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# First Responders' Experience During the Initial Chaos in a Large-scale Event

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

There is little focus on how first responders (e.g., firefighters, police officers, medical staff) experience the initial chaos immediately following a large-scale disaster. Previous research indicated that understanding the initial chaos of disaster response is imperative to keeping first responders safe and healthy. First responders may also reduce the perception of chaos by implementing situational awareness skills. This research study explored (a) how first responders experienced the initial chaos immediately following a large-scale disaster, (b) how first responders experienced their emotions (good or bad) and what, if any, emotions were present, (c) how their emotions affected job performance, and (d) how they regained situational awareness over their environment. This research study is presented in a realist ontological lens. There were 5 interview questions presented to 5 participants. The results indicated that the participants engaged in a 4-step process when they first arrived on the scene. Each of the research questions presented a specific step in the process. The first step was transitioning into response mode. The second step was an evaluation/assessment process. The third was a listing process related to what they were tasked with. The final step was proceeding with situational awareness regained. The findings from this study may be used by emergency administrators and coordinators to better train and understand first responders' needs.

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Dedication

I want to dedicate this dissertation to my family. You have sacrificed so much so that I could better myself. I have not forgotten, nor have I failed to recognize your efforts.

I dedicate this dissertation to the men and women who sacrificed more than anyone could ever imagine. It has been my pleasure to give something back. I will never forget.

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I want to thank Dr. Denise Horton, who challenged me to become a better student, writer, and person. No matter what time of the day or night, I could always count on you to be there and be supportive of my ideas, craziness, and life's challenges. The world is a better place with you in it. I will always be grateful for your expertise, wisdom, and personality. I would also like to thank Annette Mullins, Director of EAP, LVMPD, without whom I would still be struggling with participant recruitment.

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Chapter 1: Introduction to the Study

## Introduction

Throughout history, disasters have happened without warning and have been identified as natural, man-made, or some form of terrorism (Brock & Cowan, 2004; World Health Organization, 2002). First responders need courage when responding to emergencies. The sacrifices made by first responders, which may include their mental health, provide disaster victims the opportunity to return home to their loved ones.

High expectations are placed on first responders (Renaud, 2012). These individuals need to think quickly, make life-saving decisions, share information, and preserve property (Fan, French, Stading, & Bethke, 2015). Some decisions do not work in their favor, which is why very few first responders develop the characteristics and traits required to be on the front lines (Renaud, 2012). Also, Brock and Cowan (2004) argued that first responders are just as susceptible to long-term psychological trauma as the victims.

This chapter outlines my study's background, the purpose, research questions, social implications, and limitations. I used chaos theory and situational awareness theory as a theoretical and conceptual framework. Moreover, I explain why I chose these two theories for this ontological realist study.

## Background

When first responders arrive on the scene of a large-scale disaster, they face disorder, lack of communication, lack of organization, and victims (Busby & Witucki-Brown, 2011; Donahue & Touhy, 2006; Fan et al., 2015; LeBlanc, McConnell, &

Monteiro, 2015; Renaud, 2012). There is an expectation of emotional control among first responders (Renaud, 2012). Comprehension in the face of chaos and danger remains one of the most challenging tasks (Busby & Witucki-Brown, 2011).

In response to this phenomenon, several authors have pointed out the limited research on how first responders experience the initial chaos immediately following a large-scale event. There was no foundation for the development of a clinical model first responders used in the field for treatment or prevention of long-term psychological trauma or damage (Busby & Witucki-Brown, 2011; Donahue & Touhy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Busby and Witucki-Brown (2011) argued that situational awareness theory is appropriate for the development of a clinical model.

There was an opportunity to fill the gap in the research on disaster response to include how first responders experience the initial chaos immediately following a large-scale event (Busby & Witucki-Brown, 2011; Donahue & Touhy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Most of the research I found focused on later phases and the overall effect of disaster response and cleanup (Busby & Witucki-Brown, 2011; Renaud, 2012). Donahue and Touhy (2015) hypothesized that although professionals and legislative bodies have focused on studying mistakes, they have not been able to identify why the same mistakes continued to happen.

There is little research on first responders and how they experience chaos or on what steps to take to maintain control of their immediate environment during the response phase (Busby & Witucki-Brown, 2011; Renaud, 2012). LeBlanc et al. (2015) provided insight into the emotions that first responders experience, humanizing first

responders and outlining some challenges they may face. LeBlanc's et al. (2015) provided evidence of how emotional escalations influenced first responders' ability to process information and make critical decisions.

The social implications of this study are not only in the United States but all over the world. Disasters happen to anyone at any time, regardless of race, socioeconomic status, geographic location, or age. For policymakers to make changes to the initial response phase, researchers have to understand what first responders go through. First responders are just as vulnerable to psychological trauma and long-term damage as the victims were (Brock & Cowan, 2004). There is no clinical model that first responders use in the field as prevention or treatment (Busby & Witucki-Brown, 2011).

Finally, emergency responders continue to make the same mistakes despite addressing them over and over (Fan et al., 2015). Donahue and Tuohy (2006) outlined lessons not learned during a disaster response was due to the lack of frequency of large-scale events. The researchers also pointed out command and control issues with communication and lack of resources during Hurricane Katrina (Donahue & Tuohy, 2006). These mistakes lead to an increase in victims as well as monetary damage.

**Problem Statement**

First responders may sacrifice everything, from their mental health to their lives, just to save a stranger. Renaud (2012) argued for distinct characteristics first responders that commonly demonstrated. Even with all of the continued training first responders may receive throughout their career, no amount of training can prepare a person for a catastrophic event such as Hurrican Katrina or 9/11.

First responders have limited resources during the early hours following a large-scale event (Busby & Witucki-Brown, 2011). A lack of communication between reporting agencies complicated the situation even further. Busby and Witucki-Brown (2011) stressed the absence of a framework, discipline, and coordination of interagency responders, and untrained volunteers. LeBlanc et al. (2015) examined neurological and cognitive approaches and reported positive and negative emotional states. LeBlanc et al. (2015) found emotional escalations during the initial response phase interfered with first responders, healthcare professionals, and trainees' ability to interpret information and make decisions during the initial response phase.

Despite a thorough literature search, I found no research that addressed how first responders experienced the initial chaos immediately following a large-scale event. LeBlanc et al. (2015) provided an introduction to emotions and cognitive processes among healthcare providers; however, this review did not include first responders. There was an opportunity to fill the gap in the literature and include whether chaos influenced emotions and what, if any, emotions first responders could identify (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Up to this point, there has been no clinical model of prevention/treatment that first responders used in the field (Busby & Witucki-Brown, 2011). Furthermore, I explored how some first responders regained situational awareness over their immediate environment.

**Purpose of the Study**

The purpose of this qualitative study was to explore how first responders experienced the initial chaos immediately following a large-scale disaster or event. I also

explored whether there is an emotional impact within first responders (good or bad) and how some first responders maintained or regained situational awareness during the initial disaster response. This study is pertinent to the development of a clinical model of prevention/treatment that first responders can utilize in the field to reduce the effects of trauma.

**Research Questions**

The research questions used in this study to explore how first responders experience the initial chaos immediately following a large-scale disaster were open-ended and provided participants the opportunity to share their stories in a narrative conceptualization presented in realist form.

- How did you experience the initial chaos during the initial response phase of a large-scale disaster?
- How did you experience your emotions during this situation (good or bad)?
  - What, if any, emotions are present?
- How do you feel your emotions affected your job performance?
- How did you gain situational control over their immediate environment?

**Theoretical Framework**

For this study, I explored how chaos theory and situational awareness theory interfered with response efforts of large-scale disasters (good or bad consequences). These theories are still in their infancy within the social sciences. I chose these theories because they had very little research; however, researchers argued a significant impact on

how first responders performed job duties (Busby & Witucki-Brown, 2011; Donahue & Tuouy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012).

Chaos theory initially provided a correlation between unpredictable weather and unforeseen variables (e.g., strange attractors; Lorenz, 1963; Sprott & Jones, 2000). There was no specific definition of chaos within the social sciences (Ayers, 1994). The main idea derived from an underlying pattern that seemed random but is not (Ayers, 1994; Marshall, 2011). It was this "randomness" that created an environment of chaos (Lorenz, 1963; Sprott & Jones, 2000).

During the initial response phase of a large-scale disaster, everyone experiences that initial chaos differently (Busby & Witucki-Brown, 2011; Renaud, 2012). A person perceives their environment based on past experiences. If they have had less experience with disaster response, they might behave differently than someone who has more experience (Renaud, 2012). Chaos theory was appropriate for this research study due to the individual emotional and behavioral perceptions and reactions to the event.

Busby and Witucki-Brown (2011) argued the need for a clinical model that first responders utilized in the field to reduce the long-term effects of trauma. Their qualitative grounded theory study on situational awareness during multi-casualty incidents identified a gap for further research on how some first responders utilized situational awareness skills. Busby and Witucki-Brown discovered that those first responders who used situational awareness skills had more experience in disaster response than those who do not. Because this was the phenomenon I was interested in, situational awareness theory was appropriate for this study.

**Nature of Study**

This qualitative study adopted an ontological realist approach. Ontology is the idea that reality, a relevant concept, was objectively independent of thoughts or beliefs, and social norms influenced interpretation (Smith & Ceusters, 2010). Creswell (2014) argued for different views of reality that were subjective to the participant. Realism sought to discover the causal mechanisms that enabled reality to unfold in a specific context (Patton, 2015).

These philosophical approaches were appropriate for this study because chaos theory and situational awareness theory rely on personal perception, experience, and skill set (Busby & Witucki-Brown, 2011; Donahue & Tuouy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Each first responders' reality is unique to their perspective, and the context is abnormal compared to everyday life (Busby & Witucki-Brown, 2011). How people perceive their environment is determined by how they developed (Shulman, 2010). This perception included both internal and external stimuli of their environment.

**Definitions**

*Chaos*: For this study, Busby and Witucki-Brown (2011), Renaud (2012), and Adams and Stewart (2014) defined the initial chaos during a large-scale disaster as the period immediately following an event. When first responders arrived on the scene of a disaster, they met with a situation that included (but was not limited to) fire burning, screams of victims, gunfire, falling structures, extreme property damage, and identifying and locating fellow first responders (Renaud, 2012).

*First responder*: The Homeland Security Presidential Directive (HSPD) 8 (2003) defined first responders as someone who "in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and environment" (2d). Professions included in this classification include police officers, fire department, emergency management services, and paramedics (HSPD 8, 2003).

*Large-scale disaster*: According to the *Organisation for Economic Co-Operation and Development* (OECD, 2004), a large-scale disaster is an event that has a significant impact on a concentration of people. The impact must interrupt multiple systems (e.g., economy, government, and agriculture) across one or more populations. The event causes widespread fear and anxiety.

*Psychological trauma*: Long-term psychological trauma starts the moment an exposed person perceives an actual or perceived threat of death, injury, or sexual violation (American Psychological Association, 2013). The trauma starts as acute distress disorder, for which symptoms last for 30 days. Symptoms lasting over 30 days, which include recurrent memories or intrusive thoughts, flashbacks, or recurrent dreams is posttraumatic stress disorder (PTSD; American Psychological Association, 2013).

*Situational awareness skills*: The goal of implementing situational awareness skills is to maintain emotional equilibrium (LeBlanc et al., 2015). Situational awareness skills include having the ability to draw on previous experiences, compartmentalizing emotions, and appreciating the context of the situation (Busby & Witucki-Brown, 2011). Moreover, situational awareness skills are dependent on time and space (Endsly & Jones, 2004; LeBlanc et al., 2015; Palmeri, 2007).

**Assumptions**

I assumed that all the participants were over the age of 18, able to read and understand English, and could comprehend the research questions. I assumed that all participants completed all aspects of their training (e.g., curriculum, simulation, and field). I assumed that the participants work(ed) as a first responder and experienced large-scale disaster response. I assumed that some of the participants demonstrated situational awareness skills and provided insight as to how they utilize these skills during the initial chaos. I also assumed that even though there can be geographical or financial differences among regional and local offices, participant responses on how they experienced the initial chaos can be generalized across the population. This study did not look at differences among resources or location, only at how the participant experienced the initial chaos during the immediate response phase of a large-scale event.

**Scope and Delimitations**

I chose this topic because of the limited research on how first responders experienced large-scale disasters (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). The scope of the research explored how first responders coped with what they saw and made life-saving decisions. I also explored whether participants experienced an emotional escalation (good or bad) when they perceived the initial chaos and how they felt their job performance was affected.

I identified a deficiency in the previous research that explored first responders on a personal level (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Most of the research I found focused on incident commanders, response

efforts as a whole, or the doctors and nurses who took charge after victims rescue (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012).

The transferability in this study relied on the interpretation of testimony from each participant. According to Anney (2014), qualitative research requires a "thick description" of context and content for scholarly acceptance (p. 278). I assumed generalization from the description of the research, the research questions, and sampling among the specific population of first responders (Anney, 2014).

## Limitations

The research I present is a qualitative study, and the value of the results relied on my interpretation of the data into meaningful evidence that supported the assumptions (Creswell, 2014; Patton, 2015). The controversial problem with qualitative studies is the interpretation of the data. People have different perceptions, so although I may see the data one way; someone else may interpret it differently (Creswell, 2014; LeBlanc et al., 2014; Patton, 2015).

