addresses design, function, and coordination. Prior research only approaches the organizational aspects of state EOCs, where responders have limited working relationships since they do not work in the same agency. My study makes contributions to the emergency-management and organizational literature. Future researchers may expand on these contributions by visiting other state's EOCs and looking in-depth at city/county EOCs.

The independent variable employed in this study was selected based on conditions that can control, and are related to, organizational changes during a disaster. Oklahoma faces numerous hazards, many of which can become a disaster. However, some hazards have greater potential to become a disaster than others. The independent variable for this project was selected to control the hazard agent responsible for the disaster being studied. By controlling the disaster agent, conditions that may lead to organizational change can be studied.

The dependent variable was tested against the independent variable. The dependent variable is the mechanistic or organic nature of an organization's structure and was selected to test organizational structure before, during, and after a disaster.

This chapter presented a review of the literature relating to the theoretical underpinnings of the study, namely contingency theory, EOC function, and the purpose

of the study. Few scholarly articles were found regarding State EOC operation; local EOCs have received the majority of attention from researchers (Neal, 2003). Apart from a few empirical studies and discussions on function, configuration, layout, and technology, little research has been done in relation to organizational changes in an EOC during disaster response. Little research exists relating to state EOCs. These facilities and their organizations serve as a vital link between local EOCs and the federal level. The theoretical underpinnings for this study are drawn primarily from the literature on organizational science. Applying these constructs to disaster response, my research question is as follows: in what ways is a state-level emergency operations center (EOC) mechanistic or organic, and how do these organizational constructs influence disaster response?

To answer this question, two methodological analyses are employed. The first is a content analysis of EOC documentation, namely published preparedness plans and FEMA training documents. The difference between these two types of plans relates to non-disaster guides that provide the framework for disaster response and documents that specifically guides disaster response. Methodological considerations and construction are reviewed in Chapter 3 along with the findings. The second methodology involves semi-structured interviews with EOC staff. Interviewees were conducted with emergency-response personnel, seeking to gather rich and thick qualitative data. Selecting participants with prior disaster experience provided varying perspectives and knowledge of emergency management. The interviews and findings are reviewed in Chapter 4 in relation to methodological considerations and construction. Study analyses, major conclusions, and future research topics are presented in Chapter 5.

CHAPTER III

CONTENT ANALYSIS AND FINDINGS

As discussed in previous chapters, organizational theorists have shown that mechanistic and organic structures are not mutually exclusive but exist on a continuum (Burns and Stalker, 1972). Relating these constructs to emergency-management organizations is difficult due to limited research and the age of prior studies. For both these reasons, I explore FEMA training materials and a state planning document to understand their design elements. Further, seeking to help the reader understand Oklahoma State EOC organizational design as promoted by the federal government and state planning documents, ultimately showing that there are characteristics of mechanistic and organic elements within the Oklahoma State EOC. Information from these documents is used to discover concepts that encourage the formation of mechanistic or organic organizational structures.

This chapter focuses on how the State of Oklahoma uses FEMA training documents and state plans determine if an emergency-response entity employs a mechanistic or organic structure prior to a disaster. To answer this question, FEMA training documents and the State of Oklahoma's EOP are qualitatively analyzed. Concepts are captured from these documents as they relate to mechanistic and organic structures. The chapter presents

details of the analysis and relevant associated findings. Significant findings include 1) FEMA documents are silent regarding changes in organizational structure during disasters, 2) mechanistic elements are not universal among the documents, 3) external-organization cooperation is silent in the documents, and 4) disaster response is presented as a linear process.

Methodology

Qualitative research was selected as the investigative approach because it allows academic entry into the state EOC organizational construct. Qualitative methodology provides several paths for data collection and provides results with richness, depth, and breadth (Phillips, 2014). These pathways make qualitative research an appropriate investigative methodology because of the "how" and "why" questions necessary to understand the theoretical underpinnings of an organization's structure. Furthermore, the analysis tools made available by a qualitative methodology are likely to promote the discovery of new themes and to add to the academic discussion.

Therefore, the method of content analysis was selected to analyze federal and Oklahoma State EOC planning documents. Content analysis provides a means to understand gaps in Contingency Theory relating to the Oklahoma SEOC. Using content analysis requires selecting document categories to analyze and reviewing and assessing them for themes. By using content analysis within qualitative methodology, the flexible analysis of textual data is possible (Hsieh, 2005). Content analysis further allows the investigation of what is and is not included in the textual data and what is considered unobtrusive because humans are not involved (Hesse-Bibber, 2010).

The choice to use content analysis for this project relates to its exploratory nature. As noted, research on state EOCs is limited, and said research needs a starting point to investigate organizational structures. FEMA training documents and Oklahoma State EOP are the frameworks of EOC design and disaster operation. Studying these documents provides the necessary foundation for further investigation of the Oklahoma State EOC organizational structures. These are a few benefits to using the content-analysis methodology.

Content analysis is expected to provide insight into the proposed EOC organizational structure, as these planning documents are meant to be followed during a disaster. The methodology results will also validate additional methodologies employed to investigate these constructs. Content analysis methodology also allows me to explore EOC documents and relate these to the organizational structure.

Contrary to the justification of this approach, content analysis has limitations. First, the research has to be well organized to enhance the trustworthiness of this methodology (Elo, 2014). In addition, robust analytical procedures are essential and must be developed prior to analysis (Hsieh and Shannon, 2005). Finally, the researcher must check codes for consistency and ensure the method is thoroughly documented (Elo, 2014).

Research Process

Purposive sampling, or judgment sampling, was used to provide a deep understanding of how the selected documents relate to the organizational theory mentioned above (Etikan, 2017; Patton, 2002; Sharma 2017). More specifically, typical case sampling was used for this project. Typical case sampling begins by identifying

"typical" cases (Patton, 1990, p.173 and Patton, 2008). As a result, since I am familiar

with the EOC design documents, I selected those documents that are able to represent the

overall concepts and design and operation ideas of EOCs. Thereby reducing the rigor of

generalizing the results to other state EOCs, since the Oklahoma State EOC is the only

EOC in this study, although this is not the intent of this study. Oklahoma State EOC was

selected as a typical case since Oklahoma regularly experiences disasters resulting in

regular activations and staff disaster experience. Oklahoma has received 50 major

disaster declarations since 2000, for fires, tornadoes, severe storms, ice storms, and

COVID-19 (FEMA, 2022). The number and type of disasters makes Oklahoma classic

case since they are not quiet but not overly busy. Finally, I have access to the Oklahoma

State EOC allowing for entry into the field and this access is essential for conducting

qualitative research.

To select documents for this project, the researcher first visited the FEMA

training website, then downloaded documents related to the design and operation of

EOCs. The FEMA training documents were selected because they represent broad

training provided to emergency managers across the United States on implementing an

EOC. Although emergency managers may not use this as a reference for EOCs, their

guidance reflects a degree of consensus among emergency managers in the United States.

Furthermore, states frequently receive FEMA funding for disasters, preparedness, and

mitigation, and funding requirements can mandate that a jurisdiction conform to FEMA

guidelines. As a result, these FEMA documents serve as typical cases of what are

considered practitioner-level concepts related to the implementation of EOC

organizational structure. However, the FEMA documents primarily focus on how local

government EOCs and first responders (e.g., firefighters and police officers) can cooperate with different response organizations and this might be different from the state-EOC operations that emphasize coordination with local, state, and federal partners. As a result, I kept searching the documents for the state EOC to grasp how to better design a state EOC. The document type represents FEMA training documents and EOPs, and the document group represents the specific time the document was created.

EOPs are holistic documents produced during non-disaster periods, preferably before a disaster occurs. Such documents guide community preparedness, training, exercise, and overall coordination. Community departments and response groups are all involved in the planning process, thereby allowing relationships to develop among employees. The process of developing and implementing an EOP is vital and ensures the information contained within the document reflects the community's intended response to a disaster. The EOP is best described as a master planning document that acknowledges community hazards and threats and the response actions that will be taken should a threat materialize. A response-oriented planning tool should incorporate a specific hazard response in the plan's annexes. Coordination entities are noted along with the specific functions of community departments. Most departments in a city have a role in the EOP. At the state level, several departments may have a role and others may not. The EOP concept and process is the same at all levels of government and for every size of community. Incorporating this document into the project may enable the transferability of results. Consequently, I selected the State of Oklahoma EOP (relevant to EOC designs) as typical cases that can reflect the general concepts of designing and implementing EOCs within the emergency-management organizations throughout a state. Table 3.1

presents the typical cases selected and analyzed in this research, representing 818 pages

of material.

Table 3.1 EOC Documents (as of January 2021)

Date Released	Document Description
May 2019	ICS/EOC Interface
May 2019	Basic EOC Design and Function
May 2019	Intermediate EOC Design and Function
2019	State of Oklahoma Emergency Operations Plan

Hsieh and Shanon (2005) and Stemler (2000) proposed three types of content

analysis: conventional content analysis, directed content analysis, and summative content

analysis. Since this project is based on existing theory that is incomplete regarding state

EOCs (Neuendorf, 2017) and would thus benefit from expanding organizational theory

(Weber, 1990), directed content analysis was used. For this reason, the research and

operational definitions of Burns and Stalker (1972) were used to guide code development

(Hsieh and Shanon, 2005).

