

A MIXED-METHODS DELPHI STUDY OF IN-EXTREMIS DECISION-MAKING
CHARACTERISTICS: A MIXED-METHODS MODEL

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ABSTRACT

Paul Johnson, Committee Chair

Researchers have identified an academic insufficiency in investigating leadership during in-extremis situations both by emphasis and through difficulty in researching real-time events. These situations can and do commonly occur in settings involving the military and domestic safety forces such as police, fire, and emergency medical teams (EMS). This research has defined in-extremis circumstances as when the participants, whether civilians caught up in the circumstances, first responders to emergency incidents, or military personnel involved in combat situations are vulnerable to incurring significant injuries up to and including death. In plainer words, when people's lives are on the line and the decisions and actions performed during the event could greatly impact the outcome.

This research utilized a mixed-methods design gathering online quantitative data from 401 fire officers (grouped into Exemplars and General Fire Officers) and qualitative data from a Delphi panel of Exemplars only. A purpose of this mixed-methods study was to investigate how career fire officers who were identified by their fire departments as exemplars in field command reported they make critical decisions during in-extremis moments and to explore whether there are commonalities in their leadership approaches. This was attained through a Delphi panel composed of 14 Exemplar fire officers. Three rounds of semi-structured interviews were conducted that attempted to reach consensus among the Delphi panel members. In addition, the Rational-Experiential Inventory-40 (REI-40) was offered online to 17 career fire department

officers to help evaluate their tendencies towards rational/analytical and experiential/intuitive thinking.

Results from the online REI-40 survey and findings from the Delphi interviews revealed that the Exemplars rely upon their experience and intuition to a greater extent and rely less upon written procedures than did their General Fire Officer counterparts. The Delphi panel interviews indicated that personal experience was essential in developing their skill and faith in making improvised decisions based upon situational awareness of the emergency scene. The Delphi panel reached consensus and stated their ability to ‘think outside the box’ and develop unique best-case solutions was a requirement to achieving a higher level of expertise and success. Enter text of Abstract.

In the frame of reference of “many a jest is said in truth’ I dedicate this academic effort to everyone who assisted, stayed out of my way at critical moments, or suffered under the hegemony of my grumpy ‘having to do my school work’ moods. I appreciate all that was done on my behalf and pledge to make the necessary amends in a timely and appropriate manner.

Most especially, I want and most clearly need to acknowledge the burdensome extra responsibilities that my wife, Cherie, had to shoulder throughout this long academic endeavor. I know there were many times over the last years where the majority of work was handled by her with diligence and perseverance. I am now and forever in her debt.

Due to the length of time this academic undertaking persisted, I have to double-down on the sincere thanks that I offer to my family and my academic mentors who watched the years go by but only offered continued encouragement to finish the process.

To my parents, Bryce and Eleanor, who always instilled the importance of knowledge and education and that learning is a life-long dynamic that should never be forsaken;

To my children, Bryce Cameron and Eryn, who I hope to impart a similar belief that their lives will be enriched through knowledge, education and experience, with a greater understanding of the world they live in;

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CHAPTER 1: INTRODUCTION

Background of the Problem

Leadership as a general area of academic endeavor and the sub-fields of business management, educational leadership, military command, and organizational development have been researched extensively (Baran & Scott, 2010; Campbell et al., 2010; Kouzes & Posner, 2007). Much has been gained from these studies, both from an academic and practical perspective. Since most human activities involve some manifestation of social cooperation or competition, a better understanding of how to lead, manage, and develop societal organizational structures is beneficial to human progress in general (Hemingway, 1955). That said, there are leadership contexts which are thought to possess unique characteristics where the knowledge base is still emerging (Bass, 1998; Militello et al., 2007). One of these areas is *in-extremis* situations; those in which the participants are in an environment that threatens their physical/mental well-being (Kolditz, 2007). Example work areas where these especially challenging situations are expected to occur include firefighting, law enforcement, military, and some particular industrial operations and some recreational sports (Campbell et al., 2010; Kolditz, 2007).

Previous researchers have asked whether there is a qualitative difference between the successful decision-making processes found in time-critical decision-making scenarios versus normal decision-making processes, which are found in more common managerial circumstances (Flin & Slaven, 1995; Klein, 1997; Militello et al., 2007). Is there an actual difference in the thought process which is utilized to produce the best solution when time and information are limited or even contradictory and 'life and limb' might be at stake? The U.S. military concentrates significant resources and effort in training its officers and non-commissioned

officers (NCOs) for leadership in hazardous situations, particularly in the field of combat operations (Baran & Scott, 2010). Academic institutions such as West Point, Annapolis, and Virginia Military Institute (VMI) have been graduating officers into the military service for 200+ years with the idea that their particular instructional slant on character and decision-making is best fitted to the rigors of personally hazardous and time-critical situations (Campbell et al., 2010). Likewise, for decades, law enforcement and fire/rescue agencies in the United States have utilized extensive testing and training to enter their promoted ranks with the same thought as the military, that their officers should be prepared for the rapid decision-making processes apparent at emergency scenes (Coleman, 2001; Flin & Slaven, 1995).

The study of in-extremis leadership dynamics can potentially have a profound positive effect upon the men and women who will train, prepare, and hopefully be successful in leading their personnel into circumstances which can have extremely detrimental consequences to all those involved if proper judgement is found lacking (Klein, 1997; Kolditz, 2007). Many researchers have stated that there is a relatively small body of published material and too little peer-reviewed research has been undertaken in the particular area of in-extremis leadership and there is a significant need to further the academic and practitioner knowledge of the subject matter (Baran & Scott, 2010; Campbell et al., 2010; Fisher & Robbins, 2015; Gantt & Gantt, 2012; Hannah et al., 2009; Holenweger et al., 2017; Jensen et al., 2011; LaVeist et al., 2008; Sjoberg et al., 2011; Sweeney, 2010), but other researchers indicate there has been an increased effort in recent years which needs to be furthered by additional studies (Geier, 2016, Dixon, et al., 2019).

