

DISSERTATION

AN EXAMINATION OF DECISION-MAKING DURING ORGANIZATIONAL CRISES: A
CASE STUDY OF THE 2017 NORTHERN CALIFORNIA FIRESTORM

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ABSTRACT

AN EXAMINATION OF DECISION-MAKING DURING ORGANIZATIONAL CRISES: A CASE STUDY OF THE 2017 NORTHERN CALIFORNIA FIRESTORM

Organizations experiencing crises are subject to harm that can involve injuries, fatalities, financial losses, reputational damage, losses of assets, and others. This study examined a phenomenon central to minimizing crisis-related harm: decision-making. More specifically, this study examined the ways in which decision elements interact to influence decision processes and behaviors during crises. The significance of this study stems from a steady increase in the frequency and intensity of organizational crises, and the claim that novel research and insights into the phenomenon can promote harm reduction. Research in this domain has been predominantly grounded in post-positivist perspectives, suggesting that new insights and understandings can be found through alternate perspectives. This inquiry adopted a constructivist and holistic view of crisis decision-making, recognizing that the construction of meaning, or “sensemaking”, is an important aspect of decision-making. As such, this study sought to investigate how people make decisions during organizational crises, how and why some factors influence sensemaking and decision-making in the ways they do, how and why some decision factors are ascribed more significance than others, and the ways in which decision consequences influence ongoing decision-making. The conceptual framework guiding this study involved organizational crises, contextual decision factors, sensemaking frameworks, decision-making strategies, and decision consequences. The results of this study are intended to enlighten an area

that some researchers and practitioners believe is growing in importance, and to provide insights that will foster improved practitioner capabilities.

The study's findings suggest that in some contexts, organizational crisis decision-making can be appropriately described as a complex adaptive system. The findings also yielded insights related to several decision factors: past experiences, time influences, situational control, group member trust, and decision-maker self-perceptions. Among the various decision factors studied, decision-maker self-perceptions were found to be the most influential. Finally, implications for research, theory, and practice are presented.

Keywords: complex adaptive systems, decision-making, organizational crisis, sensemaking

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Finally, I thank my family, who were my inspiration for taking on this challenge. Each of you were sources of encouragement and inspiration throughout this study. You listened patiently, and you freely gave me the time and space needed to accomplish this work. I am incredibly fortunate to be part of such a wonderful family, and for that I will forever be grateful.

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CHAPTER 1 – INTRODUCTION

The essence of ultimate decision remains impenetrable to the observer—often indeed, to the decider himself. There will always be the dark and tangled stretches in the decision-making process—mysterious even to those who may be most intimately involved.

— *John Fitzgerald Kennedy, quoted in Allison, 1971, preface.*

Introduction

For a variety of reasons, the occurrence and intensity of crises have increased steadily, impacting people, the environment, and organizations in unprecedented ways. Among other types of losses, the World Bank has reported that costs associated with natural disasters alone have reached an extraordinary \$555 billion annually (Hallegatte, Rentschler, & Walsh, 2018). Despite this trend, Coombs (2010) has suggested “we have only just begun to scratch the surface” in our understanding of crisis phenomena (p. 479). Within the broad domain of crisis-related research, this study recognized the criticality of decision-making in responding to and managing crises, and investigated behaviors and processes that constitute the crisis decision-making phenomenon. This study focused on the nature of crisis decision-making associated with a major wildfire in Northern California, taking into consideration the various personal and organizational contexts that influenced decision-making during that event. This chapter describes the nature of the problem, the purpose of the study, the research questions, the significance of the study, the theoretical and conceptual framework, and key definitions.

Problem Statement

The problem addressed in this study is that an incomplete understanding of crisis decision-making processes and behaviors among practitioners could lead to flawed decision-making. Flawed decision-making, in turn, exposes organizations to excessive harm involving people, finances, reputation, assets, and other interests. Furthermore, steady increases in the

frequency, intensity, and types of organizational crises have been accompanied by heightened organizational expectations that practitioners will be capable of effectively managing these situations. Some within the research community have suggested that a limited understanding of organizational crisis decision-making (OCDM) has impeded the potential for practitioners to reduce harm, and they have called for novel research as a means of yielding new insights (Langley, Mintzberg, Pitcher, Posada & Saint-Macary, 1995; Roux-Dufort, 2007; Scott, 1994; Sommer & Pearson, 2007).

The problematic conditions described in this chapter suggest there is both a need for novel research into organizational crisis decision-making as well as an opportunity to illuminate the “dark and tangled stretches” evoked by John F. Kennedy. This study aimed primarily to explore how people make decisions during times of organizational crises, and why some factors influence those decisions more than others. As Milkman, Chugh, & Bazerman (2009) observed, “The optimal moment to address the question of how to improve human decision making has arrived” (p.1). This study aimed to advance that observation through an examination of how people make decisions, and how various factors influence the OCDM phenomenon more than others. This study’s focus centered on the 2017 Northern California Firestorm, as that event created conditions during which numerous individuals were faced with extreme OCDM challenges. Because these individuals represented diverse organizations, multiple perspectives and behaviors emerged, yielding outcomes that may be useful in improving crisis decision-making in other contexts.

A Description of the Problem

The primary problem addressed in this study is threefold: (a) crises are increasing in significance, (b) expectations of people who manage those crises are increasing, and (c) the

absence of research into organizational crisis decision-making has not produced novel insights. The combination of these factors suggests there is a widening gap between the understanding of OCDM and the need for novel insights. Each of these aspects of the problem is further discussed in this section.

Crises are Increasing in Significance

Research has suggested that the regularity of crises is steadily increasing, in part because of the complex and unpredictable nature of organizational environments (Cesta, Cortellessa, & De Benedictis, 2014; Milkman et al., 2009; Mileti, 1999; Mitroff et al., 1988; Reger & Palmer, 1996; Rosenthal & Kouzmin, 1997; Weber, 2010). Evidence also suggests the number of crises are increasing due to natural and technological disasters (Robert & Lajtha, 2002). Furthermore, costs associated with crises have become immense, as reflected in a 2018 World Bank report reporting that natural disasters alone cause annual economic losses amounting to \$555 billion (Hallegatte et al., 2018). The combination of these trends suggest that crises-related trends are multi-dimensional: crises are increasing in frequency, intensity, and cost.

Heightened Practitioner Expectations for Managing Crises

As the significance of crises has increased, so have expectations of organizational leaders, managers, and other decision-makers involved in managing them (Asgary, 2016; Sayegh, Anthony, & Perrewé, 2004). Concurrent with these heightened expectations, specialized practices such as business continuity and disaster recovery management systems have become more common (Asgary, 2016). These types of systems are intended to diminish the effects of crises and other unanticipated events on organizational obligations (Zsidisin, Melnyk, & Ragatz, 2005). While such systems are helpful in guiding an organization's response to crises, they do not eliminate the exposure to crises. Rather, they are necessary because of organizational

exposures to crises. Consequently, the need for insights into crisis decision-making remain, even as contingency planning has become more of an expectation (Zsidisin et al., 2005).

A Scarcity of Research About Crisis Decision-Making

Despite the increasing need for effective decision-making during crises, the topic has received limited treatment among researchers and theorists. Although crisis management experts have expressed a need for novel ideas to advance decision-making (Sommer & Pearson, 2007), scholars have not answered the call by engaging in rigorous research and theoretical development (Langley et al., 1995; Scott, 1994; Sommer & Pearson). In describing the elusive aspects of decision-making, Allison (1971) referenced John F. Kennedy's account of decision-making during the Cuban missile crisis as being full of "dark and tangled stretches." More recent research does not suggest the landscape has changed dramatically. Cottone (2001) suggested, for example, that while decision models describe decision processes, they universally fail to adequately describe how the culmination of the decision process occurs.

From an epistemological standpoint, research related to OCDM has chiefly adhered to decision theorists' positivist roots (Langley et al., 1995). Consequently, other perspectives have been employed to a lesser degree. While research has examined relationships between isolated decision-making behaviors and factors, research has not tended to focus on the holistic nature of their interactions. A holistic view might better explain how and why decisions processes and behaviors unfold as they do. As stated by Langley et al. (1995), "decisions get studied, behavior gets lost" (p. 266). This absence of this understanding was observed decades ago, when Einhorn and Hogarth (1981) claimed that— while decision processes are thoroughly researched— the question of *why* decision-makers engage in certain behaviors remains unanswered. The answers

to these questions may be further understood by using diverse epistemological perspectives to study the phenomenon.

Purpose of the Study

The fundamental purpose of this study was to further the understanding of how people make decisions during organizational crises. This study sought to achieve this aim using qualitative research, employing a holistic single case study method. The case context involved individual decision-making for organizations during the 2017 Northern California firestorm. The results of this study were intended to inform ongoing crisis decision-making research and theory, and to yield meaningful insights that can assist organizational decision-makers in reducing exposure to harm.

Research Questions

The over-arching research question of interest guiding this study was: How do people make decisions during organizational crises? Sub-questions of interest were:

1. What are the primary contextual factors that influence decision-making during organizational crises, and do some have more significance than others? If so, why?
2. What sensemaking frameworks do people employ during organizational crises, and why?
3. What types of decision-making strategies do people engage in during organizational crises, and why?
4. How and why do decision consequences influence ongoing decision-making?

Expected Impact and Significance of the Study

From a research perspective, the study was expected to help fill or expose knowledge gaps by adding new perspectives and by shedding new light on the phenomenon. Furthermore,

this study was intended to contribute to answering Langley et al.'s (1995) call for research to provide a richer description of the “dynamic linkages” and “interwoven network of issues” (p. 260) which decision-makers encounter. At the core of these linkages and issues are the myriad of decision factors, behaviors, and processes that constitute decision-making. From a theoretical perspective, the study aimed to add interpretivist insights to a traditionally positivist paradigm. Kersting and Obst (2016) argued current decision-making theory does not ontologically explain why people engage in non-rational decision behavior. As such, this study was intended to shed light on research questions by exploring how and why people make decisions the way they do during organizational crises.

Finally, from a practitioner standpoint, this study was intended to promote interest in practices and interventions designed to improve crisis decision-making. While it is premature to identify the precise nature of interventions that would benefit practitioners, it is expected that interventions might involve the development of reflective practice, development of group member trust and cohesion, and increased exposure to various decision-making processes. Furthermore, these insights may be informative in enhancing common standards of practice many organizations look to for crisis preparedness guidance.

Conceptual Framework

This study adopted a holistic view of the organizational crisis decision-making (OCDM) phenomenon, exploring the interactions between its principal components. The following frames form the structure of this inquiry: (a) contextual decision factors, (b) sensemaking frameworks as a precursor to decision-making; (c) decision-making strategies, and (d) decision consequences. These elements are viewed within an organizational crisis environment. Literature supporting this *a priori* framework reveals a multi-faceted domain subject to a wide variation of theoretical

foundations and researched phenomena. The exploratory nature of this study suggests this framework may serve as a launching point for other conceptions of OCDM. This section describes the elements of the framework and the relationships between them; Figure 1 provides a representation of the framework as a general systems “IPO” (input-process-output) model, and Figure 2 illustrates the key components of each framework element.

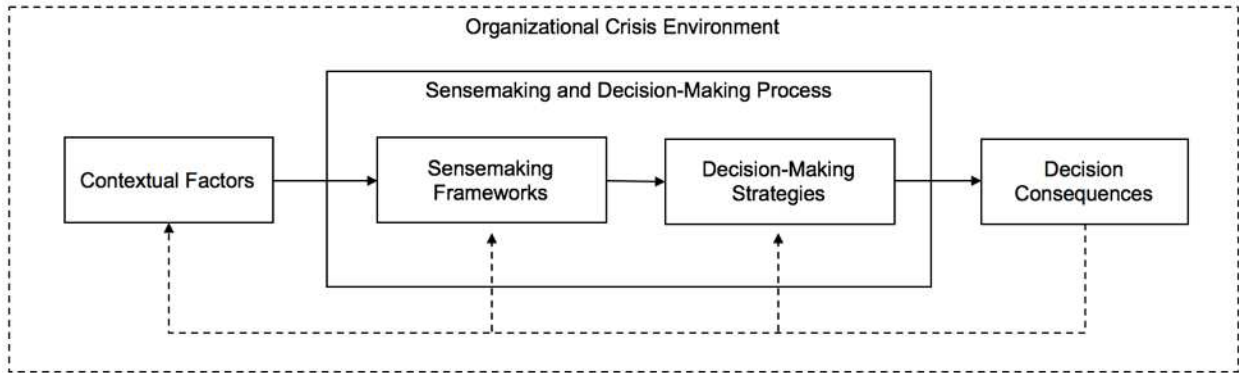


Figure 1: Conceptual framework represented as a general system model.

Organizational Crisis Environment	Contextual Factors	Sensemaking Styles	Decision-Making Strategies	Decision Consequences
<ul style="list-style-type: none"> • Fire description • Fire duration • Changing conditions • Crisis perception • Nature of outcomes 	<ul style="list-style-type: none"> • Stress response • Self-identity • Past experiences • Cognitive biases and heuristics • Group cohesiveness and psychological safety • Social factors • Time pressures • Organizational policies 	<ul style="list-style-type: none"> • Retrospective sensemaking • Data-Frame sensemaking 	<ul style="list-style-type: none"> • Conflicted decision-making • Naturalistic decision-making • Unstructured decision-making 	<ul style="list-style-type: none"> • Human • Technical • Economic • Social/organizational

Figure 2: Core concepts within each framework element.

Organizational Crisis Context

In this study, an “organizational crisis” represents the overall context in which individuals make decisions. Organizational crises are events that are unexpected and expose

organizations to severe consequences. Crisis consequences can be related to human health and safety, reputation, assets, finances, or other organizational interests. Organizational crises are further characterized by an absence of information, decision time constraints, and decision-maker stress (Alkharabsheh, Ahmad, & Kharabsheh, 2014; Bazerman, 2001; Vivacqua, Garcia, & Canós, 2016). This study did not focus on crises of a personal nature or other situations unrelated to organizational contexts. Furthermore, this study did not focus on emergency situations that—while potentially crisis-inducing—are predictable, and therefore subject to detailed planning and proactive measures (Boin & McConnell, 2007). Examples of emergency situations can involve incidents such as tornadoes, building fires, and chemical spills.

Contextual Factors

This study invoked the claim that an intertwined and changing collection of contextual factors interact to influence decision-making (Baumann, Dalgleish, Fluke, & Kern, 2014; Graham, Dettlaff, Baumann, & Fluke, 2015). In this study, the term “contextual factors” refers to the various forces that can influence decision-making, sensemaking, and crisis consequences. The ambiguous nature of contextual factor interrelationships suggests the possibility of simultaneous and entangled influences on both sensemaking and decision-making. Rather than attempting to consider all possible contextual factors, this study proposed to attend to those that have been described in literature as being significant: time constraints, stress response, self-identity, past experiences, social influences, and group member trust and cohesion. These factors are further described in Chapter two. Other important factors that emerge will also be analyzed.

Sensemaking Frameworks

The act of sensemaking has generally been described as how people “make sense” of situations they encounter (Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005). This act describes

how people establish frames of reference that allow them to comprehend, understand, and explain new stimuli (Starbuck & Milliken, 1988). Literature suggests people must undergo sensemaking before they can contemplate decision-making. Hudson and Singh (2017) have suggested “once data is coherently structured, decision-making can proceed” (p. 167). In this study’s conceptual framework, sensemaking was conceived as an output from contextual factors, and as an input to decision-making.

To investigate sensemaking in a diverse manner, this study’s conceptual framework incorporated sensemaking styles that have been associated with crisis contexts: Weick’s (1995) retrospective sensemaking properties, and the iterative data-frame approach to sensemaking described by Klein, Phillips, Rall, and Peluso (2007). Weick’s (1995) perspective is analytical, while the data-frame theory is processual. Together, they provided a multi-dimensional perspective of sensemaking’s interrelationships with other elements of decision-making. These frameworks are more fully described in Chapter two.

Decision-Making Strategies

This study incorporated three distinct decision-making models that provided a diverse means of examining decision processes. First to be discussed is the unstructured decision model proposed by Mintzberg, Raisinghani, and Théorêt (1976). The model is intentionally broad and versatile, and accommodates specific concepts related to OCDM. In this model, Mintzberg et al. (1976) suggested that previously unencountered decisions—including those involving crises—tend to follow a three-phase process: identification, development, and selection. The identification phase involves the recognition and diagnosis of a situation requiring a decision. The development phase involves information collection and the formation of alternatives. Finally, the selection phase involves making a choice which reflects a commitment to action.

This broadly structured process accommodates elements from other decision-making models, and provides a means for contextualizing research data as decision influences are explored.

Second, the model of conflicted decision-making was incorporated into the conceptual framework as a means of analyzing decision behavior associated with stressful conditions (Janis & Mann, 1976, 1977). This model suggests that in crisis situations, people tend to adopt one of five behavioral patterns that reflect a decision-maker's level of vigilance. Of the five patterns identified in the model, only behavior is considered vigilant and high-quality. Vigilant behavior involves an openness to new information and a recognition of potential biases. Low-quality patterns tend to involve non-vigilant behaviors such as procrastination, denial, rashness, and resistance to new information (Janis & Mann, 1976, 1977).

Third, this study's framework incorporated naturalistic decision-making (NDM), a strategy which offers a pragmatic solution to the challenges of consequential and time-constrained decision-making. NDM suggests that in certain conditions, individuals may not have the time, information, or cognitive capacity to analyze various decision options. Rather, people are likely to act rapidly, using a "close match" past experience to derive a course of action for a current situation (Klein, 2008; Lipshitz, Klein, Orasanu, & Salas, 2001). If a selected past experience is found to be inappropriate, the decision-maker moves on to the next most relevant past experience (Klein, 2008). The incorporation of an NDM perspective is suggested to accommodate the practical constraints of decision-making during times of crisis.

Crisis Consequences

The objectives and compositions of organizations cover a vast array of crisis consequence possibilities, as do the types of crises that organizations might experience. Therefore, the absence of conceptual boundaries results in a virtually unlimited universe of crisis consequences. To

enable the analysis of crisis decision consequences and how they influence ongoing decision-making, this study adopted elements of the crisis management model advanced by Mitroff, Pauchant, and Shrivistava (1988). Within this model, the range of potential crises were categorized into four typologies: human, technical, economic, and social/organizational. These four typologies were used in this study to analyze the interrelationships between decision outcomes, crisis environments, sensemaking, and decision-making strategies.

Study Design Overview

The act of decision-making during a crisis is complicated; it involves a number of influences that can “come from all directions” (Hickson, 1986, p. 59) leading to a myriad of decision behaviors and approaches. This study sought to explore the nature of the overall phenomenon, and aimed to shed more light on the topic through a thick, rich description of real-world experiences.

To achieve the aims of this study, the author employed a qualitative methodology that emphasized the “how and why” nature of the study’s research questions and acknowledged an interpretivist perspective. The method used in this study was a holistic single case study, which provided for the in-depth inquiry into a phenomenon within a specific context (Merriam, 1998; Yin, 2013a; Zainal, 2007). The context of interest in this study involved the 2017 Northern California firestorm, and the case involved individual decision-making during organizational crises.

Definitions of Terms

1. Contextual factors: Internal and external factors that combine in various ways to influence decision-making (Baumann et al., 2014).
2. Crisis: An unexpected event having severe consequences. Characteristics of crises

involve decision-making time constraints, uncertainty, a lack of information, and a dynamic environment (Mitroff, Shrivistava, & Udwalia, 1987; Roux Dufort, 2013).

3. Decision: A selection made for the purpose of establishing a course of action (Baumann et al., 2014; Mintzberg et al., 1976).
4. Decision-making strategy: The techniques, behaviors and processes used to arrive at a decision, as suggested by Simon (1957).
5. Organizational crisis: A crisis for which consequences relate to an organization, its interests, or its objectives, as described by Mitroff, Pauchant, and Shrivastava (1988).
6. Sensemaking: The process of giving meaning to events (Helms Mills et al., 2010).
7. Sensemaking framework: The patterns, processes, and behaviors that comprise the act of sensemaking, as described by Boland (2008).

Limitations

This study was subject to several limitations that could constrain the transferability of results or could have affected the quality of the study's outcomes. First, the study was conducted within the context of four 2017 Northern California wildfires that occurred concurrently and within a common geographical region. Because of the firestorm context, the study may be more relevant to similar wildfire events compared to other types of crises. Second, the study was focused on organizational crisis decision-making, so is not intended to apply to crises of a personal nature. Finally, this study's outcomes might have been influenced by participants' ability to recall and provide accurate and unbiased information during interviews. Information recall may have been particularly significant due to cognitive limitations during crises (Folkman, Lazarus, Gruen, & DeLongis, 1986). Measures taken to address recall and retrospection limitations are addressed in Chapter three.

Organization of the Study

Chapter one describes the nature of the problem addressed in this study, the conceptual framework for the study, research questions, expected benefits of the study, definitions, and assumptions and delimitations. Chapter two presents a literature review of organizational crisis decision-making, as well as findings that led to this study's research questions and conceptual framework. Chapter three discusses this study's proposed research method and design, as well as rationale for research design elements. Chapter three also discusses proposed details on the conduct of the study, to include case study design, sampling, data gathering, and data analysis. Chapter four presents this study's findings, and Chapter five discusses the implications of the study's findings and presents conclusions.

The next chapter describes the literature review associated with this study. The literature review begins with a description of the study's conceptual framework. Through this framework, the author has identified the core elements of the study, and how these elements are perceived. Chapter two also describes the literature review method used, as well as findings resulting from the review. The literature review findings served as significant guideposts throughout the remainder of the study.

CHAPTER 2 - LITERATURE REVIEW

Introduction and Purpose

The purpose of this chapter is to review scholarly literature concerning organizational crisis decision-making (OCDM). The basis for this review is a widening gap between OCDM research and the growing need for insights that can assist organizational decision-makers in coping with crises. The core elements of this literature review consisted of the organizational crisis, crisis decision-making perceived as being embedded within risky decision-making and general decision-making, and the individual decision-maker within an organizational context.

Conceptual Frame

As described by Merriam (1998), Roberts (2010), and Miles and Huberman (1994), the conceptual and theoretical frame used in this review offered the perspective and boundaries that guided its structure and direction. According to Schultz (1988), research can be approached from a myriad of perspectives; the theoretical and conceptual framework gave direction to both the research process and the research questions. Lacking such a framework, the study could unrealistically purport to study any and all aspects of the research topic.

With respect to this study, organizational crisis decision-making (OCDM) exists as a tiny research niche derived from a very broad decision-making research domain, so the study's framework was intentionally designed to be flexible enough to accommodate relevant aspects of the larger field. The frames guiding this literature involved: (a) the organizational crisis phenomenon, (b) decision-making during a crisis, and (c) the individual as the decision-maker within an organizational context. Each frame is discussed within the context of this study.

The Organizational Crisis

An organizational crisis is frequently thought of as an unanticipated, improbable, and highly consequential event that can severely disrupt or cause harm to an organization (Crandall, Parnell, & Spillan, 2013; Pearson & Clair, 1998) and its objectives (Weick, 1993). Crises have been known to involve a variety of situations, including natural and technological disasters, lawsuits, product recalls, and other calamitous occurrences. In this study, several interpretations of the term “crisis” were excluded. First, this study was not intended to address crises which are primarily of a personal nature, such as an individual struggling with a critical medical condition. Nor were crises viewed as the immediate response to predictable emergency situations such as building fires or small chemical spills; these types of events can be anticipated and therefore lend themselves to advance preparations (Boin & McConnell, 2007).

Decision-Making During Crisis

The organizational crisis decision-making frame significantly bounded this study within a broad decision-making research domain. Consistent with this delimitation, this literature review framed the OCDM concept as being hierarchically embedded within the frames of general decision-making and risky decision-making. The frame was approached iteratively, beginning with broad parameters focused on general decision-making, narrowing the focus to risky decision-making, and then OCDM. During this process, literature involving research, concepts, and theories that were encompassed within the broader domains was retained for potential analysis within OCDM. Each level of the embedded frame illustrated in Figure 3 is discussed.

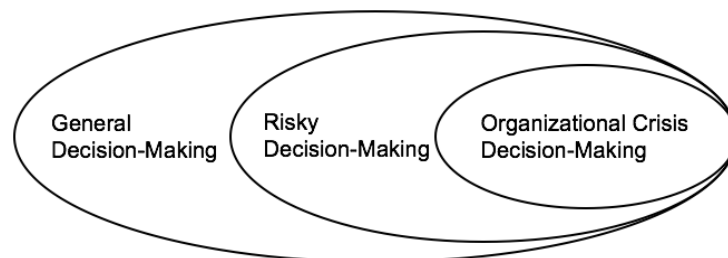


Figure 3. The embedded nature of organizational crisis decision-making.

General decision-making spans a wide-ranging domain that has been a topic of interest for centuries, with roots going back to Nicholas Bernoulli's St. Petersburg Paradox in the early 1700's (Allais, 1990) and Blaise Pascal's 1670 wager about man's belief in God. Over time, decision-making research has examined a vast array of decision types: medical choices, consumer choice, investments, and numerous others. Neuroscientist and psychologist Ernst Pöppel suggested people make about 20,000 decisions each day, ranging from inconsequential to highly important (Tönnemann, 2008). For these reasons, the vast domain of "decision-making" was deemed to be overly expansive for the purposes of this study.

In establishing the first constraint to bound this study within the broad context of decision-making, the literature review considered *risky decision-making*. In defining the risky decision-making domain, literature generally concurred "risk" implied the presence of uncertain outcomes and the potential for gains and losses (Edwards, 1954). Uncertain outcomes are associated with various levels of risk, as exemplified by gambles (Payne, Bettman, & Johnson, 1992), natural disasters (Tinsley, Dillon, & Cronin, 2012) and military conflict (Holsti, 1989; Rosenthal & Kouzmin, 1997).

At the lower end of the risky decision-making spectrum, a decision tends to be described by the mere presence of uncertain outcomes (Conrath, 1967). An example of a low-risk decision might involve consumer choice between two new restaurants; the outcome is uncertain, but the consequences are relatively insignificant. At the higher end of the risk spectrum, risky decision-making involves time constraints, stress, significant outcomes, and limited access to information (Alkharabsheh, Ahmad, & Kharabsheh, 2014; Bazerman, 2001; Vivacqua et al., 2016). An example of a high-risk decision might involve a choice about whether to insert rescue workers into a potentially hazardous situation.

Based on the range of situations and contexts within the topic of risky decision-making, this domain was still found to be overly expansive for this study. This claim is made for two reasons. First, although risky decision-making addresses high-risk contexts that are inclusive of organizational crises, it also includes simple, low-risk gambles that are not crises. Second, risky decision-making includes crises of a personal nature; an important domain, but one that is not applicable to this study's context. Consequently, this conceptual frame required further bounding.

As suggested by this review's iterative narrowing, research indicated OCDM was a nested subset of risky decision-making. Several risky decision-making parameters were used to supplement the organizational crisis frame: time constraints, stress, significant outcomes, uncertainty, and dynamic conditions. For this study, OCDM excluded risky decision-making that occurred within a personal and non-organizational context. The OCDM frame also excluded emergency situations which are predictable and subject to pre-defined reactions (Boin & McConnell, 2007). In summary, this study asserted that organizational crisis decision-making occurs in the context of an organization experiencing an improbable and unexpected event with the potential for severe outcomes.

The Individual Decision-Maker

This study's conceptual view of OCDM involved individuals who make high-stakes decisions for their organizations during a crisis; however, it was not constrained to any particular type of role. In research, crisis decision-making has often been applied to formal leaders (Bass, Avolio, Jung, & Berson, 2003; Garvin & Roberto, 2001; Hammond, Keeney & Raiffa, 2006; Mumford, Campion, & Morgeson, 2007; Vroom, 2000; Yukl, 2001). For the purposes of this study, however, decision-makers could include managers, team leaders, supervisors at all levels,

and others in decision-making roles. Because of its focus on the individual decision-maker, this study was not intended to consider group-level decision-making processes. However, this exclusion does not suggest that crisis-related decisions are made in an individual vacuum, without input or the involvement of others. Rather, in organizational situations individuals are often tasked with decision authority (Zaccaro, Rittman, & Marks, 2002), and it is those individuals who are of interest in this study.

Literature Search Method

To identify an expansive and encompassing set of literature pertaining to crisis decision-making, this review involved an iterative series of database searches, followed by a snowball reference search technique as described by Greenhalgh & Peacock (2005). While sources used in this review were primarily found in peer-reviewed scholarly journals, some practitioner journals were considered.

To gain an appreciation for the potential enormity of the risk decision-making topic, a database search for all keywords “risk,” “decision,” and “making” in the entirety of each article was conducted. The databases searched were Business Source Complete, PsychINFO, ERIC/EBSCO, and Academic Search Premier. The initial resulting dataset included over 85,000 articles. Refining the search by adding the keyword “crisis” reduced the article set to 1,610 articles. The terms “disaster,” “catastrophe,” and “emergency” were substituted as synonyms for the term “crisis;” these search results produced articles already identified, or emergency situations outside the bounds of this study. Academic journals associated with the original 1,610 article set were identified and culled to those relevant to the topic of interest. Refined search criteria filtered out journals that were not germane to this study: these journals were related to

clinical studies, family studies, financial investing, environmental studies, and animal studies.

The journals which were retained are listed below.

- Decision Sciences
- Group Decision and Negotiation
- International Journal of Conflict Management
- Journal of Behavioral Decision Making
- Journal of Contingencies and Crisis Management
- Journal of Risk and Uncertainty
- Journal of Risk Research
- Management Science
- Organizational Behavior & Human Decision Process
- Organizational Behavior & Human Performance
- Risk Analysis: An International Journal

The next iterative database search included the term “decision” in the title of the article (noting the term “decision making” did not produce relevant articles), and one or more of the terms “risk,” “crisis,” “emergency,” “disaster,” or “conflict” in the entire article. No filters were used to screen articles falling into a specific methodology or epistemology, and no date limitations were used. This search yielded 231 articles published in the timeframe 1954 to 2018. Reviews of all abstracts and scans of selected articles were conducted to verify relevance to organizational crisis decision-making and to identify key topics and areas of focus. A total of 32 articles were deemed unrelated to the study and were eliminated, leaving a set of 199 articles resulting from the database search. A snowball search (Greenhalgh & Peacock, 2005) was conducted based on the set of 199 articles to more fully explore research or concepts that

appeared to be relevant and significant. An additional 78 articles were identified, resulting in a final set of 277 articles.

Findings

The results of this literature review suggested the following: (a) crisis decision-making studies have taken place within a vaguely bounded domain; (b) organizational crises are increasing in both intensity and frequency; (c) crises result in various types of consequential outcomes; (d) decision-making strategies are essential to the understanding of decisions; (e) crisis decision-making can be viewed holistically; (f) numerous, varied, and interrelated factors influence decision-making processes; (g) new epistemological perceptions of decision-making research can offer novel insights into current theory; and (g) sensemaking is intrinsic to OCDM. These findings provide guidance for advancing the understanding of OCDM. Each finding is described in this section.

Organizational Crisis Research Has Been Vaguely Bounded

Little consensus exists with respect to the boundaries of research applicable to crisis decision-making. This implies challenges to ongoing research, because in the absence of a recognized framework, potential exists for the loss of credibility and legitimacy. Moreover, unbounded research is subject to “misidentify the phenomena it aims to describe” (Roux-Dufort, 2007, p. 106). To apply crisis contexts that range from a lost wallet (Sweeny, 2008) to nuclear holocaust (Holsti, 1989) is so vast as to be meaningless.

The first sub-category of interest within the decision-making domain involves “risky decision-making,” reflecting the presence of outcome uncertainty involving gains and losses (Payne et al., 1992). As a simple example, uncertainty is present in a gamble involving the flip of a coin, in which the odds of a “heads or tails” outcome is known, as is the amount of money to

be gained or lost. In this case, risk exists even though all aspects of the decision are predictable (there can be no outcome other than a head or a tail, and gains/losses are known). However, some researchers have argued such a view of risk is not consistent with real-life decisions (Conrath, 1967). An alternate view of risk would not be limited to pre-defined decision options and outcomes, but would consider external influences.

Reflecting the diversity of risky decision research perspectives, literature revealed risky decision-making can range from a simple coin flip to a large-scale catastrophe, suggesting that the domain is both inclusive and exclusive of crises. Consequently, further bounding of the concept was necessary: when introducing extreme risk, events are often improbable, decision variables can be unknown and constantly changing, and outcomes can be severe. Such conditions are characteristic of crisis situations (Vivacqua et al., 2016).

By narrowing risky decision-making within the context of crises, research was restricted to the higher-end of the risk spectrum. Within this context, research demonstrated a general agreement that beyond the mere presence of risk, crisis decision-making involves the elements of time constraints, stress, limited information, and severe outcomes (Hart, Rosenthal, & Kouzmin, 1993). Even within this refined view of decision-making, researchers' interpretations differed. For example, the element of time constraints has been interpreted by researchers in several ways: Argyris and Schön (1978) have argued that crisis decision-making entails split-second decision-making, while other researchers have contended that a crisis allows some time for information gathering and analysis (Janis & Mann, 1976). This study incorporated the perspective that crisis decision-making is not necessarily split-second, but can allow some time for information gathering and analysis. Furthermore, literature has suggested that crises present decision-makers with dynamic and changing situations (Sayegh, Anthony, & Perrewé, 2004). This assumption is

supported by the types of crisis situations that organizations experience: natural disasters, technological disasters, and other dynamic situations. Based upon an integrated view of these perspectives, researchers' synthesized views of organizational crisis decision-making include several characteristics: (a) event unpredictability, (b) significant potential for loss or harm to the organization or its interests, (c) time constraints, (d) limited information availability, (e) decision-maker stress, and (f) dynamic and changing situations.

Organizational Crises are Becoming More Frequent and Intense

It is tempting to view crisis decision-making as a highly-limited practitioner niche, applicable to only a small number of professionals within government emergency agencies, firefighting, law enforcement, and similar types of high-risk occupations. Research indicates that such an assumption is mistaken, as the ability to manage crises is becoming more of a standard expectation within organizations (Sayegh, Anthony, & Perrewé, 2004). Research also suggests the frequency of crises is steadily increasing due to the unpredictable and complex nature of business systems and environments (Cesta, Cortellessa, & De Benedictis, 2014; Milkman et al., 2009; Mileti, 1999; Mitroff et al., 1988; Reger & Palmer, 1996; Rosenthal & Kouzmin, 1997; Weber, 2010), and an increase in the number of natural and technological disasters (Robert & Lajtha, 2002). In terms of scale, a 2018 World Bank report found that losses caused by natural disasters alone amount to \$555 billion in economic losses each year (Hallegatte et al., 2018), demonstrating the negative consequences of some crises can be enormous.

In response to an increasing need for crisis decision-making understanding and expertise, research-derived insights have been limited (Langley et al., 1995; Scott, 1994; Sommer & Pearson, 2007). An analysis of crisis decision-making literature suggested a compelling argument that our understanding of the domain has not kept pace with the complexity and

frequency of crisis decision-making faced by today's leaders and managers (Sommer & Pearson, 2007). Roux-Dufort (2007) and Scott (1994) contended that the lack of scholarly interest in crisis-related domains has stemmed from the phenomenon's disconnection from organizational theory. They argued this schism reflects a perception among scholars that crises are an exception to common organizational practice, breaking from the norms of organizational research and theory. Research revealing an increase in the frequency of organizational crises (Robert & Lajtha, 2002) might serve as a catalyst to change this sentiment. Despite these trends, this study did not uncover evidence that OCDM has been the subject of considerable research or theoretical development. To this point, Sommer and Pearson (2007) observed "For three decades crisis management experts have called for creativity to improve crisis decision making, but theoretical development and empirical testing are scarce" (p. 1234). This literature suggests this under-representation has continued into its fourth decade.