Contingency theory provides a framework for developing codes and reviewing the

selected documents. More specifically, the theory's definitions of mechanistic and

organic organizational styles guided the development of the codes in this research. Thus,

theory-driven codes were used (Decuir-Gunby, 2011). The concept is the unit of analysis

for this project. As such, codes may be applied to a sentence or paragraph. Analysis

began by my developing the codebook, which was derived from classical definitions of

mechanistic and organic organizations and then used to determine if a document's

concepts are mechanistic or organic (Burns and Stalker, 1972). Initial coding was conducted by reviewing elements of Burns and Stalker (1972) as they relate to mechanistic and organic organizational styles. Once the initial codes were complete, I coordinated with my advisor to refine them. They were then sent to my dissertation committee for review and approval. Appendix A presents the approved codes for this project.

This section has provided details on the sampling strategy employed for this project, the selection of purposive and typical sampling, and the development of the codebook. Following this section, data analysis is discussed along with data quality.

Data Analysis and Quality

Using the developed codes, each document was read and analyzed on three separate occasions to develop a deeper understanding of the data (Erlingsson, 2017). Following this process allowed for a thorough review of the concepts and for determining whether they could be linked to mechanistic or organic organizational styles, which assisted in determining the degree to which the documents promote a mechanistic or organic EOC structure. Qualitative coding analysis can be conducted in three ways, and the following presents the type of coding used for this project.

To promote credibility, transferability, dependability, and confirmability (Guba and Lincoln, 1989), intercoder reliability (ICR) was used (O'Connor, 2020). ICR is also called "peer review coding" and "cross coding." This phase of the project is essential for a doctoral candidate and ensures the coding process is credible by checking the codes as the project moves from data to conceptual framework and ensures consistency in code assignments (O'Connor, 2020). ICR was conducted by my and my advisor's

independently reviewing two of the four documents and coding them using the codebook, following referential adequacy concepts (Phillips 2014). After coding was completed, my advisor compared the codes. The ICR results were similar, with both of us agree. The suggestions were incorporated into the research and did not materially change my codes. O7 was added to the codebook, which was resubmitted to my committee for approval. The committee also agreed with this change.

Once ICR was complete and my coding process validated, the remaining two documents were coded. Each document was coded two additional times. Codes from the three passes were noted on each document next to their concepts. Once this was completed, the four documents were sent to my advisor for review. Upon advisor approval, the first pass coding was complete, and Atlas.ti was used to organize the documents and codes.

Atlas.ti was acquired and the four documents loaded into the software for analysis. The twelve codes were then added. Each document was reviewed and previously hand-coded concepts were coded into Atlas.ti. The software kept track of each code and how many times it was used along with its location in the document. One of the benefits of using computer-aided analysis software is that it can help lump similar ideas and concepts together (Konopasek, 2007 and Baralt, 2012). Using Atlas.ti, I systematically developed the overall themes and patterns extracted from the words (Weber, 1990).

This section has provided an overview of the coding process, including ICR. Furthermore, the use of computer-assisted qualitative data-analysis software (CAQDAS) was discussed. The next section discusses the limitations of the research.

Limitations and Ethical Concerns

Only Oklahoma's State EOP and FEMA EOC training courses were analyzed as part of this project. Additionally, some FEMA training courses discuss EOC structure but are not EOC centric, and so they were excluded. AARs were not selected for analysis in this project because they only produce suggestions that cannot be implemented or are not related to EOC structure. The exclusion of the documents mentioned above is a limitation of this project.

As noted previously, I have been employed in the Oklahoma State EOC setting for over 20 years. I have access to documents in the public domain, and consequently I am able to identify those classic documents that are able to represent the core values and knowledge involved in establishing EOCs. However, I have not exercised employment privileges in the acquisition of the documents reviewed. All of the documents are available via the Internet or by request.

Finally, content analysis allows one to investigate and understand the establishment of an EOC but not the restructuring process that occurs when leadership changes. Importantly, this element can be inferred by the hidden pieces within the documents. The documents do not address leadership changes or politics but rather organizational frameworks for disaster response, such as who runs the EOC and how it should be configured. Many state directors are governor appointed, and changes in leadership often occur every four years or more. These changes in leadership can modify organizational flexibility despite the structure being mechanistic according to the FEMA framework.

Although the above limitations might make the research less attractive for emergency managers outside of Oklahoma, the core principles of designing and operating EOCs expounded in these documents reflect general concepts and principles guided by federal policies. These general concepts are included in the reviewed FEMA training material and state emergency operations plan. As a result, the following analysis can still further one's understanding of EOC organizational design and provide insights for future EOC studies.

Results

In the documents analyzed in this research, FEMA discusses three types of EOC structures: 1) those organized by mirroring the ICS, 2) those organized by various ESFs, and 3) those organized by departmental function (FEMA, 2019c, pp.57-82); (See Figure 3.1 below for more details).

These organizational structures, however, are not fixed. FEMA (2019c, p.133) notes, "As an incident begins to emerge or grow, the scope of the EOC should begin to come into focus." This sentence echoes Contingency Theory previously reviewed in Chapter Two, which holds that the type of organizational structure employed depends on the internal and external environment (Burns and Stalker, 1972). Therefore, although FEMA informs practitioners regarding the optimal organizational types for disaster response (FEMA, 2019a and FEMA, 2019c), the FEMA documents and training materials analyzed in this study do not further explain the changing nature of the EOC structure based on various disaster situations.

ICS or ICS-like EOC Structure

Many jurisdictions/organizations configure their EOCs using the standard ICS organizational structure. The structure is familiar and it aligns with the on-scene incident organization.

Some jurisdictions/organizations modify organizational titles to create an ICS-like organization that distinguishes EOC functions from ICS.
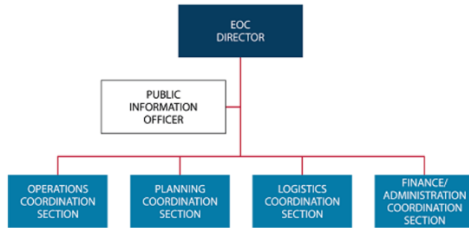
Incident Support Model (ISM) EOC Structure

Jurisdictions/organizations that focus their EOC team's efforts on information, planning, and resource support may choose to separate the situational awareness function from planning and combine operations and logistics functions into an incident support structure.

In an ISM EOC situational awareness/information management reports directly to the EOC director and resource sourcing, ordering, and tracking is streamlined.
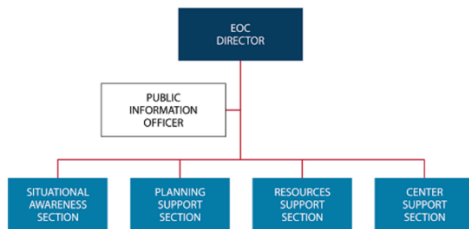
Departmental EOC Structure

Jurisdictions/organizations may opt instead to use their day-to-day departmental/agency structure and relationships in their EOC. By operating in the context of their normal relationships, department/agency representatives can function in the EOC with minimal preparation or startup time.

In this configuration, the organization's emergency manager or a senior official typically coordinates EOC efforts among the departments and agencies.

Figure 3.1: Three types of EOC Structures (FEMA, 2019b. pp.9-10)

As noted, these organizational structures are not fixed, and emergency managers must monitor the scope of the EOC based on the changes in the environment caused by a disaster (FEMA, 2019c) and the interactions between disaster responders. FEMA (2019a, p.33), for example, explains that the response framework is determined by the

interactions between responders: "The Command and Coordination component describes these multiagency coordination structures and explains how various elements operating at different levels of incident management interface with one another." More specifically, an organization normally alternates between mechanistic and organic organizational structures (Burns and Stalker, 1972). Mechanistic and organic systems fall along a continuum. Depending on the situation, the Oklahoma SEOC structure should incorporate more mechanistic or organic characteristics.

As a result, to successfully operate a SEOC in an uncertain environment, emergency managers must use a unified doctrine and protocol to manage all participants, which reflects a command-and-control managerial style (code M4 in this research). Emergency managers also need to interact with people from various backgrounds, ensure their commitments are shared, and establish coordination structures among staffs (code O1 in this research), which are characteristics of an organic system.

The Oklahoma State EOP (SEOP) shares the conceptual framework of mixed organizational structures. The SEOP (2019m p.69), for example, states that "all emergency operations will be conducted under the authority of the laws of Oklahoma and/or executive orders or authorities delegated by law to the elected or appointed officials of the State of Oklahoma," but it also states that "all government agencies having emergency responsibilities will be advised when the SEOC [State Emergency Operations Center] is activated." The above quotations demonstrate that the SEOC is able to make the ultimate policy decisions with centralized knowledge (coded as M3 in this research) but also relies on the communication and coordination between various organizations (code O5) to facilitate this decision-

making process. FEMA (2019c, p.21), as a result, exemplifies this paradox,

utilizing both organic and mechanistic characteristics for the conceptual framing of

"EOCS: A Critical Link":

> EOCs are a critical link for supporting the other NIMS [National Incident
> Management System] Command and Coordination Structures (ICS
> [Incident Command System], MAC Group, and JIS [Joint Information
> System]) before, during, and after an incident. It must be decided upon and
> clearly established in policy and procedure exactly what facility is "in
> charge" for which specific functions. Many officials in high level leadership
> positions see themselves and the EOC as "in charge." At the same time, the
> Incident Commander at the Incident Command Post considers themselves
> "in charge" because they are the ones taking tactical, operational action.