Another limitation was biased testimony. First responders' experienced situations differently based on previous experiences (LeBlanc, 2015). Blanchette and Richards (2003), Nabi (2003), and Niedenthal and Setterlund (1994) all agreed that those who had an emotional tie to a situation were more likely to interpret ambiguous stimuli. Disengaging from adverse emotional situations proved to be more difficult than positive ones.

Population size was also a limitation because there was no probable outcome. The testimony was transcribed, coded, and then interpreted from a sample of seven

participants (Creswell, 2014). The information may be generalized across populations that may or may not contain the sample criteria (Patton, 2015). For example, this study researched how first responders experienced the chaos immediately following a disaster. As previously stated, first responders consist of police officers, firefighters, emergency medical technicians (EMTs), and paramedics. If the sample comes from police officers, the results may not generalize to firefighters, EMTs, or paramedics and vice versa.

This research was limited to how first responders experienced the initial chaos during the immediate response phase of a large-scale event. This research did not consider the type of disaster (e.g., tornado, earthquake, flood) or the geographic location. This research was not about how much funding or equipment was available to the first responders. This research did not consider whether the first responder participated at a local, state, or federal level response. These limitations may also prevent generalization across the population.

## Significance

Fan et al. (2015) asserted that "decisions have to be made with limited information" (pp.1) during the initial response phase of a disaster. What Fan et al. implied is that first responders were not experiencing an emotional escalation (good or bad) that interfered with their ability to perform job duties. The fact remained that the lack of information was the driving force of decisions made, and the lack of resources caused the chaos that put life and property in danger (Fan et al., 2015).

There was no significant therapeutic model for public and behavioral health following the early hours of a disaster (Busby & Witucki-Brown, 2011). A panel of

experts conceptualized five empirical principles of the approach to disasters: (a) sense of safety, (b) calming, (c) self and community efficacy, (d) social connectedness, and (e) hope (Benedek & Fullerton, 2007). The lack of research and individual response to traumatic events were limitations to the development of a clinical model of prevention/treatment (Benedek & Fullerton, 2007).

Keeping the mind healthy was vital to healthcare providers, clinicians, police officers, and volunteers (Busby & Witucki-Brown, 2011; Renaud, 2012). Emergency preparedness training (EPT) was crucial to reducing emotional vulnerability and minimizing an emotional activation that puts lives at risk (LeBlanc et al., 2015). Studies (e.g., Scott, Swartzentruber, Maddux, Schnellan, & Walhquist, 2013) showed that implanting EPT into a curriculum reduced the risk of trauma.

Busby and Witucki-Brown (2011) and Renaud (2012) argued that first responders who had EPT understood the phases of disaster and even ran through a mental checklist; however, these checklists were not transparent. Busby and Witucki-Brown also argued that new first responders were more susceptible to long-term psychological damage than an experienced responder. Renaud argued preparedness training was essential in a successful outcome, yet it is rarely discussed; moreover, first responders did not learn to recognize chaos as a "normal" process of the event (Busby & Witucki-Brown, 2011; Renaud, 2012).

The potential for positive social change is to reduce the risk of long-term psychological trauma in the first responders. The results of the study can change EPT as well as course curriculum to include techniques on how to maintain situational awareness

by focusing on coping skills and intervention strategies for first responders, thus increasing the ability to save lives and minimize property loss or damage. This study opened the door to understanding how chaos affects emotions and cognition.

**Summary**

The effect of chaos on first responders was a topic that was not well known in the literature. First responders were in danger of developing long-term psychological trauma. They were just as vulnerable to trauma as the victims of large-scale disasters. There was no clinical model for the prevention/treatment of trauma from the disaster response. When a first responder arrives on the scene of a large-scale event, they put themselves in a situation that has potential lifelong mental health consequences.

Some first responders reduced the risk of trauma or damage by implementing situational awareness skills. These first responders utilized skills that helped them compartmentalize their emotions make sense, and appreciate the context in which their immediate environment unfolded. This study explored how chaos affected first responders and how situational awareness skills came into play during disaster response.

This chapter presented the problem and limitations of this research but also outlined the significance of this study. There was a need among first responders to explore how they experienced the chaos of disaster response immediately following the event. The next chapter is an in-depth look at how the literature provided an opportunity to fill the gap in research to include the problem outlined in Chapter 1.

Chapter 2: Literature Review

**Introduction**

Disasters happen every day. No set of determining factors can be used to foresee who will become the next victim or how to prepare for large-scale events such as the terror attacks of 9/11, Hurricane Katrina, the tsunami of Sri Lanka, or even the nuclear event of Chernobyl. There is extensive research on the mistakes made during the response phase of such events, how to enhance response methods, and how to become better prepared.

There was a lack of research that addressed the initial chaos immediately following a large-scale event. Researchers recommended filling this gap in the research by including how first responders experienced the chaos of a disaster, how emotions interfered with cognitive functions, and how situational awareness minimized the impact of trauma on first responders (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012).

The purpose of this qualitative study was to explore how first responders experienced the initial chaos immediately following a large-scale disaster or event. This study also explored whether there was an emotional impact on first responders (good or bad) and how some first responders maintain or regained situational awareness during the initial disaster response. This study was pertinent to the development of a clinical model of prevention/treatment that first responders can utilize in the field to reduce the effects of trauma. Finally, data collected proved vital for the development of a clinical prevention model that first responders can use to reduce trauma exposure.

This chapter is an in-depth review of the literature that supported the need to expand the research on this topic to include how first responders experienced the initial chaos immediately following a large-scale event (Busby & Witucki-Brown, 2011). Two key concepts and themes emerged from the literature review. First, Lorenz (1963) hypothesized why the weather was not predictable and, in the process, developed chaos theory. Chaos theory was in the developmental stage within the social sciences (Ayers, 1997). The perception of chaos begins in the unconscious, is context-dependent, and controlled by life experiences, including positive and negative emotional experiences (LeBlanc et al., 2015).

Second, Busby and Witucki-Brown (2011) argued for the need to implement a social model the first responders can utilize in the field during the initial response phase. Busby and Witucki-Brown's qualitative, grounded theory study was an attempt to bring situational awareness theory over to response efforts. They argued that experienced first responders had situational awareness skills and appreciated the context of large-scale events even though they had no clinical model to use in the field, whereas less experienced responders did not demonstrate those skills. Busby and Witucki-Brown further argued the need to fill the gap in the literature to include further research on the listing, refining, and discussion for Busby and Witucki-Brown's (2011) theory of situational awareness.

These concepts were vital in understanding how each first responder shared their experiences during the initial response phase. Each responder had different experiences, emotions, and perspectives when responding to disasters. Understanding how each

responder perceived reality and how they perceived chaos was essential in recognizing whether the responders maintained situational awareness during the critical hours after the initial event.

For this study, I conducted an exhaustive review of the literature and synthesized any variables and themes. The literature review provided an opportunity to expand the research and include how first responders experienced their ordeals. This research uncovered some vital points. For example, previous research demonstrated very little focus on the actual responders and more on the incident commanders and various response agencies. This study was paramount for the implementation of a new curriculum into training, developing training scenarios, and devising a clinical model that can be used in the field to reduce exposure to trauma and prevent long-term psychological damage.

The literature review indicated that people relied on past experiences (good or bad), emotions associated with those experiences, and the context of the situation unfolding in front of them to determine how he or she reacted at that time. It also showed how the chaos was relevant and subjective to the individual and affected the response efforts at not only the individual level but also at an organizational level. Finally, first responders attributed this to having an appreciation for the context of the event as well as having previous experience (Busby & Witucki-Brown, 2011).

**Literature Search Strategy**

The literature review strategy conformed with Walden University's dissertation guidelines for credible peer-reviewed journals. The databases included the following: (a)

PsychINFO, (b) PsychARTICLES, (c) SocINDEX, (d) CINAHL & MEDLINE simultaneous search, (e) MEDLINE with full text database, (f) ProQuest, (g) Science Direct, and (h) Thoreau: Multiple database search tool. In addition to Walden University's library database, I accessed the Federal Emergency Management Agency and the Department of Homeland Security websites. I used the following keyword search parameters: *emergency management and chaos; emotions, cognition, disaster response, cognition, and disaster or emergency response; cognition and chaos, perception and reality; chaos and social science; situational awareness theory; reality principle;* and *ego, id, and superego*.

A date parameter from 2007 to 2016 did not produce any research that addressed how first responders experienced the initial chaos immediately following a large-scale disaster. The search parameters also included full text, peer-reviewed, scholarly, and academic journal articles that focused the interest in chaos during the first hours of disaster response. None of the research was related to how first responders experienced the initial chaos immediately following a large-scale event. An updated search using Walden University's Thoreau search and the search parameters of *chaos* and *first responders* along with the date parameter of 2006-2018 generated eight research studies. None of the research addressed how first responders experienced the initial chaos immediately following a large-scale event.

Research onthe chaos within the social sciences and perception of reality led to sources from additional timeframes. In 1963, Lorenz wrote about chaos theory research on the perception of reality that led to the development of the reality principle by S.

Freud (1905/1910/1923). Freud's (1905/1910/1923) earliest theories started at the turn of the 20th century and continued with his daughter A. Freud (1933). These research studies were requested using Walden University's Document Delivery Service. I also used the key terms: *chaos theory; reality principle; the perception of reality; perception of chaos;* and *chaos during disaster response* in Walden University's Thoreau multiple database tool search.

The research revealed an apparent gap in the literature regarding how first responders experience the initial chaos during the early hours of after a large-scale event (Busby & Witucki-Brown, 2011; Fan et al., 2015; Piff, Martinez, Stancato, & Kraus, 2012; Renaud, 2012). Situational awareness theory was new to the social science domain. Moreover, chaos theory transcended from a mathematical theory over to the social sciences as well (Ayers, 1994). Research relevant to SAT and chaos in a social science exhibited a deficiency in the literature that addressed both subjects with very little scientific data.

## Theoretical Foundation

### Origin of Chaos Theory

Chaos theory is not well known in the social science field. Based on this fact, some of the relevant researchers were from more than 20 years ago. Chaos theory was Lorenz's (1963) attempt to explain why weather prediction is so tricky (Sprott & Linz, 2000). Lorenz discovered something he would come to dub "the butterfly effect." The argument went, the universe defied natural, unchangeable, observable laws. Lorenz (1963) also argued that the universe is unbalanced, non-linear, unorderly, and exhibited

multiplicity. Koehler (1995) offered his contribution by explaining that chaos was a means for researchers to "investigate long-term behavior, and its dynamic of change" (p.4).

There are no predictable behavioral outcomes in chaos theory (Adams & Stewart, 2014). When Lorenz attempted to explain the difficulty of predicting weather patterns, what he discovered was that many variables and outliers contributed to changes that were not always foreseeable (Sprott & Linz, 2000). These processes were called bifurcation and strange attractions. Adams and Stewart (2014) cited bifurcation as cosmology episodes and self-organization. In other words, bifurcation was changing within a system in response to a chaotic state (Adams & Stewart, 2014; Lorenz, 1963; Sprott & Linz, 2000).

Chaos refers to "how apparently random phenomena – such as turbulence – can stem from a simple set of deterministic laws" (Ayers, 1997, p. 373). Marshall (2011) also argued that chaos was a representation of evil and destruction. Humans perceived disorder and do their best to make sense of it by "putting forth the effort at making order" (p. 4).

Renaud (2012) further compared this phase with molecular biology and dubbed this period as "the edge of chaos." They identified as the outer edge of a cell "where actors and agents interact with each other and their environments in seemingly chaos and disorder" (p.7). The interaction appeared to determine whether the cell lived or died. Koehler (1995) defined chaos as "the irregular, uncertain, discontinuous aspect of change within the confines of a patterned whole" (p.7).

Psychologists adopted chaos theory in two forms: (a) theories and (b) metaphysical implications. There are three ways psychology applies to chaos: (a) metaphorically, (b) analytically, and (c) practically (Ayers, 1997). Metaphorical applications contributed to enlightenment or understanding psychological processes, while the analogical application used to communicate between physical and psychological systems. Finally, practical applications contributed to behavioral models (Ayers, 1977).

Skinner (1989) and Marshall (2011) supported the theory that chaos derived from the preconception that our lives are orderly. There was very little debate on how to define or perceive disorder even if the order was perceived differently (LeBlanc et al., 2015; Marshall, 2011). When there was a state of disorder perceived, negative emotions often increased, and interfered with cognitive processes (LeBlanc et al., 2015). There was no specific time or place for emotions to emerge; this interfered with memory recall and decision-making processes (LeBlanc et al., 2015).

Koehler (1995) argued that chaos theory, during a large-scale event, benefitted response efforts by providing incite to long-term behavior. Looking at disaster response to predict the exact answers for future states was an impossibility (Koehler, 1995). Adams and Stewart (2014) outlined the importance of understanding and applying chaos theory to disaster response. It will never be the absolute answer, but it is a useful tool that provided a better understanding of potential outcomes of disasters on "organizational structures of first response agencies" (Adams & Stewart, 2014, p. 416).

**Situational Awareness Theory**

Situational awareness theory has held value among aviation, military strategists, command and control, communication, and computer intelligence since the 1980s (Salmon, Stanton, Walker, & Green, 2006). Busby and Witucki-Brown (2011) introduced their grounded theory research study to bring situational awareness theory over to emergency management. Researchers argued that emergency responders who exhibited situational awareness during the initial response phase also reduced emotional escalation (Busby & Witucki-Brown, 2011; LeBlanc et al., 2015; Renaud, 2012).