Crises Result in Various Types of Consequential Outcomes

Crises are difficult to manage because, by their very nature, they are unpredictable, unexpected, time constrained, and dynamic. Furthermore, each crisis presents unique circumstances, contexts, and potential impacts. Because this study adopted a holistic view of OCDM, it attended to how decision consequences interrelate with ongoing decision-making processes and behaviors. As a frame for classifying outcomes, this study invoked the model of crisis management proposed by Mitroff et al. (1987). The model is appropriate for this study in that it provided a general approach to crisis management, applicable to wide-ranging organizations, threats, and consequences. The model classifies both threats and consequences into categories that are human, social, technical, or economic, summarized as follows (Mitroff et al., 1987):

1. Technical considerations involving harm to physical and technological systems such as buildings, products, and equipment.
2. Economic considerations involving harm such as financial losses, bankruptcy, and debt.
3. Human considerations involving issues such as injuries, fatalities, and personal well-being.
4. Social/Organizational matters involve considerations such as organizational breakdowns, morale degradation, and reputational damage.

Decision-Making Strategies are Essential to the Understanding of Decisions

Researchers have largely agreed that the quality of decision outcomes are directly related to the quality of peoples' approaches to decision-making (Conrath, 1967; Herek, Janis, & Huth, 1987; Mann, Burnett, Janis & Mann, 1977; Mintzberg et al., 1976; Radford, & Ford, 1997; Raiffa, 1968; Smart, & Vertinsky, 1977; Sweeny, 2008). As such, to examine a decision, the corresponding decision-making strategy must be evaluated (Hammond et al., 2006; Janis & Mann, 1977; Keinan, Friedland, & Ben-Porath, 1987; Mintzberg et al., 1976; Tversky & Kahneman, 1986). While researchers have used differing terms to represent the ways people go about decision-making, this study has adopted the term "decision strategy" as used by Janis and Mann (1977, p. 415), connoting the behaviors and processes that constitute the decision-making phenomenon. The review of literature has yielded three strategies associated with organizational crisis decision making: (a) conflicted decision-making, (b) naturalistic decision-making, and (c) unstructured decision-making. These strategies are further described in this section.

Conflicted decision-making.

Research conducted by Janis and Mann (1976, 1977) examined “conflicted” decisions involving consequential outcomes and inclusive of crisis contexts. In these instances, decision-makers experience conflict over negative potential losses associated with various decision outcomes, whether utilitarian (such as financial losses), or non-utilitarian (such as losses to self-esteem or social standing). Janis and Mann (1977) argued that decisional conflict influences decision strategies through the introduction of such factors as decision-maker emotion, stress, fear, and loss of self-esteem.

Janis and Mann (1976, 1977) further posited that conflicted decision-making strategies are influenced by varying degrees of vigilance. In this context, vigilance represents the extent to which decision-makers gather and analyze information, their openness to consider multiple viable alternatives, their willingness to deliberate within the time available, and a recognition of their own biases (Herek et al., 1978; Janis & Mann, 1976). Janis and Mann (1976, 1977) further asserted the degree of decision-making vigilance results in one of five coping behaviors. Four of these behaviors are considered to be non-vigilant and low-quality, and can be summarized as stalling, over-analyzing, jumping to conclusions, and selecting the path of least resistance. Behavior involving vigilance, or thorough search and evaluation, is suggested as the only high-quality pattern.

Janis and Mann (1977) suggested that decision strategies occur within a five-step decision-making process: (a) appraising the challenge, (b) surveying alternatives, (c) weighing alternatives, (d) deliberating about commitment, and (e) the degree of adherence to a course of action despite negative feedback. This model assumes that, even during a single decision-making episode, individuals’ strategies can vary constantly based on continuous assessments of potential

for gain and loss. As such, people are neither constrained to a single strategy in general, nor during specific decisions.

Naturalistic decision-making.

Naturalistic decision-making (NDM) has been described as a decision-making strategy used in real world settings (Klein, 2008; Lipshitz et al., 2001), during which situations are dynamic, stressful, uncertain, and high-risk (Klein, 2008; Schraagen & van de Ven, 2008). Klein (2008) has suggested that classical, normative decision strategies become invalid in situations subject to time constraints because “they simply take too long” (p. 16). Naturalistic decision-making allows decision-makers to quickly recognize a course of action that was effective during a past event, and therefore could be applied to a similar current situation. NDM represents a significant departure from more traditional normative decision-making strategic models involving the generation and evaluation of multiple decision options. By adopting a naturalistic decision-making strategy, people rapidly react to a situation based on expertise and prior experiences, foregoing extensive deliberation and analysis (Klein, 2008; Lipshitz et al., 2001).

The NDM strategy involves a three-step process: (a) recognizing a simple match that is based upon previous experiences, (b) rapidly developing a course of action that is “primed” by the simple match, and (c) conducting mental simulations to determine if the identified course of action is expected to succeed (Klein, 1993, 2008). If an enacted decision is ineffective, the decision-maker then recognizes and enacts the next best match to the current situation (Klein, 2008). Because recognition is contingent on one’s past experiences, Klein asserted that this behavior is influenced by an individual’s depth of experience. Because of its urgent nature, NDM has been explicitly described as being relevant to crisis situations involving time pressure, uncertainty, risk, and uncertainty (Schraagen & van de Ven, 2008).

Unstructured decision-making.

Mintzberg et al. (1976) proposed that when facing complex and unfamiliar situations, decision-makers deconstruct problems into sub-problems which are more familiar to them. By using this strategy, people limit their decisions to the most immediate problems, thereby filtering out decisions which are more long-term and perhaps less urgent (Mintzberg et al, 1976). This strategy is built upon a three-phased process. The first phase involves recognizing a decision stimulus and collecting information to aid in understanding it. In the second phase, decision-makers search for and design solutions that fit the existing circumstances. In the third phase, decision-makers filter for viable options, select a solution, and arrive at a final decision. The final stage of this decision strategy involves a deliberate and iterative consideration of alternatives based on an evaluation-choice routine. Evaluation-choice routines involve analysis, judgment, or bargaining. Mintzberg et al. (1976) found the vast majority of complex decisions involved judgment; choices based upon factors that decision-makers perhaps could not describe.

Crisis Decision-Making Can be Viewed Holistically

Complex decision-making in real-world situations can prompt people to adopt a cognitively holistic view of a situation, engaging in a number of simultaneous and interrelated cognitive activities that produce an understanding not found in each distinct element. Examples of dynamic and interacting elements comprising holistic cognition include focus and attention, developing mental models, managing uncertainty, and generating courses of action (Endsley, Hoffman, Kaber, & Roth, 2007). Klein further suggested that a holistic view of decision-making involves sensemaking, problem detection, planning, situation assessment, and naturalistic decision-making. In practical terms, literature has suggested that the holistic nature of the

OCDM phenomenon is fluid, and comprised of several aggregated decision-making actions and cognitions.

Numerous Contextual Factors Influence Decision-Making

Research suggests that numerous interrelated factors unique to individuals play a part in influencing decision-making. Researchers have described the interactive nature of numerous decision elements as a decision-making ecology (Baumann et al, 2014; Graham et al., 2015). The essence of the decision-making ecology is that a complex decision is understood and acted upon within its overall context; the ecology provides a framework for understanding decision-making (Baumann et al., 2014; Graham et al., 2015). This perspective is supported by other research which emerged from the field of psychology, suggesting that decision-making is highly complex and contextual, involving numerous inputs mapped to decision options (Glimcher & Fehr, 2013).

According to Baumann, et al. (2014), decision influences involve both internal and external factors. Internal factors include characteristics innate to the decision-maker, such as self-concept, stress response, and experience. In contrast, external factors are those imposed upon the decision-maker, and are related to environmental, organizational, and social forces. Examples of external factors include time constraints, work rules, and limited information. Both internal and external factors are further described in this chapter.

This literature review uncovered little evidence of research describing and explaining the cumulative effects of these influences, and researchers have observed that trying to understand even a narrow sliver of decision-making can be problematic. Confounding the presence of intertwined decision factors, Hammond (2007) claimed “there will be some indicators leading to one inference that will appear simultaneously with others leading to a different inference” (p. 39). Therefore, contextual factors are not viewed necessarily as being causal, but more as

entangled sources of decision stimuli. While the universe of internal and external factors is extensive, this review found several influences that emerged as being prevalent in literature. Examples of factors influencing decision-making are shown in Table 1 and discussed further in this section.

Table 1
Examples and Types of Contextual Factors Influencing Decision-Making

Contextual Factors	Type
Stress response Self-identity Past experiences Cognitive biases and heuristics	Internal
Group cohesiveness and psychological safety Social factors Time pressures Limited information	External and Organizational

Stress Response

Empirical evidence indicates that crises can induce stress, which in turn results in physiological, cognitive, and behavioral influences on decision-making (Kowalski-Trakofler, Vaught, & Scharf, 2003). LeBlanc (2009) suggested that in cases such as crises, the demand for physiological and cognitive resources can be overwhelmed, thereby causing stress. The size of the physiological-cognitive resource availability gap correlates with an individual’s level of stress. Depending on the level of stress, responses can include tunnel vision, hyper-vigilance, impaired cognitive processes, erratic emotional swings, and an increase in blood pressure and heart-rate (Lupien & Seguin, 2013; Weisaeth, Knudsen & Tønnessen, 2002). Ariely and Zakay (2001) have found that stress causes a variety of cognitive changes: the inability to retain important information, inaccurate judgment, limited information processing capabilities, and

increased defensiveness. Furthermore, Lehner, Seyed-Solorforough, O'Connor, Sak, and Mullin (1997) found stress contributes to an increased exposure to cognitive biases. From a behavioral standpoint, Lehner et al. (1997) suggested that stress results in a reduction of decision alternatives considered, the tendency to reinforce and not question a previously selected course of action, and the tendency to use ineffective decision strategies. In contrast, Entin and Serfaty (1990) found a degree of stress can stimulate vigilance and effort. However, Entin and Serfaty's findings tended to relate to conditions in which cognitive demands were low; conditions that would not generally relate to crises.

Self-Identity

The concept of identity represents how people conceive of themselves, and what that conception means (Heshmat, 2014). Research has suggested that peoples' self-identities influence their actions (Stets & Burke, 2000; Terry, Hogg & White, 1999), indicating that it is germane to the topic of decision-making. This proposition is supported by research conducted by Terry et al. (1999) and others who have found relationships between self-identity and decision behavior.

From a theoretical standpoint, self-identity suggests people do not think of themselves as discrete entities; rather, they think of themselves in terms of their social connections and the group-related roles that they play (Stryker & Serpe, 1982). Stets and Serpe (2013) suggested that social connections, or group memberships, can involve businesses, sports teams, families, churches, or others. Furthermore, role types can include worker, teacher, leader, spouse, parent, or others. Because people can fulfill many roles and be members in many groups, people tend to have several different identities (Burke & Stets, 2009). Given the presence of multiple identities, Stets and Burke (2000) suggested that people adopt an identity that is the most salient in any

particular situation. From a behavioral standpoint, research has suggested that people behave in ways they believe embody the roles they are fulfilling (Burke & Cast, 1997).

Another way of perceiving identity is through the lens of social identity. Social identity theory suggests that people tend to identify themselves based on their membership in groups (Tajfel & Turner, 1979). Through an identification with groups, people often classify themselves and others into social categories, such as the organizations for which they work, their work teams, their religious or political affiliations, or others (Ashforth & Mael, 1989; Tajfel & Turner, 1979). Hogg and Turner (1985) have suggested people identify with social groupings largely for the purpose of enhancing self-esteem (Hogg & Turner, 1985). By identifying with a social group, individuals vicariously enjoy the group's status and successes (Ashforth & Mael, 1989). Tajfel and Turner (1979) posited that group-membership categorizations lead to a "we-they" mentality, based on peoples' in-group or out-group status.

While both self-identity and social identity are similar in a number of ways, they differ largely as a matter of emphasis (Stets & Burke, 2000). Both concepts of identity relate to how people perceive themselves; however, while social identity emphasizes "who one is," self-identity emphasizes "what one does" (Thoits & Vishup, 1997). Because this study centered around "what one does" within the context of organizational crisis decision-making, this study emphasized the concept of self-identity as a contextual factor of interest.

Past Experiences

Theorists and researchers have generally regarded past experiences as a meaningful influencer of decision-making behaviors and processes. Baumann et al. (2014) argued that past experiences, whether of an actual or vicarious nature, are factors contributing to decision-making. Klein (1883, 2008) suggested past experiences play a central role in naturalistic

decision-making, enabling people to use previous occurrences as a way of informing current decision requirements. Sitkin and Weingart (1995) identified past experiences as a contributor to what a person has learned about risk-taking, and the propensity to engage in risky decision-making behavior. In discussing how people go about understanding situations they encounter, past experiences play a central role in the interpretation of cues during retrospective sensemaking (Helms Mills et al., 2010; Weick, 1995). From the perspective of decision-making within a leadership role, the influence of past experiences has been described as having both positive and negative consequences, as past experiences can provide deep insights about appropriate actions. But, past experiences can also promote entrained thinking which inhibits new ideas (Snowden & Boone, 2007).

Cognitive Biases and Heuristics

Cognitive biases are forces that influence the way we think and perceive the world around us, and literature reflects an agreement among researchers that cognitive biases significantly influence decision-making (Kahneman, Lovallo, & Sibony, 2011), often detrimental to the decision-making process (Korte, 2003). Research has yielded numerous biases related to cognition (Kahneman, Lovallo, & Sibony, 2011), social interactions (Hattis & Anderson, 1999), past experiences (Kahneman & Lovallo, 1993; Wilson, Winter, Maguire & Ascher, 2011), information integration (Vlaev, Chater, & Stewart, 2008), self-interest (Vetschera, 2005), and others.

Further confounding the understanding of crisis decision-making is the tendency for people to rely on heuristics or mental shortcuts that guide decision-making (Kleinmuntz, 1985; Tversky & Kahneman, 1975). In the absence of deeper analytical thought, decision-making heuristics can cause serious judgmental mistakes concerning information inputs, consequently

leading to significant errors (Hammond, Keeney & Raiffa, 2006; Kleinmuntz, 1985; Tversky & Kahneman, 1975). Research concerning decision-making biases and heuristics has become a topic of keen researcher and practitioner interest (Kahneman, 2011), and evidence of these research topics within crisis contexts has been found in several firefighting decision-making studies (Gonzalez, 2001; Wibbenmeyer, Hand, Calkin, Venn, & Thompson, 2013; Wilson et al., 2011). The omnipresent nature of biases and heuristics suggests the quality of crisis decision-making is mediated by these influences.

Group Cohesiveness and Trust

Because decision-making during crises is uncertain and information-deficient, people often “do the best they can,” not knowing for sure whether their decisions will yield positive outcomes. As a result, they are exposing themselves to personal risk involving social standing within their organizations, potentially experiencing the loss of face, or negative consequences associated with the inability to “make a good showing” of one’s self (Goffman, 1955, p. 222). In this study, the implications of decision-maker risk associated with social standing emerged as a significant theme and is discussed through the lens of group cohesiveness and psychological safety, further described in this section.

Group cohesiveness.

Craig and Kelly’s (1999) review of group cohesiveness literature suggests the condition is most commonly viewed as the extent of members’ attraction to the group. Others have elaborated on group cohesiveness as the tendency for a group to remain unified in the interest of attaining a common goal (Carron, 1982), and the degree to which members like and get along with one another (Mullen & Copper, 1995). Craig and Kelly (1999) noted that common views of cohesiveness can relate to either both goal achievement or interpersonal attraction, but not

necessarily both. As a matter of clarity, the concept of cohesiveness is not intended to connote an antecedent condition leading to groupthink, a condition in which people's intense attachment to an in-group status outweighs their ability to evaluate problems and solutions in a realistic manner because of in-group pressures (Janis, 1972). T'Hart (1991) asserted groupthink applies to "tightly knit policy-making groups" (p. 247), a condition not applicable to decision-makers and organizations involved in this study.

Group member trust and confidence: psychological safety.

Within contexts of organizational learning and change, Schein (1992) and Edmondson (1999, 2002) described the presence of trust, respect, and interpersonal confidence among group members as psychological safety. In a psychologically safe organization, open communications and a shared openness allow members to more effectively solve problems and take chances, as members feel like they are not subject to punishment if they make a mistake (Schein, 1992). Edmondson (1999) proposed that the presence of a safe environment is a function of the level of mutual trust and respect among members. By creating such an environment, people feel confident they are empowered to engage in risk-taking, and are "comfortable being themselves" (Edmondson, 1999, p. 354). In the remainder of this chapter, these aspects of group member trust and confidence are referred to as psychological safety.

Social Factors

In making decisions, research has suggested that people are subject to the influences of various social factors: intergroup relations and social identity (Brown, 2000), institutional inertia impeding change (Staw & Ross, 1989), the embodiment of a decision as the decision-maker (Dietz-Uhler, 1996), social rationality as a means of maintaining social structures (Gigerenzer & Selten, 2002), and others. Among senior leaders, research has suggested that social influences on

self-concept are important considerations in decision-making, involving aspects of self-esteem, self-efficacy, control, and emotional stability (Hiller & Hambrick, 2005). As a reflection of the varying number, type, and context of these influences, Gigerenzer and Selten (2002) noted the difficulty in assessing the combined effects of social forces that can cloud decision-making. Based on these observations, it is suggested that further exploration of social forces on individual crisis decision-makers will provide an enhanced understanding of OCDM.

Time Pressures

The availability of time within which to make a decision affects behaviors and processes in a number of ways. First, time pressure can increase a decision-maker's stress level (Ariely & Zakay, 2001), and as discussed previously, heightened stress levels introduce a number of physiological and cognitive implications for decision-making. Klein, Calderwood, and Clinton-Cirocco (1986) found that time constraints overwhelmingly lead people to prefer personal experiences over the consideration of decision alternatives. Kerstholt (1994) also found that as time pressures increase, people put more emphasis on negative consequences, effecting their willingness to take risks. Ordóñez and Benson (1997) found people tend to use simpler decision-making strategies under time constraints. Viewed in the aggregate, these implications suggest that under time pressure, people are subject to change their decision-making processes in ways that lessen risk and reduce quality (Maule, Hockey & Bdzola, 2000). However, Ordóñez and Benson (1997) suggested under time pressure, people do not switch to simpler strategies if too much effort is required to do so.

Limited Information

During a crisis, decision-makers tend to lack information, causing them to search for additional information, make decisions based on incomplete information, or both. Boin and

McConnell (2007) suggested that crisis events can lack reliable information and can be fueled by a cycle of communications breakdowns and rumors. Research conducted by Robert and Lajtha (2002) further suggested the absence of information during crises contributes to stress. The lack of information, combined with a poor information search, has been suggested as a key contributor to low-quality decision-making (Welch, 1989). Because of a lack of information, crisis situations are highly ambiguous, with unknown causes and implications (Dutton, 1986; Quarantelli, 1988). This perspective deviates from the origins of decision theory, in which decisions are optimized based on the analysis of complete information. Contemporary theory, however, has largely dispensed with rational choice assumptions as being relevant in real-world decision-making (Simon, 1978).

Other Decision-Making Influences

Because the domain of decision-making is vast, it is expected that a wide-range of additional influences could emerge as part of exploratory research, and therefore should not be neglected. Decision influences such as individual cognition (Brown & Ng, 2012; Janis & Mann, 1976; Simon, 2013) and emotion (Hu, Wang, Pang, Xu, & Guo, 2015; Kuvaas & Kaufmann, 2004; Lerner & Tiedens, 2006) could play a significant role in the understanding of the crisis decision-making phenomenon. The same might be true for the personal traits of gender and age, both of which have been the subject of very limited research, raising the possibility of meaningful research discoveries. The influence of leadership styles is relevant in that decision-making is an inherent responsibility within managerial and leadership roles (Barnard, 1968; Vroom, 2000; Vroom & Yetton, 1973) and is especially crucial during times of crisis (Wooten & James, 2008). Furthermore, Baumann et al. (2014) argued that work policies and procedures are

a contextual factor within the decision ecology. As other contextual factors emerge, they were identified and explored through the conduct of this inquiry.

Novel Decision Research May Offer Insights into Contemporary Theory

Since the Age of Reason, decision-making has been a topic of interest among philosophers and scholars. Weick (1993) discussed the ubiquity of decision-making research in observing that “most organizational analyses begin and end with decision-making” (p. 634). While the topic has been researched extensively for centuries, the ontological perspectives of contemporary decision theory have become incongruent with research epistemology. This situation is not suggested to reflect flawed research, rather, it suggests that theoretical capacity exists to enlighten contemporary research.

During the origins of decision-making research, theoretical perspectives were driven primarily by considerations of rationality, reason, logic, and the “economic man” (Edwards, 1954; Simon, 1978; Skorepa, 2010). Fundamental to early decision theory was the positivist perspective that humans were rational and made decisions that maximized expected value; which was typically viewed in economic terms (Edwards, 1954). The ability to objectively maximize expected value indicated that one could optimize decisions by having access to all necessary information about decision choices, and could therefore quantify the possible outcomes. The economic man perspective of uncertain decision-making would prevail until the mid-20th century, when researchers were recognizing and seeking to explain why decision-makers so often deviated from expected value theory (Edwards, 1954). At that time, researchers began to acknowledge that personal preferences influenced decision-making, thus challenging the long-held notion that rational decision-making was mutually exclusive of individual beliefs and values (Payne et al., 1992; Shafer, 1986).

Over time, decision theory has given way to a loosening of positivist assumptions, accommodating more constructivist and interpretivist perspectives. More recent theories and models have abandoned strict assumptions of rationality. Evolved, post-rational theoretical perspectives are seen in behavioral economics, naturalistic decision-making, and conflicted decision-making. Behavioral economics suggests that decision-making is influenced by heuristics, framing effects, and biases (Tversky & Kahneman, 1975, 1986). Naturalistic decision-making suggests that in certain conditions, people can entirely skip the “rational” act of alternative analysis, instead giving preference to past experiences (Klein, 2008; Lipshitz et al., 2001). Conflicted decision-making suggests decision processes are subject to varying degrees of vigilance, defensiveness, stalling, biases, and other behaviors (Janis & Mann, 1976, 1977). None of these theories support a hypothesis that a “single truth” exists. In each of them, decision processes involve outcomes that are co-constructed and subject to social and other forces.

Despite changes in decision theory to accommodate constructivist views, this literature review found crisis decision-making research has overwhelmingly incorporated post-positivist methods. Of 180 research-oriented articles examined in this review; 175 concerned quantitative, post-positivist studies. Only 3% of the total research articles reviewed used an interpretivist or constructivist methodology. Accordingly, researchers have suggested that very little subjective, qualitative crisis decision-making research has been undertaken (Alkharabsheh, Ahmad, & Kharabsheh, 2014), yielding a limited understanding of the phenomenon.

There has been a perspective among some researchers that deeply-rooted institutional norms have produced an overreliance on positivism as a means of knowing and understanding (Lincoln, 2009), and a dogged adherence to outmoded theoretical assumptions (Langley et al. 1995). The argument for engaging diverse research methodologies is supported by noted

decision scholar Herbert Simon (2013), who offered the perspective that real-world decision behavior often differs significantly from the predictions of normative models. However, this review found that researchers have commonly adopted the perspectives of expected utility and rationalism long after both have been demonstrated as limited in many real-world contexts. A wide-ranging field of holistic and constructivist research remains unexplored, and therefore few novel insights have been introduced into the domain.

Sensemaking is Intrinsic to Crisis Decision-Making

In simple terms, to engage in sensemaking is to achieve a degree of understanding during an unpredictable and ongoing experience (Weick, Sutcliffe, & Obstfeld, 2005). The process of sensemaking has been described in various ways and for various purposes. The U.S. Army's FOCUS model has sought to assist its leaders in quickly and effectively understanding dynamic situations (Sieck, Klein, Peluso, Smith, & Harris-Thompson, 2007). In the context of employee selection, Bolander and Sandberg (2013, p. 285) described the process as "practical deliberation," in which interrelated individual or social processes involve information assembly and interpretation, confirmation, selection decisions, and selection tools. Furthermore, Weick, Sutcliffe and Obstfeld (2005) proposed an analytical process applicable to chaotic, disruptive, and ambiguous conditions. Furthermore, Klein, Moon, and Hoffman (2006b) and Klein, Phillips, Rall, and Peluso (2007) presented a data/frame sensemaking model, which suggests an iterative cycle of changing mental frames and ways of interpreting data.

This review found that sensemaking is an important contributor to organizational crisis decision-making. Brown, Colville, and Pye (2015, p. 7) described the sensemaking-decision making relationship as a "complicated intertwining" of processes, often examined in contexts involving crises. Bolander and Sandberg (2013) characterized decision-making as a product of

sensemaking. Similarly, Weber and Glynn (2006) argued that institutional processes stimulate sensemaking that accompanies decisional processes. Research conducted by Lycett and Marshan (2016) aimed to operationalize sensemaking to improve decision-making processes. As such, research suggests it is improbable that a people make decisions based on current conditions if those conditions cannot be comprehended. Boland (2008) suggested the two activities are distinct: individuals look back in time to attribute meaning to the present moment while they look to the future for decision-making considerations. This moment of concurrent sensemaking and decision-making is significant; decision models frequently begin at this moment, when people evaluate and gain an understanding of a situation.

Beyond its relationship to decision-making, sensemaking research has often been related to matters involving crises and disasters, suggesting a high degree of relevance to the OCDM domain. Weick's (1993) account of the Mann Gulch wildfire catastrophe examined the absence of sensemaking and the disintegration of structure, and in his account of the Union Carbide disaster in Bhopal, India, he invoked sensemaking for the purposes of better managing and preventing crises (1988). Gephart (1993) demonstrated the role of sensemaking in his examination of a fatal gas pipeline explosion. Winch and Maytorena (2009) adopted a sensemaking lens to examine risky decision-making in a number of contexts. Maitlis and Sonenschein (2010) explicitly supported the application of sensemaking in crisis situations; they argued that the ambiguity, confusion, and disorientation experienced during crises are characteristics of sensemaking.

Three claims posited by Harris (1994) and Weick (1988) support the use of sensemaking as a means of understanding crisis decision-making: (a) sensemaking is relevant to decisions subject to multiple perspectives, (b) sensemaking provides the novel perspective that many crises

are manifestations of several actions and decisions, and (c) sensemaking considers stress levels, cognition, and speed of action. These considerations align with this study's bounding of crisis decision-making, as they allow for the inclusion of numerous decision influences, and they support the observation that subjective research may provide novel insights into the crisis decision-making phenomenon. Weick's (1988) claim offered support for the relevance of sensemaking in crisis research: "actions devoted to sensemaking play a central role in the genesis of crises and therefore need to be understood if we are to manage and prevent crises" (p. 308).

Weick's approach to sensemaking within an organizational setting consists of seven properties, presenting a framework for analyzing and describing the components of sensemaking (Weick, 1995). While they comprise the "process" of sensemaking, these properties are non-sequential (Helms Mills et al., 2010), and people various aspects to differing degrees. The properties suggested by Weick are summarized as follows (Helms Mills et al., 2010; Weick, 1995):

1. Social context: in constructing meaning, people are influenced by social interactions and cultural contexts.
2. Plausibility: people rely less on the accuracy of their perceptions than the degree to which information supports their perceptions, making them plausible.
3. Retrospection: people tend to make sense of current conditions by comparing them to ones in their past experiences.
4. Salient cues: people construct understanding through the interpretation of various indicators; some of which are ascribed more importance in order to confirm existing beliefs.
5. Enactive of the environment: peoples' ability to make sense of a situation is constrained

by the environment that they create, or it is created by the constraints that they impose on the environment.

6. Ongoing events. The sensemaking process is continuous.
7. Personal identity. Influences such as past experiences, social interactions, and personal characteristics affect how people view circumstances and ascribe meaning to them.

In contrast to Weick's seven properties, Klein, Moon and Hoffman's (2006) data/frame sensemaking model proposed a cyclical iteration of framing data, elaborating the frame as new data emerge, questioning the frame, and reframing. The model is relevant to this study for several reasons. First, the model elicits information about how and why various factors interrelate with sensemaking. Second, the model addresses the ongoing introduction of decision factors into sensemaking. Third, the model elicits data and framing information that interrelates with decision processes and behaviors. Finally, the model's cyclical nature accommodates the dynamic and changing aspect of organizational crises, suggesting that individuals constantly take in, frame, and re-frame data. The model integrates with decision-making, providing a basis for understanding a situation before engaging in decision-making processes and behaviors (Beach & Connolly, 2005).

Discussion

The purpose of this review was to examine literature related to crisis decision-making research and to identify research opportunities that address observed needs and gaps. The outcome of the literature review yielded insights related to the following themes: (a) the concept of a crisis, (b) factors that influence crisis decision-making, (c) making sense of crisis conditions, (d) decision-making strategies, (e), decision consequences, and (f) ontological approaches to research in this domain. Each insight is further discussed in this section.

The Concept of a Crisis

The ways in which crises are perceived by researchers are paradoxical to a degree. On one hand, researchers describe the features of crises in a consistent way: they are unexpected, time constrained, dynamic, uncertain, and can result in severe outcomes (Mitroff, Shrivistava, & Udwalia, 1987; Roux Dufort, 2013). On the other hand, the contexts in which this description has been applied have varied greatly. First, research addresses crisis within a myriad of domains: political crises, crisis communications, personal crises, and others. Second, the degrees of crises cover a broad continuum. To illustrate the range of perceptions as to “what a crisis is,” Sweeney (2008) discussed crises as being merely a negative event that requires attention, whereas Holsti (1989) addressed crises in the context of nuclear holocaust. Numerous other research contexts have fallen between those extremes.

The vast range of contexts to which the concept has been applied raises questions as to the usefulness of a singular definition. This review found that in order to study the phenomenon, either clear boundaries around the concept of a crisis are needed, or it is necessary to recognize that a singular definition of the concept is untenable. Ideally, the outcomes of this study will help refine current perceptions of crises or shed more light into how crises can be perceived.

Contextual Factors

As Hickson (1986) suggested, decisions involve influences that can come from all directions. And because of the nature of a crisis, these influences tend to change and interact with each other, evoking John F. Kennedy’s “dark and tangled stretches” that impede the understanding of such decisions. Baumann et al. (2014) characterized these factors as a “decision ecology” comprised of forces both internal and external to the decision-maker, further suggesting these factors result in a decision once they reach a personal threshold for action. What research

has yet to explicate is “how and why” various factors enact or interact to drive a decision-maker to take action. Consequently, further research can shed light on the salience of contextual factors in the setting of organizational crises.

Sensemaking During Crises

Brown et al. (2015) suggested that people must seek to understand ambiguous or confusing situations before they can engage in decision-making. Yet, the ways in which people go about sensemaking has been a matter of differing interpretations and definitions (Brown et al., 2015). This literature review found two sensemaking frameworks associated with crisis conditions. Weick suggested the phenomenon is largely analytical and retrospective (Helms Mills et al., 2010; Weick, 1993, 1995; Weick & Sutcliffe, 2005). In contrast, Klein (2006) and others have perceived sensemaking as an iterative process by which people interpret data based on evolving cognitive frames.

Because sensemaking has been argued to precede decision-making, literature suggests it plays an intermediary role between contextual decision factors and decision-making. However, the differing views of the nature of sensemaking suggest that its dominant forces can differ, and that sensemaking frameworks can differ. The two sensemaking frameworks that emerged in this literature review suggest that when an organization is in crisis, its decision-makers are subject to engage in different ways of understanding current conditions, thus leading to different decision-making approaches. Through a qualitative lens and an interpretivist paradigm, this study may shed more light on “how and why” people make sense of organizational crises the ways in which they do, and how those approaches influence their decision-making.

Decision-Making Strategies

This study's review of literature has yielded three decision-making strategies that relate directly to the crisis phenomenon: conflicted decision-making, naturalistic decision-making, and unstructured decision-making. Each of these strategies emphasizes different underlying conditions. Conflicted decision-making is centered on decision-maker stress, naturalistic decision-making assumes significant time constraints, and unstructured decision-making assumes complexity and changing conditions. Therefore, to view organizational crisis decision-making through one particular perspective would offer limited insights. In this study, the researcher aimed to consider each of these strategies as a way to illuminate how and why people engage in various decision-making approaches. Furthermore, the researcher recognized that the outcomes of the study may suggest different or alternate strategies that must be attended to.

Decision-Making Consequences

The intent of this study was not to judge the quality of decision outcomes; rather, it was to examine how those decisions came about. And because decisions occur within an environment, their consequences can influence ongoing decision-making. Given the ongoing nature of some crises, the implications of decision consequences play an important role in the overall phenomenon. While Mitroff et al.'s (1988) crisis typology was used to examine decision consequences, it was also clear that decision consequences could relate to other issues such as decision-maker learning and organizational learning.

Research Epistemology

From an epistemological standpoint, organizational crisis decision-making (OCDM) is a phenomenon that has been predominantly studied in a post-positivist and objective manner. As such, research has tended to deconstruct the phenomenon to examine its individual components

and the relationships between them: decision processes, decision influences, decision behaviors, sensemaking, and others. Despite research norms, evidence strongly suggests that the complex interaction between those elements plays a vital role in the OCDM phenomenon. The presence of these interrelationships is seen in decision ecologies (Baumann et al., 2014; Graham et al., 2015), sensemaking (Boland, 2008; Lycett & Marshan, 2016; Weber & Glynn, 2006; Weick, Sutcliffe, & Obstfeld, 2005), and the diverse nature of decision strategies (Janis & Mann, 1976, 1977; Klein, 2008; Mitroff et al., 1988; Tversky & Kahneman, 1975, 1986). These dynamic and varying interrelationships strongly suggest the OCDM phenomenon is subject to internally and socially constructed interpretations. As such, OCDM can be researched holistically within interpretivist and constructivist perspectives.

A holistic perspective of the OCDM phenomenon raises a number of potentially enlightening questions including:

1. How do contextual factors interact with sensemaking and decision-making?
2. How and why do sensemaking and decision-making influence decision strategies?
3. Why do people assign more importance to various contextual factors than others?
4. Are some types of decision factors assigned more importance than others, and if so, why?

Research suggests the questions posed in the above section are both relevant and unexplored. Therefore, a research agenda involving the following elements is proposed: (a) a holistic view of the OCDM phenomenon; (b) a methodology that is congruent with and complimentary to contemporary decision theory; (c) methods that provide a rich, thick description of the phenomenon's complexities, and (d) methods that are sensitive to contextual influences of the subject matter.

Conceptual Framework

As described in this chapter, an examination of organizational crisis decision making involves a number of elements: the organizational crisis environment, contextual factors, sensemaking frameworks, decision-making strategies, and decision consequences. Furthermore, literature suggests there is a sequential relationship between the elements: the crisis environment yields various contextual factors, those factors influence sensemaking, sensemaking informs decision-making, and the decision consequences further influence the environment. This sequence suggests a progression that is described by a traditional “input-process-output” (IPO) system. This system has been illustrated previously in Figure 1.

In adopting the IPO framework, the study not only allowed for the examination of each element, but also facilitated an understanding of the relationships between the system elements. However, due to the interpretivist paradigm employed in the design and conduct of this study, the researcher was cognizant that alternate conceptual elements and relationships might be constructed. Such alternate understandings did come to light. This study found that in some crisis circumstances, the sequence of system elements breaks down. In these instances, the dynamic and unpredictable nature of the crisis led to system element interactions that were unpredictable and non-linear. The alternate model reflects a complex adaptive system and is further discussed in Chapters four and five.