This study's goal is to investigate fire department officers who have been identified as demonstrating exemplar proficiency in in-extremis situations and examine their perceptions of their decision-making dynamics (such as, linear thought-processing, weighing options, eliciting

advice, reliance upon previous experiences, and following written procedures to name a few) during these particularly risky events through a multiple case Delphi panel study approach utilizing both qualitative and quantitative methods. A fundamental understanding of what decision-making characteristics are predominant within in-extremis leaders who have been identified as positive exemplars by their fire departments and how these leaders make time-limited and information-limited decisions within the context of grave consequences dependent upon these decisions is a start to better preparing future leaders responsible for in-extremis situation management.

Problem in Practice

As the individual emergency incident becomes more unstable and the critical factors affecting its outcome become more uncertain, the decision-making process needs to become more flexible and less rigid in its application; adaptation becomes the key to greater success (Wenger et al., 1990, Kolditz, 2007). This adaptability becomes the cornerstone for dealing with emergencies that are less routine and more complicated in their circumstances so that a reliance upon bureaucratic-style thinking becomes the nemesis of successful and beneficial solutions (Wall et al., 2002). Klein (2009) suggests that as the individual leader experiences a greater variety of demanding incidents, they develop a cache of alternative solutions which become almost automatically recalled with little conscious processing; what he labels, Recognition Primed Decision-Making (RPDM).

Unfortunately, there is evidence which indicates that fire departments, not unlike other organizations with specifically detailed command structures such as law enforcement, the military, and other uniformed services, do well in situations which are routine or expected to the extent that prewritten procedures fit well enough to solve these more ordinary and foreseeable

scenarios. But when the circumstances become more complex and a greater degree of critical-thinking becomes necessary, they fail to achieve the same degree of success (Jensen & Thompson, 2016).

When fire departments stress a strict adherence to predetermined procedures, there is a lesser likelihood of developing the flexible thinking that is necessary in circumstances which present with unique conditions, both obvious and subtle. Especially, when the organizational emphasis can become one of overt discipline, the concern for reprisal creates a tendency of command officers to not deviate from normal response protocols and to follow specific guidelines without much thought of possibly more appropriate courses of action (Jahn, 2019).

Purpose of the Study

The purpose of this study is to develop a better understanding of the decision-making processes of exemplar in-extremis leadership ‘under fire’ when the price for mistakes can be severe (Kolditz, 2007). Exemplar status was assigned by a character trait and experience selection process (see Appendices A & B) combined with the professional judgment of Selecting Officers who were Fire Chief Officers supervising the operational branches of their respective fire departments. This mixed-methods Delphi study will examine successful individual in-extremis leaders to gain an in-depth assessment of how they make critical decisions under extremely stressful circumstances and why they believe they are successful. This is to delve into their behavioral and mental approaches to leadership to determine if there are commonalities amongst them. This mixed-methods Delphi study will investigate how identified fireground command exemplars make decisions in a critical environment in which the decisions must be made rapidly with little confirmatory information and less room for consultation, and where the consequences of bad decisions can be measured in lives and property lost (Coleman, 2001).

As stated before, there is a strong knowledge base concerning the topics of basic management techniques and leadership styles but evidence that specifically addresses the subgroup of emergency scene leadership is lacking (Kolditz, 2007). As this is the case, the study will be more exploratory in nature and will further illuminate this specific area of leadership, investigate how do highly successful emergency scene commanders make their on-scene operational decisions, and add to the research which might lent itself to determining whether there are identifiable differences in how exemplars make critical decisions compared to lesser performing in-extremis leaders.

Many emergency response organizations rely upon standard operating procedures/protocols/guidelines to provide uniformity of care and response actions (Coleman, 2001). Some of these organizations rely upon a stricter degree of adherence to these procedures ('thou shall') and others take a more flexible approach ('thou should') and some use them more as guidelines to be known and applied as appropriate (Kolditz, 2007). This study wants to research exemplar in-extremis leaders to explore whether successful in-extremis experience leads to a greater frequency of command discretion and greater flexibility in choosing courses of action or does it indicate a greater recall and working knowledge of established protocols or will the research lead to other decision-making alternatives beyond these stated two? This study's findings may broadly apply to leadership areas in contexts described by Kolditz (2007) as 'In-Extremis'. These include public safety organizations such as police, fire, and emergency medical services (EMS), the military, certain industrial settings such as petrochemical, nuclear power, and volatile manufacturing and some of the 'thrill' sports such as competitive skydiving, rock climbing, and mountaineering to name a few.

Specifically, this mixed-methods Delphi study will explore fireground commanders and

whether emergency command experience in exemplar individuals tends to lead to greater discretion or does experience just translate into a more fluent use of established organizational procedures. Many emergency organizations indoctrinate their newly promoted officers in the established written emergency protocols (Flin & Slaven, 1995; Ward, 2006). The organizational expectation for new command officers is one of memorization and implementation with little room for personal interpretation of how best to handle the various emergency situations (Kolditz, 2007; Ward 2006). Written procedures can become an equalizer which allows the less experienced leaders to follow a course of action which has been established over years but can also be interpreted as a hindrance to more experienced leaders (Rush, 2003). These experienced leaders can rely upon their ability to discern the subtleties of the situation and their experience to design a more appropriate solution to the situation (Klein, 2009; Rush, 2003). A possible ramification of the study could be to address this apparent contradiction whereby organizational intents to create confident leaders who are able to eventually make innovatively appropriate decisions on the scene of emergencies are hampered by their initial training regimen that dictates the requirement to follow established protocols (Crichton et al., 2005; Klein, 2009; Kolditz, 2007).