Endsley and Jones (2004) defined situational awareness as the perception of the elements within a volume of time and space, comprehension of their meaning, and the projection of their status. For this study, I used this theory based on the perception of time and space and the comprehension of meaning. Busby and Witucki-Brown (2011) argued the importance of understanding the context in which the immediate environment unfolded. Situational awareness theory relies on the first responder's ability to appreciate the context of the situation, and its relevancy is subjective to the individual.

Stanton, Chambers, and Piggott (2001) outlined three definitions and theoretical approaches to situational awareness: (a) information processing, (b) activity approach, and (c) ecological approach. Endsley (1988) introduced his three-level model for situational awareness. Initially, this development provided aviation protocol understanding. Endsley also argued that situational awareness transferred to other domains such as nuclear power generation, command and control systems, and medicine. The three-level system consisted of:

1. Step 1 involves perception. Aviators perceived a situation.

2. Step 2 consists of comprehension. Once the situation was perceived, aviators then needed to comprehend what was going on around them.

3. Step 3 was the prediction phase. Aviators made a prediction based on the information processed.

It was this three-level system that was of interest to this study.

In 2011, Busby and Witucki-Brown's (2011) situational awareness theory paved its way over to emergency response. The purpose of this transference was to see if the first responders had situational awareness abilities and skills while responding to multiple casualty incidents (MCIs). Busby and Witucki-Brown (2011) argued that first responders who establish situational awareness skills appreciated the context of the situation, compartmentalized their emotions, shared more accurate information, managed resources, and understood the complexity of the scene. First responders performed all these job functions while they stabilized the scene and preserved life and property.

LeBlanc et al. (2015) argued that personal experiences contributed to emotional escalations, which, in turn, interfered with cognitive functions such as decision-making, threat assessment, and memory recall. Long-term psychological trauma and PTSD are real threats that every first responder is susceptible to (Brock & Cowan, 2004; LeBlanc, 2015). There was no theoretical framework to develop a clinical model that first responders used in the field for treatment or prevention of PTSD (Busby & Witucki-Brown, 2011). There was recognition among researchers such as Busby and Witucki-Brown (2011), Fan et al. (2015), and Renaud (2012) that there was a lack of attention

given to the initial chaos following a large-scale event or multi-causal incidents. The lack of attention suggested there was a deficiency in the training and curriculum. First responders were not provided the tools they needed to regulate emotional escalations and reduce the impact of events unfolding before them (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012).

Busby and Witucki-Brown (2011) recommended expanding their grounded theory study to include a further listing, refining, and discussion of Busby and Witucki-Brown's (2011) theory of situational awareness to include emergency nurses and other healthcare providers. Fan et al. (2015) recognized that the chaos immediately following a large-scale event; however, the research addressed managerial chaos and not first responders' experiences. Fan et al. recommended extending the framework from existing operational strategies to categorized sources of chaos and outlined the characteristics of managerial chaos to understand resource management during the early hours of a disaster better.

Renaud (2012) reviewed the National Incident Management System (NIMS) because it was a government-created framework that "all agencies must use when responding to large-scale events" (pp.2). Renaud found that NIMS did not address the initial phase immediately following a large-scale disaster. Renaud recommended expanding research to include how first responders experienced the initial chaos during the early hours of disaster response. Renaud also recommended further research on the initial chaos to contribute to the NIMS framework.

The research I present in this chapter was the cornerstone of my argument for the exploration of how first responders experienced the initial chaos immediately following a

large-scale event. The research studies presented are relevant because they come together to outline the need for my research study. Moreover, the research presented is pertinent to enhancing first response efforts.

## Literature Review Related to Key Concepts

For this study, I chose situational awareness theory and chaos theory because they relied on how first responders perceived their immediate environment and if responses were behavioral, cognitive, or both. Chaos theory and situational awareness theory accounted for how perceptions and emotions altered future predictions or outcomes. Moreover, there was no definite outcome or plausible future predictions without taking all the information into account.

In this literature review, I discussed how chaos related to and affected disaster response. There were only two research studies relevant to the discussion of the initial chaos immediately following a large-scale event (Busby & Witucki-Brown, 2011; Renaud, 2012). Additional research uncovered theoretical analyses and meta-analyses of chaos theory within the social sciences (Adams & Stewart, 2014; Ayers, 1994; Barton, 1994; Koehler, 1995). These research studies were vital for the explanation and transference of chaos from the natural to social science; however, they were not relevant to the current study. There were numerous theoretical hypotheses among researchers; however, none were relevant to this study.

I further discussed situational awareness theory and how the development of situational awareness skills benefitted first responders by reducing long-term psychological trauma or emotional damage. Situational awareness was also in its infancy

within the social sciences. I only found one research study that provided a research study relevant to this study (Busby & Witucki-Brown, 2011).

Finally, I aimed to fill the gap in the literature on how first responders experienced the initial chaos and why or how first responders utilized situational awareness skills. The premise was that chaos interfered with the first responders' ability to perform job duties effectively and efficiently, precisely due to cognitive changes. The literature review revealed the gap in the literature that I aimed to fill.

The primary societal needs are enhancing the first responders' ability to preserve life and save property. With this study, I hope to change the way the curriculum is written and taught and enhance training by implementing disaster scenario training. Also, my research contributed to the development of a clinical model that first responders utilize in the field to reduce the impact of psychological trauma.

**The Chaos of Disaster Response**

Chaos theory was in its infancy in the social sciences, and there was very little research that supported chaos in a social context. Most of the research I found was analytical and theoretical synopses of how emotions and perception of chaos interfered with cognitive processes. None of the identified targeted the gap in the literature which was how first responders experienced the initial chaos that unfolded during the immediate response phase (Busby & Witucki-Brown, 2011; Fan et al., 2015; Renaud, 2012).

The research supported the movement of chaos from the natural to social science; however, one research study tested the competency of emergency workers within chaos and disaster response (Scott et al., 2013). This researcher identified with the research of

my study. It was imperative to hear from first responders and emergency workers on how they experienced the initial chaos of a disaster to develop a clinical model that proves useful in the field of action.

The other research study tested the perception chaos had on financially dependent individuals and whether the participants were more likely to choose community over wealth amidst a chaotic social situation (Piff et al., 2012). This research was relevant because it included community responses to chaos and what they deem valuable. The research was not relevant to my study because it did not include the first responders' and their response to chaotic situations or emergency response. Piff et al. (2012) research hypothesized that individuals in low to middle socioeconomic class chose community over material wealth during the chaos of a disaster. Piff et al. (2012) conducted five different research studies and wrote the results within one article. The overall results indicated that social class is a precursor to how individuals perceive, interpret, and respond to their immediate environment.

Piff et al. (2012) overall delivery of the research was confusing at best. There were different participants for each research study. The change in participants threatened validity and generalization (Creswell, 2014). Piff et al. (2012) indicated different participant recruitment techniques. The first study recruited participants from a website, while the other studies recruited from large universities. There was also an inference that the universities changed with each study, but there was no confirmation provided. Also, the number of participants changed for each study. This change challenged generalization across populations, which could have damaged what the researcher was trying to

accomplish (Polit & Beck, 2010). Polit and Beck (2010) stated that generalization was how other researchers and scholarly peers viewed quality in a study. Piff et al. (2012) research did not meet the sample population generalization because they changed the number of participants in each study, and they also changed participants.

The previous paragraphs indicated selection bias in the studies. To avoid selection bias, recruitment methods, and the number of participants had to remain the same (Pannucci & Wilkins, 2010). Sampling validity ensured that the research methods and participant samples expanded across populations. Sampling validity required the method of sampling by using specific patterns or sampling sizes (Palinkas et al., 2015). The participants consisted of college students, and because of this, the results could not be generalized across all populations.

Similarly, Scott et al. (2013) researched the chaos of disaster responses. The two research studies (Piff et al., 2012; Scott et al., 2013) showed apparent differences in methodology, participants, and what the research was testing; however, the main topic of both research studies was how socially chaotic situations (disasters) affected cognitive functions such as decision-making. Although Scott et al. (2013) included emergency service providers, first responders did not make the participant sample. It was unfortunate because the first responders are generally on the scene of a large-scale disaster first, not emergency service providers. It was imperative to hear from first responders. My study relied on first-hand accounts/experiences.

Scott et al. (2013) tested the competency among emergency service providers by providing a 1-day (8 hours) EPT with an objective to enhance future successes with

emergency disaster response. The training included curriculum development and a disaster simulation that included a multi-actor scenario of an influenza-type outbreak.

Participants ($n = 10$) were fourth-year medical students that volunteered after receiving Scott et al. (2013) e-mail invitation to participate in a 9-hour training course. Approximately two weeks later, participants from the Veteran Health Administration Strategic Health Care Group partook in the same 9-hour training course. The *Medical University of South Carolina Institutional Review Board* (IRB) approved the project (Scott et al., 2013). Before the study, Scott et al. (2013) recruited actors from the Medical University and provided them with scripted roles.

In the replication study, conducted two years later, recruitment methods did not change. Participants ($n = 39$) included 24 medical students, seven physicians, and seven nurses (Scott et al., 2013). Of all the providers, 47% admitted they had received no greater than 16 hours of yearly disaster training. The medical students received no such training.

Scott et al. (2013) method worked with South Carolina's first EPT center for care providers by using a modified Delphi process. The Delphi Technique promoted a consensus among professionals (Eubank et al., 2016). Generally, experts did not have to work face-to-face when they used the Delphi process; however, the modification required personal interaction with other experts. The taskforce condensed dozens of competencies into 18 domains labeled under two headings: learning and performance objectives and competencies (Scott et al., 2013). The program development utilized evaluation

frameworks, coursework, and data collected. The collaboration of data, framework, and curriculum led to the creation of the didactic, small group, and simulation course.

The didactic module 1 included a lecture that introduced the training course. Modules 2-4 incorporated curriculum as well as a small group exercise. The care facilitators served as instructors and randomly assigned participants into teams of four (Scott et al., 2013). Researchers assigned specific behaviors to the actors during the human simulation. The behaviors assigned mimicked behaviors victims of respiratory crisis may exhibit (Scott et al., 2013). The behaviors provided the participants with the opportunity to address chaos, emergency medical care, and community outreach with real-world application of curriculum and training techniques.

The actors played cruise passengers that presented with an influenza-type illness that included respiratory complaints (e.g., coughing, shortness of breath, labored breathing). The trainees, who worked in teams 4-6, assessed the chaotic situation and applied skills they learned during the training (Scott et al., 2013). All teams participated in the development of an educational intervention strategy and a videoed debriefing. The scenario was attempted again after the debriefing.

Researchers required the participants to take a pretest and two posttests. One immediately after the debriefing that included two parts 1). Likert-scale self-assessment, and 2). 23 multiple-choice questions. The posttest split into three parts, 1). Likert-scale self-assessment, 2). Twenty-three multiple-choice questions, and 3). Likert-scale and open-ended questions are providing the participants with the opportunity to provide

feedback on the study. Scott et al. (2013) required one posttest after the first simulation and the second posttest after the second simulation.

Results indicated a pretest score of 51% correct ($M = 12.3$; $SD = 3.8$). After the training, Scott et al. (2013) reported posttest scores increased to 77% ($M = 18.5$; $SD = 2.2$; $p < .01$). Participants ($n = 39$) rated the training 96/100. Participant overall skill increased from 63.3 to 83.4 out of 100. Overall, Knowledge increased from 49.3 to 78.8 out of 100 ($p < .01$). At least half of the participants completed 23 out of 34 performance objectives, 8 out of 9 teams were able to resuscitate two simulators (actors), and 9 out of 9 teams helped prevent further exposure during the second attempt (Scott et al., 2013). It is important to note that Scott et al. (2013) did not report that there was an increase in self-reported or observed performance objectives.

Scott et al. (2013) reported limitations that included the need for a more extensive study or a multi-center trial to research curriculum impact. However, I also recognized that these results might not be generalized across all populations of emergency service providers. Scott et al. (2013) recruited medical students, doctors, and nurses. First responders who generally arrived on the scene of a disaster included police, firefighters, EMTs, and community volunteers (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012) did not participate. Also, the participants self-reported. This method impacted the validity of the answers (Creswell, 2014; Maxwell, 2013; Patton, 2015). Finally, a pre-test/posttest chart may have benefitted the audience with visual cues to assist with understanding how the participants improved overall.

This study held value to my research because it acknowledged the need for further EPT and cognitive deficiencies amidst the chaos as well as demonstrated chaos within the disaster response. My research relied on the very essence of how first responders experienced the initial chaos of disaster response, and even though this research expanded the gap for future research, Scott et al. (2013) was evident in the presence of chaos after an event.

The research on how first responders experienced the initial chaos immediately following a large-scale event was crucial. The data was the baseline for the foundation development of a clinical model that first responders use in the field to prevent long-term psychological trauma or damage. Each responder experienced the chaotic aftermath differently depending on how much experience and situational awareness he or she had (Busby & Witucki-Brown, 2011).

**Situational Awareness**

Five qualitative studies focused on disaster/emergency response and the deficiencies during the initial response phase. Each researcher had a different focus and direction, but they all recognized challenges that first responders experienced during the initial response. Each research study was relevant to my study as they identified the importance of social change outlined by the loss of life and property and long-term psychological trauma among first responders (Busby & Witucki-Brown, 2011; Donahue & Tuohy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2011).