As a result, to successfully operate the Oklahoma SEOC, participants in the EOC

(including daily staff and liaisons from various departments) must utilize a mixture of

mechanistic and organic characteristics. Initially, SEOC staff conduct their daily job

functions within an established hierarchy and protocol, which represent the more

mechanistic characteristics of the SEOC. For example, the Oklahoma SEOP (2019,

pp.73-76) and FEMA (2019c, p.57) clearly mention the responsibilities of the SEOC

director, which include 1) setting EOC objectives and tasks; 2) integrating stakeholders;

3) working with senior officials to facilitate the development of policy direction for

incident support; 4) ensuring the dissemination of timely, accurate, and accessible

information to the public; and 5) facilitating multi-agency coordination groups and

designating either a deputy or an EOC manager to oversee the oversight of the SEOC activities.

The above list reflects the mechanistic characteristics of regulating specialized tasks (code M1) and fixed job duties (code M2). Later in the same document, however, when discussing the decision-making process, FEMA (2019c, p.68) states, "represented departments/agencies make group decisions," which demonstrates that all staff share commitments in decision-making, which is an organic characteristic (code O1). The Oklahoma SEOP (2019, p.5) more specifically states, "effective information sharing provides decision makers at all levels of government with a sound basis for making decisions to posture and commit resources and implement plans and procedures," which provides a structure for sharing organizational knowledge and is coded as an organic characteristic in the present study (code O4).

Although both federal and state documents appreciate mechanistic characteristics in designing the Oklahoma State EOC, each focuses different types of mechanistic characteristics. Based on the analysis, the FEMA materials more frequently mention the "command and control" function (code M4 in this research) but not as much on specialized tasks and job duties that is noted in the Oklahoma SEOP. The command-and-control function includes two core concepts: chain of command and unity of command. FEMA (2019a, p.40) explains further:

> Chain of command refers to the orderly line of authority within the ranks of the incident management organization. Unity of command means that each individual only reports to one person. This clarifies reporting relationships and reduces confusion caused by multiple, conflicting directives, enabling

leadership at all levels to effectively direct the personnel under their supervision.

The above concepts are characteristic of a mechanistic system, but FEMA documents normally link them to some broader, organic concepts. When referring to the duties of an EOC Director, for instance, FEMA (2019b) notes that an EOC director's role involves the coordination of incident command and policy groups who must establish methods to coordinate various organizations and groups.

Compared to the federal documents, the relevant state EOC documents place a greater emphasize on regulating how SEOC participants should accomplish tasks related to disaster response (code M5). To regulate how state employees complete their work, state documents also utilize command-and-control concepts:

> The Department of Emergency Management and Homeland Security Director, acting on behalf of the Governor of Oklahoma, will be the principal coordinator for all interagency and volunteer service organizations' activities for all phases of emergency management, to include disaster mitigation, preparedness response and recovery. The Director, as the Governor's Authorized Representative (GAR), will coordinate as necessary with the Department of Homeland Security and FEMA for all federal assistance requirements (Oklahoma SEOP, 2019, p.17).

State documents use this concept to reiterate that a specific entity or person has control of resources and personnel. Again, state documents focus more on the importance of completing specific missions (code M5). For instance, the SEOP (2019, p.44) notes,

"the Director of the Department of Transportation, or their representative, shall be responsible for directing primary activities in connection with emergency transportation." Further, an annex in the SEOP (2019, p.29) describes the role of the Oklahoma Department of Transportation (ODOT) role as follows:

> The [Oklahoma] Department of Transportation will coordinate with the federal government for assistance provided with the National Response Framework's (NRF) Emergency Support Function (ESF) #1 in such areas as allocation of civil transportation capacity, processing of transportation requests, control of air and marine traffic, directing, management, and controlling State and Regional Disaster Airlift (SARDA) operations, funding of emergency highway repair, hazardous material actions, and damage assessment.

The focus on completing certain tasks and missions is possibly due to the Oklahoma EOC's utilizing ESFs to construct its EOP, and thus all state documents analyzed in this research focus more on fulfilling said ESFs, but this fact also illustrates the differences between federal and state-level EOC documents.

As predicted by contingency theory, mechanistic and organic systems exist on a continuum, and thus I found many organic characteristics in these documents. In fact, based on this analysis, these organic characteristics are normally paired with the mechanistic characteristics as an explanation of how to complete a task. For example, the EOC activations should be determined by the person in the highest position of hierarchy (FEMA, 2019b, p.4), but emergency managers need to use the pre-established triggers (based on the disaster situation) to complete this mission (FEMA, 2019b, p.7; SEOP,

2019, p.69). Again, to complete a mission, SEOC staff must understand these organic

characteristics (or environmental cues). Following only FEMA guidelines and SEOPs

established before disasters might not be sufficient for making decisions.

Although external environments activate EOCs, internal environments—such as

cooperation among staff from different backgrounds—also determine how the EOC

functions. FEMA (2019c, p.69), for instance, states, "decisions are made within the group

of represented departments and agencies to reach mutually agreed upon objectives," and,

"it is critical that the EOC director work in coordination and collaboration with senior

EOC leadership and those impacted by events outside the EOC (FEMA, 2019c, p.139)."

Again, no documents analyzed in this study discuss how staff should perform these

organic functions in an EOC. As a result, SEOC participants must find informal ways and

obtain experience working collectively. The SEOP (2019, p.6), for instance, notes "the

cooperation of each agency involved with preparation, coordination and implementation

of this plan is gratefully acknowledged," which means emergency managers and

responders must work together before they collectively use the SEOC. As a result, to

successfully operate the SEOC, responders should establish trust and relationships, which

is mentioned in some previous works (e.g., Chang and Trainor, 2018).

Furthermore, to facilitate the above cooperation between SEOC participants,

responders must constantly define their work as they network together in the EOC. The

organic network relies on SEOC employees' having knowledge outside of their areas of

expertise or more specifically, what other people do in their daily work), which might not

be listed in their job descriptions. Thus, networking processes are very organic. FEMA

(2019a, p101), for example, notes, "A key to success in sharing information is a common

approach to information handling, a shared understanding of key information elements, and a shared awareness of what information is most essential to support a decision." Telling employees what to do and encouraging them to work outside of their area of expertise to engage with people of different backgrounds are both imperative to operating an EOC. The EOC centric documents analyzed in this research, however, emphasize bylaws and pre-designed job responsibilities more than organic functions such as networking with participants from various backgrounds. Consequently, both mechanistic and organic elements are imperative to successfully operate an EOC, but there are many hidden elements (especially in relation to organic characteristics and functions of running an EOC) behind these documents.

Chapter Summary

In the content analysis, three factors were noted that determine how the Oklahoma State EOC is expected work during disasters: 1) organizational structure (SEOC structure is not fixed and it swings between mechanistic and organic systems during disasters), 2) organic characteristics (how SEOC staff implement those hidden organic functions to complete the pre-established missions during disasters), and 3) networking (how participants from various backgrounds network in the SEOC to complete decision-making processes). Since these themes relate to how people operate the SEOC during disasters, I conducted qualitative interviews to further explore these factors.

CHAPTER IV

QUALITATIVE INTERVIEWS AND FINDINGS

In Chapter 3, I discussed EOC-centric functions, skillsets, and basic organizational design. The documents analyzed in the previous chapter, however, regard the EOC as a static and optimally designed organization that does not change according to either external (e.g., the scope of disasters) or internal (e.g., challenges in coordinating people from diverse backgrounds and organizations) environments. Therefore, the official EOC documents and training materials examined here neglect many critical parts of EOC organizational implementation (e.g., how EOC staff implement hidden organic functions to accomplish preestablished missions during disasters). The gap between EOC documents and training materials creates barriers and possible confusion for disaster responders. Thus, this chapter further explores State of Oklahoma EOC participants' experiences during disaster response to bridge this gap. More specifically, I conducted qualitative, semi-structured, in-depth interviews to investigate three organizational factors discussed in the previous chapter (dynamic structure, organic characteristics, and networking between participants). Significant findings include: 1) experience is a vital source of training for EOC staff and supplement or supplant training documents; 2) people must learn to be flexible and seek out guidance as they work; 3) networking and teamwork among staff leads to trust and relationships, enhancing decision making efforts.

Methodology

I conducted semi-structured interviews to further understand participants'

experiences within the Oklahoma State EOC and their knowledge of shifting between the

two types of organizational structures mentioned by contingency theory (mechanistic and

organic). Because mechanistic and organic structures exist along a continuum and are not

fully described in the EOC documents and training materials I analyzed in Chapter Three,

I used qualitative interviews to explore the history and meaning of participant

experiences (Rubin and Rubin, 2011). To design these qualitative interviews, I first

considered conducting structured interviews, but these would result in data too narrow for

the concept under investigation (Hesse-Biber, 2016). Unstructured interviews, on the

other hand, might yield extensive data that would be difficult to code, resulting in

research being lost in a data set of divergent viewpoints (Merriam, 2015). I therefore

selected in-depth, semi-structured, qualitative interviews to further explore those ideas

determined by the prior content analysis and to understand Oklahoma State EOC

participants' unique knowledge and experience (Heese-Biber, 2010). Before I

interviewed the Oklahoma State EOC participants, all interview questions were reviewed

and approved by the Institutional Review Board (IRB); see Appendix D.