Theoretical Framework

Emergency incidents almost always occur without notice and present a situation that has the potential to become chaotic and confusing with the most viable and successful interventions being a combination of common factors, such as preexisting protocols/procedures/policies and solutions that are unique to the particular circumstances (Coleman, 2001; Ward, 2006). The integral features of sudden onset without prior notice, at times the inability to secure needed manpower and equipment resources in a timely manner, life- and limb- threatening

circumstances, and organizational and possibly personal liability for the consequences of the operational decisions, makes the subject of emergency scene decision-making an appropriate candidate for academic research. Many emergency incidents are managed through their entirety using a sequential decision-making process whereby each subsequent decision is usually based upon the previous decisions and little flexibility may exist on how to change the actions happening on-scene. Examples of this are when the first arriving/engaged police, fire, EMS, or military units establish their initial action plan (IAP), to include what they foresee as the incident's priorities, whether to take an aggressive or defensive posture, where to place equipment, what additional resources to ask for, and what risk tolerance becomes acceptable to name a few. This operational dynamic of the initial decisions and assignments playing a significant and maybe an immutable role in the eventual degree of success at emergency incidents, gives credence to researching and studying the thought processes that are endemic to exemplar in-extremis leaders and their organizations in such situations (Klein, 1997).

In-extremis scenarios may have many similarities yet usually contain unique dynamics in their specific circumstances. Thus, individual solutions based upon these unique dynamics combined with established unit competencies and organizational procedures are most often the best method of managing the in-extremis situation (Rush, 2003). Experience, knowledge, expertise, and quick critical thinking are possibly paramount to the decision-making processes that develop these individual solutions. The multiple concerns of limited time and information, unknown credibility of that information, and the possible dire consequences of those decisions faced at many in-extremis scenarios produce an environment that requires a different style of leadership compared to more common and ordinary circumstances (Campbell et al., 2010; Coleman, 2001; Klein, 2009; Kolditz, 2007; Ross et al., 2004). Frequently, emergency incidents

involve significant threats to life, limb, and/or property and how well these incidents are led, and the quality of the operational decisions determines their outcome (Campbell et al., 2010).

This study employs a mixed-methods Delphi design which can be appropriate and useful for exploratory research (Maxwell, 2005, Skulmoski et al., 2007). The Delphi method can be utilized as an exploratory approach that allows for the data to drive the research but still utilize relevant leadership theories which may directly or indirectly relate to in-extremis situations. This study is driven, in part, by an absence of specific theory and evidence for in-extremis decision-making, thus, an exploratory approach is most appropriate (Creswell, 2007). That said, social science research is not performed in a human/cultural vacuum, which means that previous research and existing theories can provide a conceptual framework for comparative analysis and the starting point for grounded research. Some previous research, though not initially intended to specifically involve in-extremis circumstances, can be the framework for furthering the results of this study. This study will examine a group of experienced in-extremis leaders in the fire service to look at their demographic background and their manner of decision-making upon the scene of in-extremis incidents. The four research questions will be the primary guide for the research at the onset but due to the possible emergent nature of Delphi panel research, (Landeta, 2006; Pill, 1971), the study followed developing paths of inquiry.

Guiding Research Questions

Though this study is more exploratory in its intent and design, two existing theories are applicable in viewing how they interact with in-extremis decision-making plus a third, a grounded approach concept of my own development for this study.

One is Gary Klein's Recognition Primed Decision-Making (RPDM), which has already ventured into the subject matter of in-extremis situations and will be utilized as a reference to

help evaluate the findings of this study (Klein, 1998). The RPDM theory has found that in some in-extremis circumstances, the field commander did not weigh options and decide upon the best alternative but rather made a successful decision based upon previous experiences or anecdotal learning and did not contemplate any other course of action.

The second theory is Complexity Leadership Theory (CLT) which suggests that there is an inherent dynamic within human organizations where a conflict occurs between organized managerial direction and informal innovation (Uhl-Bien et al., 2007). CLT found that when nurtured properly, this dichotomy can become the catalyst of future organizational innovation and success.

The grounded approach concept that I have labeled 'Hands-On Leadership' entails the moments when the person in the supervisory role chooses or must perform the duties they normally are managing. When the situation may dictate that on-scene leadership will shoulder the tasks that are required of their crew(s). These circumstances may be found during in-extremis incidents when resources and time to achieve a successful conclusion are limited.

These theories will be further discussed in Chapter 2, which are relevant to in-extremis leadership but have not been developed to directly answer questions concerning specific individual traits and the reasons that certain decision-making paradigms are utilized. In this mixed-methods study, the following research questions are the initial starting line for the research into in-extremis decision-making:

Quantitative Research Question:

- RQ1 - Are there statistically significant differences between the identified in-extremis exemplars and the general fire officer population in the Rational-Experiential Inventory-40 (REI-40) scores?

Qualitative Research Questions:

- RQ2 – How do the identified in-extremis exemplars report they make decisions during emergency situations?

Do they rely upon self-initiative and independent decision-making paradigms, do they become more fluent and proficient with established policies, protocols, and procedures over the duration of their careers, do they combine these two approaches, do they actively deliberate possible options, do they consult others as to their opinion, or do they utilize other decision-making paradigms?

- RQ3 – Based upon the Delphi panel responses, to what extent did the three leadership theories/concepts (i.e., Recognition Primed Decision-Making, Complexity Leadership Theory, and Hands-On Leadership) emerge as themes within the context of decision-making during in-extremis circumstances?
- RQ4 – What were the Delphi panel responses to whether organizational change within their respective departments and the U.S. fire service as a whole is needed?

Are there significant changes in the short-term and/or long-term that should be pursued? In an industry which is commonly referred to as strongly 'tradition-based, is this a positive or negative to the fire service overall? What is the ease or difficulty of implementing changes in the fire service?