These five research studies highlighted common vital factors during the initial response phase that I addressed. One major challenge was the lack of communication

while in the field. When there was minimal communication, first responders had to make difficult decisions, which could have been disastrous (Busby & Witucki-Brown, 2011; Donahue & Tuohy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2011).

Another challenge was the lack of attention focused on first responders and those who served on the front lines. I did not find any research that focused on how first responders' functioned during those chaotic states. First responder testimony was why my research study was so essential in promoting social change. Gathering first-hand knowledge of what first responders experienced will help develop a clinical model they can use in the field.

Finally, each researcher represented the idea of how chaos contributed to the ineffective response. Each researcher elaborated on the consequences of mistakes made (e.g., death or loss of property) and included ways to change the outcomes in the future. My research did not focus on all of this. My research focused on how first responders experienced the initial chaos following a large-scale event, how some maintained situational awareness. Only one research study focused on this research topic (Busby & Witucki-Brown, 2011).

Busby and Witucki-Brown (2011) explored the individual process of developing situational awareness (SA) in multi-casualty incidents (MCIs). These authors outlined the necessity for developing SA theories for nurses and first responders. The theories contributed to the foundation of a clinical model to manage contextual situations in which cognitive processes, specifically decision-making or problem-solving skills, are impaired by what is happening in the immediate environment.

Emphasizing the need for a theoretical framework that leads to a clinical model of prevention/treatment of trauma while first responders are in the field is critical. At this time, there is nothing first responders can use to prevent long-term psychological trauma or damage (Busby & Witucki-Brown, 2011). There was a lack of attention on how first responders experienced the initial chaos (Busby & Witucki-Brown; Renaud, 2012). Furthermore, there were no emotional regulation interventions first responders used to minimize psychological trauma and long-term damage (Busby & Witucki-Brown, 2011; Fan et al., 2015).

Most responders were unaware of a situation that has escalated from an emergency to a disaster until they have arrived on the scene (Fan et al., 2015). Emotional escalations impede rescue and recovery efforts from first responders putting victims and property in more danger (Busby & Witucki-Brown, 2011; Donahue & Tuohy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2011). There was a clear indication of why Busby and Witucki-Brown's (2011) research supported the need to develop SA theories in disaster response and why my research was so vital.

Previously, the concept of SA applied to aviation, business, and military organization. Situational awareness was beneficial in strategic battle plans (Busby & Witucki-Brown, 2011). The purpose of Busby and Witucki-Brown's grounded theory qualitative research was to contribute to the development of a theoretical baseline for which point a clinical model can grow. They intended to apply SA theory to disaster response.

Busby and Witucki-Brown (2011) decided that a narrative grounded theory qualitative approach was appropriate for their research. Corbin and Strauss (2008) and Charmaz (2006) guided their efforts with the anticipation of providing the ideal establishment for a clinical model of prevention/treatment of psychological trauma and long-term damage.

The participants consisted of 15 emergency responders. The data collected was transcribed. Data came in the forms of interviews, field notes, and memos. Busby and Witucki-Brown (2011) coded the data using QSR Nvivo version 12 8 software, tested theoretical samples, and analytical sensitivity included as a part of the discovery process.

Busby and Witucki-Brown (2011) discovered that SA is complicated during MCI response. During rescue procedures, the first responders engaged in two-interval procedures that have no regularity or consistency of when they can and or if they will happen. In other words, the interval procedures could happen at any time during the response phase.

The procedures fall under two categories: ongoing and proximal. The first interval identifies as continuing education and training. These activities fell under the "ongoing" category because any health care provider, emergency response personnel, and even volunteers needed to use them (Busby & Witucki-Brown, 2011). The second interval was self-questioning and critical incident debriefing and fell under the proximal category. These activities could happen at any time during the response phase, or not at all (Busby & Witucki-Brown).

Busby and Witucki-Brown (2011) also found that first responders who demonstrated situational awareness skills had real-life experience in disaster response. Furthermore, they had accumulated knowledge from these experiences and applied the information to future response efforts. Moreover, they continue to preparedness training and education.

The participants who demonstrated situational awareness skills were able to maintain contextual control over their immediate environment; more importantly, they were able to appreciate the complexity and contextual importance of the event (Busby & Witucki-Brown, 2011). These experienced first responders shared their ability to compartmentalize their emotions, communicate information, understand what resources are available, and how to manage said resources. These abilities helped the first responders stabilize the scene and save lives and property.

Busby and Witucki-Brown (2011) identified the gap in the literature and the need to expand the research adequately. They supported the need for a theory-based clinical model. Despite the lack of literature supporting the movement of SA to disaster response, Busby and Witucki-Brown (2011) presented their study in a scholarly manner.

Busby and Witucki-Brown (2011) only found one article (not identified) that included "situational awareness" and "mass casualty" or "multi-casualty" in the title. The focus of the research presented enough evidence to support further exploration of SA during MCIs rescue and recovery phase. A discovery during their research found: The House of Representatives committees and subcommittees encouraged a "major DHS

initiative" after hurricane Katrina (Busby & Witucki-Brown, 2011). Also, SA played a significant role in this initiative.

**Conclusion**

Researchers define situational awareness as an interactive experience one has with their environment which prompts the arbiter to draw on his or her own experiences to analyze and assess information to make sound judgments and decisions (Endsley, 1988; Endsley & Jones, 2004; Salmon et al., 2006; Stanton et al., 2001). Situational awareness began in aviation and military battlefield strategies but transitioned to other domains such as nuclear power generation, medicine, and disaster or crisis response.

Situational awareness skills develop over time. The more experience an individual has with a specific event (e.g., disaster response), the more prominent the SA skill becomes. People who exhibited high levels of SA exhibit an appreciation for the complexity and context of external events, they analyze and assess the risks of the tasks to determine the most appropriate course of action. They compartmentalized their emotions, so escalations reduced. Participants who exhibited high levels of SA skills identified ongoing training, simulations, debriefings, and discussions as ongoing and proximal activities. First responders and healthcare professionals made critically and potentially life-saving decisions because of this skill.

Unfortunately, no extensive research addressed how first responders utilized this skill when responding to large-scale events. Busby and Witucki-Brown (2011) conducted a qualitative, grounded theory approach to contribute to a theoretical foundation that eventually leads to the development of a clinical model. At this point, there were no

clinical models first responders used in the field to reduce emotional escalations that lead to long-term psychological trauma or damage.

In the following chapter, I will explain my research design. I will provide an in-depth look at participant logic, sampling, and recruiting methods. I will explain what my role in the research is and how the data were collected and analyzed. Finally, I will look at the ethical implications of my research.

Chapter 3: Research Method

**Introduction**

In this study, I explored how first responders experienced the initial chaos immediately following a large-scale event, whether the first responders had an emotional response (good or bad), and how they activated situational awareness skills. The information collected in this study might help change the training curriculum, develop a clinical model of treatment/prevention, and contribute to saving lives and property. The investigative tool was through open-ended qualitative questions presented in a realistic ontological framework.

This chapter provides a description of the research design and rationale. I explain the reasons for choosing the central concepts, phenomenon, and research tradition. In this chapter, I also explain the role I played in this research study as the author, interviewer, and interpreter. This chapter also includes the methodology and participant criteria, including population, sample size, and specific criteria required to participate in this study. Finally, I discuss issues with trustworthiness and how interpretation contributed to the credibility of the results.

**Research Design**

**Research Questions**

The research questions were open-ended and provided the participants with the opportunity to share their stories in a narrative conceptualization. I present these questions in realist form:

- How did you experience the initial chaos during the initial response phase of a large-scale disaster?

- How did you experience your emotions during this situation (good or bad)?

  o What, if any, emotions were present?

- How do you feel your emotions affected your job performance?

- How did you gain situational control over their immediate environment?

**Qualitative Methodology**

This research lies within the traditions of qualitative ontological realism. The reason I chose this approach was that experiences rely on first-hand accounts from first responders and how they perceived their immediate environment. Ontology is the premise that reality is a relative concept (Creswell, 2014). Realism is discovering the causal mechanisms that allow reality to unfold in a particular context (Patton, 2015). This qualitative approach was appropriate because first responders' realities are unique to perspective, and the context is abnormal to their everyday life.

Shulman (2010) outlined how chaos in psychology is not linear. Shulman argued that development and functioning were dependent on how one perceived the reality of internal and external environments. Shulman recommended further studies on the relationship between chaos and reality using psychoanalytic theory. In this qualitative study, I engaged with participants, reflected on responses, and appreciated the value-laden interviews (Patton, 2015). Bronfenbrenner (1977) further confirmed that human development was dependent on the context of an individual's immediate environment.

Maxwell (2013) referred to realism as critical realism. Maxwell combined two clashing views, ontological realism and epistemological constructivism, into one acceptable approach. Ontological realism relied on the assumption that the real world existed parallel to our perceptions and beliefs (Maxwell, 2013). Epistemological constructivism was reliant on the premise that there was no parallel reality, and we constructed our reality from what was real (Patton, 2015). Maxwell (2013) and Patton (2015) agreed that realism was the philosophical acceptance that a real-world exists. Patton further explained that reality might be "studied, known, and explained" (p. 111).

**Central Concepts**

The core concepts of this study focused on whether chaos theory influenced situational awareness skills in first responders during the initial response phase in a large-scale disaster. I explored how emotions impacted cognitive functions, such as decision-making, judgment, and risk assessment. Using situational awareness theory, I also explored what process first responders used to activate situational awareness skills.

**Role of the Researcher**

As the researcher, it was my role to guide the research within the chosen theoretical framework while I maintained the integrity of the qualitative research. I decided what to present as evidence to support my argument (Xu & Storr, 2012). In this study, I was the instrument of measurement. I was objective and remained unbiased no matter what directions the data took the research (Xu & Storr, 2012). I collected, organized, analyzed, and interpreted the data. I then determined which datum was

valuable to this research and which were not (Maxwell, 2012). Most importantly, I provided valuable insight into future research and curriculum.

## Methodology

**Participant Selection Logic**

**Population.** The target population was first responders, consisting of police officers, firefighters, EMTs, and paramedics. This population is over 2 million people in the United States. Not all first responders have experienced the response phase of a large-scale disaster, in any case. I reduced this number by implementing the criteria to reduce the participant pool. Mason (2010) suggested that 15 participants were the ideal number for qualitative research. The number of participants recommended by Cresswell (2014) is between eight and 10. My goal number was 10 participants.

**Sampling strategy.** I was the only instrument in this research, so my sampling strategy coincided with what I could do within a reasonable amount of time. For example, I could not have more than 10 participants because the study would take too long (Creswell, 2014; Patton, 2015). Palinkas et al. (2016) argued that researchers needed to choose "information-rich" cases or participants who aligned with the phenomenon they were studying. In this study, without boundaries, the possibilities were too high. The sample size complemented any future quantitative research that may come (Luborsky & Rubinstein, 1995).

The number of participants threatened the validity of the study. Too many participants would have made the data collection process take too long to conduct, and if I did not have enough participants, scholars might not accept the results (Creswell, 2013;

Maxwell, 2012; Patton, 2015). Creswell (2014) suggested that researchers outline their validity strategies to ensure their findings. Qualitative participant selections had to be large enough to ensure quality and uncover essential aspects that were initially absent.

Creswell (2014) also pointed out that threats to validity with participants in qualitative studies could be the history or the passage of time. Participants may experience additional events that interfered with their participation in the study. Maturation was also another threat. When participants mature, they may not remember everything the way that it happened (Creswell, 2014). Regression and selection could have caused additional harm to the participant. I had to be very careful with this study, as I did not want to cause the participants more harm or trauma. These were traumatic memories and experiences, and participants were predisposed to regression (Creswell, 2014). Finally, Creswell also warned of mortality threats. Mortality is when the participant dropped from the study due to unknown reasons.

The relationship between saturation and sample size depended on seven factors: (a) heterogeneity, (b) the number of selection criteria, (c) how much "nesting" of criteria is needed, (d) special interest groups, (e) multiple samples within one study, (f) data collection method, and (g) budget and resources (Mason, 2010). The information I was seeking was the driving force of selection size (Mason, 2010). When the selection was criterion specific, I risked the chance of limiting my respondents (Charmaz, 2006), for example, if I had decided to look only at respondents who had experienced an EF-5 tornado versus those who met the criteria of experiencing a large-scale disaster.

**Criteria for participation selection.** Criterion sampling is the most common method among qualitative research (Palinkas et al., 2016). For this research, I decided that the ideal criteria were that participants would have had (a) formal education and training in emergency preparedness and (b) first-hand experience responding to large-scale disasters (e.g., Hurricane Katrina, the terror attacks of September 11, or an EF-3+ tornado). As stated in Chapter 1, a large-scale disaster is considered an event that interrupts more than one system of a population or populations (OECD, 2004). The disaster had to have more than five casualties and have resulted in extensive monetary damages. Respondents had to be 18 years old or above, have at least two years' experience as a first responder, and read, understand, and speak fluent English.

**Instrumentation**

Instrumentation for this study consisted of a semi structured interview protocol. I conducted interviews with the selection of participants via computer through GoToMeeting (https://www.gotomeeting.com). Interviews consisted of open-ended questions developed from the fundamental assumptions and theoretical framework(s). I presented the questions in the realist form.