Conclusion

This review has found we are living in a time of increased exposure to crises, yet crisis decision-making research has been largely stagnant. Researchers have seldom engaged in constructivist and interpretivist inquiry as a means of producing new insights. Advancing novel methods for crisis decision-making research could offer insights to both researchers and

practitioners interested in crisis decision-making. Based on this literature review, it is argued that there is a need for a holistic research perspective to better understand how and why decisions are made during organizational crises. Novel research opportunities exposed as a result of this review involve:

- Understanding the role of contextual factors in influencing sensemaking and decision-making,
- Understanding why people assign heightened importance to some contextual decision factors,
- Understanding why decision-makers adopt the strategies that they do, and
- Understanding how decision consequences influence ongoing decision-making.

The conceptual framework used in this study has been designed to explicate both the system elements and their relationships as a way to shed light on this study's research questions. The next chapter will describe the research method used in this study. The description of the study begins with a discussion of philosophical underpinnings, leading to the study's design and case description. Next, the chapter describes the sampling criteria used to identify participants. Finally, data collection and analysis methods are described, as well as how validity and reliability concerns are addressed.

CHAPTER 3 - RESEARCH METHOD

Purpose of the Study

The primary purpose of this study was to add knowledge to our understanding of decision-making within the context of organizational crises. The specific aims of the study were: (a) to better understand how people construct meaning during periods of crisis, (b) to enhance the understanding of why some factors influence the construction of meaning more significantly than others do, (c) to explore how the construction of meaning influences the decision-making processes and behaviors that people adopt, (d) and to gain insights into how decision consequences impact ongoing decision-making. The outcomes of this study were intended to help practitioners make better decisions during crises in order to reduce harmful consequences. Outcomes resulting from the study were also expected to inform contemporary theory, to give rise to novel areas of research, and to stimulate innovative practices. Furthermore, this study addressed gaps related to the interrelationships between the construction of sensemaking and the overall organizational crisis decision-making (OCDM) process. Finally, the study aimed to address a domain in which inquiry has been scarce, and in which some research perspectives have been largely unexplored.

This chapter describes how the researcher sought to achieve this study's stated purposes, starting with broad and conceptual aspects of the study, then leading to more specific design elements. This chapter begins by discussing the researcher's philosophical basis and position, followed by a description of how the study was designed. Design elements described in this chapter include the research methodology, method, case description, sampling, data collection,

data coding, and data analysis. Finally, measures taken to overcome threats to validity and reliability are discussed.

Philosophical Basis of this Study

This study's researcher adopted the philosophical stance that decisions made during crises are socially constructed (Cottone & Claus, 2000). This underlying philosophy supports the use of qualitative inquiry that fosters a connection between the researcher and the participants, and enables the creation of a co-constructed reality (Guba & Lincoln, 1982; Kim, 2001). This study acknowledged that in order to make decisions, people construct meaning based on their own values, experiences, expertise, social interactions, cultural influences, and numerous other factors: therefore, there is no single "true decision" to be uncovered (Smith, 2004). Cottone and Claus (2000) further suggested that decision processes cannot be extricated from the social contexts that created them, or from the values and intuitions that contributed to them (Hare, 1991). In the same vein, Cottone & Claus (2000) claimed that few probabilistic theories have adequately accounted for psychosocial dynamics of decision-making, and that the inner workings of decision-makers are enigmatic and centered around "a contextual truth." These assertions provide support for this study's social constructivist and interpretivist perspective.

Researcher Position

In qualitative studies, positioning is an indicator of reliability, providing readers with information about the researcher's perspectives, assumptions, and relationship to study participants (Charmaz & McMullen, 2011). Furthermore, the researcher's position enables the readers to comprehend the study within the context of the researcher's unique characteristics (Madge, 1993). Therefore, in this section, experiences and perspectives that informed this study are described.

The researcher's professional experiences provided exposure to crisis situations and crisis decision-making in a number of settings: military, government, corporate, and others. Over that time, many decisions that raised questions about influences on decision-makers were witnessed. This study provided the researcher with the opportunity to explore the forces that could have been driving peoples' decisions. Accordingly, the researcher's interests were rooted in how people arrive at the decisions they do during crises, and why some influences appear to have preferential status. It is not suggested that a single study can fully clarify a highly complex phenomenon; rather, the study can be helpful in shedding more light on the phenomenon, and advancing theory, research, and practice.

Ontologically, the researcher's orientation is that of a social constructivist and interpretivist. As such, the researcher came to believe social interactions are better understood through a co-constructed lens: there is no single "true" answer that sits in a lockbox that research can open. Rather, this study was approached with the perspective that while there are no single truths to be uncovered in the form of a decision, some decision-making approaches may be better than others. Much has been written about what people have done during crisis-related decisions; this study intended to shed more light on why and how people engage in those behaviors, and how various decision components interact.

Methodology

This study employed a qualitative methodology as means of providing a rich and descriptive explanation of the central phenomenon. Qualitative inquiry is appropriate for this study in that the methodology seeks to illustrate a phenomenon within its context (Miles & Huberman, 1994), and to explain and describe complex personal or interpersonal phenomena (Krauthwohl, 2009). Further rationale supports the use of qualitative inquiry in that it can

investigate unexplored aspects of a phenomenon, and produce novel perspectives about unexplored aspects of a phenomenon (Corbin & Strauss, 2008). This methodology is consistent with this study's aims: to provide a thick, rich description of the OCDM phenomenon, and to examine how and why elements of OCDM interrelate as they do.

Furthermore, the study's conceptual framework accommodates a constructivist paradigm, recognizing that organizational decisions do not exist on their own, independent from decision-makers. Rather, they are subject to varying contexts and influences, and are constructed by the decision-maker and others as part of psycho-social activities. For the reasons described in this section, some researchers have recognized the need for qualitative inquiry in the OCDM domain, observing that "few qualitative studies have linked crises to decision-making" (Alkharabsheh, Ahmad, & Kharabsheh, 2014, p. 283).

Research Design

This study employed a holistic single case study design as a means of addressing research questions in a manner consistent with a constructivist and interpretivist researcher perspective. The case study method supports the aims of this study by providing for an in-depth examination of a phenomenon within a specific context (Merriam, 1998; Yin, 2013a; Zainal, 2007). The rationale for the case study method is principally based on the alignment between the purpose of the method and this study's research aims and questions. This study aimed to better understand the inter-relationships of decision-making influences, processes, and behaviors by investigating how and why those relationships occur the ways in which they do. This inquiry adopted case study guidelines offered by Merriam because of her versatility and accommodation of ideas advanced by Yin, Stake, and other scholars experienced in case study research. Merriam found a

middle ground between Yin's prescriptive approach to case study design and Stake's loosely structured design.

This case study involved consequential decision-making that individuals undertook for their organizations during the 2017 Northern California firestorm. This cluster of concurrent wildfires provided a context that allowed for a coherent analysis of decision-making processes and behaviors among a diverse group of individuals during crisis conditions. Consequential decisions of interest were those that carried significant outcomes and were made on behalf of individuals' respective organizations.

Case Description

A thorough case study involves a description of the case and its context (Creswell, 2003). The purpose of this description is to provide the reader with an understanding within which findings and conclusions can be interpreted, and to assist the reader in determining whether study outcomes can be applied to other contexts (Baxter & Jack, 2008). In this section, the researcher described the firestorm itself, including its origination, progression, and consequences. Next, the researcher described the general context and conditions under which participants engaged in organizational crisis decision-making.

A Description of the Firestorm

The 2017 Northern California firestorm involved four concurrent wildfires that broke out in Sonoma and Napa counties on the night of October 8, 2017. Three of the four fires burned until the end of the month, and one was extinguished on October 12. By the time all fires were fully extinguished, they had inflicted unprecedented damages to the region and its people. In total, the fires burned an area exceeding 145,000 acres, damaging or destroying nearly 8900 structures, killing 31 people, and displacing almost 100,000 people. California Governor Jerry

Brown said of the fire, “This is truly one of the greatest tragedies California has ever faced. The devastation is just unbelievable. It is a horror that no one could have imagined” (Associated Press, 2017).

The firestorm was unique for several reasons. At that time, merely one of the four fires, the Tubbs Fire, had become California’s most destructive wildfire in history (Cal Fire, 2018d). Two other fires, the Atlas Fire and the Nuns Fire, were among the top ten most destructive in the state’s history (Cal Fire, 2018d). The total insured losses from the Northern California fires approached \$11 billion (Artemis, 2018). In terms of human lives, the fires were the third deadliest at that time, having caused 31 deaths (Emslie, 2017). Table 2 summarizes the types of damage cause by each fire, and Figure 4 illustrates the physical boundaries of each fire contained within the scope of this study.

Table 2
Summary of Firestorm Impacts: Acres, Structures, and Fatalities (Cal Fire 2017a; Cal Fire, 2017b; Cal Fire, 2018a; Cal Fire, 2018b; Emslie, 2017)

Fire	Date Started	Acres	Structures Damaged or Destroyed	Fatalities
Atlas	10-08-2018	51,624	903	6
Nuns/Central LNU Complex	10-08-2018	56,556	1527	3
Thirty-Seven	10-08-2018	1500	0	0
Tubbs	10-08-2018	36,807	5953	22
Total	--	146,487	8383	31

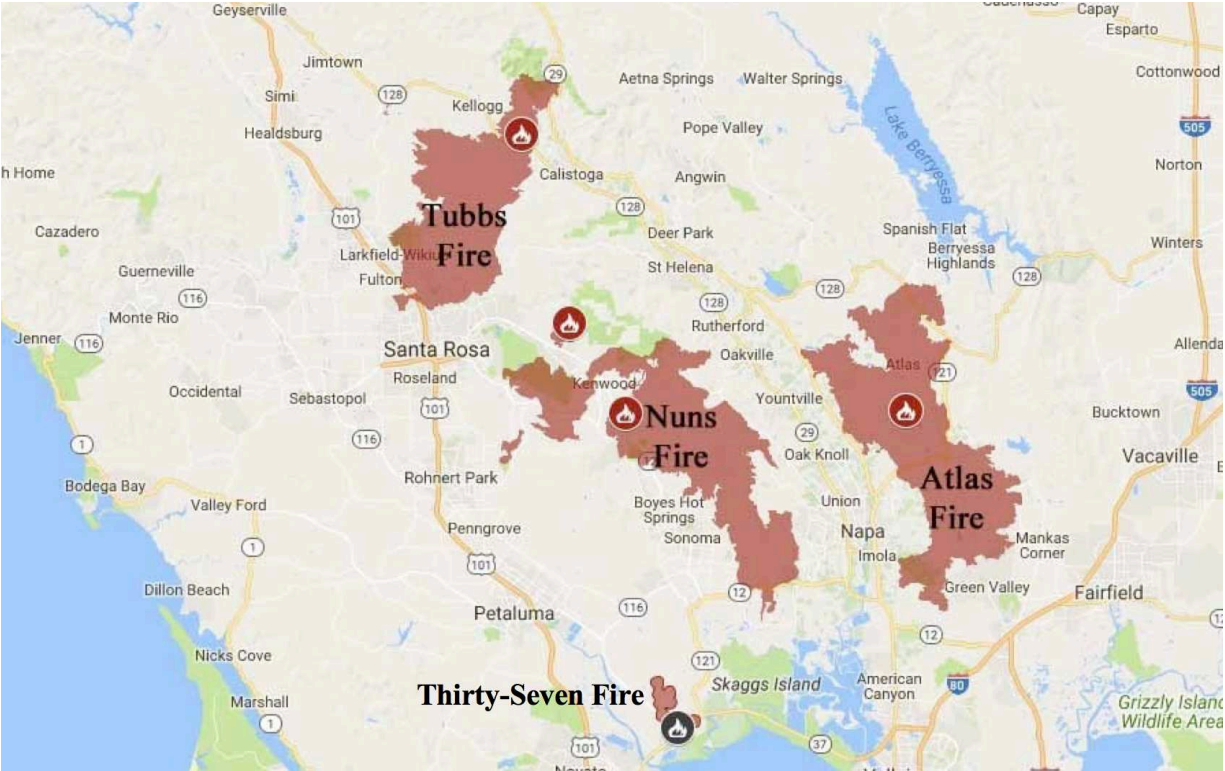


Figure 4: Map of the 2017 Northern California firestorm.

The Crisis Decision-Making Environment

This study conceived of organizational crisis decision-making (OCDM) as a system. As such, the system represents as composition of various elements that interact within its environment. Nadler and Tushman (1980) suggested the environment is comprised of forces that act upon the overall system. In this study, these most significant forces upon the overall system emerged as conditions created by the firestorm, and the firestorms’ consequences. These factors are further described in this section.

Firestorm conditions.

Descriptions of the firestorm suggest an event that was dynamic, highly uncertain, and presented the potential for severe outcomes. The dynamic nature of the conditions was largely due to the shifting nature of the Diablo wind pattern, which caused new fires to move rapidly and

in unexpected directions. Because the fires began during the late-night hours of October 8, most people in the area were asleep and unaware of the potential threat (Letson, 2018). Because many residents in the at-risk areas did not receive emergency alerts (California Governor's Office of Emergency Services, 2018; Eberling, 2018), it was not unusual for people to become aware of the fires through unofficial channels: phone calls from friends and family, the smell of smoke, a dull red glow seen through the bedroom window, or someone banging on the front door.

Uncertainty was exacerbated by extensive telecommunications disruptions that inhibited general communications (North Bay/North Coast, 2018). Participants in this study indicated that the combination of these factors created a situation in which conditions were changing, information was sparse, and uncertainty was high. While this study revealed that participants' experiences were largely unique; a number of similarities revealed shared experiences. These similarities reflect the common context within in which participants engaged in decision-making for their organizations.

Firestorm consequences.

The consequences associated with this firestorm were unprecedented, as it was the insurance industry's costliest wildfire event in history at that time (Artemis, 2018). Insurance payouts totaling \$11 billion (Artemis, 2018) suggested outcomes were both vast in scope and extreme in destruction. Accordingly, participant comments reflected a wide range of impacts resulting from the firestorm. Table 3 provides a high-level summary of consequences experienced by participants' organizations, as well as the consequences participants experienced. Types of consequences during the firestorm were consistent with crisis-related consequences identified by Mitroff et al. (1988): human, social, technical, and financial. As these categories pertain to this study, they are briefly described below:

Table 3

Types of Consequences by Participant Organization and Participant

Participant	General Impacts to Organization	Participant Impacts
P1	Grave threat to human lives; threat to structure; operational disruptions	None stated
P2	Structure destroyed; operational disruptions, threats to people; financial losses	Home evacuated
P3	Threats to property and assets; community recovery support; financial losses	Home evacuated
P4	Extreme impacts to member well-being	Home destroyed
P5	Structure destroyed, grave threats to human lives; reduced operational resources; community well-being	None stated
P6	Structure destroyed, grave threats to human lives; reduced operational resources	Family medical concerns
P7	Structures destroyed and damaged; extended operational disruptions; member well-being	Home evacuated
P8	Structure damaged; extended operational disruptions; member well-being; community well-being	Close family evacuated; Personal health toll
P9	Grave threats to human lives; reduced operational resources	Family safety concerns
P10	Destruction of business and property; member well-being	Home evacuated; Animals threatened
P11	Extended operational disruptions.	Home destroyed; Animals threatened
P12	Extended operational disruptions; infrastructure disruptions	Family safety concerns; Loss of power and water
P13	Extended operational disruptions; infrastructure disruptions	None stated
P14	Business evacuated; structures threatened	Structure destroyed; Home evacuated; Personal health toll; Animals threatened
P15	Structures damaged and destroyed, extended operational disruptions, member well-being	Home evacuated; Personal health toll

An understanding of the study's case and the environment is an essential component of understanding the decision-making system of interest. Within an unprecedented firestorm, participants experienced extreme change and uncertainty, while encountering wide-ranging consequences. It is within this common case and environment that participants formed an understanding of the conditions that they faced, and subsequently made decisions. The case and environment provide a backdrop for the closer examination of findings guided by the study's conceptual framework.

Sampling Procedures and Participants

This research incorporated purposive sampling to identify participants of interest. Purposive sampling involves the selection of participants who can contribute the most to the insights and understandings to the research aims (Chein, 1981). In purposive sampling, participants are selected based on a set of pre-defined criteria (Merriam, 1998; Ritchie, Lewis, Nicholls, & Ormston, 2013). Purposive sampling in this study involved a multi-step process based on the following criteria: (a) participants must have held or assumed a position of responsibility within their organizations at the time of the firestorm, (b) participants' organizations must have experienced significant consequences related to the firestorm, and (c) participants must have made at least one consequential decision related to firestorm. Participants were excluded if at any point in the study all criteria were not met.

To carry out the purposive sampling, the researcher first identified and examined secondary sources that provided descriptions of the overall firestorm. These sources involved government reports and articles published in various media outlets. With an understanding of the overall firestorm, the researcher established geographical boundaries that defined the region of interest in this study. Within this geographical region, the researcher conducted a map search and

identified a pool of 125 diverse organizations for potential inclusion in the study. From this overall pool, secondary sources were analyzed to identify organizations which had experienced significant consequences, as well as specific locations in which fire destruction was particularly severe. This process narrowed the potential participant organization pool to 45. Then, the researcher conducted a web search to identify individuals who were either organizational leaders, or who held safety or operational roles and would likely have had responsibilities associated with the firestorm. I sent initial recruitment email messages to these individuals. Individuals who responded with an interest in participating in the study were considered for inclusion. During a time in which the researcher was physically in the fire area, two organizations were directly approached about participation in the study.

Discussions with study participants were expected to reveal other individuals who could shed additional light on research questions. Therefore, the study also employed snowball or chain sampling in which a participant suggested the inclusion of another person (Atkinson & Flint, 2001). Snowball sampling is appropriate for qualitative sociological research (Biernacki & Waldorf, 1981) involving qualitative and exploratory studies in that it can be effective in identifying previously unidentified participants (Atkinson & Flint, 2001). While snowball sampling was not proposed as the study's primary means of identifying participants, the method was incorporated to allow for the identification of otherwise unknown individuals who could contribute to the study. Three participants were identified using snowball sampling.

Individuals involved in this study were members of various types of organizations: commercial, government, critical infrastructure, faith-based, healthcare, and educational. Types of roles held by participants were also diverse, and included business owners, senior leaders, group leaders, and leaders of functions inclusive of safety matters. As discussed previously, the

examination of diverse perspectives within the context of a single crisis event was intended to support a coherent analysis in which patterns, differences, similarities, and other outcomes of interest could be found.

Sample Size

A primary consideration in determining the appropriate number of participants in case studies is the concept of saturation: the point at which the inclusion of additional samples does not result in additional data (Glaser & Strauss, 1967; Mason, 2010). Merriam (1998) offered several signals indicating the saturation has been reached. First, information collection reached the point of diminishing returns; second, a sense of regularity has been established; and third, new information is merely tangentially associated with other relevant categories that have emerged.

An estimated sample size of eight to 18 participants was identified by reviewing seven studies that employed the case study method pertaining to decision-making and crisis response (Arthur-Mensah, 2015; Bennington, 2014; Berry, 2013; Eng, 2014; Godfrey, 2013; Johnson, 2007; Queen, 2014). Through the course of the study, saturation was iteratively assessed in two ways. First, participant data were analyzed to identify new themes or patterns that were meaningful to the research questions. Second, participant data were analyzed to identify contextual details which would add to a thick, rich description of the phenomenon. When participant data did not present new themes, patterns, or meaningful contextual details, saturation was assumed to have been achieved. In total, this study included 15 individuals.

Description of Study Participants

This study involved 15 individuals representing 13 organizations in the following sectors: commercial, government, critical infrastructure, faith-based, healthcare, and educational. All

organizations were directly or indirectly affected by the fires. At the time of the interviews, participants were either leaders of their organizations, assistant leaders, or leaders of a unit within the organization. Ten participants were men, five were women. All participants characterized themselves as being experienced in their positions. Years of relevant experience ranged from approximately 10 years to over 35 years. At the time of the firestorm, one participant was new to the role, but not to the occupation. The units of analysis in this study were the individual participants engaged decision-making for their organizations during the 2017 Northern California firestorm. Table 4 and Figure 5 provide summary information about participant and organizational characteristics.

Table 4
Study Participants: Sex and Organization Type

Participant	Sex	Organization type
P1	M	Healthcare
P2	M	Commercial Industry
P3	M	Commercial
P4	M	Faith Based
P5	M	Government
P6	M	Government
P7	F	Education
P8	F	Education
P9	M	Government
P10	M	Hospitality
P11	F	Commercial
P12	M	Critical Infrastructure
P13	M	Critical Infrastructure
P14	F	Healthcare
P15	F	Commercial

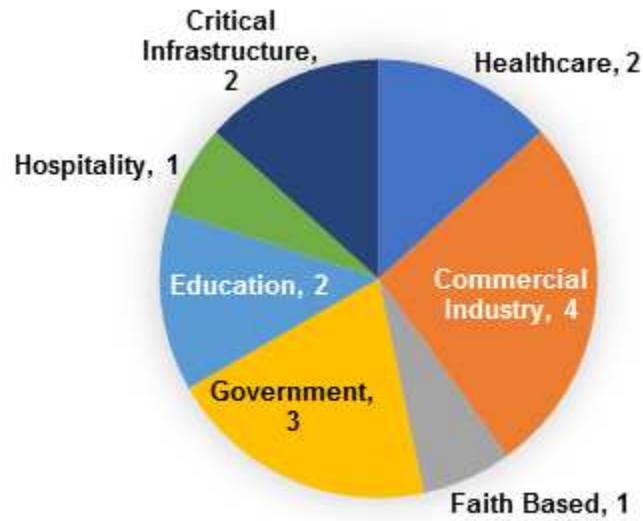


Figure 5: Numbers of participants in different organizational types (type, number of participants).

Data Collection

To enhance the study’s trustworthiness, the researcher collected and analyzed multiple data types. Findings emerged predominantly through primary sources. The researcher obtained primary data in the form of semi-structured interviews with study participants. Secondary source data were reviewed, although authoritative reports were limited due to the recent occurrence of the firestorm. Secondary sources consisted of reports, articles, social media, videos, and audio recordings. Furthermore, researcher journals were maintained throughout the inquiry, documenting connections, intuitions, questions, insights, and other types of data potentially yielding insights into the study’s research questions. This chapter will first describe primary source data collection and analysis, followed by secondary and other sources of data.

Primary Source Data

Data gathered during participant interviews served as a principal source of information for this study. Ritchie et al (2013) suggested exploratory studies such as this one do not require a great deal of structure, as the researcher should have flexibility in eliciting participants'

conceptions and values, predominantly through discourse. Therefore, the interview method was semi-structured. Using this data collection method, a consistent set of general questions was created, but depending on participant comments, the researcher engaged in various types of probing questions in order to elicit additional information. Fourteen of 15 interviews were conducted in-person, providing close engagement with participants and enabling the detection of non-verbal cues such as body language and emotion. Thirteen of 15 interviews were audio recorded and transcribed into word processing software for subsequent analysis.

Interviews incorporated strategies suggested by Merton, Fiske and Kendall (1990) in relation to interviews with people who were involved in a particular situation, but who adopted differing subjective perspectives of that situation. As suggested by Merton et al. (1990), a general structure was used in which interviews: (a) started in an open, non-directed manner to establish context; (b) continued by focusing on a specific decision event; (c) built on the specific event by examining the range of decision events throughout the firestorm; and (d) examined attitudes, beliefs, and perspectives that contributed to personal contexts. Consistent with the approach espoused by Merton et al. (1990), an interview guide was used to facilitate interviews. The guide contained questions designed to elicit information about specific inquiry aims. As an acknowledgment of the semi-structured nature of the interviews, prompts for further probes accompanied each question. The interview guide is found in Appendix A.

Fifteen participants representing 13 organizations participated in interviews. To arrange for these interviews, I contacted each participant to schedule an approximately one-hour meeting at a time a place of their convenience. All interviews were held in-person in Northern California, with the exception of one telephone interview. Fourteen interviews were conducted during the month of May 2018, and one was conducted in June, 2018. Interviews ranged in length from 40

to 75 minutes, with a typical duration of one hour. Each participant received an informed consent form to sign, at which time they had the opportunity to ask additional questions about the study. As a preamble to each interview, and as a way to appropriately frame participant responses, the researcher described the intent of the study and the research questions. Interviews were semi-structured and varied based how participants responded to questions. Because of the nature of participant responses, some interviews were more structured than others. In some cases, general questions yielded relevant information; in other cases, specific questions were asked or probed.

Thirteen of the 15 interviews were recorded. At the request of a participant, one telephone interview was not recorded, and one other interview took place while walking around the organization's property. In instances when interviews were not recorded, the researcher took notes during and after the interviews in order to accurately capture participant comments. Recorded interviews utilized two digital recording devices: an iPhone 5 equipped with the "VoiceRecorder App," and a digital recorder. Upon the completion of all interviews, recordings were transcribed verbatim to the researcher's personal computer. The researcher used a two-step process to transcribe the audio. First, audio files were processed through a voice recognition application to create preliminary transcripts. Because the voice recognition applications transcripts contained many errors, preliminary transcripts were reviewed while listening to the audio files, and appropriate edits were made. During this process, each participant was assigned a non-identifiable code. The key to codes was securely stored in a separate computer file.

Secondary Source Data

Consistent with qualitative research techniques suggested by Hodder (1994), Lincoln and Guba (1985), Merriam (1998), and others, this study involved the collection and analysis of secondary sources. Secondary sources were collected and analyzed as a means of examining the

overall context of the case study, to identify participants, to examine participant decision-making influences, and to contribute to the thick, rich description of the phenomenon of interest. Types of secondary sources included various government reports, media accounts, social media, video and audio-recordings, public records, and web-page content.

The researcher initiated the collection of secondary source data by using an iterative search approach leading from general to specific information. The researcher began identifying secondary sources by using general search criteria that would yield information about the overall firestorm. These types of sources primarily included media articles and reports generated by firefighting agencies that had been involved in the firestorm event. The information examined provided a better understanding of where the fire had caused the most damage, and which types of organizations had been impacted. This information provided direction in identifying and examining additional secondary sources which could provide more specific information about the event and its consequences. Some of these sources were useful in identifying study participants. Following the completion of participant interviews, secondary source searches and reviews were conducted to determine whether articles, reports, social media, or other sources could add more depth and context to each participant's comments.

While media accounts of the firestorm were abundant, the availability of official accounts was limited, likely because this study commenced within six months of the conclusion of the firestorm. The preponderance of secondary source data was general in nature, contained within newspaper and web-page articles. Very few sources related directly to this study's research questions. To describe the role of secondary sources used in this study, two categories were created: those that provided information of a general nature and were not cited or referenced in this study, and those that were either germane to this study's research questions, or that provided

supporting evidence or details related to the case study. The former category helped establish a thorough understanding of the larger crisis event, informing the researcher of contexts and influences that could have had a bearing on participant decision-making. This information proved valuable in the participant interviews. The latter category involved details which have been cited in the study. Only three of the cited sources were directly related to firestorm decision-making; these sources were coded using the same approach as was used with participant interview transcripts. Table 5 provides a summary of secondary sources that yielded general information and were not cited or referenced in this study. Table 6 lists and describes sources that were cited and referenced in this study.

Table 5

Types and Descriptions of Secondary Sources Containing General Information

Type of Source	Summary descriptions of sources
Newspaper and web-page Articles	<p data-bbox="678 359 1360 611">Large market newspapers such as The Los Angeles Times, the San Francisco Chronicle, The New York Times, and USA Today reflected the national attention being given to the firestorm. Articles included various descriptions of the firestorm, California’s wildfire history, implications for the local wine-growing region, and other general topics.</p> <p data-bbox="678 632 1360 993">Local newspapers and associated web-pages, such as the Santa Rosa Press-Democrat and the Napa Valley Register, provided an extensive source of articles about the firestorm. Articles were written during and after the firestorm, and as opposed to the large market newspapers, tended to address individual accounts of the firestorm, localized damage estimates, impacts to specific business, impacts to the local tourism industry, local response efforts, and other topics of a local nature.</p>
Social media accounts	<p data-bbox="678 1031 1360 1171">Numerous Twitter feeds and Facebook postings were reviewed for descriptions of the fire conditions, fire damages, and personal accounts during the firestorm.</p>
Video/Audio files	<p data-bbox="678 1209 1263 1276">Video and audio files posted by media, organizations, and individuals were reviewed.</p>
Organizational web-pages	<p data-bbox="678 1314 1211 1381">Web pages sponsored by each participant organization were reviewed.</p>

Table 6
A Summary Inventory and Description of Cited Secondary Sources

Source	Description
Government reports	<p>The California Department of Forestry and Fire Protection (Cal Fire) published numerous reports describing fire conditions, fire damages, fire response actions, and fire investigations both during and after the firestorm. Several are cited in this study.</p> <p>California’s Office of Emergency Services published a report from the Governor’s Office describing the nature of communications challenges during the firestorm.</p> <p>The U.S. Army Corps of Engineers published an account of regional rebuilding and recovery activities.</p>
Industry report	A broadband consortium report described telecommunications outages during the firestorm.
Newspaper and web-page articles	Local news sources published articles spot-lighting actions taken by local individuals during the firestorm, as well as articles providing details about the fires’ behavior, and the ways in which local residents and businesses were impacted.

Researcher Journaling

Researcher journaling provided a rich source of data which supported the formulation of findings, instincts, and other thoughts about the meaning of various pieces of data (Bazeley, 2013; Janesick, 1999; Silverman, 2003; Zeegers & Barron, 2015). In this study, journaling applied to all areas of inquiry and continued throughout the study. As a stimulus for journaling, the researcher asked several reflective questions that were routinely revisited and modified as necessary. The initial set of reflective questions was as follows:

1. What are my reactions to each participant interview, and how could those reactions

- influence how I interpret those comments? Have I applied any inappropriate assumptions or biases?
2. Did participant comments challenge any assumptions that guided the design of the study?
 3. In what ways did participant emotions, gestures, tones, and intuitions add meaning to what they have said?
 4. Have participants implicitly suggested any understandings that are hiding “under the surface” of what they have actually said during interviews? What are they?
 5. Have participants discounted information that would appear to be important? Why?
 6. Have participants’ perceptions of crisis consequences related to the factors that they recognized as significant? If so, can this be explained?
 7. Have secondary sources suggested decision factors beyond those that have been described by participants? If so, what are they?

Through researcher journaling, the researcher attempted to continually reflect on the possibilities that could lead to new theories and questions, the meaning of primary and secondary source data through theoretical and conceptual lenses, and the research also reflected on questions which would reveal insights to be found beyond the study’s *a priori* conceptual framework.

Through the combination of primary sources, secondary sources, and researcher journals, the data collection approach used in this study was designed to support the development of a thick, rich description of the phenomenon of interest. Furthermore, it was intended to bolster the study’s trustworthiness through data triangulation, described further in this section. The analysis of data collected during the study is described in the following section.

Data Coding and Analysis

The coding and analytical techniques used in this study followed approaches consistent with qualitative case study research. Coding involved a three-step process involving open and *a priori* coding, axial coding, and the identification of key themes. The study adopted a hybrid analytical approach which highlighted pattern matching and logic modeling techniques. Coding and analytical approaches are further described in this section.

Coding

As described by Corbin and Strauss (2008) and Saldaña (2009), a three-step process of initial coding involving both *a priori* and open coding, axial coding, and identifying key themes and patterns was used. Because of the nature of the study, the preponderance of data was obtained from primary sources. However, selected secondary sources that were germane to the study's research questions were coded using the approach described in this section. Figure 6 provides a high-level diagram of the coding strategy used in this study.

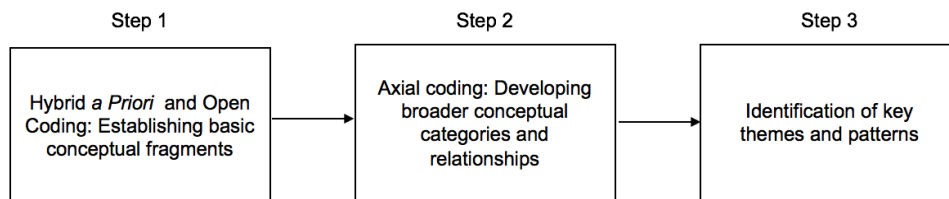


Figure 6: Coding strategy used in this study.

The first step of data analysis involved a hybrid coding strategy using both *a priori* and open coding. The use of *a priori* coding allowed for a deductively-oriented form of analysis that recognized underlying theories and concepts. In contrast, open coding enabled a more inductive analytical process, recognizing the likelihood that new concepts, themes and patterns might be identified. The intent in using a hybrid deductive and inductive analysis strategy was to yield a robust analysis, and to recognize the possibility that previously unrecognized insights could be constructed. This step began with the analysis of *a priori* codes, followed by a more inductive

process of open coding. The overall step enabled the researcher to segment the data into small conceptual fragments and then to assign data to categories and concepts. Through this process, 106 codes were identified.

The second step of the analytical strategy involved axial coding, described by Charmaz (2014), Flick (2014), Saldaña (2009), Corbin and Strauss (2008), and Creswell (2003) as re-assembling and synthesizing initial code sub-categories into broader categories, and establishing relationships between them. In performing axial coding, the researcher reviewed the initial codes in consideration of conditions, actions, contexts, interactions, and consequences. To illustrate, one example of axial coding involved the synthesis of several codes relating to how the climate within an organization affected the decision-maker. The a priori and open codes used were: clarity, commitment, control, love of the job, personality/demeanor/style, pride, and stress response. Emergent from these codes were the axial codes: role identities, modes, and personal attributes. During this process, a total of 28 axial codes were identified. Finally, the researcher raised axial codes to a higher level of abstraction to identify core themes and patterns that formulated the essence of this study's findings (Corbin & Strauss, 2008; Flick, 2014). A total of 12 key themes were identified.

As illustrated in Table 7, a coding strategy guide was developed for each research question, consistent with the study's conceptual framework elements. A full list of open and a priori codes is included in Appendix B. This coding strategy was intended to be flexible, accounting for additional outcomes yielded through the data gathering process.

The coding process involved all participant transcripts and relevant secondary sources. The researcher did not code researcher journal entries. As illustrated in Figure 7, the researcher used Atlas.ti qualitative data assessment software to facilitate coding, data analysis, and data

interpretation. Interview transcripts, articles, reports, and researcher memos were uploaded into the software. *A priori* codes were input into the system before coding was initiated, and open codes were added during the coding process further discussed in this section.