Scope of the Study & Data Sources

This mixed-methods multiple case study examined fourteen in-extremis leaders who were identified as exemplars in operational field command by their superior officers in eleven career

fire departments in the United States. The participating organizations were asked to provide the names of personnel that meet the qualifications set forth by the researcher (see Appendices A, B, & C). These qualifications were developed through a literature review and then confirmed through a member-checking process utilizing higher ranking fire department chief officers to determine which characteristics are most applicable to field command success.

These chosen in-extremis leaders were asked to voluntarily participate in the study which consisted of three initial components; a section to develop demographic information, on-line Delphi panel open-ended questions meant to discuss the individual's decision-making dynamics during in-extremis scenarios, and then they were also directed to take the Rational-Experiential Inventory (REI-40) developed by Pacini and Epstein (1999). This instrument is designed to quantitatively assess a person's tendency to rely upon either rational thought or experiential knowledge to make decisions. The REI-40 was developed from the Cognitive-Experiential Self Theory (CEST) which was developed by Seymour Epstein. The basic premise of the theory is that individuals process information in two distinct cognitive manners; a rational method which is slower and an intuitive process that is more rapid, comprehensive, and emotional. As a researcher, I understand that to utilize the data from this instrument on a comparative basis of exemplars vs. 'regular fire service officers' I need to have a much larger sample size than the 14 Delphi panel participants. In addition, I would need to administer the REI-40 to another grouping (fire officers not identified as exemplars) to compare the data results. That is *partially* the purpose this research is attempting to attain. Rather than *only* using the REI-40 for comparison evaluation, I am using it as a relevant descriptive data source of my multiple case study participants to triangulate and enrich the investigation into their particular cases (Creswell, 2009). The Delphi panel members will be asked to take the REI-40 survey after their first found

of questions and these results will be used to create additional questions for the second and any further subsequent Delphi rounds so to blend the quantitative and qualitative data into a true mixed-methods approach rather than a multi-methods design.

After the responses have been received, the demographic information will be charted, the qualitative data will be assessed and coded for consistencies, emerging themes, and conflicting answers, and then summarized. The quantitative data from the REI-40 instrument will be tabulated to determine group tendencies and outlier responses. The manner in which a typical mixed-methods approach works most appropriately, is to synthesize the data from the quantitative and qualitative responses (Creswell, 2009); in this study, it will be to evaluate the two different data sets and see if they illuminate and create a more comprehensive picture when combined with each other (Creswell, 2007).

The Delphi method utilizes a reiterative approach. The information is collected through a series of questioning which summarizes the answers between each iteration of questioning and submits the summations back to the participants to see whether they stand pat on their first set of responses or modify them based upon the group's collective answers. The Delphi design is meant to see if a panel of experts through this consecutive process will eventually come to relative agreement or distinct separation (Landeta, 2006). The advantage of the Delphi approach is the elimination of personality dynamics and its possible negative intrusion into a group of experts all sitting in the same room devising a collective answer (Landeta, 2006). The second set of responses will be evaluated, coded again if additional concepts appear, and summarized and if the responses have changed significantly, the third iterative opportunity will be provided to the respondents to see if further agreement or solidification of responses can be achieved.

Depending upon the number of fire departments who agree to participate and to what

extent their selected individuals agree to enjoin the study, more than one person may be used from a given fire department but two will be the limit so not to possibly skew the data for this study with one particular organization's individual dimensions.

Significance of the Study

This study will explore the in-extremis exemplars' perceptions of their decision-making, during moments they have experienced, when leadership is needed the most (Kolditz, 2007), when the participants are in jeopardy and there are actual threats to their life, limb, and/or mental well-being. This is not to imply that leadership in other contexts is less valuable or required but to emphasize that in-extremis situations have the potential for a much more severe and immediate consequence if operational leadership is not competent (Baran & Scott, 2010; Coleman, 2001; Kolditz, 2007).

In the Fire Service in the United States, there are typically between 80-110 firefighter deaths each year. From 1977-2017, the low year was 60 deaths and the highest was 452 (2001 was skewed due 9/11/2001 events), with an average of 112 through those years (National Fire Protection Association, 2018). Though there have been significant improvements to firefighting personal protective equipment (PPE), best-industry practices in the area of strategy and deployment tactics, increased requirements of initial and skill-maintenance training, greater awareness of physical fitness needs, and the growing issue of incidence of occupational cancer among firefighters, there still remains approximately the same number of firefighter deaths each year (Coleman, 2001, Ward, 2006). Therefore, a better understanding of how exemplar field commanders make rapid and competent decisions can assist with the ongoing efforts to bring these numbers down.

As has been stated previously, there is much literature on the topic of management and

leadership in general, but little has been written on the subject of in-extremis leadership (Baran & Scott, 2010; Campbell, et al., 2010). Military leadership has volumes enough to fill libraries, but the overwhelming emphasis has been in the areas of tactical, strategic, and organizational skills and development (Campbell et al., 2010). This study will examine the ‘in the trenches’ fireground commanders who face similar threats and look into their backgrounds and their decision-making processes at the moment when they and their charges are in in-extremis situations. The organizations and their personnel who respond to scenarios where they are exposed to threatening conditions will possibly benefit from more in-depth scientific investigations into the dynamics and complexities of leading people into harm’s way (Kolditz, 2007). Research into in-extremis leadership and critical moment decision-making has the potential to lend a more thorough understanding of the dynamics that lead to greater success when people’s lives are at risk.

Definition of Terms

The following terms will be used in the context of this study:

Exemplar – This term is used in the context of this research to mean someone that is a superior model of professional behavior and competence and serves as an ideal example of having attained mastery within the scope of their occupational practice. This research concentrates on Fire Service exemplars who perform at this level in commanding a crew or crews in the field at emergency incidents.