I present the need for this data collection, analysis, and interpretation based on the research of Busby and Witucki-Brown (2011), Fan et al. (2015), LeBlanc et al. (2015), and Renaud (2012). Busby and Witucki-Brown argued the need for the development of a theoretical framework for a clinical model of prevention and treatment that first responders use in the field. Fan et al., LeBlanc et al., and Renaud argued for the need to

expand the research to include addressing the initial chaos first responders experience.

Subsequent research provided barriers to the parameters of the research questions.

There were four open-ended research questions. The follow-up questions were

directly related to the experiences first responders endured. There were enough questions

to ensure the quantity and quality of information. I conducted the interviews via the

computer through the website, GoToMeeting, with audio recording, provided insight into

context as well as expanded the interview questions as needed. These methods

established the sufficiency of data as well as validity and credibility (Patton, 2015).

**Recruitment**

I posted open invitations to fire and police departments, emergency medical

services social media sites on Facebook (https://www.facebook.com) and LinkedIn

(https://www.linkedin.com). I outlined the criteria for the invitation. I excluded

participants that did not meet the criteria. An e-mail provided potential participants

contact information for participation. The volunteers needed to confirm that they met the

criteria by providing information to me that I confirmed through a brief questionnaire that

I provided them via e-mail. The e-mail outlined the criteria for participation. The e-mail

also provided a timeframe of 7 days to return the questionnaire. After I established that

the volunteers met the criteria, I scheduled interviews that were convenient for the

participant and myself.

**Participation**

Participants contacted me via Facebook Messenger or LinkedIn e-mail. I sent a

private e-mail to the participant's secure e-mail or message via Facebook Messenger, a

questionnaire to confirm that they met the required criteria. Once I confirmed this, I contacted them to schedule an appropriate time for the interview process. I followed-up with the participant two days before the scheduled time to confirm the appointment. I provided contact information for the participant's local crisis hotline as well as mental health facilities, and national crisis hotlines, in the event the participant needs to follow-up with a mental health professional. I recorded the interviews, so I needed additional consent to record. I e-mailed copies of the consent for participation and consent to record to the participant. Once I received these forms back with signatures, I then proceeded to the next step. I provided the participant with instructions for the interview. I followed up with written instructions, including a link to a video conference I set up through GoToMeeting.

**Data Collection**

Data collection for this study included the questionnaires that the participants filled out meeting criteria. The questionnaires also included demographic questions such as gender, the highest level of education completed, how many years of service the participant has given as a first responder, and the type of disaster they have experienced.

I collected the remaining data during the interview process. The interviews take place through a video conference room that I established through GoToMeeting. This type of meeting enabled me to record the interview and provided myself with transcripts. The online meeting source also provided the ability to do video meetings that I can take notes on visual cues. After the interviews, I followed up with the participants to make sure they were coping well. I provided them with the local crisis hotline as well as

contact information for local mental health facilities in the event the participant would like to speak with someone directly.

**Data Analysis**

The most critical process of qualitative studies was analyzing the data to report credible findings (Meurer et al., 2007). There was no basic formula for statistical results, and the findings came in the form of interpretation (Patton, 2015). Miles and Huberman (2014) suggested using a pre-coded structure to guide me through data analysis. This method also minimized any preconceived bias. I bracketed off any knowledge of assumptions I may have had beforehand, thus increasing the overall validity and trustworthiness as well (Patton, 2015). I am a student new to research, so this deductive strategy was essential for me (Trochim, 2006).

The GoToMeeting website provided a written script of the recorded meetings. The first step in the process was to ensure the accuracy of the information. Member checking is the process of returning the information to the participant to ensure the accuracy of the information provided (Birt, Scott, Cavers, Campbell, & Walter, 2016).

I analyzed each line of text for context through skills that I have developed throughout my journey. I used a categorical strategy that aligned with the pre-coded structure. My analysis began with the questionnaires and continued throughout the collection process. Patton (2015) stated that researchers fill in the gaps in the event of missing data. Data can sometimes go missing, get deleted, or lost. I protected my data by storing it in the qualitative analysis tool, Nvivo version 12. I also backed up my data on

an encrypted flash drive and stored it in a locked box, and I secured it in my office. I will keep all data, literature, notes, and signed forms five years.

## Issues of Trustworthiness and Ethical Procedures

Conducting research and interviews presented certain risks of privacy violations. I sent an e-mail to Walden University's IRB Coordinator and inquired about the usage of e-mails to send and receive documents. The IRB Coordinator informed me that I could use e-mails if the e-mail is personal and implies a certain level of security. Work or public e-mails were not permitted. According to Maxwell (2012), I ensured trustworthiness by choosing participants that met the criteria set. I needed participants that experienced the initial chaos that immediately followed a large-scale event. I also disclosed the right to withdraw to the participants, both verbally and in writing. I assured participants there is no penalty for withdrawing from the study.

Another way I ensured quality was to conduct a partially structured research question (Creswell, 2013; Maxwell, 2012). The semi-structured interview questions guided the participant but left the opportunity to expand on the questions as needed (Creswell, 2013). Qualitative studies received criticism for the researcher's ability to interpret the data correctly (Patton, 2015). I adhered to my ethical guidelines and my integrity daily, so it was vital to transfer those ethics and integrity to the conduction and interpretation of the data. Moreover, I relied on my dissertation chair to keep me accountable for the research I am submitting as it will go through rigorous checks and balances before final approval.

**Summary**

There was little focus on how first responders experienced the initial chaos that immediately followed a large-scale disaster. Based on the recommendations by previous researchers (Busby & Witucki-Brown, 2011; Donahue & Tuohy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2011) I proposed an ontological realism qualitative approach research study that explored how first responders experienced the initial chaos immediately following a large-scale disaster. I presented this work in an ontological realism framework and a narrative lens. I posted open invitations outlining the study on social media sites (Facebook and LinkedIn). Participants had to meet the criteria to partake in the interview process. I obtained consent to interview and record via e-mail. The interviews and transcripts stored using data analysis software Nvivo version 12 and stored using an encrypted flash drive. Data collection and analysis went through rigorous checks to maintain trustworthiness and ethical, procedural guidelines.

Chapter 4: Results

## Introduction

The purpose of this qualitative study was to explore how first responders experience the initial chaos that followed a large-scale event. I also explored (a) whether first responders experienced an emotional escalation (good or bad) during that initial chaotic stage, (b) what, if any, emotions were present, and (c) whether the participants felt their emotions interfered with their job performance. Finally, I explored how the participants maintained or regained situational awareness over their immediate environment.

In this chapter, I outline the recruitment process and discuss the participants. I also present the data collection, which included the recording process, accuracy check, transcription, and storage. After I present the data collection, I report my analysis of the data and provide evidence to support those findings. Finally, I discuss the trustworthiness of my findings, along with the credibility of my interpretations.

## Setting

The interviews for this research study were in an informal setting. The interviews had no organizational relationship other than Walden University. I conducted the interviews in my home office as well as my professional office. The doors were closed and locked to prevent any interruptions. I also used GoToMeeting video conferencing so the interviews could be recorded and transcribed quickly. Only the participant and researcher/interviewer were present during the interviews.

**Demographics**

The target population for this study was the first responders who participated in a large-scale disaster response. There is no set number of participants required for a qualitative study; however, Creswell (2014) suggested that between eight and 10 people were enough unless there was saturation. The respondents all met the inclusion criteria of being over the age of 18 years old, reading and speaking fluent English, having had at least 2 years' experience as a first responder, having had formal education and training in emergency preparedness and response, and having had first-hand experience responding to a large-scale disaster. Each participant described the disaster that he or she responded to so that I could confirm that the disaster criteria were met, as follows: more than five casualties, more than three systems interrupted, and extensive monetary or property damages reported.

I interviewed 2 female and 5 male respondents (see Tables 1 and 2). The first participant was female and responded to Hurricane Katrina twice, 2 months apart. She initially responded as a firefighter; however, her role changed multiple times from firefighter to victim identification/notifications. The second participant was male, and he responded to the mass shooting in Las Vegas, Nevada, as a police officer. He was among the crowd on the street and was shot at by the assailant. Participant 3 was a male who responded to the mass shooting in Las Vegas as a police officer. His role was to eliminate the threat on the 32nd floor of the Mandalay Bay Resort. Participant 4 was a male who also responded as a police officer involved in the Las Vegas mass shooting. He was one of many who responded on the investigative side of the disaster. Participant 5 was a male

first responder who responded to Staten Island, New York, after the destruction of

Hurricane Sandy. Participant 6 was a male who responded as a police officer to a civilian

evacuation of a city in Panama. Finally, Participant 7 was a female who responded as an

EMT to the Evansville, Indiana, tornado. Due to the nature of the study, the risk of a

confidentiality breach is high, so I did not collect any other demographic information

from the participants.

Table 1

*Participant Demographics*

| Participant # | Gender | Disaster responded to | Role(s) |
|---|---|---|---|
| 1 | Female | Hurricane Katrina (2) | Firefighter/crisis responder |
| 2 | Male | Las Vegas mass shooting | Police officer |
| 3 | Male | Las Vegas mass shooting | Police officer |
| 4 | Male | Las Vegas mass shooting | Police officer |
| 5 | Male | Hurricane Sandy | First responder |
| 6 | Male | Evacuation of Panama | Police officer |
| 7 | Female | Evansville, IN, tornado | EMT |

Table 2

*Interview Dates and Duration*

| Participant | Date | Interview duration |
|---|---|---|
| 1 | 12/04/2019 | 34:07m |
| 2 | 12/31/2019 | 28:19m |
| 3 | 01/08/2020 | 32:23m |
| 4 | 01/14/2020 | 54:53m |
| 5 | 01/26/2020 | 34:54m |
| 6 | 02/14/2020 | 33:23m |
| 7 | 02/19/2020 | 32:00m |

## Data Collection

I received Walden IRB approval (no. 10-31-19-0427697) on November 1, 2019, to proceed with data collection through Walden University. Data collection approval expires on October 30, 2020. Data collection began with submitting a request to post an invitation on social media sites used by first responders. The requests I sent out totaled 149, which included requests sent through Facebook Messenger, e-mails, public posts, and LinkedIn requests.

I received 10 responses from possible participants. I had to eliminate 1 because the incident did not meet the criteria. Two participants signed the consent form; however when I tried to schedule an interview with either of them, neither returned my phone calls or e-mails. In the end, I had 7 respondents who met the criteria, signed the consent forms, and moved forward with the interview.

I received a response from the director of an employee assistance program from a relatively large city that recently went through a disaster. The director asked permission to post my invitation on their private social media account that only first responders have permission to see. I submitted a request for permission to alter my data collection to include posting on private social media sites. On December 5, 2019, I received permission from Walden University's IRB to move forward with this request.

Data collection spanned 4 months, from November 1, 2019 through February 29, 2020. I did not receive any responses the first month, conducted two interviews during the second month, two interviews the third month, and two interviews in the fourth month. There was a third interview in the fourth month; however, I had to eliminate this interview because the incident did not meet the criteria.

I conducted each interview using a semi structured interview process through GoToMeeting.com. Each respondent used the dial-in option, and no one was video recorded as per Walden University regulations. Each interview was also tape-recorded and labeled with the respective participant (e.g., participant #1, participant #2); moreover, I also audio-recorded the interviews in digital format as a third backup. During each interview, I took notes on ideas, themes, thoughts that stood out to me, feelings, or anything else I felt was pertinent to my research study.

Each interview lasted 20-45 minutes. I began the interviews by going over the consent information and gaining verbal consent along with the written consent. I advised the participants of the benefits and potential for risk. I also advised the participants of the

crisis hotline numbers provided on their consent forms. Due to confidentiality restrictions, each participant will receive a general summary of my results via e-mail.

**Bias Control**

To maintain bias control, none of the participants had a personal connection to me. In addition, I have not been involved as a participant or a victim of a large-scale disaster. As the researcher, I was responsible for the interpretation of the data. During the interviews, I repeated some statements to ensure clarity and understanding from the participant. Any additional questions that I did ask were relevant to what the participant stated and not based on my personal views. I interpreted the data based on the research questions.

**Unusual Circumstances**

Three unusual circumstances happened during data collection. I received 2 responses to participate. These responses were a result of the post on a private social media site utilized by a police department. I received the consent forms back via e-mail with "I consent" in the subject line. I responded to both e-mails to schedule a time for the interviews. The first respondent e-mailed me on 01/07/2020. I returned the e-mailed to this respondent; however, I did not receive a response until 01/18/2020.

I scheduled an appointment for an interview on 01/20/2020, but the respondent did not show. I tried to contact this person via e-mail but received no response. I attempted to contact this person again via e-mail on 02/10/2020 to see if this respondent was still willing to participate, but I received no response. I attempted no further contact.

I received another response on 01/07/2020 via the "I consent" e-mail. I responded to schedule an interview, and the respondent did not reply until 01/16/2020. This respondent stated that he/she had been absent from work due to an injury. I asked if this person was still willing to participate. I did not receive a response. I e-mailed again on 01/22/2020, but I did not receive a response. I made no further attempts to contact.

The final unusual circumstance was the original Participant #6. This participant signed a consent form via e-mail. During the interview, I determined that this participant was more of a victim of a large-scale event that took place during a war. This information disqualified the participant due to nature and the role the participant played.