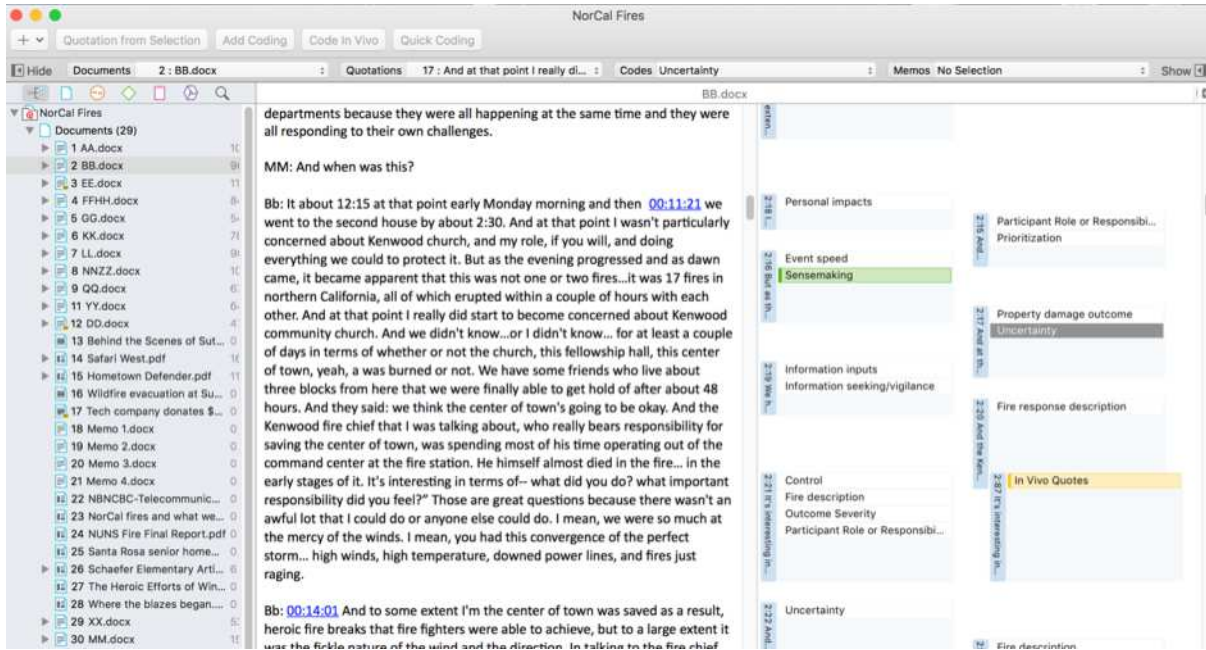


Figure 7: Example of Atlas.ti qualitative data assessment software coding.

Table 7
Qualitative Analysis Coding Strategy Guide for Interviews and Documents

Conceptual Framework Elements	Code Description	Analytical Focus/Considerations
Main research question: How do people make decisions during organizational crises?		
Overall system environment	A priori codes <ul style="list-style-type: none"> • Fire description • Fire duration • Changing conditions • Crisis perception • Nature of outcomes 	These codes describe the nature of the firestorm from the standpoint of the decision-maker, explicating the nature of the perceived crisis.
	Open coding as appropriate	
Research sub-question 1: What are the primary contextual factors that influence decision-making during organizational crises, and do some have more significance than others? If so, why?		
Contextual Factors	A priori codes: <ul style="list-style-type: none"> • Stress response <ul style="list-style-type: none"> • Self-identity • Past experiences • Cognitive biases and heuristics • Group cohesiveness and psychological safety • Social factors • Time pressures • Organizational policies 	These codes identify the decision factors that were important to the participant in the initial phase of the crisis event.
	Open coding as appropriate	
Research sub-question 2: What sensemaking frameworks do people employ during organizational crises, and why?		
Sensemaking Frameworks	A priori codes <ul style="list-style-type: none"> • Retrospective • Enacted • Cues • Data-frame • Interpretation • Framing • Re-framing 	These codes identify properties reflected in participant sensemaking, as well as the two-way influences between data and frames; the context is the initial phase of the Firestorm.
	Open coding as appropriate	
Research sub-question 3: What types of decision-making strategies do people engage in during organizational crises, and why?		
Decision Strategies	A priori codes: <ul style="list-style-type: none"> • Vigilant • Buck-passing • Stalling • Rushed/rash • Complacent 	These codes describe the degree of vigilant or non-vigilant behavior displayed by the participant during initial sensemaking and decision-making.
	Descriptive Codes: <ul style="list-style-type: none"> • Searching (for information) • Restricting (information) • Inclusiveness • Exclusiveness • Open (interpretation) • Biased (interpretation) • Delayed • Reactive • Dismissive • Others as appropriate 	
Open coding as appropriate		
Research sub-question 4: How and why do decision consequences influence ongoing decision-making?		

Consequences	A priori codes: <ul style="list-style-type: none"> • Human • Technical • Economic • Social/Organizational Open codes as appropriate	These codes identify those outcomes perceived as significant to the participant during the initial period of the firestorm.
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Note: Other coding descriptions not identified a priori were used as appropriate (See Appendix B for a full list of a priori and open codes)

Data Analysis

In determining this study’s analytic strategy and methods, the researcher drew largely from Yin (2011), who proposed multiple approaches that can be used singularly or in combination. Yin (2013b) and others have argued the adoption of multiple analytical perspectives bolsters perspective triangulation, strengthening the validity and the transferability of case study inquiries. As such, this study adopted a combination of several approaches, further discussed in this section: (a) reliance on a theoretical and conceptual foundation, (b) developing a case description, (c) pattern matching, and (d) logic modeling.

Theoretical and conceptual foundation.

The conceptual framework described in Chapter one of this study also formed the basis of the studies compositional structure, which Yin (2011) described as being necessary for guiding data analysis. The core elements of the compositional structure are grounded in theory. These concepts are described in Chapter two, and are briefly summarized as follows:

1. The organizational crisis environment;
2. Contextual factors, or internally and externally-driven decision-making influences;
3. Sensemaking frameworks that guide how people construct meaning;
4. Decision-making strategies; and
5. Decision-making consequences.

Case description.

A second approach used in this study involved the development of a case description. This purpose of developing a case description is to provide a structure within which a thick, rich description can be developed (Yin, 2011). In this study, the case description was driven by two characteristics: (a) organizations that had experienced severe consequences because of the 2017 Northern California firestorm, and (b) members of these organizations who had made at least one consequential decision during the firestorm. As suggested by Yin (2011), the development of the case description aligned with the data collection methods involving interviews, secondary source analysis, and researcher journaling.

Pattern matching.

Pattern matching was used as a method of analyzing data during this event. This technique is commonly used in case studies to compare predicted, theory-based patterns with those that emerged from empirical evidence (Trochim, 1989, Yin, 2011). To conduct pattern matching analysis, the researcher iteratively compared *a priori*, open, and axial codes with key concepts contained within this study's conceptual framework. Patterns derived from codes were examined in relation to theory-based patterns. In some instances, predicted theory-based patterns were supported. In other instances, code-based patterns were not applicable to predicted patterns, or were only applicable in specific circumstances. Table 8 contains examples of patterns derived from codes, comparisons with predicted patterns, and a brief description of outcomes related to the analysis.

Table 8

Examples of Patterns Identified Through Coding, Theory, and Outcomes

Patterns Identified Through Coding	Theory-Based Patterns	Outcomes
Information seeking behaviors	Vigilance	The predicted pattern of vigilance was found among all participants. Participants exhibited higher degrees of vigilance than predicted.
Deconstruction of complex situations into smaller problems	Decision Framing	The predicted pattern of decision framing was found among some participants. Framing appeared to be related to self-perceptions.
Use of various past experiences to guide real-time decision-making	Close match identification	The predicted pattern was found to have occurred in a modified form. People engaged in naturalistic decision-making using other than “close matches”.
Member trust as a factor influencing participant’s sense of risk exposure and self-esteem	Not predicted	Patterns related to member trust and decision-making yielded an unpredicted pattern. This pattern led to implications concerning the relationships between crisis decision-making and psychological safety.

Logic modeling.

Secondarily, this study employed the concept of logic modeling, which has been described as a hybrid between pattern matching and time-series analysis (Baskarada, 2014). Similar to pattern matching, logic modeling sought to compare predicted cause-and-effect relationships with those that emerged from empirical evidence. The researcher deemed this technique to be relevant in that it helped to explicate presumed relationships between elements in the conceptual framework’s input-process-output (IPO) system model, as well as causal relationships identified within the framework’s underlying theory and research. Techniques such

as causal mapping and sequential modeling were used to identify relationships within and between framework elements. Table 9 contains examples of patterns derived from codes, comparisons with predicted causal relationships, and a brief description of outcomes related to the analysis.

Table 9
Examples of Causal Relationships Identified Through Coding, Theory, and Outcomes

Causal Relationships Identified Through Coding	Theory-Based Relationships	Outcomes
The absence of time constraints was found to cause stress among some participants	Time constraints will lead to heightened stress	Crisis situations present various forms of time pressures, depending on the nature of the crisis context.
The inability to control an unexpected event led to a focus on events that could be controlled, resulting in either reduced or mitigated stress responses.	The inability to control an unexpected event having severe consequences will increase stress levels.	In some crisis contexts, perceptions of control influence the way people made sense of their situations, and influence how they make decisions. In some contexts, perceptions of control offer a mechanism for mitigating stress.
Sensemaking and decision-making become inextricable in some OCDM contexts.	Sensemaking precedes and leads to decision-making.	In some contexts, sensemaking and decision-making are both highly dynamic, leading to decisions before sense is made, or creating conditions in which the making of sense is essentially the making of a decision.
Decision-making is changing, non-linear, and is not related to the preservation or resumption of a known equilibrium state.	Decision-making is normative and follows a traditional input-process-output (IPO) system that preserves or resumes the organization's equilibrium state.	In many contexts, organizational decision-making is accurately described by a complex adaptive system rather than a traditional "IPO" system.

Analysis of Secondary Source Data

As described previously, secondary sources were analyzed in two ways. First, sources of a general nature were reviewed for background knowledge about the affected communities, and general descriptions and stories related to the firestorm. These sources included government reports, media articles, and social media posts. Upon reviewing these sources, the researcher kept notes pertinent to the context of the case. These notes were routinely reviewed to prepare for participant interviews, as well as to contribute to the rich description of the phenomenon of interest.

A limited number of secondary sources were germane to this study's research questions, describing the contexts in which participants engaged in decision-making. As such, these sources provided insights about the external influences that decision-makers encountered. These sources, described in Table 6 in this chapter, were subsumed into the coding and analytical strategy used for primary sources. While some media articles described individual accounts that occurred during the firestorm and involved decision-making, the researcher deemed that second-hand accounts of were not credible enough to incorporate directly into this study's findings.

Research Validity

In this study, internal and external validity were addressed primarily within the qualitative research-related concepts of trustworthiness and transferability. The study's trustworthiness related to the degree to which others would find the results of the study believable, and transferability pertained to the extent to which this study's findings could apply to other contexts (Bazeley, 2013; Lincoln & Guba, 1985). The researcher addressed trustworthiness by attending to various forms of triangulation and researcher positionality. The

transferability of findings was attended to through thick, rich descriptions, case typicality and case diversity. Each is discussed further in this section.

Internal Validity: Trustworthiness

According to Merriam (1998), research trustworthiness is the extent to which “findings match reality” (p. 201). A key contributor to trustworthiness is the use of triangulation through the consideration of multiple perspectives (Denzin & Lincoln, 2011; Flick, 2014; Merriam, 1998; Stake, 2013; Yin, 2013b). Denzin and Lincoln (2011) proposed four types of triangulation: the use of different types of data sources (data triangulation); the use of different interviewers or observers (investigator triangulation), considering multiple perspectives (theory triangulation); and the use of different research methods—a practice often associated with quantitative research involving surveys (methodological triangulation). Furthermore, Yin (2013b) suggested the use of multiple data analysis methods yields a further dimension of triangulation: perspective triangulation. This study employed data, theoretical, and perspective triangulation to achieve trustworthiness.

The researcher used a combination of primary sources, secondary sources, and researcher journals to achieve data triangulation. As described earlier in this chapter, primary sources included individuals who made consequential decision for their organizations during the 2017 Northern California firestorm, and secondary sources involved official reports, media accounts, social media, video-recordings, and audio-recordings. Research journals were used to explore and develop findings, and to attend to potential researcher biases and assumptions.

Theoretical triangulation was used to add to the richness of the description and interpretation of several areas of the study. Sensemaking was considered within the contexts of both non-sequential and cyclical perspectives. Similarly, decision-making processes incorporated

both classic normative perspectives and more recent, naturalistic perspectives. A diversity of theoretical perspectives was used for the purpose of revealing rival theories and alternative explanations, yielding more robust outcomes than would a single-theory perspective.

The researcher sought to achieve perspective triangulation through the use of multiple data analysis techniques. Pattern matching was used to examine how identified themes and patterns compared with existing theory (Yin, 2013b). Logic modeling was used to examine how cause and effect relationships observed during the study compared with expected relationships based on existing theory (Yin, 2013b).

As suggested by Glesne (2006), the acknowledgement of a researcher's biases and perspectives—researcher positionality—contribute to a study's trustworthiness. By describing the researcher's positionality in Chapter one, readers of this study are provided with insights into potential biases and assumptions that could influence the study. Furthermore, a description of positionality explains reasoning behind the researcher's ontological perspective and corresponding methodology.

External Validity: Transferability

External validity represents the degree to which a study can apply to other groups or situations (Merriam, 1998). Lincoln and Guba (1985) have argued that in qualitative studies, transferability is an indicator of external validity, demonstrating the degree to which findings apply to other contexts. Merriam suggested transferability in qualitative inquiry is achieved through a rich, thick description of a phenomenon, typicality of findings, and diversity of findings. A rich, thick description of a phenomenon—as is intended in the case study method (Njie & Asimiran, 2014)—enables others to assess whether the findings relate to them. The typicality of findings pertains to how representative the study is to other people in the same class,

enabling them to make comparisons to their own situations (Merriam, 1998). Finally, the diversity of findings is intended to bolster the degree to which a range of the study's outcomes can be applied to other situations (Merriam, 1998).

To provide a rich, thick description of the overall case and phenomenon, the researcher described participant's decision-making contexts, challenges, influences, and used their own words to support findings. The researcher sought to achieve typicality by focusing on aspects of crisis decision-making that would likely be common among other groups, and intentionally steered away from lines of inquiry that would only be applicable in this study's specific "firestorm" context. Finally, diversity was sought through the use of the case study design, which considered multiple participant roles, perspectives, assumptions, and behaviors within the context of a common condition.

Threats to Research Validity and Reliability

In this study, participant retrospection and recall about past events presented potential obstacles to research validity and reliability. For reasons related to cognition and motivation, retrospection is thought to involve inaccurate interpretations about one's own past (Henry, Moffitt, Caspi, Langley, & Silva; 1994). People may not remember some things, or they may reinterpret the past in order to cast themselves in a more positive light (Henry et al., 1994), a phenomenon also referred to as "recall bias" (Blane, 1996). Although the event of interest occurred in 2017, attending to potential lack of recall and recall bias was intended to bolster the study's trustworthiness.

This study invoked several methods to account for validity threats related to retrospection and recall. First, the study involved landmark events, or experiences that individuals found significant. Research suggests landmark events can be recalled more accurately than less

significant events (Ericsson & Simon, 1984; Henry et al., 1994). In this study, recall was aided by the presence of three conditions essential to landmark events (van der Vaart & Glasner, 2011): (a) participants perceived that the event was important, (b) participants' memories of interest were related to the domain of inquiry, and (c) memorable events held significant personal implications for participants. Second, this study focused on critical incidents, which have been associated with effective retrospective analysis (Hughes, Williamson, & Lloyd, 2007). Flanagan (1954) characterized critical incidents as having significant impacts on an individual, or which involve "a major crisis or turning point" (Hughes et al., 2007, p. 2).

During participant interviews, the researcher incorporated four elements described by Hughes et al. (2007) to bolster retrospective analysis of critical incidents: (a) establishing the purpose of the investigation, (b) describing the situational context and relevance of the inquiry, (c) delineating the extent of data collection criteria, and (d) formulating categories and sub-categories of behaviors and other actions through data analysis.

As a primary means of ensuring research validity, the researcher focused on consequential decisions that were highly significant to each participant, and expected that the Northern California Firestorm would have been perceived as being personally significant because of its potentially severe outcomes. Second, Henry et al. (1994) suggested that a comparison of retrospective data with previously validated measures aids in the interpretation of retrospective data. In this study, the researcher used historical reports and other accounts to frame discussions in order to assist participants with recall and to verify the occurrence of various events. Third, Ericsson and Simon (1984) suggested that the quality of recall and retrospection can be increased through data gathering that mirrors the events being recalled. As such, the interview guide used in this study established a broad context of crisis decision-making,

and then addressed more specific issues that reflected the firestorm's sequence of events. Finally, De Leon and Cohen (2005) described the use of artifacts during interviews as effective in eliciting recollections during interviews. Such objects are thought to focus interviewers on the topic of interest and trigger buried memories (De Leon & Cohen, 2005). In this study, materials were anticipated to include maps, pictures, or objects that were relevant to the participant and the event. As suggested by De Leon and Cohen (2005), where such objects were thought to be relevant, participants were asked to discuss their importance.

Chapter Summary

Chapter three outlines this study's purpose, underlying philosophy, research design, and methods. A qualitative methodology was used to enable an in-depth exploration of the topic of interest. A holistic single case study method following Merriam's guidance was used to support exploratory inquiry and to answer "how and why" research questions. In addition to a comprehensive review of secondary sources, the study involved fifteen participants identified through purposively sampling. Researcher journaling was undertaken to support the development of findings and to address potential researcher biases. The common context bounding the case was the 2017 Northern California firestorm; an event in which numerous organizations experienced extreme crises.

To bolster trustworthiness, this triangulated multiple data sources, theories, and data analysis methods. Furthermore, researcher positionality was described. Inaccurate or revised participant recall of factual events were identified as obstacles to validity and were attended to through data triangulation and a focus on landmark events. The critical incident technique and focused interviewing strategies were also used to support the trustworthiness of the study's

outcomes. Transferability of findings was attended to through a thick, rich description of the phenomenon of interest, and by emphasizing the typicality and diversity of findings.

The next chapter describes this study's key conclusions. The structure of the findings is organized in alignment with the study's research questions. Other findings which fell outside of the study's framework are also discussed.

CHAPTER 4 – FINDINGS

Introduction and Structure of Findings

This chapter presents the results of this study as they correspond with each research question. The chapter begins with an overall summary of key findings and is followed with a more detailed description of the findings.

Overview of Key Findings

The findings in this study are intended to either answer each research question, or to add to the understanding of OCDM in relation to each research question. In this section, each research question is stated, and is followed by an overview of findings. Following this section, more details about each of the study's findings are provided.

Main research question: How do people make decisions during organizational crises?

This study's findings suggest that within severe VUCA (volatile, uncertain, chaotic, and ambiguous) contexts, the nature of decision-making often deviates from predictable, normative processes described by traditional input-process-output (IPO) system models. Rather, organizational crisis decision-making frequently reflects the characteristics of a complex adaptive system. This finding is consequential in that decision-making theory and research have predominantly adopted normative frameworks that are consistent with IPO system models. This finding is suggested as being over-arching because it pertains to all aspects of decision-making. Furthermore, this finding suggests various implications for theory and research, as described in Chapter five.

Sub-Question 1: What are the primary contextual factors that influence decision-making during organizational crises, and do some have more significance than others? If so, why?

This study's findings suggest that five primary contextual factors influence decision making.

Each contextual factor is identified and briefly described.

1. Cohesion and trust among group members. Based on how people perceive trust and cohesion among members in their groups, those perceptions can affect the degree to which they are willing to make decisions.
2. Self-perceptions. People form strong connections between themselves and the roles that they fill, which influences how they make decisions. People also tend to project their own traits and attributes onto problems that they encounter, which affects their decision-making behaviors.
3. Past experiences. While research has suggested that similar past experiences serve as frames for making time-constrained, highly consequential decisions in the present moment, people can refer to dissimilar past experiences to form decision frames.
4. Time pressure. Research has traditionally linked decision-making time constraints with heightened stress levels. However, in protracted crises, the absence of time constraints was found to raise stress associated with decision-making.
5. Social factors. When making consequential decisions for an organization, potential impacts on family, friends, organizational members, and community members are important influences.

Among these contextual factors, influences related to self-perceptions were found to present the greatest degree of significance. Whether as a lone contextual factor or in combination with other factors, self-perceptions were found to consistently influence decision-making. This finding supports the observation that when making decisions, "utilitarian and social gains are important, but you have to live with yourself" (Janis & Mann, 1998, p. 9).

Sub-Question 2. What sensemaking frameworks do people employ during organizational crises, and why?

This study did not yield compelling evidence explicating how and why decision-makers adopt various sensemaking frameworks during an organizational crisis. However, the study did suggest that in highly complex situations, people are apt to commingle sensemaking and decision-making. The fusion of sensemaking and decision-making may in part be due to the complex and adaptive nature of crisis decision-making, in which assumed linkages between decision elements become non-linear and entangled.

This study also suggested that participants frequently made sense of organizational crises based on how much control they believed they could exert over various situations. While contemplating numerous consequential situations, some participants tended to focus on those problems which they felt they had some degree of control, while paying less attention to those that they felt they could not control. In this way, they made sense of situations within the scope of what they believed they could influence. Furthermore, participants' focus on problems that could be controlled served to mitigate decision-maker stress.

Sub-Question 3. What types of decision-making strategies do people engage in during organizational crises, and why?

This study found that participants engaged in differing decision-making strategies, largely for reasons concerning time availability and problem complexity. When participants were faced with severe outcomes and very little time to act, they frequently adopted a modified form of naturalistic decision-making. Consistent with naturalistic decision-making, they recalled past experiences from which they were able to derive viable courses of action. However, past experiences were not highly similar to the real-time challenges that they faced, as would be

expected within the context of naturalistic decision-making. In other instances, when some participants faced complex circumstances while not under strict time constraints, they tended to reframe multi-dimensional predicaments into a sequence of smaller, more approachable problems.

Sub-Question 4. How and why do decision consequences influence ongoing decision-making?

Within the complex and dynamic conditions that participants encountered, their decisions often changed their environments rather than reducing the quantity of problems requiring decisions. Because conditions were frequently complex, and because the various facets of the crisis environments were so entangled, the consequences of participant's decisions often generated new dynamics within their environments. As such, the outcomes of decisions often created new decisions to be contemplated.

The consequences of decisions were also found to relate to the ways in which participants reflected on, and learned from, their experiences. Consequences associated with quick and resolute decisions that were made in the early phases of the firestorm largely reinforced decision-makers' perceptions about these problems, suggesting a single-loop learning model. In contrast, the consequences of longer-term decisions tended to alter participant's views of the problems, suggesting a double-loop learning model.

Detailed Discussion of Findings

This section more fully discusses findings related to this study's research questions. Each research question corresponds with an element of the study's *a priori* conceptual framework. For each research question, findings are preceded with a table describing the coding progression that led to key themes. Selected participant comments are provided as evidence of findings. In some

instances, comments were assigned to multiple findings or multiple framework elements. For instance, P7's statement, "I had been trained...for a disaster situation, so it's like, okay, let's think through what we'd probably need to do" is related to categories concerning both past experiences (a contextual factor) and a sequential problem-solving (a decision behavior). The multiple relationships between some comments and framework elements mirror the complex nature of crisis decision-making, a topic further discussed in Chapter five. To contribute to a thick, rich description, many findings are preceded by brief introductions that provide a semi-narrative backdrop to the participant comments.

Main Research Question

The main research question asked in this study was: How do people make decisions during organizational crises? The key finding associated with this question suggests that during crisis contexts involving extreme chaos, change, and unpredictability, decision-making can be characterized as a complex adaptive system. This finding is significant in that it departs from traditional perceptions of crisis decision-making as a normative process that can be described within a traditional input-process-output (IPO) system model. Table 10 includes this finding's open and a priori codes, axial codes and categories, and key themes. Following the table, findings associated with key categories are further described.

Table 10

Main Research Question: Codes, Categories, and Key Theme

<i>A Priori</i> and Open Codes	Axial Codes/Categories	Key Theme
Changing conditions*		
Event speed	<i>Chaotic and changing conditions:</i> Some people perceived a sense of disorder and confusion. Environmental and contextual factors, and the relationships between them, were dynamic	OCDM transpired as a complex adaptive system
Chaos		
Complexity		
Changing problems		
Resulting outcomes and new normals	<i>An unstable organizational equilibrium:</i> The natural state of the organization changed temporarily or permanently	
Uncertainty		
Uniqueness		

*Indicates a priori code

Discussion

*P2: I mean, it'd be just complete **chaos***

*P9: It was the **perfect bait and switch***

*P14: Things kept **changing***

Themes and patterns that emerged in this study suggested that for several participants, OCDM transpired as a complex adaptive system (CAS). Participants described these phenomena with terms associated with CAS: “chaos,” “change,” and “unpredictability” (Lansing, 2003; Schneider & Somers, 2006). Researchers have discussed CAS in terms of systems that are comprised of interactive environments and independent agents (Ng, 1998). Palmberg (2009) described CAS environments as those in which interacting agents must constantly adapt. This study’s environment consisted largely of the firestorm and its related contextual factors, while independent agents involved people and groups internal and external to participants’ organizations. Because of the way the fire’s behavior changed, the nature of the relationships between agents was unpredictable and constantly changing. Similarly, decision factors within the changing environment were subject to the same patterns of change and unpredictability.

Chaotic and changing conditions.

A majority of the participants described OCDM conditions as being chaotic and changing. Chaotic and changing conditions were described by participants as involving the fire's unpredictability, a lack of information, changing social forces, the disruption of public infrastructure, and people behaving in unexpected ways. These conditions translated directly into changing and unpredictable risks to the participants and their organizations. Each aspect is further described in this section.

The chaos and change involved with the firestorm was most often ascribed to the highly dynamic and unpredictable nature of the fires' behaviors, largely because the fires began and grew in arbitrary and erratic ways. P9 described the arbitrariness of the fire's destructive nature on the first full day of the firestorm, resulting in a hazy understanding of how resources might best be allocated. P4 described the high degrees of uncertainty and inability to make sense of conditions as a by-product of the fires' unpredictable behavior. These comments were highly reflective of other participants' sentiments about the firestorm and their ability to understand conditions:

P9: the timing was chaotic. ... If somebody was controlling this fire, it was **a perfect bait and switch**, right? So, the Tubbs fire starts and all the resources go up to the Tubbs fire ... It was just enough time to get that shift up there...about an hour. And then the Atlas fire starts. And there's now only limited resources here.

P4: There wasn't an awful lot that I could do or anyone else could do. I mean, we were so much **at the mercy of the winds**. I mean, you had this convergence of the perfect storm...

Beyond the fires' rapidly changing behavior, participants commented that the scarcity of information contributed to chaotic conditions. Participants and secondary sources suggested problems with information-sharing were ubiquitous throughout the region (North Bay/North

Coast, 2018). P11, P2 and P13 described how the lack of information contributed to the sense of uncertainty and chaos:

P11: I think there's that sense of well **you don't know, you just had to wait** and see what came out of it.

P13: So, it was a lot of chaos because nobody really knew what was going on. Just not enough information and dissemination. There's too many unknowns....no one really knew anything.

P2: And I mean, **it'd be just completely chaos**, so the only thing we could do as an operator of this facility, is being very vigilant because there was no warning from anyone.

Furthermore, participants commented that the absence of critical infrastructure contributed to their perceptions of uncertainty. In this study, critical infrastructure involved electricity, water, transportation, and telecommunications. Electrical outages impacted organizational operations. The lack of water impeded fire prevention measures. Transportation disruptions prevented people from accessing areas at which they felt they could be most effective. Telecommunications outages contributed to uncertainty, as information was scarce and difficult to share. The conditions created by infrastructure disruptions were described as contributors to the abnormal and chaotic conditions imposed upon their participants' organizations.

As described earlier in this section, within complex adaptive systems, various people and groups are viewed as independent agents. Participants described how the unpredictable interactions between agents contributed to change and chaos. The independent agents in this study involved participants, their organizations, work groups, institutions, family members, friends, communities, social connections, politicians, and others. As examples of these interactions, P1 commented the reactions of staff members and clients contributed to an environment of change and unpredictability. And similarly, in the aftermath of the fires P2 and P8 described how external agents added to the chaotic nature of decision-making. P14 described

the uncertain and changing nature of rebuilding, a situation that was faced by six of the participants' organizations.

P1: And so, um, some of the ... **staff were panicking**. They didn't know what to do.

P2: You tell a sub[contractor] ... you can work up to 2:00. And **they don't show** the whole week. They got somewhere else to go.

P8: It was **pretty chaotic**. Especially with the politicians not giving us clear directions. **We spent hours and hours a day** on conference calls **and couldn't nail them down** on clarity. That hindered us greatly.

P14: It's been difficult to try to find the permits and a place that could get the permit to have the facilities. So, we were counting how many...which version we were on and you know which scheme A to B to C, you know. I think we're now on, on G ... And, and some of it was just **things kept changing**.

An unstable organizational equilibrium.

Complex adaptive systems diverge from traditional IPO systems in that they do not assume stable states of organizational equilibria. While the components of a classic system would seek to either maintain or return to a pre-existing equilibrium, a complex adaptive system can evolve into new state. As described by participants in this study, new states of organizational equilibria took many forms. Some firefighters described that newly encountered conditions as temporary "new normal" states that portended unknown implications for their organizations. Several participants described temporary equilibrium states while organizational members were displaced from damaged or destroyed building. Still, other participants found opportunity for beneficial change in the midst of crisis. Participants' sentiments about changing equilibrium states were reflected in the comments of several participants:

P8: Then [400 people] go to other sites, And that was very difficult ...There are **different rules, different cultures, different ways of going**. Each of these notions had to be confronted.

P7: We've had this horrible thing. Now **what do we do to be better?** To be back. To go forward.

P4: This is probably one of the most devastating events that the [organization] has faced in 200 years and at the same time as a **clarion call for why it exists in the first place**.

In limited instances, the firestorm's destruction was described as presenting an existential threat to participant's organizations, throwing into doubt whether it could continue in a similar form. In these cases, decision-makers faced the likely prospects of new organizational locations, structures, ownership, employees, services, and customers.

Summary.

The types of change and chaos described by the participants were wide-ranging, suggesting highly dynamic and unpredictable conditions in several contexts. Moreover, these participants also made decisions within the midst new equilibrium states. For the participants who experienced these conditions, decision-making experiences were characterized as being complex adaptive systems.

Sub-Question 1: Contextual Findings

The first sub-question asked in this study was: What are the primary contextual factors that influence decision-making during organizational crises, and do some have more significance than others? If so, why?

Findings related to this question yielded six key themes: (a) group member trust and cohesion, (b) self-perceptions, (c) personal well-being, (d) past experiences, (e) time influences, and (f) social factors. Table 11 includes examples of *a priori* and open codes used to analyze this element, as well as axial codes and categories, and key themes. Each theme is further elaborated upon in this section.

Table 11
Sub-Question 1 - Contextual Factors: Codes, Categories, and Themes

<i>A priori and Open Codes</i>	<i>Axial Codes/Categories</i>	<i>Key Themes</i>
Cohesion and trust Leadership and management Organizational culture Organizational effectiveness Time in the group	<i>Group cohesion; Group member trust; Psychological safety:</i> the presence or absence of group cohesion and trust can influence peoples' sensemaking and decision-making.	Cohesion and trust among group members
Clarity Commitment Control Love of the job Personality/demeanor/style Pride Stress response*	<i>Participant Roles:</i> Various types of role-based identities and temporarily adopted "mode identities" which can influence peoples' decision-making. <i>Participant Attributes:</i> demeanor, personality characteristics and other observable behaviors which can influence peoples' decision-making. <i>Mode identities:</i> Temporary roles and attributes that are adopted based on transient and situation-based conditions	Self-perceptions
Anger Calm Home loss/damage Human/animal safety Initial impacts Luck Physical, emotional, and psychological health Stress response*	<i>Personal impacts:</i> Fire-related impacts on participants' health, homes, health, family, animals, close friends. <i>Decision inhibitors:</i> Firestorm impacts that prevented participants from engaging in organizational decision-making.	Personal well-being
Comparative retrospection Outcome mitigation Past experiences*	<i>Participant and organizational history:</i> Various types of past experiences can influence how people engage in sensemaking and decision-making.	Past experiences

Aftermath	<i>Time pressures; time uncertainty:</i> Various types of time influences can factor into how people engage in sensemaking and decision-making.	Time influences
Immediacy		
Imposed timeline		
Time pressures*		
Community	<i>Organizational member relationships; external party relationships; community member relationships:</i> Various types of relationships can influence how people engage in sensemaking and decision-making.	Social factors
Existing relationships		
Politics		
Stakeholder pressure		

**Indicates a priori code*

Cohesion and Trust Among Group Members

P4: Trust...with it you can do so much. Without it... everything is suspect.

P11: We had a great crew...And so you garner that strength.

P8: I'm not part of the inner circle.

The degree to which participants trusted group members and felt a sense of cohesion within those groups emerged as an unexpected but common decision factor during this inquiry. Participants who described the presence of group cohesion and trust indicated that they felt a sense of confidence in members, and were willing to make decisions, even when unsure about the outcomes. P4 succinctly encapsulated perceptions about the importance of this influence:

P4: I think there's another piece that it's attached to this and to other organizations that can respond effectively in times like this...which is trust. And with it you can do so much. Without it I mean, everything is suspect. Everyone's at blame. [It is] such a big piece here.... not just **informs how I lead and make decisions**, but because **it's part of the fabric of I think, who collectively we are.**

In some instances, although members did not know each other well, conditions of trust and cohesion were assumed. For example, due to the scale of the firestorm, 351 firefighting entities were involved in the response (Rossman, 2017), totaling approximately 11,000 individuals (Harms, 2017). In this environment, P9 observed how an assumed bond with other

firefighting entities provided positive working relationships and were conducive to making decisions. While the reasons for the assumed bonds were not explored in depth, the context of the statements suggested the presence of institutional trust and cohesion:

You recognize a lot of people who don't ever wear name badges. So, I know this person, I've worked with this person, I've trained with this person. I probably should know his name, but I don't. But I know him well enough to have a working relationship with him. **So, I felt comfortable in that ... so, we had already developed a team.**

Among different participants, the sense of cohesion and trust was described at different levels: groups, organizations, institutions, and communities. One participant highlighted member trust in the organization's leadership group. In this instance, P15 pointed out that the cohesion of the group and the trusted support of management helped in navigating decision-making. P15 stated "99% of the decisions were not stressful" due to the participant's sense of trust and confidence in senior management. Another participant, P1, described the importance of trust and confidence at the group level:

P1: It played a major part that **they knew who I was. They knew what kind of person I was.** For the most part, everyone here knows each other very well and they know that...me personally.

For some participants, particularly those who were new in their roles or organizations, the absence of trust and cohesion were described as impeding decision-making. P8 provided two examples of this condition. P8's first comment described how being new to the organization created a perceived decision-making deficit, and P8's second comment touches on the realities of crisis situations, during which abnormal conditions cause organizational members to interact with different groups in different ways:

I was hired [very recently]. I didn't know almost anybody in the organization...I didn't know anybody. **I was working from a deficit...I'm not part of the inner circle ...** that was difficult.

There are different rules different cultures different ways of [doing things]. Each of these notions had to be confronted. It was hard on the [employees] and **it was probably hard on me because I was new to everybody and everything.**

Summary.

A common theme among participants as they engaged in OCDM was the influence of group member cohesion and trust. Participants suggested that group member cohesiveness and trust influenced participants' confidence that decisions would be supported. Some participants implied that high levels of group cohesiveness gave them a sense of confidence in making decisions. Furthermore, participants described that group cohesion reduced anxiety about making "the wrong decision." Participants who described low levels of cohesion and trust among members appeared to have experienced higher levels of anxiety, uncertainty, and hesitance in making decisions.

Self-Perceptions

This study suggested participants' self-perceptions were significant decision-making influences. Participant comments indicated that two aspects of self-perceptions were salient: decision-maker roles, and decision-maker attributes. Each are discussed further in this section.

Decision-maker roles.