Gathering and analyzing the data required a different approach than that used in

Chapter Three. Data driven coding was selected to interpret interviewee data. Utilizing

content analysis and interviews to investigate theoretical underpinnings and data driven

coding has precedents in literature as a valid qualitative strategy (Fereday, 2006).

Subsequently, I used data-driven codes to analyze the data, which involves reading the

interview transcripts and making notes, this started the process of developing the

codebook (Phillips, 2014). The use of data-driven codes in this methodology seeks to guide the coding process as there are not a theoretical basis, which also has the benefit of allowing a less structured approach the analyzing the data (Namey, 2008). The unit of analysis is concepts, and this is used as pathway to understand the context and insight of the material, not necessarily counting frequency of words or phrases.

Interviewees needed to have a specific skillset to provide meaningful data on Oklahoma State EOC operations. Purposive sampling was appropriate for this qualitative project, and participants were selected based on predefined criteria (Patton, 2002; Heese-Biber, 2010; Phillips 2014; Chun Tie, 2019). More specifically, typical case sampling was utilized to select the interviewees because it is appropriate when the intent "is to describe and illustrate what is typical to those unfamiliar with the setting" (Suri, 2011, p.5). Purposive sampling was primarily used for finding enough qualified interview participants to reach data saturation (Etikan, 2015).

My time spent working in emergency management and employment in the Oklahoma State EOC allows me to have contact with Oklahoma State EOC staff and gives me a wide range of options when using purposive sampling to find interviewees (Heese-Biber, 2010). Most employees in my agency are required to participate in EOC operations as part of their job. However, this participation does not mean they perform the same function each time they work at the EOC, although it does mean that many interviewees could be acquainted with my department. Additional interviewees were selected based on their roles as liaisons in the state EOC. The selection process yielded forty (n = 40) interviewees, achieving data saturation and following guidance from Marshall (2013). The number of interviewees was chosen to acquire reach and thick data

to further the field by allowing interviewees to share their deep knowledge of the EOC

(Creswell, 2012) and, more importantly, to acquire enough data to capture a range of

participant experiences (Mason, 2010). To increase the diversity of interviewees, I

selected interviewees from multiple organizational levels (departments), government

levels (local, state, federal), and entities within a given government level. The purpose of

this technique is to ensure multiple viewpoints are reflected in the results, thereby

improving the credibility of this research (Rubin and Rubin, 2005). Furthermore, by

interviewing Oklahoma State EOC participants from multiple agencies, governmental

levels, and organizational levels, individual experiences that may contradict or overlap

each other can be captured in the data set (Urquhart, 2012). See Table 4.1, below, for the

background of each interviewee. Also, see Appendix E for IRB approved letter to

interviewees.

Table 4.1 List of Interviewee Agencies

Agency	Level of Governments	Number of Participants
Department of Education	State	1
Department of Public Safety	State	1
State Department of Health	State	2
Office of Homeland Security	State	2
Federal Emergency Management Agency	Federal	3
National Weather Service	Federal	1
Oklahoma County	County	1
Department of Emergency Management	State	24
Department of Transportation	State	1
Owasso EM	City	1
Red Cross	NGO	1
Salvation Army	NGO	1
Media	Private	1
Total (n)		40

Qualitative interviews require follow-up questions to ensure the researcher achieves sufficient depth and understanding of a theme or idea. As such, questions and follow-up questions (Rubin and Rubin, 2005) were developed to better understand the concepts being discussed in the interviews. Probes were used to follow interesting leads offered by participants (Heese-Biber, 2010). The use of social cues were vital (Heese-Bibe, 2010) and the use of video conferencing allowed me to review important markers.

All interviews were recorded and transcribed with participant permission, which was obtained before recording commenced. The recordings have been kept confidential with strict password requirements. I am the only person able to access the recordings, and they will be destroyed once the project is complete. Similarly, transcripts have been password protected and encrypted. The transcripts will be destroyed once the project is complete. These procedures ensure participant confidentiality and anonymity. Zoom interview strategies were followed to ensure participant experience was not interrupted by video-conferencing issues (Gray, 2020).

Peer review for this section of the project included having my dissertation committee review my methodology, codes, and results. I merged and synthesized my codes with peers to increase the creditability of this research (Bryant, 2019). I also avoided common mistakes by organizing the codes broader categories and using selective codes (Saldana, 2016). During the analysis, I kept refining the codes to grasp the general concepts from these interview transcripts. My peers have extensive experience as researchers and within the emergency-management discipline. Their input greatly improved this project and increased the credibility of the results. The semi-structured interview codebook is located in Appendix B.

As discussed above, data-driven coding was used to analyze the transcripts. More specifically, I utilized the open-coding, or initial-coding, method to complete the first cycle of coding (Saldana, 2016 and Chun Tie, 2019). By following the three primary questions (the factors influencing EOC operations during disasters) for this methodology, the data can be reduced to discrete parts and then analyzed (Strauss and Corbin, 1998, and Saldana, 2016). However, the codes should be considered provisional (Saldana, 2016) and allow the data to take the research in a new direction (Glaser, 1978). To conduct the initial coding, I read the interview transcriptions over and over, looking for similar concepts. Then I put similar concepts together and looked for patterns relating to the three questions. Furthermore, the codes should relate to each other (Saldana, 2016). I then sent to my peers to review my work and approve the codebook. Finally, I used the approved codebook to analyze the rest of the transcripts.

Thematic content analysis was used to capture qualitative data from the semi-structured interviews. I then utilized the computer software Atlas.ti to analyze these transcriptions and lumped similar concepts together. Each interview transcript was reviewed and concepts were coded in Atlas.ti. The software kept track of each code and how many times it was used along with its location. I then systematically developed the overall themes and patterns extracted from the words and sentences.

Limitations and Ethical Concerns

Interviewing coworkers, Oklahoma State EOC employees, presents limitations that may cause issues with data quality and integrity. Coworkers may feel constrained in their responses and not talk openly with the me, even though I am conducting the interviews as a Ph.D. student. Further, participant identity has been kept anonymous and

all responses were confidential, my professional relationship with the interviewees may have interfered with their responses. Creswell (2015) postulated that ethical issues should be discussed before conducting data collection. Furthermore, Creswell (2015) has noted that there is a common misconception that ethical issues only arise during data collection. Thinking about ethical issues requires researchers to critically evaluate all aspects of the project and link ethical concerns to each step in the design process (Creswell, 2012). My employment in the Oklahoma State EOC and my relationship with many of the interviewees presents ethical issues, which will be mitigated by coordinating with my dissertation committee and advisor.

Interview limitations are present in relation to obtaining willing participants, arranging interview times, and avoiding workplace conflicts of interest since purposive sampling was used. A few cautions are noted in relationship to the questionnaire due to question-related bias and the fact that interviewees may have been reluctant to answer questions despite the assurance of confidentiality. These possibilities raise ethical concerns, which must be considered in methodological design and implementation. Similar to document selection, the interviews involved only Oklahoma SEOC participants. As discussed previously, participant diversity between organizations and the diversity within the organization were vital to increasing research credibility. Despites these efforts, the transferability of results to other states is limited. However, the research does provide a foundation for future research with other state EOCs.

Results

The results from Chapter 3 provided further pathways to increase understanding of the Oklahoma State EOC, which informed the data gathering strategy in this chapter.

In this section, the semi-structured interview results are presented and examined. Themes within the interview data are reviewed and analyzed to advance this project beyond the results of Chapter 3 by addressing the three components arising out of the content analysis results. These components are 1) Oklahoma State EOC structure is not fixed and might be different than training and planning documents; 2) there are many environmental cues both internal and external to consider; and 3) networking in the Oklahoma State EOC and influence on the decision-making process. Within each of the three components are subcomponents that emerged through data driven codes. The results of this chapter will guide future research into Oklahoma State EOC organizational structure.

EOC Organizational Structure as Static

EOC organizational structure is presented as static in FEMA training material. People may be confused as they report to the EOC or those that work there as they are unsure of their role and what is required of them beyond the roles listed in the training material. Differences result in uncertainty as EOC staff's perceived reality differs from their training. Staff must then reconcile these differences as they integrate into disaster response operations and experience situations for which they are not prepared. Their acclamation to the EOC internal environment is organic, yet as has been proposed in Contingency Theory the internal environment is influenced by the external environment. Therefore, the EOC structure shifts throughout disaster response and this was captured in interviewee responses.

FEMA training states people in the EOC work together by collaborating and making decisions, but to do so requires exchanging information. However, FEMA does

not tell people how they should work together or barriers to information exchange. To facilitate the inter-agency cooperation, people must remain flexible in the EOC and anticipate changes as the external environment shifts during the disaster, ultimately requiring staff to be flexible, which is also not addressed in training documents. Demonstrating this element, an interviewee said:

> Some of the main duties that we would be doing during an activation are scalable. We may not do a situation update, for example, for every single activation, but we know how to do it for any activation no matter how big or small it is […] Of course, you're always going to have situations that come up that are unplanned for. A lot of that, for us, tends to be political or personnel issues, where a particular person is asking for something that is outside of what we normally do, and we have to figure out how to handle that.