## Data Analysis

Data analysis began with verification of accuracy with the transcriptions. I transcribed the interviews twice for accuracy, once through GoToMeeting and once myself. I went through each transcription and listened to the recording to ensure accuracy.

I uploaded the transcriptions into NVivo (Version 12) and began coding. I used inductive coding for this study. Thomas (2006) stated that inductive coding reduces the data to standard terms. I used this method because it helped me bring out the context, perception, and the reality participants experienced.

There were  main research questions; however, the first question I asked was for the participant to describe the disaster that he or she participated in, so there was a total of five questions coded for 7 participants. I developed a list of codes from the first question asked: roles and relationships, resource management, the human element, safety,

experience, training, communication, chaos, preparedness, exposure to trauma, time, situational awareness, and event/location. I confirmed these codes with my dissertation chair before moving forward. I did not list the codes in any particular order; however, NVivo automatically listed them in alphabetical order. The remaining four questions started with these principal codes except for the final question, because of the nature of the final question, added situational awareness.

I coded Questions 1-5 and then listed the principle codes under the questions. For example, I coded answers from Participants 1-7 for Question 1 under the node for Question 1 and so on. I coded each participant's answers with the coordinating question. Once I completed this process, I coded the data according to the preset codes. I then went back into the node for the questions and looked at the nodes that had the most references.

Under Question 1, there were additional nodes that emerged under the presence of realism and perception. A total of 53 codes emerged from Question 1 with 650 references. The remaining questions and codes were dependent on what question I asked. I coded Question 2 according to perception because I asked participants what their personal experience was during that initial chaotic stage. Under the second interview question, which was the first research question, I identified 80 codes (13 principal codes and 67 sub codes) with 773 references.

I asked Questions 3 and 3a, and I hoped to discover specific feelings identified and whether said emotions incited an emotional escalation (good or bad). This question was trickier than the first three questions. I coded the question under the preset codes and then went back through to identify any feelings that participants quoted (e.g., anger, calm,

fear). I coded Question 4 with cognition terms. I asked participants if/how they feel their emotions interfered with their job performance. I based these codes on perception as well.

I coded Question 5 according to situational awareness. After the preset codes, I added situational awareness node with two sub-nodes: situational awareness abilities and situational awareness skills. These additional codes helped me identify which participants were able to use situational awareness abilities and which skills were prominent during disaster response.

**Codes, Categories, and Themes**

As previously stated, the inductive coding developed from the first question, which asked the participants to describe the large-scale disaster that he or she responded. This research study relied on ontological realism. As previously stated, ontology is the premise that reality is a relative concept (Creswell, 2014). Realism is discovering the causal mechanisms that allow reality to unfold in a particular context (Patton, 2015). The inductive coding had to be directly related to how the first responders perceived their immediate environment. I summarized the emerging themes, codes, and participant responses (see Table 3) based on their size and number of references. Emerging themes and codes showed a significant number of participants to be considered relevant.

Table 3

*Research Questions and Interviewed Questions Asked*

| Research questions | Interview questions |
| --- | --- |
| | IQ1 Can you describe the large-scale disaster that you participated in? What was the large-scale disaster you participated in? |
| RQ1 How did you experience the initial chaos immediately following the large-scale disaster/event? | IQ2 How would you say you experienced the initial chaos during that first response phase? |
| RQ2 How did you experience your emotions during this situation (good or bad)? | IQ3 How would you say you experienced the initial chaos during that first response phase? |
| RQ2a What, if any, emotions were present? | |
| RQ3 How do you feel your emotions affected your job performance? | IQ4 How do you feel your emotions affected your job performance? |
| RQ4 How did you gain situational control over their immediate environment? | IQ5 How do you feel you were able to gain situational awareness over your immediate environment? |

Table 4

*Emerging Themes for Interview and Research Questions 1-2a*

| Interview and research questions | Emerging themes and codes |
| --- | --- |
| IQ1 Can you describe the large-scale disaster that you participated in? What was the large-scale disaster you participated in? | Chaos, communication, event-location, experience, exposure to trauma, the human element, exposure to trauma, preparedness, resource management, roles & relationships, safety, situational awareness, time, and training |
| IQ2<br>RQ1 How would you say you experienced the initial chaos during that first response phase? | Chaos – Confusion, death and identifying victims, injured people, sensory interference, shooting, crowd, triaging<br>Communication<br>Experience<br>The human element - Coping Skills (emotional and problem-based)<br>Emotional experience – Negative, neutral, positive<br>Family – Personal family, sense or feelings of family<br>Preparedness – Environmentally, physically/emotionally<br>Resource management – Human, material<br>Roles & relationships – Duty, solo, teamwork<br>Safety – Community, personal<br>Situational Awareness – Ability, skills<br>Time – Time of event, time on scene<br>Training – Automatic, curriculum/general, EPT, simulated |
| IQ3<br>RQ2&2a How would you say you experienced emotions during this situation and, um, what emotions can you identify? | Chaos – Confusion, loss of control, interruption of senses, external stimulus<br>Experience<br>The human element – Cognition, emotional experience, family fear, lack of emotions, negative emotions<br>Preparedness – Mental preparedness<br>Resource management – Effectiveness, efficiency<br>Roles and relationships – Sense of duty<br>Safety – Threat<br>Training |

Table 5

*Emerging Themes for Research Questions 3-4*

| Interview and research questions | Emerging themes and codes |
|---|---|
| IQ4<br>RQ3 How do you feel your emotions affected your job performance? | Chaos<br>The human element – Cognition, emotional experience, coping skills,<br>Roles and relationships<br>Training |
| IQ5<br>RQ4 How do you feel you were able to gain situational awareness over your immediate environment? | Chaos<br>Communication<br>Event – location<br>Experience – Exposure, new experiences, shared experiences<br>The human element – Cognition, emotional experience, coping skills<br>Preparedness<br>Resource management<br>Roles and relationships<br>Safety<br>Situational awareness – Situational awareness abilities, situational awareness skills<br>Time<br>Training |

**Evidence of Trustworthiness**

**Credibility**

I received approval to conduct this research study through Walden University.

Walden University accredited by the Higher Learning Commission (Walden University,

2020). I worked closely with my dissertation chair, committee member, the university

research reviewer, and the IRB coordinator. I had to gain approval through all four stages

before I could begin data collection with the interview process. I had no control over who

responded to my invitation to participate. I posted invitations on social media sites based

on profession and location.

I submitted approval to change methods by permitting my invitation to be posted on a private social media site. I submitted an e-mail for a change in recruitment to IRB on November 21, 2019, and received permission on December 5, 2019. My research questions and interview protocol was approved through my dissertation chair, committee member, URR, and IRB coordinator, thus reducing the risk for bias. I conducted the interviews using the interview protocol and using additional questions to clarify and confirm participant answers. Also, I used GoToMeeting, a digital recording device, a regular tape recorder, and notes I had taken during the interview process.

**Transferability**

There was no change in transferability. The participants all participated in a large-scale disaster response phase, although in different roles. Each participant has confirmed and provided testimony evidence that each has participated in the response phase of a large-scale disaster as a first responder. I confirmed generalization across the population of first responders. I interviewed 7 participants and collected rich, quality data, which demonstrates saturation throughout the research questions. I began to see the same themes emerge throughout the research and interview questions amongst the participant answers. At that point, I felt that 7 participants had gained saturation.

**Dependability**

The dependability of my study relied on the interpretation of the data and coding system. Also, I utilized my dissertation chair and committee member to confirm my thought processes and the legitimacy of my findings. The dependability also relied on my ability to scrutinize my work as well as my ability to let the data take the lead (Creswell,

2014; Maxwell, 2012; Patton, 2015). Also, the use of NVivo version 12 provided research tools that minimize bias (Silverman, 2010). Finally, participants were clear on what the study was researching. They received a consent form outlining the benefits and risks as well as the background information and interview protocol. They were again reminded of the purpose of the study as I gained verbal consent. The interviews were recorded and stored in 3 different methods to ensure accuracy and security. I wil also provide a summary of the results to the participants.

**Confirmability**

Throughout my study, I kept a notebook of contacts, notes, ideas, definitions, locations and disasters, codes, and other various important information to have a paper trail of documentation. NVivo version 12 also kept a log for every time that I logged into my study. I have e-mail documentation of research guidance, requests, approvals, and consent forms. I also have documentation of attempts or conversations with participants and potential participants. I repeatedly referenced chapter 3 to maintain consistency throughout the testing, analyzing, and reporting phase.

## Results

**Research Question Reporting**

I interpreted each research question through chaos theory and situational awareness theory. I identified each research question as an essential step in a 4-step procedural phenomenon, which is the first responders' ability to regain situational awareness over his or her environment. The following section outlined each research

question and how the first responder participant answered the interview questions. I also provided specific quotes from the participant that supported my findings.

**Disasters.** The totality of the reported disasters is incomprehensible. The reported disasters included Hurricane Katrina, August 2005, which had an estimated death toll of 1,833 people and cost 108 billion dollars (Zimmermann, 2015). Participants 2-4 participated in the mass shooting in Las Vegas, October 2017, with 53 dead and over 500 injured, with the monetary damages are estimated to be over 600 million dollars (Crosby, 2017). Participant 5 responded to Staten Island, NY, in Hurricane Sandy, which had an estimated global death toll of 286 and caused 50 billion dollars in damages (Toro, 2013). Participant 6 participated in the evacuation of a Panamanian city, which left 1000 dead and caused 165.6 million dollars in damages (Kelley, 1990). Participant 7 responded to the EF3+ tornado that touched down in Evansville, IN, November 2005, and left 23 dead, 5-6 unaccounted for and caused 92 million dollars in damages (National Weather Service, 2020). See Table 6.

Table 6

*Reported Disaster Participation*

| Participant | Disaster/event | Date | Deaths | Monetary damages |
|---|---|---|---|---|
| 1 | Hurricane Katrina | August 2005 | 1833 | 108 Billion |
| 2 | Mass Shooting-Las Vegas | October 2017 | 53 | Est 600 Million |
| 3 | Mass Shooting – Las Vegas | October 2017 | 53 | Est 600 Million |
| 4 | Mass Shooting – Las Vegas | October 2017 | 53 | Est 600 Million |
| 5 | Hurricane Sandy | October-November 2012 | 286 Globally | 50 Billion |
| 6 | Evacuation Panamanian City | September 1990 | Est 1000 | 165.6 Million |
| 7 | Evansville, IN EF3+ Tornado | November 2005 | 23 | 92 Million |

**RQ1: How did you experience the initial chaos during the response phase of a large-scale disaster?** The first theme to emerge was transitioning into response mode. The transition happens when the first responder arrives on the scene, and he/she can see the magnitude of the disaster. The participants described several characteristics that they associated with this initial experience. Participants indicated that there was much confusion. Participant 2 stated, "We didn't know what was going on at first. We weren't sure if it was some kind of terrorist attack or if it was just someone coming in to overrun the facilities" when describing his experience with the mass shooting in Las Vegas.

Another characteristic of RQ1 was the amount of death and injuries the first responders encountered. All seven participants talked about the number of injuries and deaths that they had responded to. Participant 2 stated that he witnessed, "several people

down, they were obviously fatalities." Participant 7 recalled the moment after an EF3+

ripped through the town of Evansville, IN, by stating, "I mean it was just blackout. It was

just crazy. And just the screams and the crying and the children, the children were the

harder, you know, we had a baby that came in deceased that they found in the ditch."

Five out of seven participants felt that communication played a significant role in

the initial transition. Participant 3 testified, "the first time I'd ever been a cop for 22 years,

first time I'd ever heard just mass pandemonium and screaming on the radio." He further

stated, "I mean, you could hear, uh, the, uh, audible, um, stress and trauma in people, um,

just listening to the radio." Participant 4 talked about, "There's not much radio service in

there, the radio would cut in and out, and it just depends on whether you got radio service

or not."

I broke the human element code into ten descriptive codes. Six out of seven

participants mentioned one or more descriptive codes listed under the human element

code. The participants mentioned coping skills, emotional experience, and family the

most.

Some type of coping skill was mentioned 17 times from five participants.

Debriefing and compartmentalizing were among the most recognized. Participant 3

mentioned, "And so it was really the first time for me personally and the trauma of, you

know, kind of ready and the response to get down there and get myself in the right

mindset." Participant 5 remembered, "I have to forget everything that my family is going

through and respond for everyone else."

Overwhelmingly, all seven participants did not feel prepared for their roles. Participant 1 stated that she "definitely did not know what I was doing.". Six out of seven participants mentioned resource management during the interviews. The lack of human resources appeared to be the most significant deficiency. Participant 1 stated, "I responded to Katrina, and I responded to it two different times. I think it was nine days and then again two months later. The first time in New Orleans and again in Mobile, Alabama. You went in as the fire department, the police department, crisis workers, whatever they needed at that time." Participant 2 stated that he was "assigned overtime for the event."

All 7 participants talked about their roles and relationships during the disaster response phase. Six out of seven talked about having a 'sense of duty' to the public, their team, and themselves. Five out of seven talked about the safety factor. There were three types of safety identified: threat assessment, public safety, and personal safety.

Personal safety was the lowest concern for the responders. Participants 2, 3, 4, and 6 had engaged in neutralizing the threat while ensuring public safety. They had accepted death, and some even prepared for it as part of the duty. The most challenging part identified as coming to terms that they may not see their children again.