Extreme context situations – This term is used in this study interchangeably with In-Extremis (see below). The reason for its inclusion is that some of the researchers utilized this term in their studies rather than the latter and it speaks more authentically of their work to use the term.

Fire Service – Though this might seem too obvious to necessitate its inclusion, it is quite often misunderstood what qualifies as its more common responsibilities. The modern U.S. municipal fire department is typically an ‘all-hazards’ agency and as such performs not only firefighting, fire prevention and fire code enforcement, but also emergency medical services (EMS), (which was normally 80-90% of the run volume for municipal career fire departments in the U.S. in 2020), technical rescue/special operations (e.g., rope, confined space, trench, structural collapse, machine and vehicle extrications, swiftwater, flood, dive, rescues to name some), hazardous material incidents (Haz-Mat), and many public education outreach programs. The term Fire Service is typically capitalized in industry publications and will so in this dissertation.

Fire Service Ranks – Most fire departments in the U.S. are organizationally led by a Fire Chief. Other, less often used titles for this position are Fire Commissioner, Director of Fire and EMS Services, or Safety Director. Organizationally, below this position are additional ‘Chief ranks’; Assistant Chief, then Deputy Chiefs, then Battalion or District Chiefs who are usually the ‘command rank on the street’. Following the Chief ranks are Captain, then Lieutenant in the command ranks, then Engineer, Paramedic, EMT, and Firefighter in the non-command ranks.

Hands-On Leadership – This term is used in this research to denote when leaders either through choice or necessity, perform the same task(s) as the members they lead are also performing. This may be when supervision becomes secondary and performance matters most as might be found during emergency situations or can involve non-emergency tasks as well. This leadership style can blur the line between job descriptions of those leading and those led as completion of the mission becomes imperative, not who accomplishes it. In in-extremis situations, this maybe the fire Battalion Chief or EMS Supervisor who performs

Cardiopulmonary Resuscitation (CPR) due to multiple victims at an accident, the police Lieutenant who must engage an active shooter at a school shooting, or an U.S. Army Captain who engages the enemy due to being outnumbered during an ambush. In non-emergency situations, this might be helping clean the bathrooms in the fire station, washing patrol cars, or assisting with an inventory audit in the motor pool.

High Reliability Organizations – This term is used to describe organizations which perform consistently and successfully in conditions where catastrophic accidents and mission failure could be expected due to situational complexities, risk factors and varying uncertainties.

Immediately Dangerous to Life and Health (IDLH) – This term is used in the Fire Service to refer to any condition found on an emergency incident which could cause injury or death to victims or responders within a short period of time. Examples of such would be the conditions inside of a burning building that has a well-involved fire or a toxic gas leak at an industrial complex.

Incident Commander – This term is most commonly used to refer to the person who has ultimate control of an emergency scene. It is typically used in police and fire operations in many countries (Ward, 2006). This person is normally on location in close proximity for more common emergencies (e.g., structure fires, technical rescues, injury accidents, etc.), but may be stationed remotely in larger events (e.g., industrial accidents, airplane accidents, mass casualty incidents, natural disasters, etc.).

In-Extremis – This term is derived from the Latin phrase which means ‘at the farthest point’ or ‘at the point of death’ (Kolditz, 2007). In the context of this study, it means leadership situations where the circumstances threaten both the leader and the followers with physiological and/or psychological harm. Examples of this scenario are police stand-offs, interior structure

firefighting, Haz-Mat emergencies, and military combat situations where those operations place its members into harm's way. This term excludes the more common or administrative duties which make up the majority of each of these organizations' daily duties.

Naturalistic Decision Making (NDM) – This is a decision-making framework developed in the late 1980s which focuses more upon how people gather information and make decisions in real world circumstances.

Operations Bureau – This is the title normally found in U.S. fire departments given to the bureau which manages the 'on the street' 911-call responses from the various fire stations within that department. This bureau typically has the majority of the members and the incidents. Other bureaus are usually smaller and/or more logistically oriented such as Building/Fleet Maintenance, Professional Standards, Fire Investigation, Fire Inspection, Training, Homeland Security, Technical Rescue, Community Involvement, to name the more commonly found.

Procedure – Typically, in the Fire Service, the term procedure is used to dictate a written series of actions to be followed for administrative and emergency circumstances. In some cases, these are rigidly mandated and the term 'shall' is utilized. In other cases, the term 'should' is used to indicate some degree of flexibility in the procedure's application. Some fire departments use the terms policy, protocol, directive, regulation, and rule instead of procedure so in this research, the term procedure will be interchangeable with these terms.

Recognition Primed Decision-Making (RPDM) – A NDM theory developed by Gary Klein which found that the cognitive processes which occur in in-extremis situations under time-sensitive and information deprived conditions rarely follow an analytical process of comparing alternative options but lock onto situational cues which elicits an already known course of action which is usually successful.

Structure Fire – This term is used to describe a fire involving a building, typically a residential house size building or larger.

Working Fire – This is a common fire service term used by the first arriving fire apparatus when they find an actively involved structure fire; thus, the fire incident is a ‘worker’. It is more frequent that dispatches to possible structure fires found little to no fire involvement upon arrival.

Limitations and Delimitations

There are numerous possible limitations to this study. Recognizing these potentialities is the first step for the researcher to hope to control their effects and for the reader to determine whether these steps were adequate and therefore what weight to grant the data and results (Glesne, 2011).

A limitation to this study is one normally inherent in studies which utilize qualitative methodology. The external generalizability is limited to the specific persons whom the data was gathered from and their particular organizations (Maxwell, 2005). Qualitative multi-case studies attempt to develop inferences which can be transferable as cross-case themes but do not attempt to generalize to the population as a whole (de Vaus, 2001). Since the study’s qualitative data (Delphi interviews) has the limited sample size of the 14 exemplars and lacks a control group for any comparison, the data is meant to serve a descriptive purpose to better define the leadership characteristics of the participants only.