People can remain flexible if they have information on the changing external environment, which is situational awareness. However, for staff to have situational awareness they must know where to get the information or who(m) to talk with, neither of elements are provided in the training documents. Having situational awareness is essential to making decisions and people must talking with each other to determine how they are going to complete their missions during EOC operations. An interviewee noted the importance of situational awareness to their mission:

> I rely heavily on a situation unit leader to do a lot of the situational awareness stuff while we're going on […] I also rely on the other people around, being able to go and ask them. If I've got something and I'm not

sure about what it adds -- what the actual actions are going, taking place, I can go and ask one of them and get that information, also, to add the situational awareness.

This quote further explains the importance of working with people of different backgrounds to complete the situational awareness effort:

First we have to clarify if it's really a shelter or if it's an evacuation center. We have to figure out whom the request is coming from and what they're needing. We'll reach out and contact whomever—we'll just say local EM. We'll just contact the local EM and say, "Hey, what are you needing?" They're going to tell us the fire is coming close. They need an evacuation center and somewhere close, but not in the direction of the fire. We'll contact our VOAD partners. First is always American Red Cross, and then depending on where it is, second is Salvation Army. Sometimes those are flipped because sometimes Red Cross just can't get there or Salvation Army just can't get there. It just depends. I reach out to our VOAD partners and see what they have going on where they're already at. They might already be there and the local EM doesn't know that.

Therefore, people in an EOC must form a team and exchange information to make decisions. The need to form these teams to make decisions is organic, especially since this process does not represent hierarchical decision-making structure mentioned by the EOC documents and training materials analyzed in the previous chapter. An interviewee, for example, explains:

Everything that's done with the State EOC is in support of local jurisdictions, so talking to them and seeing exactly what they need [is important] […] This should start, quite frankly, from your coordinators in the field who should have their finger on the pulse of everything that's going on there. Then that information funnels up to the operations director or manager and then shared with the EOC manager and the director. I would think those top three people, from operations up, should be the ones working together, funneling all the information they have, and making that decision.

Again, the gap between the EOC training documents and implementations creates some confusions, especially for those new participants. Even for experienced EOC participants, as they also may not be familiar with every detail in the EOC documents and training materials. An interviewee, for instance, interpreted the usefulness of these documents for his/her role by stating:

We do not rely on operations or planning or another part of the agency to provide that to us because that hasn't been a consistent product that's been provided in the past. A lot of times if it is provided, the information that's included isn't what we're looking for, or the timing doesn't line up with when we need to really start our report. Sometimes depending on the timing of disasters, that's difficult to arrange.

As a result, to facilitate the EOC operation, people must become familiar with those hidden parts not mentioned on the documents and training materials—such as how should they work with other people to complete their job/role specific tasks. An

interviewee referenced these hidens elements by describing his/her job related actions that are outside of the training document and planning structures:

I know that ideally you would have a public information officer for each agency. That would be connected to the hip with their liaison, their EOC liaison. That doesn't always happen for every agency. Some agencies are a lot less involved than others on the public-information side. That's why I have to have those relationships and communicate with the liaisons themselves because sometimes I'm getting the information directly from them. For example, the health department, we work a lot with the health department year-round, with the health department PIOs. When we have an activation, when we have a disaster, I typically will go to the liaison and ask them to start their hospital queries that they do, where they're checking to get a daily count of how many injuries are reported at area hospitals. That's something that I work through the liaison for, not the public information officer.

Another interviewee hints the hidden parts of Oklahoma State EOC operations could be learned from practice and discussions, he/she says:

If I'm looking for ambulatory requirements or the activation of helicopters perhaps, that I could quickly flip [an SOP] through to find some guidance there as opposed to trying to find the appropriate section. I think exercising that and maybe having group discussions to go over the content with the people that are going to be manning those positions would help as well because I think there's a lot more people in the emergency management

business like me, that when you read something, you read it. But until you

actually practice it, put it to use, or have conversation about it, I don't think

it really is retained well.

Therefore, plans are vital to disaster response. To successfully operate an EOC,

however, having previous experieneces on practicing and discusssing these plans is

equally, if not more, important to furthering the disaster response mission. Planning

concepts were noted by several interveiwees when asked how they complete their roles

when the planning documents are insufficient for their job requirements:

A lot of times experience based on what has happened in the past with past

incidents and the pros and cons that have come out of that does impact my

decision making in the impact there is no *EOP* or *SOP*. Also, sometimes the

EOP or *SOP* does not have all the correct information or ideas of what could

happen. Sometimes that past experience does help alleviate some strain that

the *EOP* or *SOP* does not cushion. If there's different resources, you can

pull in from different resources, agencies, departments for situations that

were not previously mentioned in the plans. If I have that experience, then

it's easier to make decisions that would otherwise be something that you

have your hat thrown up in the air not sure what to do.

Although those documents, plans, and training materials might be different from

the actual disaster situations, they do provide structure for people to make decisions.

However, as discussed in this section and established with empricial data, those

documents do not and cannot cover all possiblities staff may encounter as they operate in

the EOC during disaster response. Therefore, relying only on those documents and

training materials are not sufficient to successfully operate an EOC, so we will continue

discuss those hidden elements that facilitate EOC operations.

Environmental Cues in the EOC

Many factors from the external environments, or the environmental cues, also

influence the EOC operation; not only the mechanistic rules and regulations in those

training and planning documents. These factors represent the response-generated

demands of disasters that cannot be fully addressed in those documents. Subsequently,

the lack of fully documented guidance represents hidden elements of operating an EOC,

necessitating experience and flexiblity to support EOC operations. The following quote

demonstrates how experience influences staff decision making:

> Again, that's situationally based. But typically, it's when the threat to life
>
> safety and threat to property has resolved itself. For example, a tornado has
>
> gone through a small town. The operational phase, to me, would end once
>
> all people are accounted for and that the risk to further damage to public
>
> property or to the loss of life has ended.

Inexperienced staff struggle to understand how their expected job role links with

those documents and the current response objectives. People must determine if they're

involved (e.g., a phone call) in the decision making process or where they perceived EOC

role intersects with expectations. Additionally, this hidden element cannot be reflected in

those documents that guide EOC operations and staff must learn them through

experience. Below a participant notes how prior EOC experience helped guide their job

role as the disaster progressed:

In the past, whenever I was directly involved with an activation, it was more on an assist level or an observation level. It definitely helped as far as—I mean, since I work in public assistance, it definitely helped in having an idea of where the process would continue once that time arrived. For example, knowing where to start preliminary damage assessments, or PDAs. You had an overview, kind of an insight, into what had taken place, where things were happening, where you needed to get a start at, where the largest impacts were, which definitely helped whenever you're trying to get started.

The challenges posed by the hidden elements of EOC disaster response also extend to experienced staff. For staff to be experienced in the EOC operations may take several events or even years. Those training and planning documents cannot account for every type of disaster or how EOC operations shift during and between disasters. Staff eventually learn these hidden elements and several interviewees described how EOC operations shift depending on staff perception of the event:

Some of the smaller ones that are a little bit less informal, if you will, those are handled sometimes a little differently. We may not send out notifications; we may not send out a letter stating who will be doing what; what they'll be doing; the different people that'll be involved, their positions; what roles and responsibilities they will have in the activation. There are some that are informal which we just activate. Then there are those that are more formal, and we take a lot more steps and measures.

As Oklahoma State EOC organizational structure shifts staff roles will be refined and deviate from the planned generic job descriptions. Those trianing and planning documents list generic job descriptions (roles) but do not provide guidance on how the job shifts during disasters or between disasters. The expectations of the role and realities of disaster opertaions are disparate; subsequently staff must learn this on the job and a time sensitive environment. What isn't listed in this job description are several elements of 1) who needs the information, 2) should they act on the information, 3) how situational awareness role should handle confliciting information. These shifts in job roles lead staff to refining and redefining their EOC acitvities as they gain experience.

As people refine and redefine their EOC roles, it also means they will not conduct their role the same way in each disaster. Notably, this is another hidden element in those planning and training documents that sets expectations for new EOC staff about their role. As new EOC staff learn their role they incorporate their prior experience into the new disaster response. Interviewees provided insight into how their job role is redefined by stating:

> Well, there's always something going on. That's the key. Even when it's a blue-sky day and everything's going well, you have to deal with the other aspects of the job, whether they be political or whether they be territorial or whatever. There's always something new happening, whether we're working on a new SOP, whether we're trying to educate different people in the field on what emergency management does, whether we're just trying to meet the needs of our local jurisdictions. There's always something going on. So it's not like we work from disaster to disaster. As a matter of fact, I

always found that the actual activation and the disasters might be the easiest

part of the job, because you knew exactly what you were going to do and

you reacted to it. And you tried to do it in a thoughtful manner and a manner

that helped your customers. Whereas the day-to-day operations were more

mundane but just as important. Because you're actually setting yourself up

for the future disasters.

This experience and job role redfining allows EOC staff to better anticipate

response-oriented demands. Meaning, what happened last time may happen again and

how did the issue get solved. Experience also allows staff to incorporate new situations

and piece together prior responses to find innovative solutions. Many interviewees

described this cricular concept as "event training," which is conveyed in the following

quote:

I'd have to say that because we get so much experience, because of the level

of activity that our state experiences for impacts, for events that require us

to activate the state EOC, I never felt that I was at a loss as to what needed

to be done because our events trained you so much so to be able to have that

knowledge that you needed for adequately responding, or coordinating

response efforts. If that makes any sense? Even if it may not have been

captured in the SOP, I didn't feel at a loss for not being able to function

when that need arose because we had so many events and activities and

incidences that happened in the state. You quickly pick up on what needs to

be done.