Most of the participants mentioned time in some form. Participant 2 said, "it felt like forever. I know now just going back and watching all the video, I've been documented, it was 10 minutes total from start to finish. So, from the time he started shooting his first rounds, the time he stopped, it was 10 minutes." The participants

suggested that the amount of time they were in their respective roles contributed to their response abilities.

It is also important to point out that the amount of time they initially exposed to the event also played a role in their response phase. Participant 4 stated, "I can see you know, the blood on the floor from where the security guard had been shot in the leg, and we all just swarmed up my FTO, my field training officer stayed in the center Hub."

The final characteristic that contributed to the transitioning into response mode was the amount of training and type of training the responders had received. All 7 participants suggested that their training ignited an intuition-based training activation. Participant 1 said, "it is, it comes as an automatic to you with training and things like that," while participant 2 suggested, "Um, you know what, it's kind of where it was just your training kind of kicks in." Participant 2 also stated, "Um, yeah. So, you know, I'm going through my progressions, trying to find the shooter." Participant 4 remembered thinking, "So I know what automatic fire sounds like, and I was like, oh, this is this is not good."

Participant 7 acknowledged, "Well, it scared the heck out of me cause you know, you were so ready for these things to cause we practice them and you practiced and practiced, even in the ambulance you practice and practice." The participants identified generalized training with the curriculum (formal education) as well as simulated training and numerous years of experience as their primary abilities to transition into response mode.

**RQ2 and RQ2a: How did you experience your emotions during this situation (good or bad)? What, if any, emotions are present?** Research question 2 and 2a identified as step two of the 4-step process. I determined that this was the assessment phase. This step was where the first responders began to prepare themselves mentally, emotionally, and physically for what they were about to do. This step is vital regardless of whether the responder is neutralizing a threat or pulling dead bodies out of a dwelling, lake, or ditch.

Throughout the interviews, I learned that five out of seven participants felt that chaos contributed to their emotional experiences. One participant said, "It was, it was like all auditory, it was overwhelming. The text messages, the phone calls, uh, everything was going on at once," and "It was, it was just hard to focus on what the priority should because there were so many things coming at us."

Six out of seven participants talked about how the human element contributed to their emotional experiences. I broke the emotional experience code down into 4 identified sub codes: emotional awareness, emotionally distracting, physiological symptoms, and unbelievable. There was a common belief between the participants that their experience was highly emotional. Participant 1 stated, "if I'm there and, and, you know, and it was a crazy situation, don't get me wrong, it was probably the one that most, um, you know, emotional, distracting, uh, devastating things I've ever been a part of my whole, my whole life." Participant 3 testified, "So I do not think it's anything that we necessarily get training on, and we get emotional awareness, and we certainly have a program in our department for peer counseling, and you know."

The participants recognized the coping skills as a form of preparedness that they used at the time or had access to in their respective fields. I broke coping skills into two categories: problem-based and emotional-based. Six of the seven participants mentioned a specific coping skill. Compartmentalizing was among the most common. Another coping skill was the use of a metal music playlist to "get your game face on," as stated by the first participant. She stated that the playlist "it's very hard to explain, but it takes you to a place that you can put yourself into a place where you don't have emotion."

Most of the participants did not feel that their emotions escalated at the time of response. Six out of seven felt that they had a lack of emotional response while reporting negative feelings such as shock, overwhelmed, frustration, anger, crazy, and emotionally distracting. Three participants reported positive feeling responses such as calmness, acceptance, and understanding.

Roles and relationships played a role in the evaluation process and emotional experience among the first responders. Six of seven participants believed that their role as a first responder provided them with a unique ability to compartmentalize their emotions and set aside any personal obstacles such as family dedication and duty so they could do their job. Participant 1 reported, "but that's the magnitude that you can go to in your head when you've been trained that you can actually just flip into this other place that you can just go to and get, get stuff done and get it taken care of." Participant 7 provided a model example of this step by saying, "If we do take that responsibility on, you have to, you've had to deal with things in your way on your terms, and my way of dealing with it was, if it's my time to go, it's my time to go. I don't care where I'm at, what I'm doing, or who I'm

doing it with. If it's my time to go, I'm going to go. And that's my way of dealing with, you know, cause I'm going to do what I was trained to do."

Time factored into how the first responders experienced their emotions. Overwhelmingly, 5 out of 7 participants felt that the time they had on their job minimized their emotional reactions. They also indicated that time contributed to the amount of training they had. Exposure time helped first responders compartmentalize more effectively. Participant 2 indicated, "So now we do get some awareness. I think it is more awareness that we get. And then, over time, you build up that ability to turn that stuff on and off when need be."

The final characteristic of the evaluation phase and how first responders experienced their emotions was how they received their training. Participants stated that "it is one of the things that I was trained with at our Sheriff's office is that you don't have emotion when you are on the scene a certain thing," "we are probably one of the best-trained departments in the country," and "So, um, you know, your training really just, I mean the cliché is to say it, but you know, your training just really kicks in." The participants did not feel their emotions escalated during the initial chaos, and therefore job performance was not a factor.

**RQ3: How do you feel your emotions affected your job performance?** The third step in the process to regain situational awareness over the immediate environment was job performance. I needed to assess how emotions interfered with job performance (good or bad). Overall, the participants did not feel their emotions interfered with their job performance. Participants testified, "They don't. Okay. Like I could literally flip a

switch, and I have no emotion. I can go in and do my job and have no emotions while I'm doing it. And then I can go after my job has done, I can go and have a complete meltdown with someone and then, deal with it and be fine," "you're able to do things better if you're able to calm your emotions down," and "I think there's actually a positive and negative aspect to it. Um, I think the ability to turn that on and off the emotions allows us to function and, um, focus."

The most significant identifying characteristics of this research question focused on cognitive abilities, such as the ability to adapt to their surroundings, comprehension, decision-making, hyper-focusing, perspective, self-doubt, and task completion. One participant suggested, "you could make bad decisions. Um, you know, things can just go really bad, especially for a police officer. So, if you're able to control your emotions and focus on the task at hand, um, you know, then you're able to handle the situation better." While another participant suggested, "so I think that, you know, maintains our vigilant and we were able to block all that external stuff out and focusing on what the mission is," and "Hey, we need you to do a search warrant on his house or we need you to do this. We just block everything else out and focus on, okay, I need to get from A to B, and how do I do that?"

Several statements were significant but one stuck out to me more than others in RQ3, which was, "if all the officers were to like freak out and start screaming and running away and not help them and try to get that threat, then what good are we as police officers?" This statement spoke volumes to me as a researcher. This statement

supports what I discovered in the beginning. Not everyone can become first responders. First responders have specific characteristics that others do not (Renaud, 2012).

Most of the participants mentioned training as a reason they felt their job performance was not affected, "you know, we, we get trained really well and, and expected to do what we're trying to do," and "I felt very comfortable doing it very natural doing it." All the participants indicated that they received formal and adequate training. The participants accredited their training to their ability to regain situational awareness.

**RQ4: How did you gain situational control over their immediate environment?** The fourth step in the process and the final theme that emerged was the regaining of situational awareness or proceeding. The ability to regain situational awareness relied on several factors. Steps 1 through 3 were crucial; however, participants discussed several obstacles they had to overcome before they could regain control over their immediate environment. Six participants described chaos as an obstacle. One participant stated, "you know, the mass casualties, you know, the trauma that occurred from this event is something that just has not been seen in this country ever!" Some had to put aside their safety, "I'm getting shot at by all these bullets, and you know, it is crazy" and "You can be making a fatal mistake by doing it too early. It is very difficult, but when it is done right, it really does work even though it is complex."

All 7 participants indicated that previous experience provided them with the ability to regain situational awareness. The first participant stated, "I think just having my years of experience and then be in like being in the situations that I have been in and then

just learning from my peers too." I asked participant 7 if she contributed her ability to training or exposure, and her response was, "exposure, I would definitely say exposure."

Intuition also played a vital role in regaining situational awareness. One participant indicated, "it is not something that can be taught; it is a feeling." Intuition identified as a feeling, automation, coping skills, preparedness, and situational awareness abilities/skills. Intuition was the sixth sense if you will. First responders are taught to listen to it through simulated training and experience/exposure.

The ability to regain situational awareness had a lot to do with cognitive abilities. I categorized these into 8 subcategories: being aware of surroundings (habituated), decision-making, information processing (heightened senses), job performance, memory, reaction, self-awareness, and self-doubt. These 8 cognitive functions served as a baseline for first responders' ability to engage in situational awareness. The functions that were referenced more included being aware of surroundings, decision-making, information processing, reaction, and self-awareness.

The utilization of coping skills enabled the participants to compartmentalize. Participant 7 revealed,

> you have to keep your emotions in check. Yes. You can't cry. You know you don't get to cry, no, you don't get to show your emotions, not until after. And even then, you still have to keep them in check, and I say check because you can't cry in front of everybody.

Participant 5 stated,

a part of the life-saving strategy is to not look at it emotionally and handle the job.

I mean, that's how we are taught. There isn't a lot of people that I've seen that,

there's some, there's some that can't handle it. You know?

The ability to have situational awareness abilities and skills relied on several key

elements: preparedness, resource management, roles and relationships, time, and training.

When I interpreted these, it was almost a cause-and-effect picture that emerged. The first

responders who had training that included regular reality-based training and many years

on the job stated that they were mentally prepared for what they had to do because they

had situational awareness skills that "automatically kicked in" such as intuition.

Situational skills that emerged while conducting this study included skills that

were expected, such as being aware of surroundings and self-awareness. However, some

were not expected, such as intuition, relying on teamwork, and muscle memory. Self-

confidence, self-reliance, and communication also emerged as essential. Every responder

stressed the importance of experience and training as a factor that enhances someone's

ability to engage in situational awareness.

## Summary

In Chapter 4, I discussed the discovery of a 4-step process that first responders

must engage in to regain situational awareness over his or her immediate environment.

Research question one related to step one; this was the transition into response mode.

This transition phase relied heavily on the first responders' ability to take in what he or

she sees in terms of the magnitude of the situation. The participants described how they

experienced the initial chaos, and important descriptive terms were associated with the definition of chaos in a large-scale disaster.

The second research question was the second step in the process, which was evaluations and assessment. The first responder shared his or her emotional experiences and what emotions were prevalent. The participants indicated that they did not experience an emotional escalation during this time. There were identifiable emotions, such as shock, frustration, anger, calm, overwhelming, and understanding.

The third research question indicated that none of the participants felt that they could not perform their job duties because of their emotions. The third question also served as the third step in the process, which was listing. The participants were able to engage in job duties because they used their situational awareness skills taught to them through years of experience, training, and teamwork.

The final research question determined the final step, which was proceeding. This procedure was how first responders regained control over his or her immediate environment. Situational awareness relied on particular cognitive abilities, training, experience, roles and relationships, and intuition. I discovered situational awareness skills such as being aware of surroundings, self-awareness, muscle memory, relying on teamwork, and intuition. Situational awareness abilities required several vital elements: preparedness, resource management, roles and relationships, time, and training. The results of this question were paramount for my interpretations.

In Chapter 5, I discuss my interpretation of these results. I elaborate on critical findings such as the 4-step process I have mentioned repeatedly in chapter 4. I outlined

the implications of this study, and I outlined the limitations of this study and

recommendations for future studies. Finally, I provide the implications and conclusions

of the study.

Chapter 5: Interpretations and Conclusions

**Introduction**

This qualitative study explored how first responders experienced the initial chaos immediately following a large-scale disaster, how they experienced their emotions (good or bad) and what, if any, emotions could be identified. Research questions explored how first responders felt their emotions affected their job performance. Finally, this study explored how first responders were able to regain situational awareness over their surroundings. In this chapter, I discuss the interpretations and implications of this study. I outline social implications and discuss limitations, opportunities for future research, and the conclusions drawn from this study.

**Key Findings**

This study employed inductive coding. The inductive coding created came from the initial interview question asking the participants to describe the disaster they responded in. There were 11 principle codes: chaos, communication, event-location, experience, exposure to trauma, the human element, preparedness, resource management, roles and relationships, safety, situational awareness, time, and training. Each research question was interpreted into a step.

Research Question 1 was interpreted as the initial stage. The first responder arrived on the scene of the large-scale event. Arrival provided the responders the opportunity to "size up" their surroundings. They were able to take in the magnitude of their direct surroundings. I named this transition the responder phase.

Research Question 2 explored how first responders experienced their emotions (good or bad) and what, if any, emotions were present. I identified this as the evaluation or assessment phase. I discovered through the second research question that the responders prepare themselves emotionally, mentally, and possibly physically for disaster response.

Research Question 3 explored how participants felt their job performance was affected. Participants did not feel their emotions affected their job performance. This question represented the first step that began the cognitive process of listing. According to participants, the listing is going through a mental checklist of tasks he or she must complete to accomplish a particular goal. Participant 2 stated, "I'm going through my progressions, you know, trying to fight the shooter." When asked, Participant 2 indicated, "it was all in my head," I started to recognize how involved and intimate first responders' job duties are. Participants had to focus on what their job duties were at the time while maintaining community safety and security.

Finally, Research Question 4 explored how first responders were able to gain situational awareness over their surroundings. This question served as the final step in the process of gaining control over themselves and their environment. Specific situational awareness skills became apparent. Some of these skills were evident, such as tunnel vision and training, whereas some were surprising, for example, muscle memory and intuition. Participants also revealed specific characteristics that situational awareness abilities required, such as excellent communication skills and the ability to push past the confusion and focus on the task at hand.