Participants suggested during the firestorm, they closely identified with a myriad of roles that influenced their decision-making. Types of roles included those of leaders, family members, change agents, friends, and others. That several participants identified closely with their roles may in part be explained by opportunities for enhancing self-esteem: rescuing people, protecting property, protecting member well-being, restoring organizational operations, and others. Table 12 provides examples of the types of role-identities described by participants, and their implications for decision-making.

Table 12

Examples of Participants' Role Identities and the Nature of Impacts for Decision-Making

Participant	Role Identities	Nature of Impact on Decision-making
P1	Leader, mentor, organizational family member	Decision emphasis on care for staff and clients, with consideration for individuals needs
P3, P4, P6	Leader, family member	Changing decision focus between family and organizational needs
P7	Leader, change agent	Decisions designed to introduce organizational changes
P9	Leader, difference maker	Decisions regarding firefighting and rescue tactics and strategy
P14	Head of organizational family	Decisions emphasized benefit to members over participant self-interest

As an example of how one participant's leadership identity influenced decision-making, P7 described the role's wide-ranging implications concerning member engagement, communication, organization, delegation, and organizational improvements. As such, the role was described as significantly influencing the way decisions were made, and provided insight into types of decisions that were deemed important:

The first major obstacle was to get my community at large to understand that **I was in charge** and that I needed to set a direction and get steps in place and then **engage people** as to how they **could help them forward** ... So, standing, **taking my leadership responsibilities**, and **putting them out there** and then organizing who I needed to put forward first and then moving and then getting going on a plan, whatever that plan was ... **Maybe it's my leadership style**. I am not the kind of leader that needs 43 people doing my job. I felt like I engaged the people around me ... I'm going to have to make some decisions about what we're doing and not doing and who's doing what as we move forward. ... It's **also for me and as a leader, it's an opportunity** to really look at the structure you have in place for how you are leading; How is the business working, not working and should you make changes now?

Other participants described different roles during the firestorm. For example, P1 alluded to the filling a role of "family member" within the organization. P1's role-identity implied

feelings of personal responsibility for organizational members' lives and well-being, much as a traditional family member might experience. From a decision-making standpoint, P1 took initiative concerning decisions to evacuate staff and clients during the first hours of the fire. For other participants, traditional family member roles significantly influenced their decision-making, as participants had to balance family concerns with those related to organizational matters.

Decision-maker attributes.

An emergent pattern in this study revealed that participants demonstrated a high sense of self-awareness concerning their personal attributes and characteristics. Participants' comments about their own characteristics explicitly or implicitly evoked such attributes as: analytical, type-A, calm, optimist, calm, engineering mindset, organized, instinctual, unexcitable, and competitive. Table 13 provides examples of the ways in which people explicitly or implicitly described how they viewed themselves. While these attributes tend to suggest positive forms of self-perception, it is foreseeable that further examination of this matter might reveal other types of personal attributes.

Table 13

Examples of Participants' Personality Attributes and Impacts on Decision-Making

Participant	Demeanor, Personality Attributes	Nature of Impacts on Decision-making
P1, P15	Compassion	Individual member, client care considerations were integral to decisions
P3, P13	Calm, Analytical	Sequential and measured analysis and decision selection
P4	Deliberate	Decisions emphasized long-term member well-being
P7	Type A	Ambitious and bold decisions guiding the organizations future
P9	Passion	Decisions reflected a persistent optimism about what the group could accomplish
P14	Unselfishness	Decisions occasionally sacrificed personal well-being in order to promote the interests and well-being of organizational members

Participants shared that these personality attributes were instrumental in how they went about making decisions, as well as influencing the decisions that they made. For instance, P3 described personality attributes of remaining calm and unexcitable, even during stressful situations. P3 further implied that these attributes enabled a rational and analytical approach to decision-making, even as fires burned toward the facility. When asked about how P3 arrived at multiple decisions, P3 responded “They were just obvious”; suggesting that an analytical approach to decision-making simply led to a logical conclusion. Similarly, P13 described a tendency to adopt an “engineering” mindset and manner during unexpected situations. In working through critical decisions, P13 described how the engineering mindset played into the decision-making process.

Stay calm, figure out the problems, keep going through to the solution, solve it, fix it.
And I tend to have more of an engineering mindset so it's very logical for me.

P2 implied that earlier life experiences as a professional athlete influenced P2's self-perception. This experience appeared to contribute to P2's personality traits as being competitive and determined, and as such appeared to perceive that obstacles presented by the fires were merely challenges to be overcome. This was implicit in comments made about the decision to re-open the facility two months prior to a timeframe suggested by insurance adjustors:

It was just a march toward that [schedule]. There was nothing ever like, oh, we, you know, coulda, shoulda, woulda or, or, you know. It was very singular in our direction... what had to happen.

Temporary roles and attributes: mode identities.

Several participants described that in some instances, circumstances caused them to temporarily adopt roles or attributes that guided their behaviors and decision-making: these were described as "modes." Participants implied that temporary modes served as transient attributes and roles that framed decisions. For example, P9 described how personal connections caused difficulties disconnecting work priorities from needs associated with personal relationships. To manage potential conflict over personal connections, P9 commented that a "business-like" mode was adopted as a way to achieve separation from personal influences. In this way, P9 was able to concentrate on assigned responsibilities and their associated decisions:

I wanted to help...at least give them information ... It was, it was "[P9]: is a friend" ... so that was a little less business-like ... So, I did have to temper some, I don't know what I want to call it, **like business-like, you get in the mode.** I kind of had to get in ... **mode**, like very curt, matter of fact, you could almost call it rude to a certain extent. I couldn't do that with those people [friends], but I still had to be firm.

In another example related to a more formal sense of mode, P5 and P6 discussed that traditional firefighting strategies were abandoned due to the fires' extraordinary amount of destruction. In this instance, the participants were compelled to adopt a "rescue mode" behavior

and role instead of the traditional “extinguishment mode”. P6 described this condition as highly unusual, and that the mode was not adopted naturally or easily. P6 implied that this abnormal mode presented decision-making difficulties such as heightened stress, complexity, and uncertainty.

I've been in the fire service for about 34 years. I had never heard dispatch say on the radio to all responding people that it's a **rescue mode, not extinguishment mode**. So that was, **that was a different animal**. ... They were pretty much surrounded by fire at that time. And like I said, they were in **rescue mode**. ... So, it would be just bump and run, you know, from house to house. So yeah, a **very hard mode to go into**.

Participants stated or implied several types of modes: crisis mode, triage mode, business-like mode, theory-X mode, event management mode, rescue mode, and others. While these modes were diverse in nature, they appeared to consistently act as attributes or roles that guided how participants went about decision-making. Participants' comments suggested that these modes were latent aspects of their self-identities, triggered as a result of transient real-time conditions. Table 14 provides examples of temporary mode identities, and implications on decision-making.

Table 14
Examples of Participants' Temporary Mode Identities

Participant	Modes	Nature of Impacts on Decision-Making
P4	“Theory X”	Behavior diverged from a natural tendency to engage in participative decision-making to a more directive style
P5, P6	Rescue mode	Decisions reflected new strategies and tactics that were abnormal for the organization
P8	Crisis mode, Triage mode	Adoption of a new mental model in which normal operations and assumptions were abandoned, and during which only vital decisions would be addressed
P9	Business-like mode	Introduction of a sense of distance between the participant and social connections as a way of maintaining a disciplined approach to decision-making
P15	Crisis mode, Event management mode	Differing perceptions on the condition of the organization and the nature of how decisions were perceived

Summary.

In this study, participants suggested that various aspects of their self-perceptions were influential factors in their decision-making. Aspects of self-perception included both the roles that participants held, as well as attributes that characterized participants. Furthermore, participants described temporary modes relating to their roles and attributes, affecting decision-making in a more transient manner.

Personal Well-Being

Findings suggest that despite this study’s focus on organizational decision-making, participants consistently perceived decisions related to personal concerns as a top priority. Types

of personal concerns identified by participants included personal safety, family safety and health, home destruction, home evacuation, physical and emotional strain, and animal safety. For the purposes of this study, these were classified as types of impacts within a theme designated as “personal well-being.” Participants consistently commented that decisions related to personal well-being were a top priority during the early stages of the firestorm. This finding suggested participants either considered matters of personal well-being to be a top priority due to the nature of their consequences, or they realized that they could not attend to other organizational matters until personal matters were resolved. Comments offered by P7, P4, and P3 were indicative of a common sentiment among participants who faced personal impacts.

P7: So, at the start, **at the start it was definitely personal.** I mean, the first twenty-four hours.

P4: We were awakened at about midnight by the incessant banging on our front door and my wife and I woke up ... And uh, the guy across the street came over to wake us up and said there’s a wildfire that just crossed [the highway], and it's coming right down our street. Get out of here as fast as you possibly can ... And **we ran for our lives. And at that point I wasn't thinking about the [organization] at all.**

P3: We knew we were going to get back to business, we didn't know when. Yeah, you know, I think our concern was more for the county and for people and obviously, you know, our home **from a personal standpoint, um, and just trying to, you know, when are we going back to normal life.**

This finding was not unsurprising when thinking holistically about participant experiences. However, it was surprising that within a study which was explicitly focused on organizational decision-making, every participant that faced significant personal consequences included those decisions within the context of organizational decision-making. These comments suggested that participants tended to view matters of personal well-being with the context of organizational concerns. This implications of this finding are further discussed in Chapter five.

Past Experiences

Participants indicated that past experiences played a part in how they perceived current firestorm conditions and how they engaged in decision-making. In some cases, participants used dissimilar past experiences to guide their understanding of real-time circumstances, as well as framing decisions about courses of action. While this was true for general types of sensemaking and decision framing, it was not true for specific tactical decisions.

Six participants described that they had experienced previous natural disasters but stated that the scopes of those disasters were limited in comparison to the extreme nature of the 2017 firestorm. For example, P7 described how the perception of past experiences informed current circumstances:

I was a head of [an organization] when the Oakland hills fire occurred, which was another terrible disaster. I was in another ... leadership role in the 1989 earthquake occurred. And then I was also head of another [organization] on the peninsula when [the] gas fire happened ... **So those would be disaster experiences** that I was actually working when those things were happening. And how to...**what do you do first?**
Second. Third.

When participants invoked aspects of very dissimilar past experiences, they tended to apply only some relevant aspects of those experiences to current conditions. This was demonstrated in participants' recollections of non-crisis experiences that they found demanding. In these instances, participants appeared to judge that conditions experienced in the past were relevant enough to apply to the current crisis, despite the different nature of the experiences. Participants described these types of past experiences as demanding, but not as crises. Because of the indirect relevance of these past experiences, participants tended to be selective about how experiences were perceived to have informed decision-making. In doing so, they identified relevant aspects of the past events that could be applied to current conditions. For example, P1

described how experiences as a volunteer were employed as a means of decision-making and problem solving during the fires:

I'm a [volunteer]. We do a lot of event planning and **there is a lot of delegation** that is involved when we do have events and sometimes the time is getting closer and they're still **a lot of stuff to do** and I think that I did get into this ... mode to where it's almost like **this is an event that has to get done at this time.** We don't have a lot of time and there's still some things that need to get done...So yeah, I just got into this leadership role, which... **I'm drawing on that experience...**

Some participants described recollections of past experiences in a manner evocative of iterative sensemaking. In these instances, participants indicated that their interpretation of data emerging from past events changed as the firestorm evolved. P3 described an example of such an instance. During the first few hours of the firestorm, P3 also recalled memories of another fire event in Oakland. In this case, P3 suggested that a seemingly similar past event evolved to become quite different, putting a significantly different complexion on the decision-making environment:

...this is fire weather, **this is just like what happened in Oakland.** [But over time], **this was very different.** I mean the conditions that started were the same, the hot dry fall weather condition that we get. But [in Oakland] it wasn't this sort of extended anxiety of, when is this gonna be over? You know, when, when does the risk go away?

Summary.

In discussing the relevance of past experience on decisions made during the 2017 firestorm, participants described several types of past events. Some events were vaguely similar and provided a framework for decision-making. Other past experiences were entirely dissimilar but contained elements that could be selectively applied to current decision-making. These recollections support the concepts related to retrospective sensemaking, during which people scan experiences, even dissimilar ones, for salient cues in order to make sense of current

conditions. Furthermore, comments revealed that participants engaged in iterative sensemaking by reframing conditions as new data emerged.

Time Influences

Participants in this study consistently indicated that the presence or absence of time constraints influenced their decisions. Severe time constraints affected short-term decisions such as evacuations, rescue operations, and property protection. Unexpectedly, some participants recalled that time uncertainty, or the absence of time constraints, was a significant contributor to decision stress. Both types of time influences are discussed further in this section.

Time pressures.

As expected, participants explained that time pressures presented the need to rapidly make or adjust various tactical decisions, such as how to fight a fire, whom to rescue, what property to protect, or how to evacuate people from an area. The sources of time pressures were primarily associated with the early phases of the fire, when it was burning most erratically and presented the greatest potential for harm. Consequently, the types of decisions subject to these time pressures tended to be related to initial actions taken in response to the fire: rescue operations, evacuations, and the protection of assets. P1, P2, and P6 described how the fast-moving fire and changing conditions forced rapid decisions concerning the protection of employees' and clients' lives.

P1: At the time it was so fast... **I just wanted to get everybody out as soon as possible**.... just in case. Yeah. We weren't even told to evacuate. I said, I'm not going to wait. **Let's get outta here.**

P2: But **at the time it was so fast** that mean, I mean, yeah, we did the plan.

P6: Well that report kind of validates what we were seeing and what we're thinking. We had no idea how fast. It was heading over towards Sonoma County. Then we started hearing reports on the radio that it's already to this point, **it's really hard to believe it was going that fast. So that was a very unique situation.** So, in a case like that, do you

respond to calls, or are you making more strategic decisions about where the fire could go?

Time uncertainty.

Of greater interest was the degree to which an absence of time pressure, or time uncertainty, generated participant stress, as this was unexpected. These situations were associated with the aftermath of the firestorm and the long-term recovery processes endured by participant organizations. These processes tended to center around building repairs, reconstruction, and re-occupation. Because of the uniqueness and extreme consequences of the fires, various administrative systems designed to support recovery activities were often both ill-understood and overwhelmed. For example, P14 described how a lack of information about rebuilding contributed to time pressures. In this instance, the inability to understand rebuilding requirements impeded P14's ability to make timely and high-quality decisions about how to rebuild the organization's facility. One example provided concerned rebuilding permit processes:

I didn't understand the permit process that was going to have to go on with the city or the county. It's been difficult to try to find the permits and a place that could get the permit to have the facilities. So, we were counting how many...which version we were on and you know which scheme A to B to C, you know, I think we're now on, on G.

Similarly, P4, recalled a perception shared by several other participants who faced long-term recovery challenges in the wake of the firestorms' aftermath:

There's a period, it's like a ghost town right now in parts of [the town]. And all the lots have been cleared...that took about six months...But that's over. And what they found out after all the cleaning occurred, many of the plastic pipes that were delivering water melted. Polluted the water. And so, **you've got thousands of people that are caught in this no-man's land. Literally being unable to rebuild and being unable to sell** and they're still contending with all the insurance issues. They got kids trying to figure out where to go to school. **Its crisis...the crisis continues.**

Summary.

Participants shared differing views of time pressures associated with crisis decision-making. These pressures were experienced in two ways: threats that required immediate

decisions, and uncertainty about unbounded timelines associated with long-term recovery decisions. Both of these types of pressures were described as stress-inducing. While literature has tended to associate stress with severe time constraints, this study has found the absence of time constraints can also cause stress and influence decisions.

Social Factors

Participants in this study described social factors as significant within the context of better understanding conditions and implementing decisions. Types of social factors involved connections with organizational members, external organizations, and community members. Each of these types of social connections is further discussed.

Organizational member relationships.

Participants consistently described the importance of their organizational members as a factor in their decision-making. These social factors typically revolved around decisions concerning member safety and well-being. Without exception, every participant organization had members who had experienced significant personal impacts, both in the early phases of the firestorm, and during its aftermath. Several participants described a sense of responsibility for organizational members, and the importance of the decisions that could affect them:

P8: I guess the other considerations were for the employees that lost their homes. We were trying to be considerate. **Our decisions affected everyone in our organization.**

P4: Primarily [decisions were] to provide a source of community and **connectivity and caring** right at a time when people were feeling very threatened in isolated.

P3: Fortunately, none of our staff lost homes, but just trying to keep track. We had a couple of people who went through some real close calls during the week. And so, **staying in touch with them.**

Concerns about member well-being were uniformly described as significant influences on decision-making, suggesting that participants perceived member well-being as an important aspect of organizational crisis decision-making.

External party relationships.

As a component of social factors, several participants indicated that relationships with external parties influenced decision-making. In this study, external parties represented people or groups which were not members or constituents of the participants' organizations. External parties included government agencies, local businesses, and various types of service providers. Participants shared that interactions with external organizations influenced decision-making in various ways: some external organizations provided information, and some provided assistance. Several participants described examples of the significance of the support they received from external organizations:

P13: We were able to work with PG&E. We worked with their governmental affairs coordinator person. We were able to get elevated on the repower effort.

P7: So, FEMA reached out to us and our [executive] was able to make a contact with someone locally in San Francisco that then got us to our right FEMA representative...and he said, "great, we're here for you."

P14: [The insurance services] were incredibly helpful, you know, because I mean, like they know me ... They were like, you might need to do this, do you need to take care of this? How can we help you get this going? So there, there was a lot of, of help that we had.

P3: My friend who's a fire chief here at the station was sort of a go-to...he's part of a circle of friends. Our kids all grew up together, so he was, he was on the receiving end of constant phone calls. We were trying to get updates.

Community member relationships.

Because of the extent of damage sustained by Napa and Sonoma counties, their communities were severely impacted. Participants commented that, as a result of the fires, fabrics of the local communities were strengthened, creating a constructive environment in which decisions could be made and enacted. The environments were described as those in which the communities were highly supportive of the participants and could provide assistance with the

implementation of various activities. Comments made by P6 and P7 demonstrated this perception:

P6: A local grocery store, for example, just left the key. "Take whatever you need." Which we took advantage of. We took inventory of everything we took. We kept all the receipts and reimbursed them, but they didn't care about that.

P7: Our strength has been in this feeling of community that no matter what we were going to hang together and not give up and push forward. And that's helped us tremendously, and not get caught in the "I can't do anything" state.

P6 further described how a sense of commitment to the community directly influenced decisions involving where to deploy firefighting resources. In this case, the participant described enormous pressure to send local firefighting resources to a different municipality:

Well, briefly you think about the politics behind it. How are we going to look to everybody else? But then you quickly realize, well **our best bet for our people is to protect our town** because we weren't getting the outside help that we'd normally get if it were just an isolated fire. **So that quickly was an easy decision.**

One participant offered a counter-perspective about the positive nature of social forces associated with the local community. Being relatively new to the region, P7's comments described the sense of being somewhat detached from the local community. As opposed to being a detriment, P7 viewed that same independence from the community was perceived as a benefit, providing a degree of freedom from community expectations and perceived obligations:

I have not grown up here ... And so, **I don't have the historical attachment** which many of these community members do ... Frankly, it's, **it's helped me be more objective**. So, **we had a natural disaster and I didn't get stuck**. I moved, you know, I knew I had to do things. I have to get going. ... Things are just more sequential and you can just kind of approach things that way rather than, everything's sort of connected and you don't get through anything really.

Summary.

Participants recognized that their organizations did not exist as insulated units, but they were subject to forces involving various social entities: organizational members, external organizations, and communities. Consequently, participants uniformly shared social factors

influenced their decision-making, providing access to information and support for decisions and actions. In contrast, one participant recalled that a detachment from social forces allowed for more subjective decision-making, a condition that the participant viewed as favorable.

Contextual Factors Summary

The contextual factors considered in this study were internal and external forces that influenced participant sensemaking and decision-making. While types of influences were wide-ranging, participants’ comments suggested member trust, cohesion and participants’ self-perceptions were of high importance. Other significant factors discussed by the participants involved past experiences, time pressures, and social forces.

Sub-Question 2: Sensemaking

The second research sub-question asked: What sensemaking frameworks do people employ during organizational crises, and why?

The findings related to this question describe how perceptions of control influenced sensemaking. Table 15 includes examples of a priori and open codes used to analyze this element, axial codes and categories, and key themes. Following the table, findings associated with this question’s key theme are further described.

Table 15
Sub-question 2 - Sensemaking Frameworks: Codes, Categories, and Themes

<i>A priori and Open Codes</i>	<i>Axial Codes/Categories</i>	<i>Key Theme</i>
Changing conditions* Event speed Complexity Uncertainty Uniqueness Chaos	<i>Stress, satisfaction and problem scoping; People can make sense of conditions based on what they believe they can control or influence. This sensemaking can result in stress response, a sense of satisfaction, or it can re-scope problems.</i>	Perceptions of control

* *a priori codes*

Perceptions of Control

*P4: Yeah, there was certainly **a feeling of almost resignation and helplessness** in terms of not being able to at least come over here and hold a garden hose.*

This section discusses the concept of control as a factor influencing participant sensemaking. Because the firestorm event was uncertain and changing, participants reflected they had to continually make sense of their current situations to make decisions, or merely to understand whether situations required decisions. Participants indicated that they made sense of their situations based in part by what they felt they could control. Within the emergent theme of control, this study identified elements involving stress, satisfaction, and problem scoping, each of which is further discussed.

Stress.

Within crisis contexts, research has discussed the concept of control largely in terms of its relationship to stress. In this vein, the more someone can exert control over a situation, the less likely the person is to experience heightened stress and anxiety (Lazarus, 1993). The ability to control a situation relates to the coping and response resources at an individual's disposal. These resources can be cognitive, emotional, social, physiological, and material (LeBlanc, 2009). Therefore, a lack of resources results in a lack of control and higher stress levels.

In the case of the 2017 firestorm, participants generally described that they did not have control over many of the problems that they encountered. Moreover, they stated that had very few resources to draw upon. P4's comments related to the lack of control were representative of other participant experiences:

It's interesting in terms of; what did you do? What important responsibility did you feel? Those are great questions because there wasn't an awful lot that I could do or anyone else could do. I mean, **we were so much at the mercy of the winds**. I mean, you had this convergence of the perfect storm... high winds, high temperature, downed power lines, and fires just raging ... Yeah, there was certainly a feeling of **almost resignation and**

helplessness in terms of not being able to at least come over here [to the facility] and hold a garden hose.

Control, or the lack thereof, took various forms. Often a lack of control stemmed from high levels of uncertainty, implying that participants could not control what they could not understand. Participants also described the inability to control conditions which impacted them negatively, but which they could do nothing about. This was seen in several instances while the fires were raging, when some participants lacked resources and capabilities to fight the fires. In some cases, organizations that under normal circumstances would have been able to address various problems were completely overwhelmed because of the magnitude of the firestorm's destruction. An example of this was shared by P6, who described that inadequate resources influenced the ability to take meaningful actions:

There's just **absolutely nothing anybody could do**. There's not enough water. Not enough firetrucks. Not enough guys to make a stand on that. It was moving so quick.

Based on common conditions involving a lack of control, it was expected that participants would have consistently experienced heightened degrees of stress. This was true for some participants. For example, P14 related the lack of control experienced during the fires as a contributor to stress and uncertainty:

To me, I think it's a level of stress and uncertainty and I mean, I think that the **control in your life may be kind of an illusion** in the grand scheme of things.

Contrary to expected findings of heightened stress, two unexpected but more consistent themes were identified. First, some participants described a sense of satisfaction about what could be controlled, rather than stress about what could not be controlled. Second, some participants described that uncontrolled aspects of their conditions were disregarded, reducing the scope of their problem sets.

Satisfaction.

While facing conditions that were partially beyond their control, several participants shared that they felt a sense of calm and satisfaction about the situations that they could influence. For these participants, their sense of contribution seemed to carry more weight than a sense of futility or resignation. For example, P9's comments suggested while many issues could not be controlled, doing the best at executing whatever decision was made provided a sense of satisfaction:

And so, I felt like once we were out there, that was it. It was comforting to know that I don't have to worry about [the Partrick fire] and I don't have to worry about Tubbs. My job is right in front of me.

These feelings of satisfaction did not indicate participants were complacent about ongoing problems, rather that they were at ease with themselves as they focused on problems under their control.

Problem scoping.

Some participants suggested that uncontrollable events influenced how they made sense of the problems that they faced. For these participants, a lack of control appeared to be a heuristic that narrowed the problems under consideration. If the problem was out of a participant's control, it was removed from the set of problems under consideration. P10 shared an example of this phenomenon. Over the first three days of the firestorm, P10 faced two immediate concerns: harm to the business establishment, and harm to horses resident on the property. When the researcher probed whether a priority was assigned to either of the concerns, P10 described a feeling of helplessness and resignation about potential harm to the business, while at the same believing the fate of the horses could be influenced. P10 summed up those feelings as follows:

Whether the [business] burned down was beyond our control, but we could save our horses.

Similarly, P11 expressed a sense of acceptance that as an organizational leader, certain situational dynamics could not be controlled. These comments appeared to suggest that certain decisions did not need to be contemplated at that time. The comments also implied perceptions of control served to regulate the level of stress experienced by the participant:

There's that sense of well, you don't know, you just had to **wait and see** what came out of it ... **I try to keep a focus** on being here [at the facility]

The concept of control appeared to serve as a sensemaking heuristic that enabled people to comprehend conditions that were complex, uncertain, and potentially overwhelming. First, participants described that by segregating problems they could control from those that they could not control, they were able to derive a sense of satisfaction about their decision-making. Moreover, participants suggested a perceived lack of control over various problems played a part in reducing the scope of large and complex problems. In these cases, problems that could not be controlled were eliminated from the set of problems requiring decisions.

Summary.

Research suggests the lack of control over a situation results in decision-maker stress. This was true for some participants; however, other participants implied that they felt a sense of satisfaction related to the situations that they could control. Another theme indicated that by framing an event based on a perceived sense of control, participants reduced the scope of the problems and decisions that they faced. In doing so, these participants removed some uncertainty in order to achieve a sufficient understanding of a situation. The fundamental influence that the sense of control had on the individuals appeared to be “do I worry about this or don't I?” This finding departs from research which correlates a lack of control with higher stress levels.

Sub-Question 3: Decision-Making Strategies

The third research sub-question asked: What types of decision-making strategies do people engage in during organizational crises, and why?

Findings associated with this research question are described by the strategies people adopted while making decisions. As described in Chapter one, in this component of the study's framework the researcher identified three predominant strategies found in literature, while at the same time recognizing the potential for other strategies to emerge. The three strategies in this study included conflicted decision-making, naturalistic decision-making, and unstructured decision-making. Table 16 includes examples of a priori and open codes, axial codes and categories, and key themes used to analyze this research question. Following the table, findings associated with key themes are further elaborated upon.

Table 16

Sub-question 3 - Decision-Making Strategies: Codes, Categories, and Key Themes

<i>A Priori</i> and Open Codes	Axial Codes/Categories	Key Themes
Contextual factors* Data analysis Information gathering* Past experiences* Plausible alternatives	<i>Modified naturalistic decision-making; Normative decision-making: People engaged in varying decision strategies based on consequences, time availability, and the complexity of the problems they faced.</i>	Strategy adoption
Complexity Evaluating alternatives Problem solving Tactical decisions	<i>Deconstruction, simplification, and sequencing; When facing complex problems people might reframe key decisions as a sequence of problems, each of which can be addressed with an identifiable solution.</i>	Decision reframing
Calm Decision avoidance* Decision paralysis Information seeking* Modes	<i>Perceived certainty; social factors; group member trust: Different factors can contribute to varying degrees of conflict experienced by decision-makers.</i>	Decision conflict
Information seeking* Outcome severity Self-perception Uncertainty Unexpected Uniqueness	<i>Openness to information: People engage in varying degrees of information searches, and incorporate that information into ongoing decision-making.</i> <i>Decision adherence: People can adhere to prior decisions for various reasons and resist making adjustments.</i>	Decision vigilance

**Indicates a priori code*

Strategy Adoption

P13: If Baskin and Robbins had 300 flavors instead of 31, I think you'd never pick your ice cream.

Previous sections of this chapter have discussed findings related to “why” people make the decisions they do during crises, primarily based on how they make sense of conditions, and which factors influence their decision-making. This section discusses findings related to “how” people go about decision-making. As described in Chapter two of this study, decision strategies were investigated within the context of three types of decision strategies: conflicted decision making, naturalistic decision-making, and unstructured decision-making. Two of the strategies (conflicted and unstructured decision-making) are normative and processual, indicating that they involve a methodical analysis of relevant information, followed by the selection from among several decision alternatives. In the case of naturalistic decision-making, individuals do not consider multiple alternatives; rather, they rapidly adopt a course of action that most closely resembles a past experience. This study revealed that people used elements of each strategy, depending on the nature of the decisions they faced. The underlying reasons for the adoption of different strategies appeared to be related primarily to time constraints and personal factors. Participants’ use of decision strategies is further described in this section.

Modified naturalistic decision-making.

As a way of understanding decision strategies, participants were asked to describe decisions that stuck out in their minds as being significant. Some participants described time-constrained problems with severe outcomes. For these participants, decision-making appeared to occur naturalistically. However, while scholars have suggested that naturalistic decision-making involves the recollection of a highly similar past event, none of these participants suggested they had experienced anything comparable to the 2017 firestorm. Rather, participants recalled a

myriad of events that formed a framework for action. Some past experiences were vaguely similar, and others were highly dissimilar. For this reason, they implied they engaged in a “modified” naturalistic decision-making strategy.

Normative decision-making.

Participants shared a tendency to adopt normative decision-making strategies in crisis contexts related to long-term recovery, rebuilding, and business resumption efforts. In these situations, participants were not subject to immediate time constraints which would have prevented analysis and deliberation. Because long-term recovery activities tended to involve a number of decision factors—regulatory requirements, finances, internal and external pressures, member well-being, and others— participants indicated they were compelled to gather and evaluate information before deciding what to do.

An unexpected aspect of normative decision-making was that some participants iteratively eliminated possibilities based on various contextual factors, leaving them with only one alternative. This decision-making process is not suggested to be sub-optimal; rather, it is suggested to deviate from traditional normative decision strategies. Based on some participants’ descriptions, they accepted or rejected possibilities as they progressed toward a final alternative, but they did not explicitly identify multiple alternatives for concurrent analysis. P13’s comments were representative of participant’s sentiments, suggesting that minimizing the number of options under consideration was a way to fend off decision paralysis:

There were so many [possible alternatives] to pick from that was almost paralyzing. It's like if Baskin and Robbins had 300 flavors instead of 31, I think you'd never pick your ice cream.

Summary.

Depending on the nature of their environments, participants engaged in decision-making strategies that tended to reflect either a modified naturalistic or normative strategy. Naturalistic decisions involved identifying past experiences that could provide real-time guidance. Normative decision-making was described as engaging in information collection and analysis; however, in several cases, multiple alternatives were not articulated. In these cases, the analysis tended to involve an ongoing elimination of possibilities as a way to arrive at a final decision.

Decision Reframing

P7: I'm an organizer and I can visually sense steps. Decision...next step.

Participants in this study faced multiple decisions within highly complex environments. Types of decisions involved human safety and well-being, property and asset protection, animal safety, and the continuation of operations. These decisions occurred under conditions that were changing, uncertain, and in some cases uncontrollable. To cope with such difficult conditions, some participants suggested they deconstructed complex situations into manageable problems, and sequenced solutions in ways that would allow them to make progress.

Deconstruction, simplification, and sequencing.

Several participants suggested that they reframed complex situations into manageable problems with identifiable solutions. This reframing strategy was seen during the first hours and days of the firestorm, as well as during its long-term aftermath. While the urgency of decisions was different in each of these contexts, both created conditions that were complex and unfamiliar to participants. For example, during the first hours of the fires, P1 described that nobody in the organization was aware of any fires, even as the Tubbs fire was razing the adjacent neighborhood and moving quickly toward P1's facility. At that time, commercial electricity had failed, police cars and fire engines were rushing by the facility, and dazed residents had wandered into the

facility. When P1 realized the fires were approaching, the situation was complicated by the presence of both staff and clients at the facility. P1's simplification of this complex situation was described as follows:

At that time, my only focus was... **get everybody to the lobby and then we'll take it from there. That's step one.** ... All I could think of was, um, we got them out of there and they're safe. And, uh, anything else that came after that was kind of like, not that big of a deal.

Other participants also described the deconstruction of complex situations. For example, P12 and P13, managed critical transportation services in the region; services which were essential to enable local residents to leave the area, and also necessary to bring additional firefighters and equipment into the area. During the firestorm, these participants faced fully interrupted operations, no electricity, disrupted communications, minimal staffing, political pressure, and a high volume of demands from both customers and government agencies. As a means of coping with the overall situation, the entangled web of crisis conditions was reframed into a sequence of problems and solutions.

P12: It's just like, oh, **there's a problem here, let's find a solution.** Okay. So, we have a generator here; let's get it over there and so then we can start charging our phones, maybe taking phone calls and just get things going. So as soon as we have power we started making phone calls, so to find out where our guys are and see who's safe, who's not safe.

P13: It was probably a good two to three days before all the procedures got ironed out on reporting, but then it got into a steady routine of a couple times a day. What's your employee status? Who showed up? What resources you have today? What's the status on the [site] and the resumption of [operations]? ... **Stay calm, figure out the problems, keep going through to the solution, solve it, fix it.**

Some participants reframed decisions through de-construction during the firestorm's aftermath and prolonged rebuilding activities. As described in the following participant comments, P7 faced challenges associated with the organization's long-term recovery strategy. P7's organization had suffered significant property damage and destruction, the displacement of

many organizational members, and was under internal and external pressure to speed up recovery activities:

For a disaster situation, so it's like, okay, let's think through what we'd probably need to do ... I'm an organizer and **I can visually sense steps. Decision...next step.**

Summary.

Participants in this study were required to make decisions in highly complex and uncertain conditions. Rather than become paralyzed by the enormity of the challenges they faced, several participants re-framed complex situations into a series of more discrete problems. While the problems were not simple, they were simplified because they could be addressed with identifiable solutions. In this way, participants were able to re-frame decisions into problems that had lesser degrees of complexity and uncertainty.

Decision Conflict

This study yielded evidence that degrees of conflict, or being torn over risks associated with different decision alternatives, varied among participants, and ranged from very little to significant. Furthermore, some participants indicated that their feelings of conflict changed as the context of the firestorm changed. Reasons for the varying degrees of decision conflict were related to contextual factors involving perceived certainty, social factors, and member trust.

Perceived certainty about positive outcomes.

Unexpectedly, during the early stages of the firestorm when conditions posed the highest threats to people and property and time pressure was greatest, some participants indicated they experienced very little decision conflict. Reasons for the lack of conflict varied. For instance, P9 suggested even if some decisions were not optimal, they were perceived as having positive outcomes. Therefore, P9 was not torn over those decisions:

There were times where I knew **that if I put out 100 percent effort, regardless of the decision I made**, whether it's to save this house or save that house, I knew if I put out 100 percent effort **I was going to save one** of them. And I don't know, maybe it's not normal, but **that never weighed heavy on me because I just figured we're doing the best we can** and knowing that we were doing.... at least my crew was doing the best we could... sometimes bad things happen ... **I never really felt like, oh my gosh, I'm torn with this decision** because.... sometimes it was first come, first serve.

Similarly, while encountering numerous types of complex problems, P4 indicated a lack of conflict because of a certainty about overall decision-making responsibilities:

I think I had clarity and I think the people, others who had responsibility for leading the [organization], and indeed the [members] all had real clarity in terms of what our role was.