The previous points demonstrated that experience is important for operating at the EOC because it helps staff to understand the changing demands of disasters. More specfically, response-oriented demands bring different challenges, resulting in a complex environment, both internal and external. These challenges require staff to adjust as the external environment changes, which can result in important information for decisions or another disaster during the current disaster response.

The response-generated demands of a disaster necessitate quick information gathering and decision making. As such, staff cannot have all information necessary to make a completely informed decision. Experienced staff can adjust to these constraints and refine their job role for improved decision making. Further, since they haave prior experience, they can draw on this experience and improvise novel solutions for the current disaster from pieces of prior disaster response decisions. Interviewees talked about how important experience is over time and how this has helped them during EOC operations:

> In fact, well, because having had the experience where you know that sometimes decision making, time is of the essence. We set down and we had good relationships and had talked with each other about what was allowed, what was expected, what in terms of the boundaries with which direct decisions could be made or with which I could task agencies to perform certain functions. I knew when there was a certain line. For example, with the National Guard, I could call up Highway Patrol and say we need you to send some folks over here because a tornado has hit X, Oklahoma. With the National Guard, because I knew with rules,

regulations, policies, procedures and legality issues that I needed to run that

through the chain. It might be that I would make the recommendation that,

yeah, we do need to send. Here's what I think we need to send.

Another disaster may occur during initial disaster response creating additional

challenges to the internal EOC environment further complicating decision making as staff

must separate the two disasters when making decisions. Coordinating two disasters at

once is another hidden element of EOC operations. Experienced interviewees noticed this

hidden element and cited events in May 2019 when a flooding disaster occurred in

Oklahoma and a tornado disaster occurred two weeks into the flooding event.

Additionally, many interviewees noted the COVID-19 disaster that started in March 2020

and continued until May 2021, along with an ice storm diasaster in October 2020 and a

winter storm disaster in February 2021. A notable quote from an interviewee on this:

> Well, again, I think that you have four phases of emergency management,
>
> but that they constantly overlap each other. You might be working on an
>
> after-action from one disaster while it's still going on, and a new disaster
>
> starts. That doesn't mean that the first responsibility you have is any less. It
>
> just means that you have to be flexible to jump in to do more than one thing
>
> at one time. You have to multitask. But again, if you've got the right people
>
> in place for the different divisions, response is always response, recovery is
>
> always recovery, mitigation is always mitigation, and preparedness is
>
> always preparedness. It's just how many different things you're taking on
>
> at the same time. And you have to trust them but, also, verify what they're

doing to make sure that they're meeting both the needs of the current disaster and the one that's coming up.

Due to the challenges noted in the previous discussions, to successfully operate the EOC, the senior EOC members need to network with new EOC participants. By networking with others, people get help that allows them to gain those experiences necessary to function the EOC and become familiar with those hidden organic characteristics during EOC operations. New EOC staff may or may not have completed training, yet even if they did these results indicate they still need to be mentored by experienced EOC staff. So, we'll continue by discussing those organic networking activities that occur among all EOC staff.

Networking in the EOC

When EOC staff arrive for disaster operations they may know fellow coworkers if they have prior experience, yet new staff will not know many people and must spend effort to network. Networking is essential for information gathering and decision-making. Further, networking illustrates the need to understand how people from various backgrounds network in the EOC to complete those decision-making processes.

As we mentioned before, senior EOC members have to share information to help those EOC participants with less experience. Importantly, information sharing is based on the team, which is quite different than the hierarchical structure mentioned in many EOC documents and training materials. The hierachical structure may mean staff must operate outside of established chain of command to gather needed information, yet staff make a decision within the mechanistic structure, as noted by a few interviewees.

I think it's a mixture. You always have different personalities within any operations center, so it's a mixture. It always seems to work better when it's as a group to help troubleshoot issues, to help identify resources. It seems to be working toward that aspect of being able to work as a group. It always seems to take a little bit to get that group fully functioning and understanding everyone's different personalities and the way they think and operate […] I would say it takes about a week or two to really get the team understanding what's going on across the board, and we're good to go from there. It always works better as a group and a team effort at this point.

Another interviewee noted the important of experience in working with other staff but also those hidden elements in the prior section, whereby staff know what decisions can be made and decisions requiring approval:

Usually the JOC, the Joint Operations Center, the person who's responsible for military support civil authorities and I had had a conversation and talked about this. I gave them a heads up. They gave me a heads up if they got a call. We worked out here's what we think we might need. Ultimately, we went back through the chain of command to the director, to the chief of staff, to the governor to authorize that because that's the legal framework. That's what's required to pay the bills. It worked both ways. We had a good clear understanding of what those boundaries were and when that needed to be done.

The previous unoffical discussions and networks result from the relationships and trusts built before disasters. They are unoffifcial discussions since those EOC training

and planning documents do not discuss these important organic elements. As people build these informal relationships they are more likely to trust each other, which improves coordination and decision-making. The emerging relationship and trust is demonstrated by the following quotes whereby interviewees discussed how trusting or knowing someone helped them work together during EOC operations:

> Um, that was -- and I told my folks, that's, that's a great deal. They're, they're trusting us, and that's a great responsibility on our part to never violate that trust. To me, that's, like I said, it, it, uh -- we go wherever we're needed, and we help. That's, uh, y-, y- -- the whole attitude in your EOC changed and made, made us feel much more welcome. Uh, obviously, the more people feel like you're, you're, you're welcome and, and wanted, the better support you get. Like I said, you're always going to get support regardless, but you know how human nature is.

Another interviewee cited the importance of knowing people as they enter the EOC and how this improves their working relationship and trust:

> Yeah. And the other piece to it is making sure that all of the other players in the arena, whether it's one person or the other, making sure I know those folks, what they're doing, knowing where to turn if I need something, knowing where to turn if somebody needs something of me. Yeah. Building up a team and getting to the point where those interpersonal connections can be kind of forged in shared hardship to the point where you start building trust, I think, is crucially important in an EOC.

The importance of building relationships and trust before EOC operations

provides benefits when a disaster occurs. Yet, new staff do not know people, as noted

previously, requiring them to establish these relationships during disaster response. As

such, during the EOC operation people build trust and experience among staff, whereby

trusts and relationships evolve out of teamwork and are critical to completing their jobs:

> We hear often from the field that "I, I gave it to the first guy," or "I told the
>
> first guy this." It-, it just -- um, it's frustrating for everyone. As much as
>
> possible, I think it's important to keep the same people because you're going
>
> to develop those relationships further. If the relationships aren't great, um,
>
> which that happens periodically, you want to make sure that you identify
>
> that early enough to where you can, um, intervene and, and maybe, um, alter
>
> some staffing positions, changes. It might just be personality conflict, but
>
> identify those kind[s] of issues up front quickly, uh, to where they don't
>
> continue to, um, fester and create problems down the line.

Another interviewee described how they observe others working together and fit their

roles to work with these staff, this incorporate previously discussed organic elements of

flexibility and trust. Demonstrating how the organic elements of the EOC are vital to its

success during disaster operations:

> I did see that [the importance of having trust built before disaster]. I saw
>
> them working together in the context that I just mentioned as far as planning
>
> and things like that. I also saw them working together in terms of verifying
>
> information. You know, "We have information that this is happening...is
>
> that what you're hearing too?" It was just a really good support[ive] system

there. That's why, as a [an EOC position this person served], I felt great

there because I knew the information I got was going to be accurate; it was

going to be vetted many times over and all. I just fully trusted everyone I

worked with. I did see them working together. When you look in that bull

pen and you see them just sitting elbow-to- elbow, and they've all got one

common goal, and that's to keep everyone safe. I saw that working every

time I was in there.

Chapter Summary

In this chapter I have introduced the methodology for the qualitative semi-

structured interviews and the reasoning for conducting those interviews. The results of

those interviews demonstrates the Oklahoma State EOC has many hidden organic

elements that are not provided for in the generalized FEMA training documents. Based

on the qualitative interviews and resulting data-driven codes, there are some suggestions

to operating the EOC. First suggestion is trust and relationships built before disasters are

vital to operate the EOC. Next suggestion is during EOC operations, people need to

network and build a team to successfully operate the EOC (which might imply EOC

operation relies on teams; so we might need to fix the team members and lower the turn

over rate). More suggestions and conclusion of this dissertation will be discussed in

Chapter Five.

Chapter V

Dissertation Conclusion
and Suggestions for Future Research

Introduction

Chapters 3 and 4 discussed the two different methodological analyses utilized for this project 1) those FEMA training documents and the State of Oklahoma EOP and 2) semi-structured qualitative interviews that I conducted. I will present suggestions based on the results of these two methodologies. As previously noted, State EOC centric research is sparse, thereby limiting comparison of these findings with other academic research.

In general, the qualitative interviews revealed 1) Oklahoma State EOC participants must recognize and learn the hidden organic elements of EOC operations during disaster response, 2) this experience allow them to network and form teams, leading to relationships an trust among participants, 3) new staff, even if trained, will need to acclimate to the EOC environment before they can perform their job roles.