The principal codes, with subcodes, served as descriptive coding for the questions and processes. These descriptive codes were listed as crucial if a significant number of participants fell into the category. In the following section, I discuss how I interpreted the data and how the four-step process is vital to this study.

## Interpretations

The need to explore how first responders experience the initial chaos immediately following a large-scale disaster was evident throughout the Chapter 2 literature review (Busby & Witucki-Brown, 2011; Fane et al., 2015; LeBlanc et al., 2015; Renaud, 2012). Busby and Witucki-Brown (2011) conducted a grounded theory study that introduced situational awareness into the social sciences; however, the study explored emergency room nurses in multi-casualty accidents.

What Busby and Witucki-Brown (2011) discovered was that the respondents went through two-phase interval procedures that fell under two categories: ongoing and proximal. Ongoing because there was no consistency as to when the responder would need to use them. The proximal interval procedure included critical debriefing (Busby & Witucki-Brown, 2011). None of the other qualitative research studies in chaos theory or situational awareness theory were relevant to this study; however, researchers argued the importance of exploring how first responders experienced the initial chaos immediately following a large-scale disaster (Busby & Witucki-Brown, 2011; Donahue & Tuohy, 2006; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012).

The interpretation of the data through the theoretical framework revealed a four-step process that was an unintended finding. Each of these research questions was

interpreted as another step in the process. This interpretation relied on chaos theory characteristics and traits outlined in Chapter 2. Chaos theory (Lorenz, 1963) was developed as a means of predicting weather patterns, not psychological behaviors. There was no clinical definition of chaos for psychology; however, chaos was defined for this study in Chapter 1 under the Definitions section. It is not the definition that became remarkable but more the characteristics of what makes chaos, chaos. I called this phenomenon situational chaos.

Adams and Stewart (2014) argued that there are no predictable behavior outcomes in chaos theory. Many variables and outliers contribute to changes that may not be foreseeable (Sprott & Linz, 2000). The bifurcation process stood out the most. Bifurcation is the process by which there are changes within a system, in response to a chaotic state that required self-organization (Adams & Stewart, 2014; Lorenz, 1963; Sprott & Linz, 2000). Marshall (2011) also suggested that when humans perceived disorder, they did their best to make sense of it by "putting forth the effort at making order" (p.4).

Renaud (2012) identified and compared this phase with a process within molecular biology where "actors and agents interact with each other and their environment in seemingly chaos and disorder" (p.7). Furthermore, the interaction was the determining factor of whether the cell lived or died. It is this process that is comparable to what the responders went through. The responder is analagous to the cell, and the disaster corresponds to the outer edge where actors and agents interacted. The process of gaining perceived order (situational awareness) was a process of self-organization.

Busby and Witucki-Brown (2011) argued that first responders reduced negative emotional escalations due to their ability to appreciate the context of the situation around them. Endsley and Jones (2004) outlined perception as a vital element. Endsley and Jones (2004) stressed that the perception of elements within the volume of time and space contributes to the comprehension of meaning.

I developed a clinical model to coincide with the research questions and the steps H.E.L.P which stands for halt, evaluate, list, and proceed. The research questions served as individual steps in the process. The first research question was the basis for the need to gain situational awareness. The chaos phase provided the transitional phase. The transitional phase was the step first responders had to stop and take a look around them to take in what they were about to do. The first research question became the first step in the clinical model, halt, or stop. The first responders had to stop and take in what they were about to engage in.

The transitional phase supported Busby and Witucki-Brown's (2011), Endsley and Jones' (2004), and Renaud's (2012) reported account of what first responders had to do to get through this primary chaotic phase but fills the gap as to what the responders went through when they arrived on the scene. The transitional phase enabled them to prepare themselves mentally and emotionally. The first responders were able to provide a first-hand account of what they experienced as chaos. Participants named confusion, crowd, death, and sensory interruption as just some of the characteristics chaos had for them. These accounts helped me grasp what the participants went through.

Communication was also a significant factor in the transitional phase, as well as how the participants experienced chaos.

The transitional phase also required coping skills. Emotion-based and problem-based coping skills were mentioned equally. Emotion-based coping skills that were mentioned were compartmentalizing debriefing and self-talk. Problem-based coping skills included communication, intuition, and teamwork. Utilizing these coping skills enabled the first responders to prepare themselves mentally and emotionally.

Throughout the chaotic stage, the first responders expressed the lack of concern for their safety. There was an overwhelming response in their preparation and acceptance of death. Some of the participants even said goodbye to their families in their heads. The participants were then able to enter into the second phase of emotional exploration and the evaluation/assessment phase.

Participants agreed that their emotions played a role but that the role was minor. Participants discussed their emotional experiences with me during the interview process. The participants felt the situation was stressful; however, their training took over, and they were able to engage in coping skills (emotion-based) to compartmentalize their emotions. The training each had received was prominent in how they handled their emotions. This second phase or step allowed the first responders to evaluate their safety, community safety, and assess any remaining threats. Fittingly, I named this step evaluation.

Busby and Witucki-Brown (2011), LeBlanc et al. (2015), and Renaud (2012) agreed that emergency responders who exhibited situational awareness skills also reduced

emotional escalations. The interview data confirms this theory. The responders did express certain emotions that they could recall, which included negative feelings such as shock, confusion, and numbness, but some also reported positive feelings such as calm and compassion.

First responders interviewed reported they pushed past their own emotions so they could complete their duties. The evaluation phase enabled the responders to look at their surroundings and determine whether they had to neutralize any active threats (four respondents were involved in events that pertained to active threats). If there were no active threats, scenes had to be secure enough to engage in response activities. The evaluation step leads into the third step, job performance or listing the steps or actions needed to complete a task.

The third research question explored how first responders felt their emotions interfered with their job performance. I interpreted this through chaos theory and situational awareness theory. This research question required the respondents to engage in cognitive abilities. The respondents did not feel their emotions interfered with their abilities to perform their job duties. The data appear to disconfirm the assumption that emotions interfere with first responders' ability to complete their job functions.

LeBlanc et al. (2015) argued that personal experiences contributed to emotional escalations that interfered with cognitive functions such as decision-making, threat assessment, and memory recall among healthcare professionals and trainees. Although LeBlanc et al.'s study population did not include first responders' in the field, the researchers argued that healthcare professionals and trainees' cognitive abilities were

interrupted when they experienced an emotional escalation. Thus, healthcare workers and trainees have to think quickly to make lifesaving decisions just like first responders. This was the closest population to first responders that correlated with my study. Furthermore, LeBlanc et al. argued that emotional states influenced the way healthcare professionals and trainees perceived the world around them. The results of this study appeared to contradict this assumption.

To complete the transition into situational control, first responders had to grasp what they needed to do. They had to focus on what they were tasked to do. The participants accredited the ability to do this to the training they received. LeBlanc et al. (2015) touched on Easterbrook's (1959) cue utilization theory, which suggested as emotional arousal increased, attention moves to more relevant cues that fit the situation that is happening in the immediate environment.

The participants in this study mentioned this ability on numerous occasions throughout the interviews. The participants called this tunnel vision. Participant 4 stated, "people they call it tunnel vision like everything will start to grey out, and I honestly, I think it did a little bit." LeBlanc et al. (2015) suggested that cue utilization theory could be why specific memories during a crisis were accessible while others were not. Further research may be needed in this area beyond the scope of the current study.

The last step becomes the actuation of situational awareness, or proceed to the task at hand. The final phase was the step that saved lives and property. Without the first 3 steps or phases, the final step would not have been possible for the participants. Participant 7 confirmed this by saying, "tunnel vision is when everything kicks in that

you know, and you just start doing what you are supposed to be doing, and you don't worry about anything around you, you just worry about triaging those patients."

First responders who were able to gain situational awareness over their environment, contributed it to training and exposure. The first responders could not say their ability came from training more than experience or vice versa. This study brought to light situational abilities and skills that I have not found in previous research. Some of those abilities and skills included relying on teamwork and training, muscle memory, tunnel vision, and intuition.

Before this study, there was very little research that focused on how first responders experienced the initial chaos in a large-scale disaster. This research expands the knowledge base and provides a starting point for understanding chaos in a large-scale disaster. More importantly, this research was conducted as a method to explore chaos theory and situational awareness theory in a psychological aspect that has never been done before.

## Limitations of the Study

There were several limitations to this study. First, the interviews were conducted via online video conference; however, the participants chose to call into the conference room versus use video chat. This limitation reduced my ability to look at facial features and body language. Creswell (2014), Maxwell (2012), and Patton (2015) all stated that visualizing body language and facial expression was an excellent opportunity to add to data collection. Another limitation was the number of respondents. Although there was enough quality-rich data, I would have liked to have had more participants from other

large disasters interviewed. Additional participants may have led to the discovery of additional coping skills, situational awareness abilities, and skills.

The discovery of the clinical model, H.E.L.P. may not be generalized across populations with fighting psychological trauma; moreover, the trauma discussed in this study was acute exposure meaning the event happened very quickly. Halt, evaluate, list, and proceed may not be appropriate for long-term exposure to trauma.

The participants in this study included more police officers than other first response professions. I assumed this was due to the help from the employee assistance program director that posted my invitation on a private social media site. I did not feel it was necessary to include gender identification, race, ethnicity, or marital status. I explored how first responders experienced the initial chaos immediately following a large-scale event. I did not require specific demographic information. Future research may benefit from gender differences or marital differences in experiences.

I explored experiences associated with large-scale disaster response, emotional experiences, job performance, and situational awareness abilities. I did not explore previous experiences that may have altered their ability to perform their job functions (good or bad). This is recommended for future studies.

## Recommendations

I recommend additional studies in situational chaos, specifically de-escalation processes, as well as debriefing methods. I further recommend additional studies in the implementation of H.E.L.P. The clinical model, H.E.L.P., as defined in the previous sections. This clinical model can be taught through the general curriculum of formal

training, to provide a better understanding of how the abilities are developed and added to simulated training to obtain experience.

I recommend additional studies using H.E.L.P. The implementation of this clinical model would provide valuable information in the form of a quantitative study with two groups of first responders. In this study, one group would use H.E.L.P. while the other group does not. This study would measure cognitive abilities, such as decision-making and job performance. The study would benefit most with a small educational course with a simulated training activity, much like the study described by Scott et al. (2013).

The study conducted by Scott et al. (2013) began with a pretest on knowledge, a small educational course, the training simulation, then a posttest. Scott et al. (2013) discovered overall knowledge increased from 51% to 77% ($M = 18.5$; $SD = 2.2$; $p < .01$). Scott et al. (2013) further suggested additional studies that research the impact of the curriculum, and then I recommend additional simulated training where the real-world application of H.E.L.P is practiced.

I recommend additional studies exploring chaos and situational awareness theories in psychology. Finally, this study revealed several characteristics and skills within situational awareness abilities. I recommend that future studies explore these characteristics to determine prominent skills, such as the ability to compartmentalize emotions.

**Social Implications**

This entire study was conducted to develop a clinical model first responders can use in the field. Busby and Witucki-Brown (2011) expressed the crucial need to develop something that first responders can use during the response phase to reduce the impact of psychological trauma while enhancing response efforts. First responders used H.E.L.P. They were unaware of this process. The use of chaos theory and situational awareness theory in realist ontological form brought this 4-step procedure to the surface.

The results of this study are paramount in battling long-term psychological trauma among first responders. This study may change the way the curriculum presented within formal training. The participants in this study had high remarks for the training they received. Each participated in different experiences; however, they stated that simulated training helped their ability to engage in situational awareness skills. I hope that enhancing simulated training and curriculum will save lives, property, money, and prevent ongoing mental health issues.

**Conclusion**

I had the responsibility of conducting this research study. Researchers have called for more attention to the initial chaos immediately following a large-scale disaster (Busby & Witucki-Brown, 2011; Fan et al., 2015; LeBlanc et al., 2015; Renaud, 2012). The research before me paved the way to the development of a clinical model first responders can use in the field of action. The use of chaos theory and situational awareness theory in psychology is still in its infancy. Before this study, there was no clinical definition of chaos; however, this research study outlined specific characteristics.

Situational awareness theory was used in multi-casualty incidents with emergency room nurses. I used this with first responders. The use of situational awareness in the field requires more exploration, as does chaos theory. However, I was able to define the process that first responders experience during that initial response phase, and I have named this situational chaos.

The 4-step process that first responders engaged in during the initial chaos was a critical finding. This process enabled first responders to transfer themselves from a state of chaos and activate situational awareness abilities and skills. The participants contributed this ability to training and exposure. Simulated training contributed to the participant's exposure and experience level. The participants did not feel that their emotions interfered with their ability to perform their job duties, which disconfirmed the assumption that they do, making this a crucial finding also.

The findings of my study can change the way first responders face specific challenges. The data collected can change the EPT and the curriculum. My research study will contribute to reducing long-term psychological damage in sudden onset traumatic events such as large-scale disasters, whether they are natural or man-made. It has been my pleasure to play such an intricate role in this process.

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Appendix: Interview Protocol

1. What was the last or largest scale disaster you participated in?

2. How did you experience the initial chaos during the response phase?

3. How did you experience your emotions during this situation?

   a. What feelings, if any, were involved?

4. How did you feel your emotions affected your job performance?

5. How do you feel you were able to gain situational awareness over your immediate environment?