In contrast, in cases when high degrees of uncertainty were experienced, some participants indicated that they experienced decision conflict. P14 and P8 described experiences following severe damage to property. In the aftermath of the firestorm, these participants faced strategic decisions about how their organizations would continue. Confounding these decisions were unknown factors related to regulators, insurance reimbursements, environmental conditions, and others. These participants indicated the uncertainty created significant decision conflict:

P14: We don't know whether or not a, we're going to be well served by waiting for FEMA to clear a lot, or do we spend \$75,000 of our own money to do it, right? To get a head start? Uh, **we don't know if we're going to have the ability to rebuild** our own property. Either because we got polluted water or were under-insured or simply cards are stacked against us and we need to go somewhere else.... We know what the questions are, but we don't know what the answers are, you know, and I, and I think it's that unknown rather than the known, which is huge. So, one of the things that we've tried to do as [an organization] is to address the unknowns.”

P8: **And so was hard not to say, OK let's just go back. I mean, really hard.** But our main focus is always the [people].... What's going to happen to [them]? ... You don't want to mess that up to put that at risk.

Social factors.

Social factors were also described as a source of decision conflict. Participants described being torn between organizational priorities and social relations. For example, P9 recalled being torn about decisions arising from family and friend requests for help:

It weighed on me because there were a couple of times where like a really close family member of mine [asked] “Can you do something?” The answer's no ... But this is also a family member of mine that asked me to do that and so I'm, I'm trying to like... through text message... “sorry”, trying to eloquently and politely say I can't do this. **That was a pain in the ass because I also then spent 20 minutes dwelling on it.**

In contrast, P7 described how the absence of social connections influenced decision-making. In this case, P7's lack of close connections to the organization and community were described as mitigating decision conflict. P7 commented that some organizational members' attachments to each other and to the community caused them to “get stuck” and become paralyzed. P7's suggested the sense of detachment allowed for objective decision-making:

I don't have this, this high level of loss that some of my colleagues do. ... Frankly, it's, it's helped me be more objective. So, we had a natural disaster **and I didn't get stuck**. I moved, you know, I knew **I had to do things. I have to get going.**

Group member trust.

In several instances, participants suggested that group member trust and cohesion mitigated decision conflict. When participants described trust and cohesion among organizational members as being low, they also described experiences of decision conflict, as they were unsure about how decisions would be interpreted and supported by members. In cases when member trust and cohesion were high, participants suggested that decision conflict was mitigated. For example, P15 stated a general sense of support from organizational leadership enabled P15 to make timely decisions that, “99% of the time,” did not involve conflict.

Summary.

Decision conflict arises when people perceive that their decisions could lead to negative personal consequences. As a result, they experience anxiety and stress. In this study, participants described degrees of decision conflict ranging from minimal to significant. Some participants suggested that simply having certainty that their actions resulted in positive outcomes, even if limited, served to mitigate decision conflict. Other factors influencing decision conflict were suggested to involve uncertainty, social connections with family and close friends, and trust among group members.

Decision Vigilance

*P2: it'd be just completely chaos, so **the only thing we could do as an operator of this facility, is being very vigilant***

This section discusses decision vigilance as a contextual factor being comprised of two elements; openness to information and decision adherence. This study revealed two areas of interest concerning vigilance. First, most participants implied that they were open to new information. Second, some participants described an adherence to their initial decisions based on factors related to self-perceptions. Each of these areas is further described in this section.

Openness to information.

Participants in this study consistently shared the need to seek out information in support of their decision-making. This need was fueled both by the highly uncertain fire conditions during the first days of the fires, as well as uncertainties during long-term recovery activities. Particularly in the first days of the firestorm, conditions changed rapidly, and so the basis upon which to make decisions required routine information updates. Similarly, participants shared that long-term recovery activities were steeped in uncertain requirements and changing conditions. Consequently, regardless of whether decisions that were made during the immediate onset of the

firestorm, or months after the fires had been extinguished, participants described the desire for more information upon which to make decisions. Examples of these sentiments are found in comments made by P2 and P4:

P2: And I mean, it'd be just completely chaos, so the only thing we could do as an operator of this facility, is being very vigilant because there was no warning from anyone.

P4: Just getting information, with the information you have a little more control with which to make decisions.

In their efforts to be vigilant about changing conditions and filling information gaps, participants described that they relied on numerous sources: government agencies, friends, social media postings, television, and community members. P8 described, despite being as vigilant as possible, the organization still encountered an information deficit related to important decisions:

We'd gather as much information as we could and then move forward. So, when we decided to move back [into our building], we didn't all feel good about that, because we felt like **we didn't have all of the information we needed to make that decision, but we felt like we had enough to try** it out and see what happened. It was very scary because we didn't know if we were making a bad decision on behalf of our [people].

Finally, some participants described how the uncertainty and confusion about their conditions hampered vigilance. For instance, P14 described conditions in which more information was needed to make better decisions, but because of the uncertainty of conditions, P14 was challenged to clearly understand the problems that needed to be addressed.

Consequently, P14 implied it was difficult to know how to be vigilant:

I also didn't kind of go, hey, tell me some more about why I should do this ... I didn't think to ask more questions ... And now I'm kind of like, you know what, what should I have asked you about that I didn't?

Decision adherence.

Several participants showed little adherence to prior decisions, suggesting that high degrees of uncertainty and change resulted in a continual re-evaluation of information and re-

consideration of previous decisions. P2 and P14 shared changing conditions and the ongoing exposure to new information had a significant influence on building reconstruction decisions:

P2: You get into the [rebuilding] process and, and, and you kind of find out stuff as it goes in front of different desks for approval and the often, oh no, “you need this”. **And all of a sudden that changes from plans C; okay, that's not gonna work.**

P14: It's been difficult to try to find the permits and a place that could get the permit to have the facilities. So, we were counting how many...which version **we were on and you know which scheme A to B to C, you know. I think we're now on, on G ...** And, and some of it was just **things kept changing.**

In contrast, other participants described adherence to prior decisions due to perceptions of pragmatism and self-perceptions. From the standpoint of pragmatism, some participants implied in the midst of changing conditions, they felt the need to establish a clear course of action for the organization to follow and wanted to avoid changing course. In these cases, changes in strategic decisions were simply viewed as non-viable. In other instances, self-perceptions appeared to contribute to decision adherence. In these cases, participants implied a tendency to adhere to decisions that reinforced those perceptions. Types of self-perceptions were described as being related to be role-based descriptors such as “leader” and “change agent”.

Summary.

Participants consistently suggested they engaged in vigilant decision-making behaviors. To the extent that they could gather and incorporate information into their decisions, they did. For decisions that were associated with long-term recovery activities, several participants described that they continued to evaluate new information and adjusted their decisions accordingly. Some participants indicated that they adhered to earlier decisions because, in part, those decisions were representative of decision-makers’ self-perceptions.

Sub-Question 4: Decision-Making Consequences

The fourth research sub-question asked in this study was: How and why do decision consequences influence ongoing decision-making?

The primary themes associate with this research question involve system enactments and interactions, as well as decision-maker learning. For the purposes of this study, decision consequences have been viewed within the frame of their outcomes, as opposed to the decisions themselves. Findings in this section have not ascribed value judgments to decision consequences; rather, they have been examined as influences affecting ongoing decision-making. Table 17 includes examples of a priori and open codes, axial codes and categories, and key themes applicable to this sub-question. Following the table, findings associated with key themes are further described.

Table 17
Sub-question 4 - Decision Consequences: Codes, Categories, and Themes.

A priori and Open Codes	Axial Codes/Categories	Key Themes
Action types Initial action Changing decision Decision type Existing relationships Organizational response	<i>Enactments and interactions:</i> The outcomes of decisions can both enact and interact with their environments and contextual factors in ways that introduce new and ongoing decision considerations.	System enactments and interactions
Population/community Preparedness measures Property destruction* Retrospective information	<i>Learning styles; Retrospection and lessons learned;</i> People tended to engage in single or double loop learning, depending on the stage of the crisis.	Decision-maker learning

*Indicates a priori code

System Enactments and Interactions

The results of this study suggest that decision outputs enact and interact with the overall OCDM system environment. Within the context of this study, enactments were viewed as decision outputs that produced new decisions. Interactions, in contrast, involved decision outputs that changed the environment in ways that altered ongoing decision-making. Each aspect is further discussed, and Table 18 provides examples of decision enactments and interactions that

Table 18

Examples of Decision Enactments and Interactions with System Elements

Nature of Decision	Types of Enactments and Interactions
Business re-opening date established	Decision introduces factors involving new external compliance requirements, social relations, and work rules. Compressed timelines result in time constraints and stress factors.
Alternate business location identified	Decision enacts an unfamiliar physical and social environment for the organization, further leading to altered influences such as stress, work procedures, social interactions, and the extent to which organizational changes could be controlled.
Re-population of evacuated areas	Altered nature of crisis environment and need for new construction of meaning that drives strategic and tactical decisions. The crisis environment essentially “flips” from how to get people out of town safely to how to get them into town safely. Factors such as communications, work rules and procedures, communications, and social relations influence decision-making.
Establishment of member support mechanisms	The decision refocused the participant sensemaking about the organization’s core purpose, further recasting the organization’s environment. Social relations were significantly affected by new organizational procedures introduced for the purpose of member support.
Upgrading of destroyed structures	The concept of new physical structures precipitated an altered vision of the organization and shifted the environment from one of <i>recovery</i> to one more aligned with <i>renewal</i> . The re-cast organizational future further influenced social relations, work rules, and communications.

As participants made decisions, they frequently created conditions under which new decisions had to be contemplated. By making decisions, participants did not necessarily reduce the number of problems requiring decisions; rather, they often changed the nature of ongoing decisions. This phenomenon reflected the entangled nature of the crisis, as conditions requiring decisions were seldom isolated matters. For example, consequences pertaining to the continuation of operations often entailed system enactments. Because the firestorm caused such extensive damage to property, several of the participant's organizations were displaced permanently or temporarily. As such, these participants had to make decisions about how work would be performed on a temporary basis, and when facilities could be re-occupied for the purposes of resuming normal operations. P8, for example, was engaged in decision-making that concerned temporary work arrangements. These decisions sparked a chain of other types of decisions associated with logistics and member well-being:

We need transportation...**who is that going to fall on?** Did that person lose her house? Can she handle it? What safety net do we need for her here? **So, there were a lot of contingency plans.** I arranged for counseling services...that was outstanding. **Some of the staff didn't know how to cope in their personal lives** or with the things they were hearing from [other members].

Similarly, P5 and P6 made decisions concerning the re-population of areas that had been evacuated. In this case, the decision to re-occupy an area led to a series of additional decisions.

P5 shared the types of new decisions that were introduced:

There wasn't a pre-established plan before the incident. That was something that ...once we evacuated, we started discussing. Okay, **at some point we're going to have to let people back in** ... Grocery stores and people without power ... groceries are going to spoil so they're going to need somewhere to go right away. Having the fuel stations opened up so that when people got here they could kind of get their lives back to normal. **So, we started to prioritize who do we need in town helping us facilitate that before we start letting people in and.... Do we reopen this side of town and then that side of town?**

In addition to the enactive nature of decision consequences, participants described that decisions interacted with their environments in ways that altered ongoing decision-making. These types of interactions influenced a range of decisions factors: personal, social, political, and others. P14 described a situation in which a decision pertaining to how business insurance claims were received created certainty about staff availability, but high levels of uncertainty about financial implications:

So, I said, I'm able to pay you for up to two years. ... I had to pay taxes on it. So instead of having this huge devastating loss on the taxes, I had to show this big chunk of income ... I didn't know. I know that now. So that was kind of a big shock. About April 13th. It's like, wait, what? Oh okay. And I didn't have a plan. Like what am I going to do with my business if there is [another] disaster.

Decision-Maker Learning

P9: Never in my wildest dreams would I ever say that this was possible, so it's made me rethink what it can do, 100 percent.

P14: There are things that I wish I had known then that I know now. So, you know, live and learn.

The outcomes of this study provided some insights into participants' reflections on their own decisions. The nature of these reflections provided two types of insights: (a) participants indicated the contexts of decisions influenced the way they learned from those decisions, and (b) participants formed new perceptions about plausible future crisis events.

Decision contexts and learning styles.

This study suggested that the ways in which participants learned from their decisions was related to the context of those decisions. Most participants suggested they were satisfied by the decisions that they made during the early phases of the fire, when the risk of harm presented by the firestorm was greatest. As such, reflections upon those decisions tended to reinforce that they were appropriate. Comments provided by P9, and P1 represent these types of participant perceptions:

P9: ...it's like bad things happen, and give 110 percent and then you can sleep at night knowing that you made the right decisions and you tried your hardest and bad things are still going happen. Yeah. So, I don't know if that's what I cognitively thought at the time, **but I think in that kind of post review** going back home and thinking back on it, I **never really felt like, oh my gosh, I'm torn with this decision** because.... sometimes it was first come, first serve.

P1: I think that **now that it actually happened ... what we did worked**. So that gives us a little sense of security...

Because these types of decisions were time-constrained, they tended to suggest a naturalistic decision strategy. Given that naturalistic decision strategies do not involve the identification and evaluation of multiple alternatives, this “single solution” decision process may explain participants’ tendency to not question or re-evaluate those decisions. In contrast, participants were more likely to re-examine decisions that were made during the aftermath of the firestorm, as suggested by P14: “I'm not really trained in how to alleviate **all of those uncertainties**. ... But you know, **I did the best I could and I had my own stress**.” Comments made by P8 and P14 further suggested the conflicted nature of decisions made during the fires’ aftermath:

P8: [A community member] didn't feel like she could be authentic and genuine about welcoming first responders who didn't save her house but who did save our [facility]. And so, **I had no idea that that sentiment was out there**. I'm so very sorry, **I would've been more sensitive**.

P14: I immediately got a hold of the insurance people, and there are things that I wish I had known then that I know now. Um, so, **you know, live and learn**... So, you know, **I've learned a lot of things that I didn't know** and, there were things that I just didn't know and I didn't even know that I needed to know them, you know? And, and there were just so many different things pulling so many different ways.

P7: And the structure I'm thinking about is going to create some change ... maybe a surprise ... to my colleagues as we go forward, but **I see that we have to make some changes**.

Participants’ tendencies to re-examine longer-term decisions may be explained by the normative strategies that were used to make those decisions. Longer-term decisions were less

time-constrained, and often considered multiple possibilities. As such, this study's findings suggest decisions involving multiple alternatives were more prone to retrospective re-examination than those that were naturalistic and involved a single solution.

Reflections and lessons learned.

Several participants suggested after the fires were extinguished, they had not had an opportunity to reflect broadly on their experiences. During the participant interviews, several people shared information about lessons learned at the organizational and personal levels. At the organizational level, several participants described tactical improvements. Types of tactical improvements included the purchase of communications equipment, the improvement of contingency plans, and the types of training exercises being conducted. At the personal level, participants were unanimous in stating that they re-considered what types of crisis events they believed to be plausible. P9's comments reflected a common change among participants in how they framed what types of crisis events might occur.

I've looked at like the hills...for 15 years...I never thought that that fire could start there and ended up there... **never in my wildest dreams would I ever say that was possible. You're crazy. That could never happen** ... No, no way would I ever think that. So, it's made me rethink what it can do, 100 percent, 100 percent.

Summary.

During this event, participants implied retrospections about past decisions were largely related to the strategies that had been used to make those decisions. Participants tended not to re-examine naturalistic decisions, while they were retrospective about normative types of decisions. Furthermore, participants suggested that lessons resulted in changes in tactical measures, as well as a re-consideration of what types of crisis events are plausible.

Chapter Summary

This chapter presented the results of various types of data collected during this inquiry. Data were presented in categories that mirrored the study's research questions. Highlights of the study's findings are summarized below, and key conclusions and implications arising from these findings are further discussed in Chapter five.

The finding relating to this study's main research question suggests that traditional input-process-output system models may not accurately describe some OCDM contexts. Rather, decision-making during VUCA (volatile, uncertain, chaotic, and ambiguous) contexts can be more accurately conceived as a complex adaptive system. The employment of a complex adaptive system model in the examination of crisis decision-making could offer novel insights into the OCDM phenomenon, and is further discussed in Chapter five.

The contextual factors considered in this study were both internal and external to each participant. Factors involving member trust and cohesion were identified as being significant, as were participant self-perceptions. Member trust and cohesion were found to create environments in which people felt that they could safely make decisions without negative repercussions from other members. Self-perceptions were significant in that participants identified closely with various roles, and so adopted characteristics that they believed defined those roles in a positive light. Several of the participants described temporary roles and attributes, or "modes", as being significant influences on their decision-making.

An unexpected aspect of sensemaking involved the concept of control. While research has suggested a lack of situational control heightens stress levels, this study found something different. Some participants identified situations that they could not control as being out of their

decision scope. As a result, the inability to control some aspects of a crisis situation served to reduce, not heighten, stress levels.

With respect to decision strategies, this study found that some participants engaged in a modified form of naturalistic decision-making. While this decision style followed the pattern of naturalistic decision-making, participants generally did not invoke highly similar past experiences. Rather, they derived general guidance from a variety of past events. Other participants deconstructed complex and uncertain conditions into sub-problems for which they could identify clear solutions. By adopting this approach, these participants avoided the potential for decision paralysis by re-framing decisions into problems that were more comprehensible.

Findings concerning decision consequences suggested that individuals' decision retrospections are influenced by the strategies they used to make those decisions. Decision consequences have provided insights that have improved tactical measures, as well as individual beliefs about what types of crisis events are plausible.

CHAPTER 5 - DISCUSSION AND CONCLUSIONS

Introduction

The principal purpose of this study was to better understand decision-making during times of organizational crises. The problem this study aimed to address pertains to the scarcity of crisis decision-making research and theory (Roux-Dufort, 2016) during a time which crises are increasing in frequency and intensity (Dirmeyer, 2014; Freedman, 2014; Merchant, 2014; Mileti, 1999; Mitroff, Shrivastava, & Udwadia, 1987) and costs (Economist, 2012). To explore this topic, this study employed a holistic single case-study method centering on the 2017 Northern California firestorm. Numerous organizations experienced crises due to the firestorm, and a range of organizational decision contexts were encountered. This study involved a diverse set of participants, all of whom were engaged in decision-making for their organizations. The case study method was used to develop a thick, rich description of organizational crisis decision-making to enhance the overall understanding of the phenomenon. Ideally, these results will be of interest within both the scholarly and practitioner communities, leading to more insightful research, theory, and practice.

Chapter four presented this study's findings, and Chapter five elaborates on those findings. First, key conclusions are interpreted, discussed, and related to existing research. In some cases, new conceptual models are proposed to stimulate further research and discussion. Second, the limitations of key findings are discussed. Finally, implications for further theory, research, and practice are discussed.

Discussion of Key Conclusions

The key conclusions presented in this chapter are those which may have the most significant implications for organizational crisis decision-making (OCDM). These conclusions are summarized as follows: (a) complex adaptive systems apply to VUCA crisis decision-making, (b) crisis decision-making strategies can vary within a common event, (c) decision-makers' personal well-being is an important OCDM factor, (d) self-perceptions evoke an OCDM system archetype, (e) temporary mental models influence sensemaking, (f) perceptions of control influence OCDM's stress and scope, (g) psychological safety influences OCDM, and (h) sensemaking can be inextricable from decision-making in VUCA circumstances.

Complex Adaptive Systems Apply to VUCA OCDM

With respect to the research question "how do people make decisions during organizational crisis?" this study has suggested that peoples' decision-making behaviors and processes are often non-linear and dynamic, particularly during VUCA (volatile, uncertain, chaotic, and ambiguous) circumstances. This finding is a departure from traditional explanations of crisis decision-making, which have routinely employed linear process models and traditional systems-based approaches. As a reflection of this established tendency, this study's *a priori* conceptual framework also incorporated a traditional process model. However, the results of this study indicate some types of crisis decision-making phenomena are better conceived as complex adaptive systems (CAS). This conclusion is further discussed, and an alternate model is proposed.

Systems theory limitations.

Aguilar-Savén (2003) described organizational processes as involving a set of actions that are logically ordered and lead to a desired result, and further suggested that modeling these

processes fosters a comprehensive understanding of a set of actions. Numerous techniques have been used to model various processes, but they reflect a common characteristic: they utilize assumed relationships between various inputs, processes, and outputs (Aguilar-Savén, 2003). The perception of phenomena as processes is further supported by von Bertalanffy's (1968) systems theory, which proposes that the complex relationships between the components of a phenomenon can be understood using a holistic (process) perspective. Furthermore, systems theory suggests systems maintain an equilibrium state by adapting to external forces (von Bertalanffy, 1968). Such thinking about processes modeling and systems theory has become foundational to practices that continue to thrive in contemporary social sciences (Dooley, 1997; Hayles, 1991; Walby, 2007), and has also become a consistent theme in theory and research related to OCDM.

Despite the assumptions used to construct this study's conceptual framework, its outcomes have indicated that during times of volatility, uncertainty, complexity, ambiguity, or VUCA, process modeling and traditional systems theory are incongruent with how OCDM might really take place. This is argued for several reasons. First, process goals and outcomes are not always clear and can be subject to change. Second, linear input-output relationships between process elements change and cannot be consistently described. Finally, an organizational system's equilibrium state can be unstable. In essence, the chaotic nature of some OCDM contexts can contradict the structure of predictable process/system relationships.

The relevance of complex adaptive systems.

In contrast to the linear and organized nature of process models, complex adaptive systems (CAS) are characterized by change, irregularity and disorder (Dooley, 1997; Stacey, 1995). Furthermore, CAS' underlying complexity theory perspective accepts that the states of

component parts, and the relationships between them, are emergent: they can be present, absent, independent, overlapping, or non-linear (Schneider & Somers, 2006; Walby, 2007). And unlike conventional process models, CAS does not assume that a system's equilibrium state is inclined to remain stable. As such, the CAS perspective provides an alternate interpretation of component interactions within VUCA crisis environments.

For the participants in this study, the 2017 Northern California firestorm reflected the characteristics of a VUCA crisis. The event was an unprecedented, and involved extreme levels of uncertainty, complexity, and change. Decisions were subject to many uncertain internal and external forces: human reactions and stress, decision-maker self-perceptions, random fire behavior, social interactions, administrative requirements, changing resource availabilities, organizational cultures, and others. The nature of problems requiring decisions involved the complex interplay between numerous internal and external contextual factors, and key decisions often interacted with other decisions that were subject to their own entangled influences. Participants were faced with the challenge of preventing or stemming severe consequences while being subject to continually changing conditions and navigating fluctuating roles, time pressures, senses of control, social influences, and other factors. Therefore, rather than operating within relatively orderly input-process-output decision-making systems, participants were subject to random and unpredictable sequences of events. Examples of unpredictable relationships between decision factors are described in Table 19.

Table 19

Examples of Varying Relationships Between Decision Factors

Factors	Description Varying Relationships Between Factors
Time pressure and stress	The expected relationship between time pressure and decision-maker stress was inconsistent. Even in cases of severe outcomes including loss of human life, under time pressure some decision-makers described feelings of excitement, exhilaration, and focus. In some cases, extreme stress was experienced. In others, no relationship between time pressure and stress was seen.
Stress and non-vigilance	Decision-maker stress did not consistently yield non-vigilant decision behaviors. Generally, regardless of the degree of stress experienced by participants, they acted in a vigilant manner. Exceptions to this observation did not appear to be related to stress factors.
Work rules and work practices	Work rules did not consistently influence work practices, as would be expected. In a number of cases, even when contingencies had been developed, the unique nature of the fires caused participants to create novel solutions to unforeseen problems.

OCDM implications for naturalistic decision-making.

This study further yielded interesting results concerning the adoption of naturalistic decision-making (NDM) as it relates to complex adaptive systems (CAS). Klein (2008) has proposed that in complex real-world settings, people refrain from identifying and examining decision alternatives because time does not allow for such deliberation and analysis. Rather, people scan their own experiences and “naturalistically” adopt a previous course of action that is a close match with the current situation. According to NDM research, relevant previous experiences are those that are similar to current conditions. In this study, several participants employed NDM-like strategies, but none had previously experienced any situations that were similar to the firestorm. In some cases, participants invoked vaguely related experiences, such as less destructive emergencies or natural disasters. In other cases, participants invoked entirely

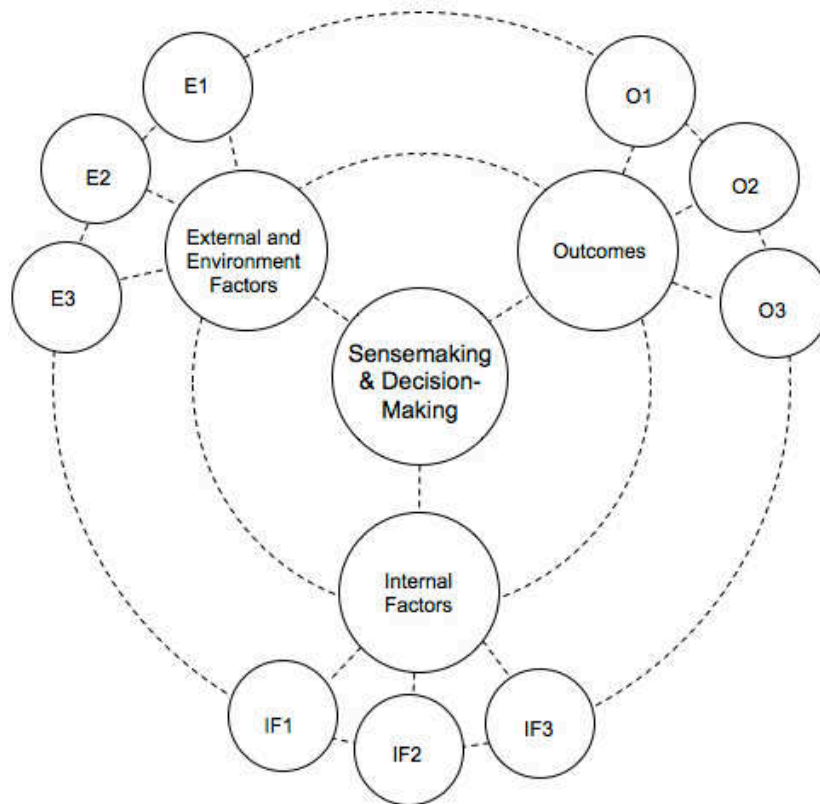
unrelated previous experiences, such as overcoming difficult work tasks. However, in both types of NDM-like behaviors, participants described that these previous events were helpful in establishing a framework for decision-making. This outcome suggests that applications of NDM may be broader than previously assumed, as with CAS types of crises. The applicability of CAS may be explained in part because, by their very nature, CAS events do not repeat. Therefore, in CAS decision-making contexts, it is highly improbable that an individual will identify an appreciably similar past experience. This study suggests the possibility that during CAS events, people may scan for and adopt whatever experiences or lessons that they perceive will help with real-time decision-making.

As a final discussion point regarding the applicability of CAS to crisis decision-making, this study suggested that participants were making decisions while organizational equilibrium states were unstable. These instances were seen in the following examples: (a) several organizations temporarily ceased normal operations in order to focus on supporting fire evacuees: in one case, this focus became integral to ongoing services; (b) some organizations were completely displaced for extended periods during which they operated within unfamiliar cultures, norms, and practices; and (c) for some organizations, the severity of damage posed questions as to whether the organizations could continue in a similar state, or if they could continue at all. These examples suggest that equilibrium states can be altered temporarily or permanently, further supporting the conceptualization of OCDM as a complex adaptive system.

In summary, this section has suggested VUCA crises can be more appropriately described as complex adaptive systems than as traditional IPO process models. In this study, decision-making was complex, contextual factors continually changed, decision processes were non-linear, and organizational equilibria were unstable.

A proposed model.

As discussed in this section, VUCA crisis decision-making can occur within a system that is complex and adaptive. A model for understanding OCDM through a CAS perspective is proposed in Figure 8. This model envisions a conceptual framework for exploring crisis decision-making contexts which are highly dynamic and complex. The intention of this model is not to describe decision processes; rather it is to stimulate thought about contexts in which certain factors become significant and interact to influence decision-making. Such contexts might involve classes of individuals, types of groups, or specific crisis scenarios.



$E(x)$: External or Environmental factor (x) $IF(x)$: Internal factor (x) $O(x)$: Outcome (x)

Figure 8: Crisis decision-making envisioned as a complex adaptive system.

Within the CAS perspective, the following frames form the structure of the proposed model: (a) the organizational crisis environment, including factors external to the decision-

maker; (b) factors internal to the decision-maker; (c) crisis outcomes, or consequences, and (d) sensemaking and decision-making behaviors and processes. The dashed lines between components represent sporadic, changing, and unpredictable relationships within an open and changing environment. The model functions as sort of a “neural network” in which various nodes can become significant, influencing sensemaking and decision-making in various ways at various times.

This model introduces an alternative philosophical underpinning to crisis decision-making in that it diverges from sequential assumptions about system components; an observation that Walby (2007) suggested is relevant to social relations. In this model, a singular reductionist paradigm is supplanted with the idea that multiple ontologies can underlie the phenomenon. Consistent with Walby’s (2007) studies of social sciences, this proposal “avoids the rigidity of the notion of a system as made up of its parts. Systems can be over-lapping and non-nested” (p. 454). This model represents a marked departure from past systems-based conceptions of OCDM, perhaps providing a means of more fully understanding the phenomenon.

An example of how the model might inform the understanding of OCDM is offered in Figure 9, within the context of a decision made by a participant during this study. In this case, the destruction of the organization’s main building resulted in a decision regarding temporary work arrangements. The outcome of this decision resulted in an altered work design and work processes that yielded further decision requirements. For example, the altered work design led to new types of interactions between members and external parties. From a participant standpoint, a heightened level of stress was experienced, as was the decision-maker's need to adopt a temporary “family leader” role in light of the new work environment.

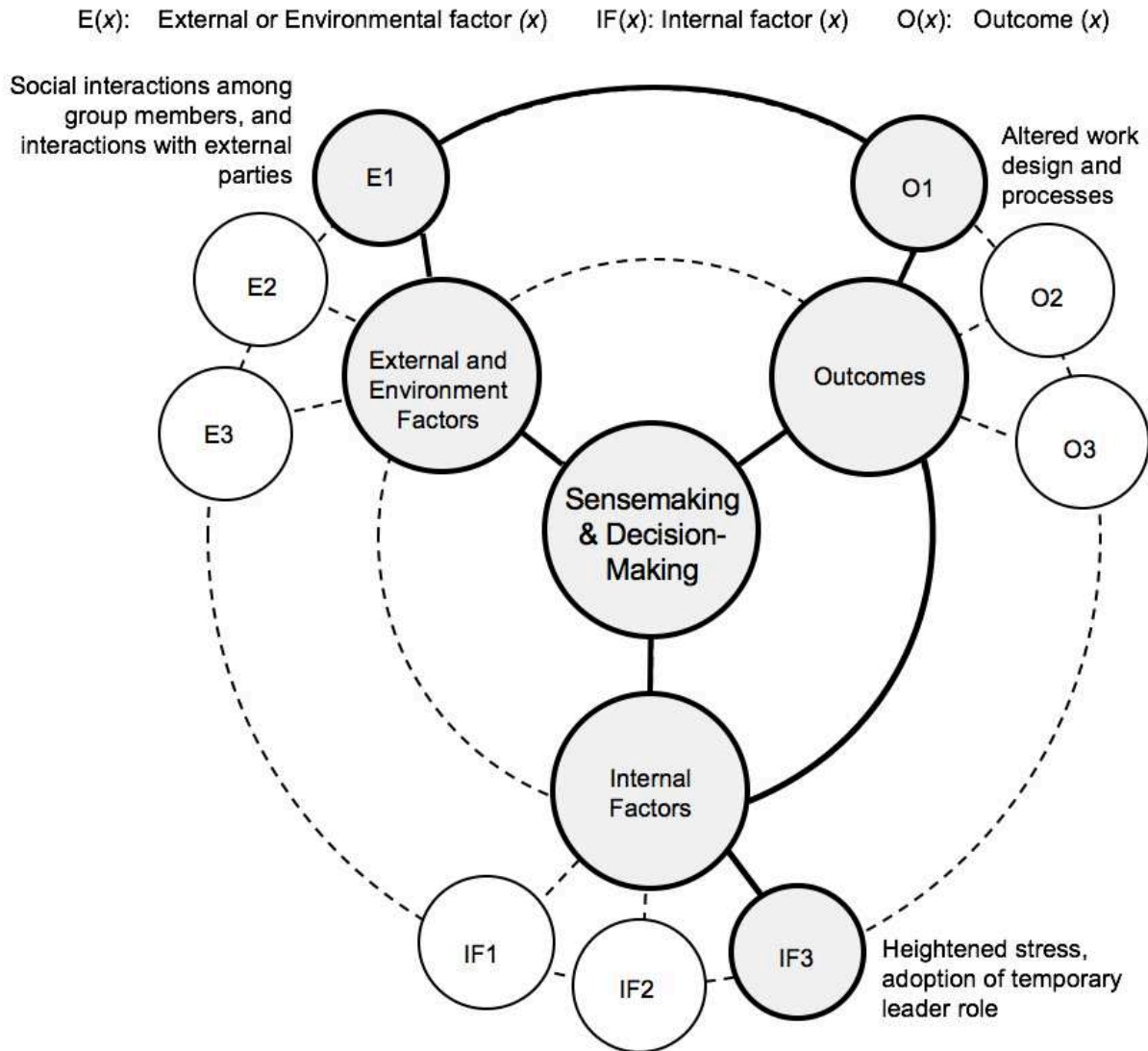


Figure 9: CAS model example: decision regarding temporary work arrangements.

By simultaneously considering relevant internal and external contextual factors, combined with decision outcomes, this model is proposed to help envision “how and why” various factors interacted to influence decision-making within a particular circumstance. Because the number of contextual factors and the dynamic relationships between them is vast, the usefulness of such a model will likely require a narrowly defined decision case. Primarily, this model is proposed to serve as a useful springboard for the further investigation of the OCDM phenomenon.

OCDM Strategies Can Vary Within a Common Event

Given the common characteristics of a crisis— uncertainty, time constraints, and severe outcomes— it was expected that common perceptions of crisis conditions and characteristics would be found during this study. To the contrary, participants were found to view the nature of crises in considerably different ways, leading to different decision-making strategies.

Differing views of crises.

A discussion of crisis decision-making should naturally consider the notion of a crisis itself: what it is, and what it is not. This study's review of literature has found that scholars generally agree on a small number of crisis characteristics: uncertainty, time constraints, and severe outcomes. But beyond that, descriptions and conceptions of crises are a matter of debate (Hermann, 1972; Phillips & Rimkunas, 1978; Roux-Dufort, 2016). The results of this study indicated that participants also perceived their own crisis situations in different ways, leading to varying decision-making behaviors and approaches. This section describes how several aspects of the 2017 firestorm were perceived differently by participants: crisis duration, decision time constraints, stress, uncertainty, and the nature of outcomes. Following these descriptions, implications for decision-making behaviors and processes are discussed.

Crisis duration.

Participants' perceptions of crisis durations ranged from hours to months. For some, the crisis involved the immediate response to dangers posed by the fires, and was limited to the first few hours or days of the fires. For others, the crisis involved the long-term recovery from losses, and the uncertainty surrounding the firestorm's aftermath. For some of these participants, the crisis continued while this study was undertaken, and they insinuated that it would continue long after the study was completed. Others perceived the crisis as being of a more medium-term

duration, involving specific organizational recovery activities over a number of weeks or months.