Since the study sample for the Delphi panel is not randomized and is specifically meant to represent only in-extremis leaders who have been identified as successful exemplars, the study does not explore the traits, and decision-making characteristics of those leaders that were not considered to meet the study’s parameters. A hallmark of the capacity to generalize research

findings to a larger study population is the random sample (Mertler & Vannatta, 2010) so to eliminate any research bias on choosing the data sources. But this study's purpose is to gather evidence from persons who have been previously identified with unique characteristics; positive exemplars in the field of in-extremis leadership. But Maxwell (2005, p. 115) points out that qualitative studies should be more "concerned with achieving internal generalizations within the study's focus rather than external generalizations to an overall population."

Another of the study's possible limitations is the lack of reviewers or additional coders of the qualitative data. A method of counteracting a singular interpretation is to have multiple readers code the data and confer on their various studied opinions of its meaning. This form of triangulation allows for a consensus and reduces individual differences in interpretation (Maxwell, 2005). Since this study is a doctoral dissertation, it will only have one researcher codifying the data and will be more prone to individual impressions. Similar to this possible limitation is the dynamic of researcher bias. It is in the nature of qualitative research that the researcher is a key part to the study and its data (Creswell, 2007). The subjectivity of the researcher is considered intrinsic to qualitative studies but a researcher *mea culpa* is also necessary for the reader to best understand this limitation's possible intrusion into the study. This researcher is an in-extremis officer for the last twenty-two years in a firefighting/emergency medicine fire department and has well-developed ideas about the best and most effective manner to lead people during extreme context situations. This said, the study will rely upon the expertise of the dissertation committee as over-readers of the data and results. In addition to that 'check and balance' the researcher will utilize the method of member checking. The in-extremis leaders participating in the study will have the chance to review the initial response data to ensure its accuracy and the initial mega-codings to assist the validation process (Maxwell, 2005).

A final limitation to consider is that it is a research study which utilizes both qualitative and quantitative approaches. This methodological approach can use existing theories as comparative or foundational frameworks but relies heavily upon exploring the gathered data with an inductive eye to discover the 'truths' that are revealed (Glesne, 2011). The Delphi research procedure itself is iterative and continuous as the evidence-gathering process may point to new directions and develops additional salient issues during the study. The limitation to this approach belies the lack of a previously established conceptual framework; without a strong foundation to build upon, the conclusions maybe errant (Franklin & Hart, 2007).

In a further attempt to reduce the limitation of researcher bias, the first series of on-line interactions will be with fire department command personnel of at least the rank of Battalion Chief to help construct the final participant selection leadership checklist created from the literature review. The command personnel used for determining the leadership trait checklist will be excluded in any follow up stages of the study so the concept of self-validation cannot occur (Maxwell, 2005) by them picking individuals in their fire departments who reflect their notion of exemplar rather than the collective summation of the traits.

This study also has its delimitations purposefully designed by the researcher. I used a convenience rather than a random approach to choosing the in-extremis agencies to participate in the study. The study's logistics necessitated that the fire departments asked to participate have websites and internet access. This delimitation poses the ability to create a more cosmopolitan flavor to the data which might not exist if the search parameters were expanded to smaller, rural fire departments.

The second and most probably important delimitation was my choice of creating specific parameters that the study's in-extremis leaders (exemplars) must have attained and be defined

by. The study is to explore very successful in-extremis leaders and asks the participating organizations to identify personnel who represent the most proven successful and competent of their membership. This exclusion of those who are not the successful fringe as defined by the study's established literature-reviewed guidelines will obviously only examine an eclectic segment. According to the National Fire Protection Association (NFPA) in 2017, of the approximately 1.1 million U.S. firefighters, 30% were career and 70% were volunteer. This study will exclusively focus upon career departments because of the greater frequency of experiencing in-extremis scenarios. This is a significant delimitation written into the study protocol and if expanded in a later study, might produce varying results.

Organization of the Remaining Chapters

This study is organized in the following manner: Chapter 1 is the introduction to the study which includes the background to the problem, the purpose of the study, the significance of the study, the statement of the research questions, the theoretical framework of the study, the definition of terms, the scope of the study, and the organizational summary of the study. Chapter 2 is the literature review for the study which examines a comprehensive variety of current publications on subjects that deal directly and indirectly with in-extremis leadership. Chapter 3 outlines the research methodologies utilized, the data collection process used, and the procedures of this study. Chapter 4 presents the study's results which includes an analysis of the data collected by the study. Chapter 5 is a summary of the major findings developed from the study's results to include suggestions for future academic inquiry and possible policy implications.

CHAPTER 2: LITERATURE REVIEW

Introduction

The purpose of this study is to explore the characteristics of experienced and successful in-extremis leaders within the fire service through a mixed-methods Delphi study approach. A frequent comment found in much of the literature expressed the nascent phase of the investigation into this particular field of leadership when compared with the more general themes of management and leadership theories which have been researched for over a century now (Baran & Scott, 2010; Campbell et al. 2010). This comment has appeared many times throughout the proposal so far, but my concern for finding the library devoid of sufficient related materials became unfounded as the process continued. There is an ample supply of scholarly writings on similar leadership subjects to produce a solid initial starting position. The lack of literature can be found in literature covering a twenty-year period and seems to more indicate a relative absence of scholarly work rather than an absolute deficiency on the issue.

The existing literature has been the foundation for the general perspective of this study plus served as the sounding board for the specific nature of the research questions and the applied methodologies. The research questions and conceptual premises were continuously altered and enhanced through the iterative process of reading additional literature, usually identified through the ‘mining’ of the references found in the limited body of work which addressed the specific topic of extreme context leadership.