Based on the collected data, five conclusions can be reached in this dissertation: 1) Oklahoma State EOCs organizational structure is dynamic, 2) training documentation should be updated to reflect hidden organic elements to better train new staff, 3) staff should be encouraged to refine their EOC job role and understand the importance of being flexible, 4) prior research on the design, function, and operation of

an EOC does not convey the true organizational structure uncovered in this research, 5) future EOC research should treat state and local EOCs as different organizations. For remainder of this chapter I will discuss suggestions for Oklahoma State EOC operations, future research, and overall limitation of this research.

<div align="center">**EOC Operations Suggestions**</div>

The data gathered from Chapters 3 and 4 and subsequent results provided four suggestions for discussion. These four suggestions are discussed below, along with their implications for EOC training and operations.

Oklahoma State EOC Organizational Structure is Dynamic

Chapter 3 results did not reveal much about how Oklahoma SEOC structure is established or if it changes during disaster response. Those FEMA documents and the State of Oklahoma EOP provided an organizational framework and specific suggestions for organizational types (ESF, ICS, departmental, or hybrid). Additionally, the documents also revealed the structure has mechanistic underpinnings whereby decisions are made at the top and filter down to frontline staff. They also hit at information being centralized within the organization and staff focus on their specific role. However, some data from the content analysis did reveal organic elements to the EOC structure; subsequently this finding supports Burns and Stalker's (1976) assertion that organizational structure shifts between mechanistic and organic. EOCs dynamic structure is also noted in data from Chapter 4 interviews.

Chapter 4 interviewees clearly discussed organic elements as the main operational environment within the Oklahoma State EOC. References were made to mechanistic structures, specifically connecting to these elements after disasters decisions are made

and then following procedures to relay those decisions along the chain of command. Interviewees also noted they coordinate with others in the EOC and not necessarily within their division, another organic element that encompasses technical knowledge throughout the organization. Knowledge transfer also leads to shared commitment from staff regarding organizational objectives. However, disaster response requires the organization to be flexible should another disaster occur, which swings towards organic.

Chapters 3 and 4 results show that Oklahoma SEOC organizational structure may be implemented as mechanistic before a disaster. However, once the disaster occurs the organizational structure must shift to meet the changing external environment (contingency theory). Staff must come together and handle the response-generated demands and interviewees noted having "the right people in place" to get tasks accomplished. Fundamentally, Oklahoma SEOC staff need each other to conduct and complete their job role, whether by networking or self-organizing, this represents an important aspect of EOC operation.

EOC Emergent Networks and Self-Organizing

Prior research has established that during routine times people have institutionalized knowledge but during nonroutine times noninstitutionalized social networks emerge leading to new or novel concepts (Max and Mark, 1994). Further Tierney (2004, 2014) notes "disasters are occasions that stimulate the development of various forms of collective behavior." These concepts were revealed in this project demonstrating Oklahoma State EOC staff also experience development of novel concepts during disaster response. Response-generated demands change each disaster and staff must adjust to these changes. Even though the FEMA training documents prepare staff

for working in the EOC and the State EOP provides guidance on how people should work; the response-generated demands cannot be totally predicted and staff must adjust to these changing demands. As such, requiring flexibility among stuff with the outcome of improvisation and emergent networks. New staff may undergo these changes more than experienced staff, as newer staff only have training to support their decision-making processes. As staff become experienced and develop relationships, they refine their EOC roles.

The results from this study show prior research of first responders can be applied to EOC responders, adding to prior research by Dynes, Drabek, Mendonca, and Webb whereby role flexibility has been determined as essential to disaster response (Mendonca, 2001). This research and results are unique by a State EOC and staff organizational structures, and revealing staff enact role improvisation during and after a disaster. This shift in role enactment allows staff to make quicker decisions during the next disaster. Role improvisation is most powerful when similar situations present and this emphasizes the need for experienced disaster managers, beyond the training material.

These EOC roles are listed in those training materials, however results from this project show people do not remember those training material. Staff may reference training or planning documents as an afterthought but not as their primary go-to when arriving at the EOC. New staff develop networks to support their decision making. As a result emergent networks occur, representing organic elements of disaster response that are not clearly discussed or emphasized in the documents reviewed as part of the content analysis in Chapter 3. As such self-organizing and emergent network leads to staff refining their job role as experience increases.

EOC Job Role

Training documents and to some extent planning documents list expected job roles of EOC staff, which is mechanistic and discussed in Chapter 3. These elements create challenges since people operating within these functions operate under unplanned constraints and circumstances (Tierney, 2014). Challenges emerge and are due to roles being generally based on established plans of what needs to be done but reality deviates from the plan on how to do the job (Tierney, 2014). Interviewees noted they must make decisions, yet before doing so they may need to work with other team members. Flexibility in the job role is another consideration and both of these allow staff to modify and refine their EOC role as they gain experience.

The drawback of this role refining is if someone leaves, new staff must be trained and then gain disaster response experience. A circular training process does enable new staff to learn but also reduces their effectiveness during disaster response as they spend time forming relationships and trust. Needing to form relationships comes from not knowing people in the EOC that may be able to help them fulfill their role, they may know people in their agency but will be working with new people in the EOC during disaster response. As networks grow and people gain experience, it allows them to continue refining their job role, which may look quite different than the training and planning documents.

There is an opportunity after disaster to link these changes and update the job role. Even if suggestions are made for changes, the training and planning documents may not be modified. Coordination among staff about their role and refinement is organic and was demonstrated through the interviewee responses. These organic elements are vital to

EOC operations, yet represent hidden elements, a previously unknown component of EOC disaster response.

EOC Staff Must Learn Hidden Elements

The prior suggestions all have a common linkage to EOC staff learning the hidden elements of operating an EOC. The FEMA documents and the Oklahoma State EOP cannot provide the level of detail to prepare staff for disaster response, however they can provide guidelines that represent the organic environment found in an EOC. Subsequently, this does not hinder teaching elements that are mechanistic, such as chain of command, but would better prepare staff for the realities of working in the EOC with others. Further, developing a cooperative working environment encourages these relationships and trust formation.

Even though relationship building was previously discussed, it is worth mentioning in this section. The hidden organic element of networking is a strong influence in EOC operations as staff must work together to complete tasks. The need for these relationships is missing from the documents but was readily demonstrated in the interview data. As staff report to the Oklahoma SEOC they must learn each other's job role and determine where their roles intersect. They also learn the capabilities of others in the EOC and where they can get support, if necessary. By working with others, trust is formed and allows these newly acquainted staff to readily cooperate during future disasters, meaning they do not have to spend time building relationships. The struggle here and in the FEMA documents is new EOC staff are a certainty and the training documents are insufficient to support these trust formation processes.

Updating those FEMA documents to illuminate the hidden organic elements of EOC disaster response would be beneficial to trainees. Further, updating the documents would also help experienced EOC staff understand the organic processes that occur. Plans can also be framed to encourage teamwork and relationship building by using past disasters as a guide for how people actually worked together instead of how a few staff think they should work together. Results from both methodologies revealed a disconnect with those training and planning documents and the actual organizational structure staff create during disaster response. The next section will provide suggestions for future research on how to resolve this disconnect and add to the body of scholar literature on EOC organizational structure during disaster response.

Future Research

This project has uncovered foundational EOC results and serves to update existing literature on EOC disaster response, but more importantly bridge gaps in literature regarding these facilities. Future research can expand these concepts and continue to enhance our understanding of EOCs. A few research ideas emerged from this project that will continue the conversation on these important facilities.

Differences between state/local EOCs

EOCs serve a community and this community can be a small town, county, state, or tribal. Each of these governmental levels have different responsibilities, resource flow, and legal requirements. Scholarly literature is silent on the differences between these EOCs and this is important due to disaster response requirements for each. Important differences exists between these levels whereby state level is likely to have many more employees than a city. Tribal EOCs can work through a state EOC for federal funds or go

directly to the federal government. State EOCs must implement federal oversight requirements for local EOCs regarding federal grant programs. These suggestions are only a few of the differences among EOCs government levels.

Separating EOC governmental levels during research would benefit our understanding these community centers and how emergency managers coordinate to support resource requests. Local officials frequently have mutual aid agreements, yet states face different legal requirements when needing to transfer resources across state boundaries. The political dimension of EOCs is harder to study but would benefit academic understanding of these centers and their place without this sphere. These studies will update literature from 20 years ago and provide additional research opportunities.

Compare State EOCs across the United States

This study focused on the State of Oklahoma EOC, limiting transferability of results. However, additional studies can explore other state level EOCs, specifically their organizational structure. Additional studies may allow results to be transferred to other states. Additionally, there are states that have limited disasters. A comparison of their operation with those states that have frequent disasters is of interest. Thereby helping to advance our understanding of state level EOCs.

Utilize Qualitative Interviews to Study EOCs and Update Literature

Even though prior qualitative research in an EOC has been conducted regarding function (Neal, 2003; Swain, 2004), design (Bliss, 2013) and reconstruction (Kendra, 2004) there remains a wealth of opportunity to study EOCs in more depth using qualitative methodology. As this project shows, semi-structured interviews provided a

rich data set regarding staff experiences during disaster response. Focus groups are good use of qualitative data gathering and could provide deep discussion on EOC topics, especially when working with EOC staff and liaisons.

Longitudinal studies should be considered, which would enhance data gathering and research credibility. Prior observational research has occurred during exercise events and/or visits lasting days. Even though this data gathering provided beneficial data, exercise events are not disaster response. EOCs activities are illuminated during disasters and the same conditions cannot be replicated during exercises. Conducting research using multiple qualitative data gathering techniques will help future researchers better understand EOCs connection to their community and disaster response mission.