Decision time constraints.

Some participants' key decisions were greatly constrained by time, and some were not. Several participants perceived that consequential decisions had to be made within minutes of becoming aware of a problem. This rapid decision-making tended to relate to saving the lives of people, animals, and property. In contrast, other consequential decisions were viewed as being strategically-oriented, such as determining how to approach the replacement of destroyed property, or the ongoing well-being of organizational members. Still other consequential decisions were viewed as being virtually unbounded by time, largely because understandings of the decisions themselves were unclear, and the factors influencing them were ambiguous and changing.

Stress factors.

Participants described a wide-range of stress perceptions and responses. Some participants perceived that stress was not a factor in their decision-making, while others indicated that they were under extreme levels of stress. Furthermore, some participants indicated they did not feel stress, but rather a feeling of focus, adrenaline, or excitement. The degree of stress perceived by participants appeared to be related to internal factors such as self-perception and past experiences, as opposed to the nature of the decisions themselves. Furthermore, some participants related stress to the lack of time constraints, and not knowing when important recovery activities could occur.

Uncertainty.

All participants viewed their decisions as involving a significant degree of uncertainty. However, some participants were able to simplify or deconstruct highly complex and uncertain

situations into problem sequences that they could make sense of and act on. In these cases, uncertainty did not substantially inhibit decision-making. Other participants suggested the presence of many unknown and changing factors, coupled with a lack of information, created environments in which it was difficult merely to identify and understand problems that might require decisions.

Crisis outcomes.

Participants' concerns over the fire's outcomes were wide-ranging. Although this study was framed within the context of organizational crises, participants consistently stated that personal matters were initially their most important concerns, suggesting that they could not be separated from organizational concerns—a point that will be further discussed in this chapter. Consequently, participants adopted a wide-ranging view of organizational concerns: personal losses, as well as harm to people, animals, property, business operations, and stakeholder well-being.

OCDM strategies: behaviors and processes.

This study found, based on varying perceptions of crisis situations, participant decision behaviors and processes varied. This section further discusses decision behavior and processes within the contexts of conflicted decision-making, naturalistic decision-making, unstructured decision-making, and crisis decision-making heterogeneity. Each is summarized and discussed in relation to this study's findings.

Conflicted decision-making.

As described in Chapter two, Janis and Mann (1976,1977) have suggested the quality of consequential decisions is largely a function of decision-makers' vigilance, or the extent to which people seek out and are open to new information when comprehending problems. From a

behavioral standpoint, participants in this study generally exhibited high levels of vigilance. Participants' comments demonstrated they sought out and were open to new information that would enable better comprehension and decision-making.

Two factors may explain participants' general pattern of vigilant behavior. The first factor relates to self-appraisal. During the initial phases of the firestorm, participants did not appear to experience significant losses of self-esteem caused by actions for which they were ashamed. Janis and Mann (1977) have suggested feelings of shame and self-disapproval can lead to irrational, non-vigilant behavior. During this study, nothing the participants did was instrumental in creating the initial crises encountered by their organizations. Therefore, it can be speculated participants were not subject to feelings of guilt, defensiveness, or losses of self-esteem that could contribute to non-vigilant behavior.

Second, high levels of participant vigilance appeared to involve social appraisal. During this event, the fires' damages were so devastating and unprecedented that utilitarian losses appeared to be perceived by organizational members as being out of the participants' control. Consequently, the losses of social appraisal related to those damages was not a significant risk. During the early phases of the fire, comments indicated that decisions intended to save lives and property were well-received, regardless of whether they were optimal. In the fires' aftermath, however, participants described conditions that involved losses to self-esteem and social standing. These decisions were described as being strategic, and more subject to the judgments and political influences of organizational members (Allison, 1971; Eisenhardt & Zbaracki, 1992). In these cases, participants commented their decision-making became more conflicted, and information-seeking and appraisal were more likely to have been curtailed. In these cases, participants implied they relied on their own instincts and judgments to guide strategic decision-

making. It is possible that if these participants had engaged in more information-seeking and appraisal while making strategic decisions, those decisions would have yielded different results.

Naturalistic decision-making.

Klein (1993, 2008) introduced the idea of naturalistic decision-making (NDM) as involving decision situations in which people lack adequate time to identify and examine alternatives. During these conditions, people associate a current problem with a similar past problem, and then conduct mental simulations to quickly identify a course of action (Klein, 1993, 2008). This study found evidence that NDM behaviors and processes were used, but in a modified fashion. The modifications to NDM appeared to stem primarily from the unprecedented nature of the firestorm. This event produced entirely unique conditions; none of the participants indicated they had experienced, or even envisioned, an event of such magnitude. Therefore, few participants suggested they were able to recognize and directly apply knowledge gained from past experiences. However, some participants suggested they indirectly applied various types of past experiences to guide their current decision-making. Some past experiences were vaguely similar to the firestorm, such as with other natural disasters. Others invoked experiences entirely unrelated to the firestorm. This behavior was well represented by P8, who had not previously experienced a fire, but stated, “this wasn’t my first rodeo.”

In summary, while the study participants were experienced in their roles, the highly unique fire conditions did not allow them to identify similar past experiences. Rather, the participants identified indirectly related past experiences to prime their thinking about viable courses of action. Consequently, this study suggests people may engage in NDM even when current problems would seem to be unrelated to past experiences. In these cases, people make indirect connections they perceived as being relevant to real-time decision-making.

Unstructured decision-making.

Mintzberg et al. (1976) proposed that when facing complex and unfamiliar situations, decision-makers deconstruct problems into sub-problems which are more familiar to them. Mintzberg et al. further suggested this behavior enables people to limit their decisions to the most immediate problems, thereby filtering out decisions which are less urgent. This study found evidence of the problem deconstruction behavior described by Mintzberg, et al. (1976). In a variety of situations that involved a complex arrangement of multiple decision factors, participants focused on identifying actionable components of overall problems, as described by the following comments:

P12: There's a problem here, let's find a solution ... stay calm, figure out the problems, keep going through to the solution, solve it, fix it.

P7: I'm an organizer and I can visually sense steps. Decision...next step.

P11: We're pretty good at this little shell game, right? Right. In terms of, okay, we got to take care of this, put this fire out and then we'll move over to this or whatever.

P1: At that time, my only focus was...get everybody out...that's step one...

P13: Stay calm, figure out the problems, keep going through to the solution, solve it, fix it. And I tend to have more of an engineering mindset so it's very logical for me. So that's probably just my first thought was okay, what's the work? Keep going in steps.

The reason that participants adopted a problem deconstruction behavior appeared to relate, in part, to their self-perceptions. Participants' self-perceptions were ascribed to views of their own personality attributes, as well as their various role-identities, as exemplified by the comments: [P7] "I'm an organizer"; [P1] "I like to consider myself somewhat of a leader in any role I take; [P9] "I tend to be an optimist in most situations." Participants who implied they saw themselves as being analytical, or wanted to be seen as strong leaders, were more apt to engage in the deconstruction of problems. Comments suggested making tangible progress was important to these participants. Factors such as past experiences and training were also influential, but

participant comments suggested those factors did not rise to the same level of significance as self-perceptions.

This study indicated that, to varying degrees, strategic decision-making aligned with Mintzberg et al.'s (1976) three-phased model involving identification, development, and selection. Furthermore, evidence did not consistently reflect the model's underlying assumptions that decision-makers act on sufficient information and without predisposition. In cases where decisions were quick, decisive, and bold, some participants implied some degree of ongoing partiality in support their decisions rather than engaging in an ongoing deliberation about the best alternatives. Comments by P7 and P9 illustrate how self-perceptions of confidence and assertiveness were suggested as decision influencers:

P7: I needed to put forward first and then moving and then getting going on a plan, whatever that plan was ... Maybe it's my leadership style. I am not the kind of leader that needs 43 people doing my job.

P9: I actually want to go out now. Where's the next fire and then where's my name on that list? I hope it's number one because I want to go out. So yeah, I think that all helped to my stress level was um, was that I, you know, I've always said this to people because I don't want to sound like I want somebody's house to burn down, but they're going to... eventually, somewhere in the city there'll be another fire.

In contrast, other participants implied that they took a more deliberate decision-making approach when high levels of uncertainty impeded the evaluation of various strategic decision choices. Furthermore, in these cases some participants found themselves stymied by unforeseen interim decisions of a tactical nature, and so found it difficult to identify a plausible strategy. In these cases, the significance of participants' self-perceptions did not appear to outweigh their decision-making uncertainty:

P8: **How am I supposed to know?** This is not my field of expertise, you got to get someone who knows to tell me but no one wanted to do that. That was a lot of back-and-forth.

P11: **I think there's that sense of well you don't know**, you just had to wait and see what came out of it.

P14: **I'm not really trained in how to alleviate all of those uncertainties**. That's not... If I had, had a really, really incredible practice manager or something, maybe they would have done a much better job than I did. But you know, I did the best I could and I had my own stress to that role...

The comments and observations in this section suggest that Mintzberg et al.'s decision process was employed to varying degrees, primarily based on self-perceptions and uncertainty. Individuals who displayed confident and assertive self-perceptions were more apt to make decisions based on incomplete information. In contrast, people with more conservative self-perceptions demonstrated a tendency to seek more information and certainty before making decisions.

Crisis management heterogeneity.

This study suggested that the behaviors and processes used by decision-makers during organizational crises are heterogeneous and cannot be consistently conceived through a single model. Existing crisis models (Janis & Mann, 1976, 1977; Klein, 1993, 2008; Mintzberg et al., 1976) were not found to be applicable to any participant in totality. The results of this study did not suggest the models used in this study are flawed; rather, the results advocate that no single decision-making model is universally applicable to the wide-ranging nature of crises. This point can be underscored merely by looking at the dramatically different decision-types faced in two well-known crises: the Mann-Gulch fire and the Cuban Missile Crisis. Decisions during the former were immediate, local, and involved self-preservation. Decisions during the latter were longer term, global, and involved geo-political strategy. Like the 2017 firestorm, the vast spectrum of crisis decision-making types and conditions are not fully explained by a single model.

This conclusion suggests that there is fertile ground for theorizing and research. This researcher suggests that, rather than attempting to apply broad models as explanations of crisis decision-making, it may be helpful to more precisely associate existing models with various crisis situations or characteristics, refining the ways in which both theory and research are applied. The ancillary outcome of such research could also assist in addressing identified difficulties associated with defining crises (Hermann, 1972; Phillips & Rimkunas, 1978; Roux-Dufort, 2016) and theorizing about crises (Topper & Lagadec, 2013).

Furthermore, research rooted in diverse ontological and epistemological perspectives is recommended as a means of developing a well-rounded understanding of the phenomenon. As discussed earlier, the vast majority of research related to this topic has adopted a post-positivist perspective, and to a far lesser extent, interpretivist. Moreover, this study found no indication that a critical theory paradigm has been applied to this topic, despite the possibility that power structures involved with OCDM might shed a different type of light on the phenomenon. Similarly, a post-modern perspective might also illustrate ways in which individuals develop their own unique perceptions of crisis decision-making.

Decision-Makers' Personal Well-Being is an Important OCDM Factor

Despite the researcher's efforts to limit this study's scope to organizational matters, all participants discussed personal impacts as significant decision-making factors. The researcher initially considered these comments to be extraneous, as they did not correspond with prevailing views of organizational crises concerns. These views have tended to emphasize economic, reputational, and operational impacts, or work-related injury and death, and environmental harm (Mitroff et al., 1988; Mitroff et al., 1987; Pearson & Clair, 1998; T'Hart, Rosenthal, & Kouzmin, 1993). In contrast, the types of personal and consequential decision factors discussed by

participants involved threats to their own lives, the loss or evacuation of their home, threats to their friends and family, the loss of basic needs, threats to their animals, and threats to their social relationships. These concerns are discussed in this chapter as matters of personal well-being.

Within the context of personal well-being, participants implied that if they failed to address their own needs, they would not be able to assist their organizations effectively. When participants were asked about critical decisions, their responses evoked the well-known air travel pre-flight safety instruction to “put on your own oxygen mask before helping others.” None of the participants indicated that they initially placed organizational concerns over significant personal matters. Therefore, upon further examination and reflection, the researcher recognized that these concerns should be explored as a meaningful (but thus far absent) crisis decision-making factor. Accordingly, this section explores the nature of significant personal well-being influences on decision-making from the perspectives of (a) victimization, and (b) real-world limitations.

The need to attend to decision-maker impacts is partially described by the cognitive impacts of traumatic experiences and a resulting sense of victimization. Taylor’s (1983) theory of cognitive adaptation proposes people who are victims of traumatic events suffer a loss of meaning, control, and self-esteem, leading to negative psychological functioning. Building on Taylor’s theory, Pearson and Clair (1998) proposed that crises undermine peoples’ conceptual systems, potentially leading to decision-making impairments and negatively impacting organizational dynamics. This phenomenon was exemplified during Hurricane Katrina’s aftermath, which created victims out of numerous emergency responders (Moynihan, 2009).

The findings of this study also suggest that during the initial hours and days of the fires, most participants were unable to tend to organizational matters because of practical limitations. Even as organizations were being impacted, eleven of the participants were being evacuated from their homes or were helping extended family members as they were being evacuated. Two participants lost their homes, and at least three of the participants were involved in saving animals that were threatened by the fires. Furthermore, participants described the damage caused by the fires as involving communications disruptions, road closures, power outages, loss of water, and other impacts. Through these comments, participants described conditions that simply prevented them from addressing organizational matters. This situation was in no way unique; a similar situation was also observed during Hurricane Katrina, during which Runyan (2006) observed that many business owners were compelled to “direct immediate attention to their homes before turning to their businesses” (p. 18).

The reader may assume conclusions about the importance of personal concerns are self-evident, but that view is not strongly supported by organizational practice. The International Organization for Standardization (ISO) and the National Fire Protection Association (NFPA) have developed commonly recognized crisis planning, management, and response standards for industry (ISO, 2009, 2012; NFPA, 2010); none of which have emphasized personal well-being as a matter of concern. Rather, ISO standards emphasize concerns related to organizational activities, processes, structures and services, while the NFPA standard discusses concerns related to security, financial impacts, and organizational reputation. Furthermore, top risk concerns cited by practitioners do not identify problems associated with personal well-being; rather, they relate to organizational matters such as information technologies failures, regulatory changes, and

corporate scandals (Deloitte, 2018). In a 2018 report on industry crisis preparedness, concerns related to natural disasters did not include personal well-being matters (Earth Networks, 2018).

While personal well-being has been found to be a significant decision factor during some crises, this study recognizes that such matters are not relevant during all types of crisis circumstances. Crises which occur strictly within organizational boundaries are not likely to trigger the types of personal well-being impacts of interest in this finding. Based on this study's results, characteristics of crisis in which personal well-being impacts become an element of OCDM are proposed to include crises which:

- Threaten the life and safety of decision-makers in contexts that are external to their organizations;
- Threaten decision-makers' families or loved ones, to include animals;
- Damage or destroy decision-makers' homes or other property; or
- Damage or destroy infrastructure upon which decision-makers rely in contexts external to their organizations.

This conclusion holds implications applicable to OCDM theory, research, and practice. From a theorizing perspective, personal well-being may represent an important construct that touches on self-concept, emotional health, psychological health, and other important humanistic considerations. Such a theoretical perspective would arguably support views related to human capital theory: viewing people as "capital" would also suggest that capital has value and should be cared for. With respect to research, some studies have indirectly touched upon matters of decision-maker personal well-being; but these findings appear to have been ancillary observations rather than areas of emphasis. From the perspective of practice, professional standards organizations can consider ways to meaningfully incorporate personal well-being into

planning guidance. Such practices would be appropriate in the contexts of risk assessments, contingency planning, and business continuity planning.

Self-Perceptions Evoke an OCDM System Archetype

The prominence of participants’ self-perceptions as decision-making factors emerged as a common theme during this study. Of 15 participants, ten described circumstances suggesting that their decisions appeared to stem considerably from how they perceived themselves. As an example, participants who viewed themselves as strong leaders tended to make decisions that reinforced that perception: decisions tended to be bold and decisive. People who viewed themselves as analytical tended to take a measured and sequential approach to decision-making. The nature of participant self-perceptions related to both role-types and personal attributes. Table 20 contains brief descriptions of categories of self-perceptions and how they translated into decision-making.

Table 20
Examples of Self-Perceptions and Implications for Decision-Making

Self-Perceptions	Implications for Decision-Making
Analytical; Engineer	Complex situations were broken down into sequential tasks
Athletic; Competitor	Problems were approached energetically, proactively and decisively
Strong Leader; Capable	The crisis was used as opportunity to instill positive change and improvement
Calm; Unflappable	Approached imminent hazards deliberately and unemotionally
Family head; Mentor	Assumed role of life-saver and staff
Coach; Connector	Emphasized decisions pertaining to mutual support and care

The attachment of self-perceptions to decision-making may in part be understood through people’s tendencies to perceive events in ways that are beneficial to their self-concepts (Weick, 1993, 1995). Despite the influence of self-perceptions, participants did not appear to perceive

their decisions as self-serving, but in ways that legitimately benefited their organizations. In most circumstances, participants who implied that decisions were related to their self-perceptions also believed their decisions to be high quality. On the other hand, people who appeared to struggle with decision-making challenges were less vocal about their self-perceptions.

Self-enhancing cognitive biases may have played a role in these perceptions, as positive characteristics people see in themselves tend to be correlated with positive outcomes (Kelley, 1987; Miller & Ross, 1975). While people tend to associate personal characteristics with successful outcomes, they also tend to associate unsuccessful outcomes with forces that are external to them. As a result, more attention is directed toward that which decision-makers associates with their own attributes.

For the reasons described in this section, participants' self-perceptions and associated expectations about the failure and success of various problems evoke the underlying principles of the "success to the successful" system archetype (Senge, 1990). According to this model, when multiple activities rely on limited resources, resources are assigned to the more successful activities, thereby depriving the other of resources and causing its demise. As such, success or failure is essentially a self-fulfilling prophecy based on resource allocation. A similar phenomenon may be true within the context of OCDM. Like the success-to-the-successful archetype, whether any particular aspect of a crisis is given attention and resources can be based on decision-maker self-perceptions rather than the severity of the outcomes or other salient factors. If a decision-maker perceives a problem's outcomes are positively related with his or her traits, the problem is likely to receive more attention. In contrast, if a problem's outcomes are viewed as relating to external factors, it is likely to receive less attention. The model is presented visually in Figure 10.

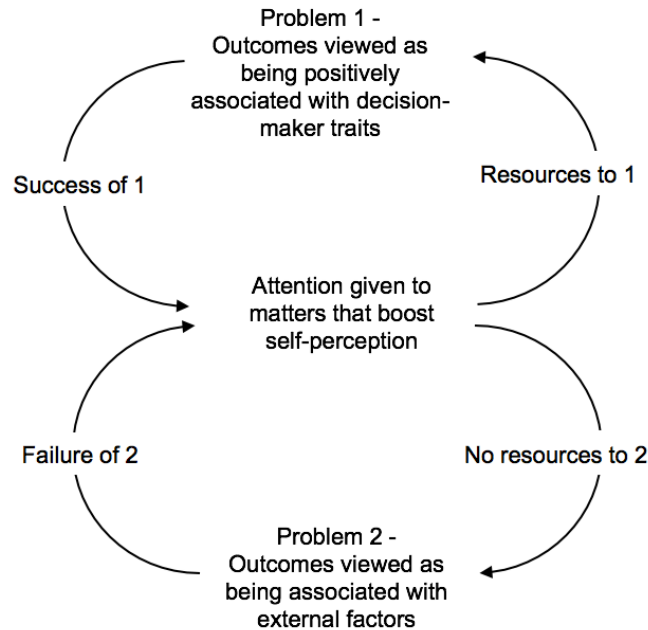


Figure 10: Self-perception in OCDM envisioned as a system archetype.

In this model, Problem 1 is perceived as being positively related to the decision-maker’s self-perception, and therefore receives more emphasis, leading to a higher degree of success. The opposite is true for Problem 2. Because it is not perceived as being associated with positive aspects of the decision-maker’s self-perception, it is de-emphasized and fails as a result. In retrospect, the decision-maker’s self-perception is reinforced because of Problem 1’s success. The results of the model suggest a self-fulfilling prophecy whereby people solve problems that they relate to how they view themselves. While personal attributes are perceived as indicators of success, they actually serve as gate-keepers which direct our attention to one problem or another.

Temporary Mental Models Influence Sensemaking

“You make a decision, but...you get into a mode a little bit.” [P9]

An emergent theme in this study involved the temporary adoption of cognitive states described as “modes.” Types of modes explicitly identified by participants were crisis mode, rescue mode, problem-solving mode, triage mode, event management mode, leadership mode, and ministry mode. These temporarily adopted cognitive states appeared to have created

transient self-perceptions and mental models that shaped the ways in which participants made sense of conditions. Further exploration of temporarily adopted states may shed light on the ways in which people form mental models that mediate contextual factors and sensemaking.

As discussed earlier, the nature of complex adaptive systems (CAS) involves uncertainty and change which inhibit the ability to make sense of one's environment. And yet, making sense of one's environment has been identified as intrinsic to decision-making (Helms Mills et al., 2010; Weick, 1995). Therefore, decision-makers face dilemmas in which they must make sense of environments that cannot be well-understood. The decision-makers are therefore challenged to establish some form of meaning upon which decisions can be made and enacted. Mental models are suggested to assist in addressing that need.

Mental models have been described as mechanisms that enable people to understand and interact with their environments (Gentner & Stevens, 2014), and to form expectations of future environments (Rouse, Cannon-Bowers, & Salas, 1992). Rouse, et al. (1992) further asserted mental models enable connections from "situation-general knowledge structures to situation specific expectations" (p. 1300), which suggests that the use of mental models in CAS conditions may serve to bridge gaps between uncertain environments and sensemaking. If, as this study has suggested, some crisis situations are accepted as CAS, it is plausible that the role of mental models can enable sensemaking during extreme crisis conditions. The mediating role of mental models between CAS crises and sensemaking is envisioned in Figure 11.

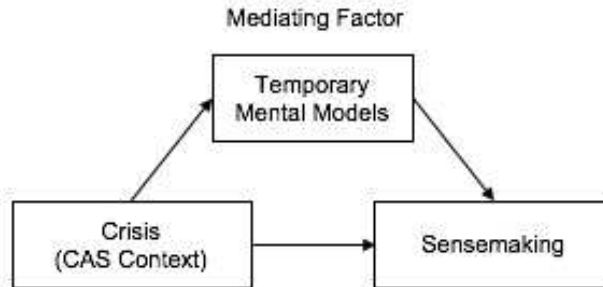


Figure 11: Mental models as a sensemaking mediator during CAS crisis contexts.

As opposed to Weick’s (2005) characterization of mental models as being intrinsic to sensemaking, the temporary nature of some mental models may suggest that they are not innate to a decision-maker but are adopted situationally. As such, the valence of temporary mental models might be seen as mediating the way in which sensemaking occurs.

Furthermore, participants’ invocation of temporary behavioral modes might be partly explained by trait activation theory (TAT). TAT suggests some personality traits can be triggered or amplified by trait-relevant situational cues (Tett & Guterman, 2000). While researchers have put forth various arguments about the relationship between situations and traits, they are reconciled by an agreement that peoples’ perceptions of situations mediate how their behaviors are influenced (Mischel, 1973). Some situation-trait relationships are predictable and identifiable. For example, Newman, Donohoe, and Eva (2017) have suggested organizational climates can be created and observed to understand how individual traits are affected. In contrast, crises are unexpected, unpredictable, changing, and occasionally unprecedented. This suggests crisis situations may have the capacity to induce latent decision-maker personality traits. Whether these traits positively or negatively influence decision-making may not be known until a crisis occurs. This “real-time” understanding of decision-maker behavior is counter to the proactive nature of organizational preparedness. This reality supports the appropriate use of proactive interventions for the purpose of inducing otherwise unidentified modes or traits that

could significantly influence decision-maker behavior. Such interventions might include mock exercises or drills, but these events must be compelling in order to reveal “unmasked traits” (Mischel, 1977; Tett & Guterman, 2000).

Perceptions of Control Influence OCDM’s Stress and Scope

A research sub-question in this study asked how and why decision-makers ascribe more significance to some decision factors than others. The results of this study indicate perceptions of control emerged as significant decision factors. However, participants appeared to perceive control in different ways than have been identified in literature.

Peoples’ beliefs about having little or no control over a problematic situation has been recognized as a contributor to decision-maker stress (Lazarus, 1993). Significantly heightened stress levels have been found to impair decision-making due to cognitive and physiological reactions (Lazarus & Folkman, 1987; Selye, 1965). This study, however, sheds a different light on how decision-makers perceived control, and how those perceptions affected their sensemaking and decision-making.

As discussed earlier in this chapter, several participants described crisis decision-making as involving factors which were uncertain, ever-changing, and non-linear. Within this entangled web of influences, some decision-makers identified problems they felt they could not influence or control. But, rather than becoming anxious about these situations and experiencing heightened stress levels, some participants excluded aspects of problems over which they had no control. In doing so, they eliminated stress factors, reduced the scope of problems under consideration, and transformed their own crisis landscapes into ones that were more manageable, predictable, and actionable.

This behavior may in part be explained by the association between feelings of control the preservation of one's self-esteem. Kelley (1987) described this as "effective control," suggesting that people place a high degree of importance on their ability to influence their environments. Similarly, Bradley (1978) argued that individuals interpret past events in ways that are not destructive to their self-esteem, and in doing so, can exclude factors that they perceived to be out of their control (Miller & Ross, 1975). Hastorf, Schneider and Polefka (1970) succinctly described this behavior in positing that "We attribute success to our own dispositions" (p. 73). This assertion is consistent with research on sensemaking, which attaches great importance to the maintenance of ones' self-concept (Weick, 1993). By ascribing failures to forces beyond their control, people can avoid responsibility for those failures (Brown & Jones, 1998) and protect their social standing (Miller & Ross, 1975).

This study observed that feelings of control may not only be retrospective but can be "prospective" in that they can apply to future events. As opposed to perceiving that a situation "was out of my control", comments evoked the belief that a situation "will be out of my control." Participants assigned an understanding of what they believed they could control onto a situation that was ever-changing, and during which the aspects of control were likely to change. As a result, a participant's level of control was subject to have been under- or over-estimated at any given point in time.

Because this study did not delve deeply into why people perceived control in the ways that they did, the roots of these behaviors were not uncovered. Consequently, this observation may suggest that additional research about feelings of control during crises can shed light on decision-making behaviors. Three areas of research are envisioned: (a) within the entangled nature of OCDM, explore meaningful relationships between feelings of control and other

decision factors; (b) explore more deeply how and why people project retrospective sensemaking into the context of future events; and (c) examine relationships between self-concept and feelings of control during crisis situations.

Psychological Safety Influences OCDM

Schein (1992) and Edmondson (1999, 2002) suggested mutual trust and confidence within a group creates a climate of psychological safety. In a psychologically safe organization, people believe that their words and actions are protected from negative interpersonal consequences (Schein, 1992). While it has become an accepted group dynamic, psychological safety has been researched primarily within the context of group learning in small group settings.

In this study, some participants implied the climate of psychological safety had a significant influence on their decision-making. Participants suggested trust and confidence were significant in relation to how much support they felt they would have if a decision turned out to be a mistake. Some decision-makers implied they felt empowered to make decisions because they believed they would not be penalized for a mistake. Because they felt empowered to make decisions, they did not experience stress produced by social pressures, and they were not compelled to engage in a potentially paralyzing analysis of important decisions. In one instance, a participant made decision motivated by personal factors, while knowing that it did not conform to organizational priorities. The participant stuck to the personally-motivated decision, knowing others would be supportive even though the decision was counter to what others would have expected. In other instances, where trust was deemed to be low, participants expressed a sense of isolation in the decision-making process, reflecting an anxiety as to how decisions would be received and supported. In these cases, decisions were described as highly conflicted and stressful.

This study suggested the influences of psychological safety may extend well beyond the context of organizational learning and are far broader than small group settings. Consequently, further studies into psychological safety in organizational decision-making contexts may yield novel insights into decision-making behaviors. Complementary to another finding in this study, further investigations could reveal meaningful insights between psychological safety and self-concepts, enhancing understandings about how people feel empowered to engage in risk-taking, and are “comfortable being themselves” (Edmondson, 1999, p. 354).

Sensemaking Can Be Inextricable from Decision-Making in VUCA Circumstances

“...it just seemed obvious” —P3 comment regarding a decision-making process.

Researchers generally agree sensemaking is a precursor to decision-making (Boland, 2008; Bolander & Sandberg, 2013; Brown, Colville, & Pye, 2015; Weick, 1995). According to this view, people must understand a situation before they can evaluate and decide upon a course of action. However, this perspective rests upon two assumptions about decisions: (a) the recognition of a “problem space” requiring a decision (Simon, 1957), and (b) decisions involve the identification and analysis of options. The results of this study identify instances which deviated from those assumptions. Therefore, an alternate interpretation of the relationship between sensemaking and decision-making is further explored.

As previously discussed, instances in which problems were unclear, and in which multiple decision options were not evaluated, involved situations described as volatile, uncertain, complex, and ambiguous, evoking characteristics of complex adaptive systems. These instances tended to have occurred in the early phases of the fire, during which participants were reacting to immediate threats. Because of the chaotic nature of the situations facing participants, problems could only be vaguely understood. Within these unclear and changing environments, participants

simultaneously faced multiple and vaguely-understood problem types: threats to self, threats to others, threats to property and assets, and operational disruptions. Rather than analyzing various identified problems, participants appeared to have faced entangled issues, and often were merely trying to understand “what the main problem was.” As described in other sections of this study, numerous internal and external factors were included in participants’ cognitive calculus.

Some participants inferred that once situations were sufficiently comprehended, decisions emerged. In other words, “to understand was to decide”: through the understanding of a chaotic environment, decisions became self-evident. In some cases, participants did not appear to recognize discrete problems and then identify decision options. Indeed, when asked about consequential decisions, many participants were at a loss to identify one, even though they made decisions concerning multiple problems. Rather, once a situation was sufficiently understood, action was taken. One participant who faced a myriad of problem types exemplified this behavior. Having been asked about how decisions were arrived at, the participant simply responded, “it just seemed obvious.”

The essence of Weick’s underlying assertion about sensemaking is not under debate: people need to understand situations before they act on them. However, the sequential nature of that relationship is of interest. As opposed to sequential processes, some participants’ experiences evoked an iterative and ongoing relationship between sensemaking and decision-making. This relationship may be partially explained by Klein et al.’s (2006a, 2006b) assertion that people constantly use “frames” of understanding as way to interpret data, and as new data is introduced, pre-existing frames evolve and change. In this way, “meaning” is constantly shifting and adjusting. Logically, this would be especially true during complex and dynamic crisis situations.

Naturalistic decision-making (NDM) may further aid in exploring how a frame of understanding might transform into a decision. Klein (1993) suggested that NDM occurs in natural settings where experienced people must act within time constraints. The NDM model describes that people associate a frame of understanding with a past event that provides guidance for action; therefore, analysis of decision options is not required. While Klein's NDM model suggests that frames lead to decisions, participant behaviors indicated that the frames actually became the decisions. In that way, the decision-making process was virtually transparent to the participants, potentially explaining why they did not tend to recall specific decisions, nor did they imply that sensemaking was a distinct activity.

Summary

The conclusions described in this chapter reflect the variable nature of crises and their associated decision-makers. Rather than identify sweeping inferences that apply to all crisis contexts, this chapter has demonstrated the fickle nature of OCDM. Based on an argument that OCDM can occur as a complex adaptive system, elements of the decision-making system can produce countless decision influences. This chapter has discussed these variables as involving variable perceptions of crises, decision strategies, self-concepts, perceptions of control, temporary mental models, and psychological safety. Furthermore, this chapter suggested that decision-maker well-being has been an under-represented aspect of the overall OCDM system.

Implications for Theory, Research, and Practice

This study has merely scratched the surface of an important but largely unexplored topic. Ideally this study will inspire others to take a closer look at the nature and inner workings of OCDM, shedding more light on the phenomenon. Although the results of this study may have a

wide range of implications for both individuals and organizations, this section discussed those that the researcher viewed as being the most significant.

Implications for Theory

The outcomes of this study may provide some contributions to how the philosophical underpinnings of OCDM are perceived, and how those perceptions influence theory-building. Highlighted in this section are considerations regarding theoretical ontology, and implications concerning organizational studies.

Re-thinking how crises and crisis models are conceived.

“All models are wrong, but some are useful.” -Attributed to George E. Box

Problems associated with how crises are conceived are nothing new. This study’s review of literature and analysis of interview data suggest that a re-conception of “what a crisis is” may provide for much-needed insights, potentially removing conceptual impediments that have stymied the inclusion of the crisis phenomenon as a part of organizational studies. The ways in which crises are conceived logically lead to implications for derivative topics such as crisis decision-making, crisis leadership, crisis management, crisis communication, and others. But to date there has been little consensus about what constitutes a crisis, contributing to the topic’s under-representation from management literature (Roux-Dufort, 2013). Consequently, revisiting how the topic is conceived may prove beneficial within a number of disciplines.

Scholars have interpreted the concept of a crisis in several ways. Contrary to researchers’ concerns about conceptual differences, this study may suggest they are actually not distinct enough. This is argued because various crisis concepts purport to describe similar phenomena, when perhaps they do not. For instance, should a common theoretical model apply to both losing one’s wallet and avoiding global nuclear catastrophe? In literature, both are crises, yet the

contexts are hardly similar. Merely within the bounds of the 2017 Northern California firestorm, crisis situations differed for a myriad of reasons: the number of people involved, the nature of harm posed, time pressures, political influences, organizational cohesion, and numerous others. Even in a common setting, this study revealed a wide range of perceptions about the nature of the event. For some, it was long-term and simmering, and for others, it was immediate and VUCA. Some participants experienced debilitating stress, and others were energized. In summary, real-world crisis situations varied tremendously, despite researchers' calls for conceptual consensus.

Rather than search for a universal and standard interpretation, perhaps crises can be usefully conceived at various levels of abstraction. For instance, the understanding of a crisis might be well-served by theorizing at a grand level, recognizing and accounting for broad situational and contextual differentiators: unexpectedness, outcome severity, and uncertainty. To supplement grand-theory abstractions, mid-range and local theories might be developed in constrained ways that account for more defined variables or aspects: individual or organizational contexts, types of consequences, crisis durations, and other contexts. By viewing the topic through the lens of various abstraction levels rather than universal applicability, substantially different types of crisis situations might find theoretical and conceptual homes that are, in Box's words, "useful."

Moving beyond traditional systems thinking.

To date, the philosophies underlying OCDM theories have almost exclusively reflected reductionist and process-based paradigms. In these paradigms, the view of OCDM as a construct is one that can be broken down into core components, and the relationships between those components can be identified and described. In this view, the phenomenon seeks a natural state of equilibrium, and when variances from that state occur, the system acts to restore balance.

While this may be an accurate theoretical perception of some crisis conditions, this study revealed alternate possibilities: both OCDM components and their relationships can be emergent, changing, and non-linear in VUCA (variable, uncertain, chaotic, and ambiguous) situations, and equilibrium states can be unstable or changing. In light of that finding, this study proposed an alternative perspective that reflects a complex adaptive system (CAS).