I have separated the literature into two broad categories and then subdivided each of those into more exact constructs to better illustrate the current literature. The uniqueness of in-extremis leadership must be understood by looking at these two general traits; extreme contextual conditions and its associated leadership dynamics. These bring to bear a synergy

which requires in-extremis leaders to operate under a different set of guidelines than found in different management circumstances (Campeau, 2008; Flin & Slaven, 1995; Ward, 2006).

Though it is typical to think of in-extremis leadership associated with organizations that deal with these situations on a regular basis, societal dynamics have made in-extremis circumstances a more frequent occurrence for non-emergency agencies such as schools and universities.

The three general headings of the literature review are separated into six sections for in-extremis conditions, five sections for in-extremis leadership dynamics, and three sections for conceptual frameworks as follows:

1. Conditions of In-Extremis contexts

- a. Changing and diverse circumstances: in-extremis situations occur in a limitless array of physical and societal circumstances.
- b. Hostile environment/threats to person: in-extremis situations by definition involve dangerous circumstances to those engaged in the emergent conditions.
- c. Unalterable/unavoidable factors: in-extremis situations inherently contain elements that cannot be changed or avoided such as fire, injured persons, or armed personnel.
- d. Ambiguity: in-extremis situations commonly involve circumstances which unfold without definitive explanations or interpretations at the time of occurrence.
- e. Time constraints and limitations: in-extremis situations more often than not are limited in the amount of time to successfully solve the particular problem.
- f. Knowledge/information limitations: in-extremis situations commonly present themselves without the ability to accurately discern all active factors involved.

2. In-Extremis leadership dynamics
 - a. Competence: in-extremis situations require the leaders to be well-trained and prepared to effectively handle an assortment of circumstances.
 - b. Trust: in-extremis situations require the personnel being led have sufficient trust in their leaders if the situation is to be most successfully completed.
 - c. Shared risk and hardships: in-extremis situations may also involve threats to the leaders' health in addition to the personnel they lead.
 - d. Situational awareness and scene management: in-extremis situations mandate a proficiency in its leadership to rapidly assess and react to various factors which can affect the course of action immediately.
 - e. Intuitive decision-making: in-extremis situations, at times, mandate the necessity of rapid decision-making combined with limited information of questionable credibility which can create a 'fog of war' scenario. Leaders must rely upon intuition as well as prewritten procedures.
3. Contextual frameworks: this mixed-methods Delphi approach will utilize one grounded approach leadership theory and two existing leadership theories as reference for a comparative basis.
 - a. Hands-On leadership theory is what I'm labeling the grounded theory approach that this research will investigate. In this style, leadership may have to actually perform the same duties alongside their followers such as can occur during emergency incidents.
 - b. Complexity leadership Theory: leadership within complex organizations is formed through inter-relational dynamics on an individual and structural level.

- c. Recognition primed decision-making (RPDM): leadership within in-extremis situations must make rapid and competent decisions without deliberating alternative options due to time constraints.

Environmental and Decision-Making Conditions of In-Extremis Contexts

This section of the literature review on in-extremis leadership has certain commonalities within the grouping. I postulate that the literature describes factors which are unique in their presence or in their magnitude versus more ordinary circumstances faced by management (Klein, 2009; Kolditz, 2007; Ward, 2006).

Changing and diverse circumstances

In-extremis incidents are rarely at the choosing of the organizations and personnel that must respond or react to these incidents such as military conflict, structure fires, or hostage situations (Klein, 2009). A hallmark of these situations is their changing and diverse natures which requires constant evaluation and reevaluation of all conditions which bear upon the potential outcomes (Uhl-Bien et al., 2007).

Ross et al. (2004) stated that the U.S. Army had developed their Military Decision-Making Process (MDMP) so to provide their field commanders with a systemic manner of weighing options but found that it was too cumbersome to be able to react rapidly enough to counter enemy simulations and was too difficult to properly implement in field training exercises. The ingredient that was missing from this process was factoring in the necessity to speed up the decision-making process so that friendly forces were able to react and deploy faster than their opposition forces (Ross et al. 2004, p. 10). The battlefield conditions can rapidly change and it was prudent to utilize a decision-making procedure which was simple and relied upon rapidly recognizing current situational features which experience and training allowed the

commanders to follow previously successful courses of action (Ross et al., 2004).

Elmqvist et al. (2010) found that organizational response priorities such as preservation of life and property for public service entities such as police, emergency medical, and fire have to be grounded in the circumstances at hand. That any written protocols must be tailored to the specific situation encountered rather than applying the organization's typical course of actions in a generic formulaic manner. Campeau (2008) further elaborated on this theme by stating a significant difference between pre-hospital care and transportation performed by paramedics deals with the contextual setting of the emergency scene and that paramedics must "fit" their procedures to the circumstances (p. 286). The fact that the emergency scenes are normally beyond the absolute control of the first responders and there are often interested bystanders (family, friends, neighbors, additional victims, law enforcement, and other involved governmental and commercial entities, etc.) who become involved in the scenario to some extent, the paramedics must deal with these factors which can produce rapid change to the circumstances by managing the human element on scene as much as the emergency features (Elmqvist, Brunt, Fridlund, & Ekebergh, 2010). Gantt and Gantt (2012) discuss this need to control the possible changing elements of an emergency scene in that the responders need to be watchful of the circumstances which can lead to bystander/victim agitation and panic. Gantt and Gantt write that the conditions for public panic are overblown in popular myth but can occur and can set the incident in a direction that cannot be recovered. The responders must attempt to alleviate real or even perceived concerns by both bystanders, interested parties, and the victims themselves that there exists an immediate threat to their person, that fleeing the scene will eliminate the threat, and that they or the emergency responders are helpless in solving this threat (p. 44). This requires the responders to constantly monitor the social conditions as well of the

physical circumstances of the scene so to be able to anticipate and react to forces that may change actions required for successful outcomes.