Research Limitations

As previously reviewed in Chapter 1, 3, and 4, there are limitations to this research from both a qualitative methodology standpoint and my role as a practitioner. I believe this research limitation summary is important for readers to understand how I approached this project and efforts to adhere to rigorous ethical requirements. Throughout this project my committee chair, advisor, and committee members were kept informed of any concerns that may compromise the ethical standing of this research.

Qualitative Research Limitations

Since this research was designed a qualitative inquiry, I utilized purposive sampling methods to select training and planning documents, along with interviewees. Further, I only studied the State of Oklahoma Emergency Operations Center and not other state level EOCs. Each state has unique laws and enabling legislation for emergency management, resulting in disparate organizational evolution among states.

Additionally, I analyzed national FEMA training documents as part of the content analysis, and these are available online. They are also the primary EOC training material yet are limited to three courses. Also, the State of Oklahoma Emergency Operations Plan (EOP) is a singular document and no other state EOPs were analyzed. The total analyzed page count of the content analysis among the four document was 818 pages. As such, the results of this research do not represent all state-level EOCs and the results from both methodologies cannot be transferred to other states, even though this is an ideal outcome of qualitative methods. Qualitative validity (Maxwell, 2002) was of primary importance thorough the research process. Ultimately the results do not represent all states in the United States or possible EOC organizational structures.

My Role as a Practitioner

As a practitioner I have access to those training and planning documents reviewed in this project. Further, I worked at the State of Oklahoma EOC, the facility I studied in this project. All analyzed documents are readily accessible, and I exercised no special privilege obtaining the documents used in the content analysis. The number of documents was limited to three training and one planning. The three FEMA documents are the totality of available training material centric to EOCs.

This dissertation has illustrated the hidden organic elements of a State EOC and how these elements are essential for disaster operations. Further, directions for future EOC discussion and research were provided. As previously noted, EOCs at different government levels should not be treated the same in research. Additionally, researchers should take a step beyond observing EOC operations for a short period of time and

dedicate a longer time period to observation and interviews. Doing so will better inform

the body of literature on EOC operations. ₚ

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APPENDICES

Appendix A

Mechanistic and Organic Codes

Mechanistic Codes

M1	Specialized Tasks	Employees work separately and not in groups. They are narrowly focused on their work tasks. Collaboration among employees is limited.
M2	Job Duties are Fixed	Organizational procedures are created and specified for each position. Employees are expected to follow the guidelines established for their function.
M3	Centralized Knowledge	Knowledge about the organization, goals, and tasks is contained at the top where it is centralized and not shared.
M4	Command and Control	Leadership issues instructions for staff with communication flowing from the top down. Employees only get their tasks from supervisors and little information flows up the chain.
M5	Focus on completing specific missions but not the overall goals	Employees work on their individual task independent of organizational goals where local success is more important than the overall organizational contribution.

Organic Codes

O1	Shared commitment among staff.	Staff contribute equally to the problem and solution by sharing tasks and being equally committed to the problem.
O2	Task Collaboration	Networking defines and redefines tasks.
O3	Network Relationships	Network relationships define authority and communication.
O4	Organizational Knowledge	Similar technical knowledge is located within multiple parts of the organization.
O5	Side to Side Communication and information	Communication occurs among organizational levels, not just up/down and includes information instead of commands.
O6	External Prestige	External expertise affiliations have importance and prestige.
O7	External Environment	How the external environment influences activation decisions.

Data-Driven Codes

Code Numbers			Codes	Explanation
1			Organizal Structure - EOC structure is not fixed and it swings between mechanistic and organic systems during disasters	Interviewees discuss those items that demonstrate the EOC structure is a continuum between mechanistic and organic.
	1-a		Information and Situational Awareness – being flexible	Interviewees describe the importance of information flow during disaster response.
	1-a-a		Background Conversation	Interviewees describe how EOC conversations influence their access to information.
	1-a-b		Coordination	Interviewees discuss how coordination among EOC participants occurred.
	1-b		Decisions	Interviewees describe points requiring response-oriented decisions.
	1-c		Planning and associated activities that occur before and during a disaster.	Planning and processes that occur during disaster response.
	1-c-a		Objective	Interviewees discuss disaster response objectives as part or not part of planning.
	1-c-b		Roles	Interviewees discussed their roles as set by plans and the planning process.
	1-d		Control	Actions by EOC participants that consolidate authority with them.
2			Organic Characteristics - how EOC staff implement those hidden organic functions to complete the pre-established missions during disasters	Interviewees discuss those organic elements that are missing from the content analysis results and how these hidden elements are implemented.
	2-a		Examples of hidden organic parts of disaster response in the EOC	How interviewees organically worked together.
		2-a-a	Decisions	Interviewees discuss what is needed to make a decision.

			Experience -> Refine Role	Interviewee prior history with disaster response and how this influences decisions.
		2-a-b		
	2-b		Challenges and Complex	Interviewees describe items that pose challenges and complex issue to disaster response.
3	Networking - how do participants from various backgrounds network in the EOC to complete those decision-making processes			Interviewees discuss networking, relationship building, and trust in the EOC during disaster response.
	3-a		Teamwork	People coming together to solve disaster response issues.
	3-b		Networking – those elements that result from people networking during disasters.	People working a disaster start working with new people.
	3-b-a		Trust	Interviewees discuss how trust influences their networking.
	3-b-b		Relationship	Interviewees discuss relationship building as part of disaster response.

Appendix C

Approval Letter from OKState IRB

Oklahoma State University Institutional Review Board

Date:	07/15/2021
Application Number:	IRB-21-295
Proposal Title:	STATE EMERGENCY OPERATIONS CENTER ORGANIZATIONAL STRUCTURE DURING DISASTERS A QUALITATIVE STUDY
Principal Investigator:	PUTNAM REITER
Co-Investigator(s):	
Faculty Adviser:	Ray H Chang, Ph.D.
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt
Exempt Category:	

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which <u>continuing review is not required.</u> As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:
1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,

Oklahoma State University IRB

Appendix D

Qualitative Interview Questions

1. Who makes the decision to activate the State EOC?
   a. Do you see this as a team decision or single person?
   b. What decisions are made that lead to activating the EOC?
   c. Does the EOC activate for small or big events?
      i. Explain if there is a difference between these.
2. Have you read the State EOP and SOPs relating to disater response?
   a. Do you follow these documents?
   b. Are these sufficient to guide your job duties or restrictive?
   c. How does your experience guide you when the EOP and SOP are absent?
3. Explain your daily routine –
   a. During routine days
   b. During disaster response
   c. Liaison – how do you integrate with EOC staff
      i. Are you aware of your job role
      ii. Do you receive guidance
4. When you were in the EOC did you observe any changes in the EOC structure during the disaster response.
   a. Explain the changes you saw
5. Discuss how you work with others during disaster response?
   a. Do you form teams and define work products?
   b. Do you work with others to complete tasks?
   c. Can you make decisions without your supervisor?
   d. Are you aware of other divisions disaster work and needs?
   e. Do you work with external entities?
6. When you are responding/recovery a disaster and another disaster happens, what occurs in your role
   a. When does the EOC deactivate for your team?
   b. How can you deal with multiple disasters?

Appendix E

Letter of Invitation to Participate in Research

Oklahoma State University Institutional Review Board

**State Emergency Operations Center
Organizational Structure During Disasters**

Date: _____

Dear_____

I invite you to participate in a research study conducted by Putnam Reiter, student in the Oklahoma State University Fire and Emergency Management Administration program. My faculty advisor is Dr. Ray Chang, Associate Professor, Emory-Riddle University.

The purpose of this study is to examine organizational structure at a State EOC before and during disaster response. You are eligible to participate in this study if you are a State EOC participant during disaster response. I am asking that you complete a 45-minute Zoom interview with me. This survey contains questions about your role during disaster response and State EOC organizational structure. Your responses will be anonymous and confidential.

Your participation in this study is completely voluntary. If you choose to participate you may choose to discontinue participation at any time and you may choose any of the survey questions that you do not wish to answer. Feel free to contact me at Putnam.reiter@okstate.edu or 405-590-0118 if you have questions.

Sincerely,

Putnam Reiter

VITA

Putnam Ervin Reiter

Candidate for the Degree of

Doctor of Philosophy

Dissertation: STATE EMERGENCY OPERATIONS CENTER ORGANIZATIONAL STRUCTURE DURING DISASTERS A QUALITATIVE STUDY

Major Field: Fire and Emergency Management Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Fire and Emergency Management Administration ta Oklahoma State University, Stillwater, Oklahoma in May 2022.

Completed the requirements for the Master of Regional and City Planning at University of Oklahoma, Norman, Oklahoma in 2002.

Completed the requirements for the Bachelor of Science in Geography at University of Oklahoma, Norman, Oklahoma in 1995.

Experience:

Oklahoma Department of Emergency Management and Homeland Security
        Director of Support Services: May 2021 to Present
        EOC Manager: June 2011 to April 2021
        Information Technology Officer: September 2001 to May 2011
        Project Impact Officer: October 1998 to September 2000

National Aeronautics and Space Administration
        Desktop Support Analyst: January 2001 to August 2001

Oklahoma Climatological Survey
        Lead Mesonet Operator: March 1996 to September 1998
        Mesonet Operator: January 1994 to February 1996