The introduction of alternate paradigms such as CAS suggests fundamental changes in how VUCA crisis decision-making can be theorized. Diverging from the historically reductionist, predictive, and post-positivist stances ascribed to the existing OCDM theories and models, a re-imagined theory could reflect a context in which components and relationships appear, disappear, and change, depending upon circumstances. While this type of theorizing might not advance predictive or normative modeling, it could stand to be very useful in understanding “what is plausible” from both organizational and individual sensemaking and decision-making perspectives.

Furthermore, a CAS view of crises would represent a departure from ontological norms associated with the current post-positivist era within the social sciences (Potter, 2016), and insights based on interpretivist perspectives could illuminate the topic in different ways. This implication does not oppose post-positivist thinking, rather it is an argument that a more expansive perspective will yield a broader set of insights. For example, it would seem likely that power structures could factor into some crisis decision-making contexts, and as such, critical-based theory-building could shed more light on the nature of those influences. Alternatively, if one subscribes to findings regarding the importance of internal factors as influencing decision-making (specifically, that the nature of the crisis is largely conceived in the mind of the decision-maker), engaging in theorizing from a post-modernist perspective would likely add unique

understandings to the phenomenon. Generally stated, viewing the phenomenon from diverse theoretical perspectives is apt to yield new and useful insights.

Implications for Research

OCDM has been consistently described by researchers as being a complex phenomenon. But despite this recognition, the illumination produced by scientific research has primarily originated from a common reference point; one that is post-positivist and quantitative. Even this study's departure from the overwhelmingly post-positivist research tendency has yielded modest insights that may not have been previously discussed. As an outgrowth of this study, the following areas of research are suggested as being worthy of further epistemologically-diverse investigation.

Psychological safety and OCDM.

This study suggested that group trust and confidence among members create conditions of psychological safety, an important antecedent condition that significantly influences OCDM. In the presence of psychologically safe conditions, participants demonstrated they were more apt to make decisions and were less constrained by concerns about the organizational repercussions of those decisions. In climates that were more psychologically unsafe, participants faced additional stress and uncertainty that impeded decision-making.

While studies pertaining to psychological safety have largely focused on organizational learning, they have gradually branched out into other areas such as leadership, creativity, self-efficacy, and others. However, this study has not revealed evidence that the topic has been studied within the context of OCDM, or more generally, decision-making. Further extending psychological safety into OCDM research would appear to be both relevant and insightful. The relevance of such research might be traced to several factors identified in Edmondson's (1999)

psychological safety scale. While the psychological safety scale factors reflect team contexts, Edmondson (1999) indicated the outcomes of psychological safety are realized by “individuals’ willingness to engage in otherwise threatening learning behavior” (p. 353). Therefore, this researcher submits that “individuals” are often decision-makers, and “threatening learning behaviors” often relate to decision-making during crisis situations. Inductively, psychological safety would therefore appear to relate to the willingness of individuals to engage in decision-making, crisis-related or otherwise.

Insights from research concerning OCDM and psychological safety could touch on both individual and organizational matters. As discussed previously, research from diverse ontological and epistemological paradigms is encouraged to shed light on the following questions: (a) is there a relationship between psychological safety and decision-making conflict as described by Janis and Mann (1976, 1977)? If so, what is the strength and nature of that relationship?; (b) to what extent does psychological safety influence naturalistic decision-making as described by Klein (1993, 2008)?; (c) over what period of time is psychological safety typically developed within teams?; (d) what are the implications of psychological safety for decision-makers who are new to their teams?; (e) how and why do decision-makers perceive the state of team psychological safety in the ways that they do?; (f) have effective means of accelerating psychological safety been established?; and (g) do conditions of psychological safety alter during crisis events? If so, how and why? A more complete understanding of these areas could support the development of more effective team and individual interventions related to OCDM.

Decision-maker well-being.

This study suggested that crisis conditions can debilitate decision-makers, effectively inhibiting OCDM. Yet research on this topic is scant and often peripheral to other areas of

emphasis. Studies related to large natural disasters have noted that key decision-makers were incapacitated for various reasons (Moynihan, 2009; Runyan, 2006), but those conditions were not described in depth. Further comprehensive inquiry into decision-maker well-being would offer additional insights into the nature of these factors, as well as their degrees of consequences within the context of OCDM. Important questions might relate to concerns such as: (a) what types of crisis contexts have yielded significant decision-maker well-being difficulties?; (b) what types of personal well-being problems have decision-makers had to contend with?; (c) what are the characteristics of decision-makers who have experienced personal well-being problems?; and (d) is there evidence of conditions or practices that have reduced the degree of decision-maker well-being impacts? Through an evidence-based and comprehensive understanding of these conditions, scholars and practitioners may be better equipped to mitigate or prevent such impacts.

Research transferability.

This study was not intended to be limited to a specific type of organization, participant role, or crisis type. Rather, it was intended to explore the ways in which people made decisions for their organizations during times of crisis, using the 2017 firestorm as a common reference point. While this study did not presume that a firefighter's decisions would be similar to that of a business owner, it was designed in a way that did not exclude the possibility that their decision-making experiences might be mutually informative. As such, this study could serve as a launch-point for a more comprehensive and bounded inquiry that can be more closely associated with identifiable types of organizations or individuals.

To the extent that organizational characteristics are aligned with external decision influences, patterns and themes germane to these influences could offer more granular OCDM

insights. Types of organizational characteristics bounding further explorations could involve industry sectors, employee population sizes, organizational structures, organizational cultures, the nature of the organizations' missions, and others. Similarly, examining individual characteristics in future OCDM research could illuminate matters concerning internal decision factors. Such outcomes could be transferrable to categories of individuals that span various organization contexts. Characteristics of interest could involve role types, leadership styles, years of experience, personality types, gender, self-perceptions, and others. Through more focused research, it is suggested that outcomes may be more readily applicable to the population of interest.

Implications for Practice

Ultimately, improved crisis decision-making offers the prospect of protecting lives, property, reputations, human well-being, and other organizational interests. Literature suggests that, as a practice, OCDM has not been treated as its own domain. Rather, it has tended to fall into the broader topic of crisis management. Therefore, the implications for practice identified in this study are discussed as elements of overall crisis management practices. Proposed in this section are several possible ways in which to improve practice: the enhancement of guidance standards, and the incorporation of reflective practices into OCDM learning.

Enhancement of guidance standards and frameworks.

A great deal of OCDM practice is influenced by regulatory or voluntary standards and frameworks: the International Organization for Standardization (2009, 2012), the National Fire Protection Association (2010), the Federal Deposit Insurance Corporation, the Federal Energy Regulatory Commission, and others. The guidance documents produced by these organizations offer recognized ways of addressing organizational crises and factors that drive decision-making:

data collection and analysis, team structure, communications, and others. As discussed previously, these standards are oriented predominantly at matters that are internal to an organization. As such, the standards do not address two findings identified in this study: (a) decision-maker well-being, and (b) psychological safety.

Decision-maker well-being.

Guidance standards influencing OCDM tend to address personal well-being in the context of issues that are internal to organizations. These types of issues focus on safe working conditions, response to emergency situations, employee pay and benefits, employee security, and other conditions that the organization can influence. However, these standards remain silent on matters for which organizations do not have direct responsibility. Issues that fall into this category can include matters such as the health and well-being of employees' families, the health of employees' animals, damage to employees' homes, emotional trauma that is unrelated to the workplace, employees' residences loss of water, power, or other infrastructure, school closures, and others. Because key decision-makers are subject to these conditions, organizational decision-making is also affected. As reflected in this study, the risk involved with these standards is that crisis conditions may render decision-makers unable to support their organizations because of over-riding personal matters. A recognition of this possibility within standards is suggested as a means of mitigating this risk. The introduction of "good practices" aimed at these conditions might fall into both proactive and reactive measures. Proactive measures might involve:

- promoting, encouraging, and assisting key decision-makers with the development of "home response plans." Such plans might include family emergency contact lists, access to medication during evacuations, and ways to communicate with family members if normal methods fail;

- assisting key decision-makers with reducing home-related risk such as power loss, fire danger, and flood exposure; and
- assisting key decision-makers with the identification of animal care and sheltering services.

Reactive measures may include activities that would occur during a crisis, such as:

- arranging for support services such as transportation, child-care, animal care, or temporary lodging;
- establishing informal communication networks among families; and
- assigning unaffected employees to provide assistance to families of affected decision-makers.

While these measures may be common practices for some organizations, they have not been recognized as standard practices. Consequently, the practices are likely to be implemented inconsistently across organizations, without the benefit a comprehensive set of recommendations. This study indicates that the integration of employee well-being into recognized standards would positively affect organizational crisis decision-making.

Psychological safety.

The standards referred to in the previous section tend to reflect crisis management activities as occurring within the context of teams that are functioning well. However, this study pointed out this assumption is not always valid. On occasion, teams are not cohesive, trust among members has not been established, and decision-makers can be negatively impacted by those conditions. Despite a psychological safe climate's influence on OCDM, this condition is not addressed in established guidance standards pertaining to crisis management. The nature of psychological safety practices offered in this study include:

1. Considering the absence of team cohesion and trust as an organizational risk factor;
2. Engaging in team building activities for ad hoc groups that come together only during times of crisis; and
3. Creating team member awareness of the implications of psychological safety.

Improving OCDM through reflective practice.

Roux-Dufort's (2000) research offered a very simple claim: after a crisis, most organizations do not learn very much. While there are many reasons for the claim, Roux-Dufort cited several that pertain to the outcomes of this study: (a) crises are minimized or excused because their complex and unexpected nature are often considered aberrations from the status quo; (b) crises impede cognitive flexibility associated with learning due to stress and anxiety; and (c) learning activities are often focused on social or political concerns as opposed to real learning. In other words, research suggests crises are difficult, uncomfortable, messy situations that we would rather not deal with.

In spite of organizations' general distaste for learning from crises, some common practices exist. One common practice is the crisis debrief (Lagadec, 1997). Unfortunately, the usefulness of debriefs is limited, as Lagadec (1997) found organizations tend to focus their learning on deviations from expected results, while at the same time shying away from exposing ill-understood aspects of the organization. Under these conditions, debriefings may have little to do with truly understanding the decision-making processes and behaviors that have been experienced during a crisis. Furthermore, this limited view of crisis learning fails to touch upon many of the issues found to be salient in this study: organizational trust, well-being problems that impede decision-making, the non-linearity of crisis situations, changing status quos, and others.

In contrast to common learning techniques such as debriefings, novel approaches to learning may further advance OCDM understandings. For instance, reflective practices have been established as an effective way to learn (Husebø, O'Regan, & Nestel, 2015). In reflective practice, people learn by thinking about previous knowledge as they evaluate their experiences, and therefore they can incorporate those learnings into future actions (Gibbs, 1988). The results of this study suggest that reflective practice may provide an effective individual and organizational means of learning about OCDM. Through reflective practices, individuals are likely to consider the wide range of factors that are germane to OCDM. This study proposes that Gibbs' (1988) six-step reflective cycle may provide a sound basis for OCDM reflective practice. The cycle is described below in the context of OCDM:

1. Description. What happened? What situations emerged that required decisions?
2. Feeling. What thoughts and feelings did the decision-maker experience?
3. Evaluation. What aspects of the situation were thought to be positive or negative?
4. Analysis. How did (or could) the decision-maker make sense of the situation? Do other experiences apply to the situation? Do experiences of other people apply?
5. Conclusion. What else could have been done? Is there a general conclusion that can be drawn?
6. Action Plan. In future crises, what can be done, and what can be done differently?

Certainly, barriers to reflective practice exist. As stated earlier, crises are unpleasant matters to deal with. Engaging in reflective practices will take both imagination and courage, as the approach presents a new frontier of crisis learning that might yield uncomfortable truths. Consequently, it may be that a body of empirical evidence is assembled by researchers before the practices are widely acceptable, but this study suggests initiating the effort could be worthwhile.

Some Final Words: Implications for Organizational Studies and HRD

While scholars have observed that the study of crises—and therefore OCDM—have been excluded from organizational studies because they are viewed as anomalies, this study suggests something different. Crises can impact any organization at any time, and therefore, the ability to effectively respond to them is an inherent organizational responsibility. Organizational members should not assume they are immune from crises, regardless of how exposed they assume they are to various risks.

The ubiquitous nature of crises is widely recognized by regulators. For example, in the United States, the Security and Exchange Commission requires publicly traded organizations to disclose significant crisis-related risk factors in their annual reports (Commission Statement, 2018). Academic and industry research indicates organizational leaders feel high levels of pressure to be able manage crises, and have identified unexpected crises as a top strategic risk (North Carolina State University & Protiviti, 2019). Organizations are seldom immune from all risks and threats. In brief, the phenomenon is universally relevant.

Furthermore, the absence of crises and OCDM in organizational studies seems to signal that only “common” organizational phenomena warrant scholarly attention. This is a curious rationale, as it appears to deviate from norms in other scholarly domains. In other scholarly areas, improbable but highly impactful phenomena are not ignored: rare diseases (medicine), rare mental conditions (psychology), and uncommon merger and acquisition techniques (business) are not treated as out-of-bounds. Rather than focus on the absence of crisis and OCDM inclusion in academic studies, this researcher is optimistic that there are abundant opportunities to make progress and advance knowledge in this area— advances in which human resource development (HRD) can play a part.

While a myriad of subject matter areas within the HRD domain are likely applicable to the advancement of OCDM, one core aspect of HRD is viewed as being highly relevant: leadership. Each of the participants involved in this study were, or became, leaders in some capacities, often at the highest levels of their organizations. Given that organizational crisis decision-making often falls into the responsibility of leaders, it follows that the development of crisis leadership capabilities would benefit organizations. Despite this need, Wooten and James (2008) suggested leaders have been inadequately prepared to manage crises, both in terms of decision-making and other leadership skills.

Consequently, the question is asked: what role can HRD play in advancing leaders' OCDM capabilities? A primary role that HRD can play is simply to recognize that crises and OCDM are inherent to organizations and are therefore are inherent aspects of leadership. In doing so, HRD can support the refinement of relevant leadership competencies, a measure that would provide a framework for crisis decision-making (Bolman & Deal, 1997). Furthermore, HRD can leverage the community's vast knowledge of organizational culture to explore the effectiveness of crisis leadership styles within various cultures. And to the degree leaders engage in strategic planning, Ruona, Chermack, and Lynham (2003) suggested HRD can support the development of crisis awareness, as well as policy and procedure development. While only a few opportunities have been discussed, recognizing that crises are germane to organizations opens up a wide range of opportunities to apply HRD knowledge and research. By engaging in OCDM, HRD can play a vital role in protecting people and their organizations.

Chapter Summary

Chapter five has discussed this study's conclusions and implications. An over-arching conclusion reached in this study was that in volatile, uncertain, chaotic, and ambiguous contexts,

organizational crisis decision-making can be described as a complex adaptive system (CAS). This conclusion is novel in that it departs from traditionally normative and process-based explanations of decision-making. A CAS-based model of organizational crisis decision-making is proposed.

This study further suggests that naturalistic decision-making (NDM) may be influenced by past experiences which are not highly similar to real-time conditions. NDM research has suggested that people make time-constrained and high-severity decisions by using similar past experiences as proxies when determining courses of action. This study suggested that people can invoke a variety of past experiences to guide urgent and consequential decision-making, even when experiences are not similar to current conditions.

This study has also drawn a number of conclusions related to factors that influence decision-making. First, personal well-being was described as a significant concern, and was often viewed as an organizational matter. Second, peoples' perceived inability to control a situation narrowed the scope of decision-making, thereby decreasing associated stress levels. This was an unexpected finding, as research has suggested that the lack of control over a situation results in heightened stress levels. Third, group member trust was found to be a significant decision factor, suggesting the need for further research into various aspects of psychologically safe climates and decision-making.

A key implication resulting from this study concerned calls for theorizing within the domain of crisis studies. Several scholars have argued that a unifying theory should be developed to bring clarity to the domain. However, this study has found that even within a similar context, perceptions of crises vary dramatically. Therefore, while a grand theory may be useful, mid-range and local theories may be appropriate to accommodate the highly unique and contextual

aspects of various crisis phenomena. Such theorizing could also serve as a platform upon which to advance further organizational crisis decision-making research.

The practical implications of this study suggest that leaders, managers, and other crisis decision-makers will be well-served by standards of practice that incorporate behavioral and social decision-making factors. While current standards of practice provide frameworks that guide the implementation of various activities, they do not address the myriad of decision-making factors that are associated with those activities during a crisis. Therefore, this study argues for a more expansive view of decision-making within relevant standards of practices.

Finally, this chapter has suggested that matters related to organizational crises should be more substantially represented within the field of organizational studies. While crises have traditionally been viewed by scholars as organizational anomalies, recent trends have suggested that the ability to respond effectively to a crisis has become a more common expectation of leaders. Because it encompasses a wide-ranging scope of human and organizational dynamics, it is argued that HRD can play an instrumental role in shaping the relevance of organizational crisis studies.

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APPENDIX A: INTERVIEW GUIDE

<p>Interviews will follow Rowley’s (2012) guidance on initiating discussions:</p> <p>Researcher introduction: I will introduce myself and provide a brief description of my background. I will then discuss why I am conducting this research, and why it is of interest to others.</p> <p>Interview format: I will describe the estimated length of the interview, seek permission to use an audio-recorder, and remind them that they may decline to answer any questions.</p> <p>Informed consent: At the beginning of each interview, participants will be asked to review the consent form, and to acknowledge consent by signing the consent form before the interview commenced.</p> <p>Aims and objectives: I will review aims of the research as a way to create interest and to establish a wide frame for interview questions.</p>	
Purpose & relation to research questions	Question
<p>Frame the case, establish personal context, gain an initial sense of the person’s role identity</p>	<ol style="list-style-type: none"> 1. What was your role during the time of the fires? <ul style="list-style-type: none"> • <i>(probe for description of organization and key responsibilities)</i> 2. What is your role now? <ul style="list-style-type: none"> • <i>(probe for description of current organization, if different)</i> 3. Prior to the fires, had you experienced similar situations? <ul style="list-style-type: none"> • <i>(Probes: what was your role? How did that influence you?)</i>
<p>Identify an initial decision for purposes of establishing a foundation for the person’s SM and DM processes and behaviors.</p>	<p>(We’ll start by talking about a specific decision that you dealt with...)</p> <ol style="list-style-type: none"> 4. What did you see as your most important decision during the initial stages of the fire? <ul style="list-style-type: none"> • <i>(probe for why, what was driving the importance: consequences, pressures, time, other?)</i>
<p>Examine SM and DM aspects of the initial decision.</p> <p>Attend to decision factors focus and priorities.</p> <p>Attend to SM behaviors and</p>	<p>(Talk me through that particular decision...)</p> <ol style="list-style-type: none"> 5. What sort of information was important to you, and why? <ul style="list-style-type: none"> • <i>(Probes: consequences, or other?)</i> 6. How did you get information? 7. What did you recognize as key indicators that helped you

<p>processes.</p>	<p>understand what was going on?</p> <ul style="list-style-type: none"> • <i>(Probes: What were they? How did they help you understand what was going on?)</i> <p>8. What aspects of that decision did you find the most difficult or challenging?</p> <ul style="list-style-type: none"> • <i>(Probes: time constraints, stress, social pressures, procedures, changing situation, lack of info, other)</i> <p>9. How did you arrive at your decision?</p> <ul style="list-style-type: none"> • <i>(Probes: evaluation? NDM? other?)</i> <p>10. How do you perceive the outcomes of that decision? <i>(would you make the same decision again?)</i></p>
<p>Examine ongoing SM and DM.</p> <p>Attend to decision factors focus and priorities.</p> <ul style="list-style-type: none"> -Time constraints -Stress -Personal identity -Past experiences -Social influences -Work rules and procedures <p>Attend to changes in SM/DM behaviors and processes.</p>	<p>(Let's take a step back and look at the big picture now...)</p> <p>11. Over the course of the fire, what other types of decisions became the most important to you?</p> <ul style="list-style-type: none"> • <i>(Probe: What were then and why were they important? What had changed and how did you know that?)</i> <p>12. Did the way in which you collected information change as the event progressed?</p> <ul style="list-style-type: none"> • <i>(Probe for how information was obtained, and what was most importation)</i> <p>13. Did certain key indicators that help you understand what was going on?</p> <ul style="list-style-type: none"> • <i>(Probes: What were they? How did they help you understand what was going on?)</i> <p>14. What aspects of the ongoing need to make decisions did you find the most difficult or challenging?</p> <ul style="list-style-type: none"> • <i>(Probes: time constraints, stress, social pressures, procedures, changing situation, lack of info, other)</i> <p>15. How did you arrive at your decisions?</p> <ul style="list-style-type: none"> • <i>(Probes: evaluation? NDM? other? Multiple?)</i> <p>16. How do you perceive the outcomes of those decision?</p> <ul style="list-style-type: none"> • <i>(Probes: would you make the same decisions again?)</i>
<p>General recollections and comment to identify other</p>	<p>(Again, taking a broad look at your experience during the fires...)</p> <p>17. Thinking back on your first important decision, can you review</p>

retrospective insights.	why that was meaningful to you? 18. Looking back at (...the key issues we've been talking about), do you think you would have done anything different? Why? 19. Would you have any recommendations for other people that find themselves in a similar situation?
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APPENDIX B: INITIAL LIST OF ALL A PRIORI AND OPEN CODES

The following table presents all codes used during this study, in alphabetical order. This list was extracted from the Atlas.ti project file associated with this study.

Code	Description
Action	This code represents things that were done that might have been a result of a specific decision.
Aftermath	Outcomes related to the long-term effects of the event.
Anger	The presence or indication of participant anger.
Antecedent conditions for DM	General description of pre-existing conditions that could have established a particular "DM environment" (my term); potentially related to sensemaking.
Assumption: get over it	A participant assumption that people should be able to "get over" fire issues and move on.
Assumption: lack of appreciation	A participant assumption that the general population doesn't have an appreciation for firefighting sacrifices.
Assumption: this will never happen	A participant assumption that this type of event could not occur or was not foreseen.
Bias, Assumption. Preconception	The indications that biases may have been influencing a decision or a belief.
Calm	The mention of calm, or the appearance of calm in a situation during which some level of chaos, uncertainty, or excitement could be expected.
Changing conditions	Reflects dynamic event conditions; describes the nature of the crisis.
Changing decision	Instances in which decisions were changed. This might provide insight into "why" decisions change...perhaps from a systems perspective.
Chaos	The mention or appearance of chaos. In the absence of chaos, I used the code "calm".
Clarity	The mention, perception, or appearance of situational clarity.
Cohesion and trust	Cohesion and trust can be internal or external, and can involve the team, org, community, or institution. Connectedness or "sense of community" might be a

	good way to think about this.
Commitment	The presence or absence of doing something based on a feeling of commitment to the organization or its stakeholders.
Communications context	Relates to the role of communications or the perception of its importance in the event.
Community relationships	Relating to the relationship between the participants and the communities in which they live/work.
Comparative retrospection	An initial code that is designed to capture the participant's view of their experience in relation to past experiences or to those of others during the same event.
Complexity	Captures a characteristic of the event as mentioned by the participant.
Confirmation bias	Participant's preconceived ideas about "how things are".
Confliction	Relates to the idea that the participant was conflicted about a decision (or not).
Control	The mention of control (over being able to do something) as being present or absent.
Coping	The mention or appearance of coping mechanisms, whether in terms of long term effects, or decision making.
Decision	Possible decision points. These might be "actions", or should be combine with "actions".
Decision avoidance	Participant's reluctance to make a decision.
Decision ecology, influences	Comments related to overall decision ecology.
Decision paralysis	Participant inability to make a decision due to "paralysis".
Economic forces	Economic influences on SM/DM.
Emotional or psychological issues	The mention of emotional support as a need or influence.
Establishing new relationships	Relationships that participants developed through the course of the fires.
Evaluating alternatives	Relates to vigilance and evaluation of options...classic normative DM model.

Event description	Quotes helping to describe some situation or reality at a point in time.
Event speed	Relating to how fast the event was perceived as progressing.
Existing relationships	Participant's previously established relationships, internal and external to the organization.
Financial Outcomes	Loss of dollars as an outcome.
Fire description	Descriptors of fire behavior.
Fire response description	A description of how firefighters responded to the fire.
Human health and well-being	A description of how the fire impacted people's health and well-being.
Human or animal safety	Outcomes associated with health impacts, fatalities, etc.
Identity	Identity as a factor in terms of decision ecology or outcomes.
Immediacy	The degree of time urgency related to a problem or decision.
Imposed timeline	Time pressure resulting from a timeline established by the participant or someone else, and not necessarily driven by the occurrence of an outcome.
Information inputs	Relates to the types of information inputs received by the participant...or not received.
Information seeking	Explicit search for new information to inform decision making.
Initial action	Things that the participant or organization did early on in the event.
Initial impacts	Impacts to the organization or individual early on in the event.
Initial notification	When/how the participant became aware of the event.
Is this a Crisis?	Relates to how the person or organization viewed a particular point in time (early on, now, etc.).
Key Memories	Key "take-aways" recalled by the participant.
Leadership, management	Can relate to leadership and/or management importance; or support such as overt actions taken by leadership to support the decision-maker. Could have been before, during or after the event.

Lessons learned, retrospection	Various observations made when thinking back on the event.
Love of the job	A participant trait demonstrating love for the job...may be related to commitment?
Luck	The mention or indication of "luck" (good or bad) being a factor in a situation related to a decision (or eliminating the need for a decision).
Misinformation	Describes information received that was not accurate or reliable.
Mitigation	Things done during the event to mitigate harm.
Modes	The idea that you are in a particular mental state that corresponds with your role/responsibilities at that time.
Observations of other's experiences	Various observations of others' experiences.
Ongoing impacts	Crisis-related impacts that haven't been resolved yet.
Operational outcomes	The disruption of routine or important business or organizational functions.
Opportunity	Situations in which participants saw opportunities to improve things as a result of the situation.
Organizational Culture	Aspects of the participant's organizational culture.
Organizational effectiveness	Aspects of the participant's organizational effectiveness or ineffectiveness.
Organizational Description	Comments that help describe the organization.
Organizational Response	Descriptions of how participant organizational responded to the event.
Outcome Severity	The notion that the event posed severe outcomes. This could also relate to the uniqueness of the nature of the possible outcomes.
Participant Role or Responsibility	The role of the participant at the time of the event.
Past Events, Experiences	Events that the participant might have drawn from during this event. This could also refer to the lack of experience in a certain area.
Personal impacts	Personal impacts, or potential impacts, to the participant.

Personality, demeanor, style	Relates to the personality and demeanor of the participant; could be self-perceived, perceived by others, or perceived by me.
Plausible alternatives	Consideration of “what could happen”
Politics	Political influences on SM or DM.
Population response/impacts	A general description of how the population responded to the fire.
Population/community outcomes	General types of impacts to the local population.
Preparedness measures	This can involve planning, team structure, assigned roles, exercises, proactive mitigation measures, etc.
Pride	The mention or appearance of participant or team pride with respect to how the situation was managed.
Prioritization	Discussion of prioritizing actions or outcomes.
Problem solving, Decisiveness, NDM	The notion that a particular issue is a problem to be solved rather than a situation requiring a decision. These were also characterized by decisiveness.
Professional experience	Experience held by the participant.
Property damage outcome	Fire damage to structures or property.
Property destruction description	Descriptions of property damage (structures, vehicles, other).
Real time concern	Issues deemed important by the person or the organization at the time of the event.
Resulting outcomes/new normals	The state of something post-event.
Retrospective information	Information that is known now but wasn’t known then (and could have impacted a decision).
Rules, Procedures	Rules and procedures as an SM/DM factor.
Self-perception	How people view themselves, whether socially, role-based or attribute based
Sensemaking	Represents times in which the participant “made sense” of a situation or drew conclusions about something.

Stakeholder Pressures	DM pressures from internal (superiors) or external (stakeholders).
Stress Response	Comments related to the presence or degree of stress, anxiety, worry, fear, adrenaline, or similar feelings.
Tactical actions/decisions	This is a broad code intended to catch actions that could have implicitly involved key decisions, but those might not have been discussed by the participant.
Time constraints	Instances in which time pressures were mentioned or were implied.
Time in the group	The amount of time that the participant has been a member of their work group or organization.
Unbounded time	The sense that no timeline can be associated with a decision or action.
Uncertainty	Comments related to the state of uncertainty at the time; could relate to the absence of information.
Unexpected	The extent to which something was or wasn't expected to happen.
Uniqueness	The degree to which something was unprecedented.
Unknown time	Instances in which a participant did not have a sense of a decision timeline, often because of its influencing factors.

APPENDIX C: PARTICIPANT RECRUITMENT TEMPLATE

Date: (date)
To: (participant name)
Subject: Invitation to Participate in Research Study

Dear (participant name),

My name is Cliff Thomas; I am a doctoral candidate at Colorado State University in the School of Education and would like to invite you to participate in a dissertation research project. In general, my study will explore how people make decisions for their organizations during times of crisis. Crises have been—and continue to be—challenging situations for organizations, yet many researchers believe that there have been few new insights to help people improve decision-making. This study is designed to produce new insights into crisis decision-making. As such, I am hoping to interview several people whose organizations were affected by the 2017 Northern California wildfires, and who made a critical decision associated with that event. The Principal Investigator for this research is my advisor, Thomas Chermack, Ph.D., Professor, in the School of Education at Colorado State University, and my advisor is Russell Korte, Ph.D., Professor, in the Graduate School of Education and Human Development at The George Washington University.

It is my understanding that you were involved in critical decision-making for (organization) during the wildfires. I am hoping to conduct a 1 hour interview with you at a time and place that is convenient. The purpose of the interview will be to explore various aspects of critical decisions that you made. There is no intent to “judge” decisions; rather, I hope to understand how you engaged in the decision process, what influenced you, and how you went about arriving at your decisions. I have a short list of questions to ask, but I expect that our discussion will be flexible.

The time required of you is limited to a single interview lasting about one hour. You will have the option of reviewing the transcript of your interview. This may take you an addition 45 minutes - 1 hour. If you are interested in participating in this study, I will provide you with an informed consent and answer any questions you might have about the study.

If you would like to participate, or if you have any questions, please contact me at cliff.thomas@colostate.edu, or call me at 720-837-4338. If you have questions about your rights as a volunteer in this research, please contact the CSU Institutional Review Board at RICRO_IRB@mail.colostate.edu; 970-491-1553.

Sincerely,
Cliff Thomas
Doctoral Candidate
Co-Principal Investigator
Organizational Learning, Performance, and Change
Colorado State University
Email: cliff.thomas@colostate.edu
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Thomas Chermack, Ph.D.
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Principal Investigator
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APPENDIX D: INFORMED CONSENT FORM

Consent to Participate in a Research Study Colorado State University

TITLE OF STUDY: An Examination of Decision-Making During Organizational Crises: A Case Study of the Northern California Firestorm

PRINCIPAL INVESTIGATOR: Thomas Chermack, Ph.D Advisor, Organizational Learning, Performance and Change; Colorado State University; Email: thomas.chermack@colostate.edu

CO-PRINCIPAL INVESTIGATOR: Cliff Thomas, doctoral candidate, School of Education; Organizational Learning, Performance, and Change; Email: cliff.thomas@colostate.edu

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH? You are being asked to participate in this research study because of your experiences related to the October 2017 wildfires in Northern California. Specifically, the investigator is interested in interviewing people who believe that they made at least one high-stakes decision for their organizations during the wildfires. A high-stakes decision is one in which you believe that a decision could avert or lead to severe outcomes for your organization.

WHO IS DOING THE STUDY? This study is being conducted by Cliff Thomas, doctoral candidate, School of Education (Organizational Learning, Performance, and Change Program) with the guidance of his Advisor, Russell Korte, Ph.D and Principal Investigator, Thomas Chermack, Ph.D.

WHAT IS THE PURPOSE OF THIS STUDY? The purpose of this study is to explore how people engage in crisis decision-making for their organizations, with a focus on the processes and behaviors associated with decision-making. The purpose of the study is not to examine whether decisions made were appropriate or not, or to evaluate the quality of decisions.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST? This study will involve an interview with you at a convenient private or semi-private location; the interview should last approximately 1 hour. At your discretion, you may review the interview transcripts; this review is estimated to take 45 minutes to 1 hour. The only member of the research team expected to be present is Cliff Thomas. With your permission, the interview will be audiotaped.

WHAT WILL I BE ASKED TO DO? You will be asked to answer questions about a high-stakes decision-making experience during the October 2017 Northern California wildfires. You will be asked to describe various aspects of your decision-making, such as what you perceived decision outcomes to be, the factors that were influencing you, what pressures you experienced, what choices you felt were available to you, and how you felt about making the decision.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS? There are no anticipated risks associated with this study. It is possible that discussing a difficult decision might be uncomfortable. It is not possible to identify all potential risks in research procedures, but the researcher has taken reasonable safeguards to minimize any known and potential, but unknown, risks. However, if at any point you wish to stop the interview, you are free to do so.

ARE THERE ANY BENEFITS FROM TAKING PART IN THIS STUDY? By participating in this study, you might gain new insights that will assist in personal and professional settings involving decision-making. Other benefits might be offered in the form of opportunities to reflect on issues discussed. Also, you might gain knowledge if you read the results of this study.

DO I HAVE TO TAKE PART IN THE STUDY? Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

WHO WILL SEE THE INFORMATION THAT I GIVE? The investigator and co-investigator will keep private all research records that identify you, to the extent allowed by law. Your privacy is important to us, but you should know that every research study involves some risk to your confidentiality. It's possible that other people could find out you were in the study or see your study information. But we will take the following steps to keep this from happening. With our confidentiality measures, we think this risk is very low.

Only the researchers identified in this document will see the information that you provide. Researchers will take measures to protect your identity and confidentiality the best they can. We will delete your name from information that you provide, and instead use a code that is known only to the researchers. Other information that might be used to identify you will also be deleted. The only place that your name will appear is on the consent form and secure, password protected records, that include consent form and code key.

Several additional features of the study will contribute to maintaining participant confidentiality. This study will not report information linked to a city, specific date and time, job title, organizational identifier, or other individual or organizational characteristics. Because this study will involve individuals from various public and private organizations within the entire region impacted by the wildfires, participants will represent a very small segment of the impacted population, reducing the likelihood that participants will be identifiable. The study's results will emphasize overall outcomes, not those of individuals. For these reasons, the researchers believe that individual participants will not be identifiable.

Researchers conducting this study realize the potential risk to personal and professional reputation. Beyond the steps taken to protect confidentiality, this study will not offer any potentially disparaging or judgmental conclusions about decisions being "good or bad". Rather, the intent of the study is to examine how and why people arrive at decisions during times of organizational crisis.

When the study is complete, the code key will be maintained in a secure, password protected record to enable the researcher to contact you for follow-up research, if relevant. Only the research team will have access to this data. The only exceptions to this are if we are asked to share the research files for audit purposes with the CSU Institutional Review Board ethics committee. When we write about the study to share with other researchers, we will write about the combined information that we have gathered. Neither you nor your employer will be identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY? No compensation will be offered for participation in this study.

WHAT ELSE DO I NEED TO KNOW?

The researchers would like to audiotape your interview to be sure that your comments are accurately recorded. Only our research team will have access to the audiotapes, and they will be destroyed when they have been transcribed. Do you give the researchers permission to audiotape your interview? Please initial next to your choice below.

- Yes, I agree to be digitally recorded _____ (initials)
- No, do not audiotape my interview _____ (initials)

The results of this study could lead to researcher interest in follow-up studies. Do you give permission for the researchers to contact you again in the future to follow-up on this study or to participate in new research projects? Please initial next to your choice below.

- Yes _____ (initials)
- No _____ (initials)