Campeau (2008) discussed a further issue of change which is a concern when deciding what and how to best deal with extreme context situations. Public service responders typically go from circumstances which are mundane and normal such as the activities most commonly performed in a firehouse (e.g., chores, training, meals, etc.) to an emergency scene which can be of great significance such as life or death scenarios to those who called for assistance and this immediate response involves social, physical, and psychological changes to the crews involved (p. 291). As well as these changes, the actual location of the scene has preexisting social significance which now changes due to the intrinsic stimuli brought forth by the emergency. What was a family kitchen with its inherent intimacy to family members and exclusion to the outside world or a company's office setting, now becomes an area which must be controlled by personnel who were unknown until just moments before. This transition can cause social and psychological dynamics which must be dealt with along with the nature of the emergency call itself (Campeau, 2008). These dynamics can take a form from assistance, information providers, skeptical bystanders to outright hostile interference.

Berlin and Carlstrom (2011) found in their study that on scene collaboration was normally minimized to particularization of tasking between the various emergency agencies whom respond but there are incidents which are too large or the responding resources are asymmetric to the point that cross-agency assistance is required (p. 169). Police, fire, and EMS have their typical areas of responsibility but there were incidents which necessitated one or all of these responding organizations to fill in or assist in the role of the others. There are times where police are the first on the scene and immediate medical or rescue activities are needed and

normal course of actions are changed (p. 166). Though there were specific tasks usually associated with the different agencies, the responders realized they might have to perform outside of their area of expertise so to accomplish the ultimate goal of saving the victim or reducing the injuries and loss caused by the emergency.

In addition to the constantly changing nature of in-extremis scenarios, there are also factors of diversity and multiculturalism which must be accounted for if a best possible solution is to be implemented (Connerley & Pedersen, 2005). There is a greater awareness of the issue of social justice and its application towards emergency assistance and mitigating the effects of both smaller incidents and larger natural disasters. Emergency responses are now more directly tied to cultural competency than ever before (Collet, 2007; LaViest et al., 2008). Collet (2007) states that orthodox liberalism was the overarching guiding public thought and it assumed the positive effect of the neutrality of the civic realm. This entailed a one size fits all approach that would be the most optimal solution to emergency incidents but multiculturalism is now understood to play a more significant role in deciding what course of action to implement. The victims, bystanders, and responding personnel may speak different languages from each other or have different social meanings associated with various mitigators which can have disruptive consequences if not understood and handled accordingly. A better understanding by the on-scene leadership of various social and cultural factors that can occur during in-extremis situations will lead to better case solutions (Collet, 2007, p. 137).

Two studies conducted in the aftermath of Hurricane Katrina discovered that minority and poverty status were directly correlated to the degree of vulnerability and length of impact of that natural disaster (Andrulis et al., 2007; Toldson et al., 2011). Toldson et al. (2011) used data collected from opinion polls conducted with survivors on the one-year anniversary of the disaster

and found that persons identifying themselves as a minority or living below the poverty standard prior to the hurricane, were more than twice as likely to report significant injuries to themselves or family (p. 373). Additionally, the data indicated there was a significant difference in the social, psychological and economic recovery of these same persons over the intervening year (p. 374). Andrulis et al. (2007) had similar findings that minorities and impoverished persons were less likely to have transportation to flee the area, less likely to have alternative living arrangements outside the projected affected area, and less likely to have insurance to cover property damage and health-related issues associated with the hurricane. Both studies also found that the typical warnings given by governmental agencies were interpreted differently than by mainstream society and that subtle cultural distinctions on how information is received and validated meant that there were multicultural differences on how the hurricane was dealt with (Toldson et al., 2011, p. 362).

Hostile environment/threats to person

The definition of 'in-extremis' includes the inherent issue of danger to at least some of those involved. It is a derivation of a Latin term meaning 'at farthest reaches' or 'at the point of death' (Rush, 2009). Thus I posit that it can be accepted as a basic axiom of this discussion that threats are intrinsic to in-extremis incidents whether involving the military, police or fire departments or larger volatile industries such as petrochemical and nuclear power plants (Kolditz, 2007). Some types of incidents such as emergency rooms' trauma alerts involve potentially great significance to the patient but little threat towards the professional responders but other incidents such as large commercial buildings and warehouse fires can involve great personal threat to the responding personnel and therefore dictate a different leadership style (Hannah et al., 2009).

Kolditz (2007), in his book *In-Extremis*, details those dangerous settings require an outward focus of attention in both leaders and their followers. Any self-preoccupation with emotions or thoughts can be counter-productive to successfully accomplishing the mission and is detrimental to navigating in-extremis situations. The very existence of danger, and the more significant the potential threat, the greater the demand for attention to be oriented towards exterior stimuli rather than an inward focus, necessitates that in-extremis leaders be self-aware of their emotional state but do not let it be a decisive consideration. Thus, successful in-extremis leaders become trained to disregard inner emotions such as anxiety and fear and are able to lose the self into a highly vigilant focus on environmental/social/behavioral cues (Kolditz, 2007, p. 116). This perspective results in a relaxation which allows leaders to focus upon the threat factors nearly entirely and this avoids leadership pitfalls like demonstrations of self-concern, uncertainty and “abrogation of personal responsibility” (Kolditz, 2007, p.125).

Some authors have written that there are specific psychological and physiological conditions which in-extremis situations create due to the presence of danger to persons on scene (Elmquist et al., 2009; Flin & Slaven, 1995). Elmquist et al. (2009) examined four mass casualty incidents finding there was a pronounced psychological and physiological reaction to caring for another’s life-threatening injuries in close proximity. The role required of the responding leaders and crews facilitated them becoming embedded personally into the situation. Flin and Slaven (1995) looked at emergency command competence assessments and concluded that the analysis procedures needed to mimic real-life circumstances as much as possible to bring the psychological and physiological symptoms to the fore in a manner resembling the impact real-life emergencies bring about (p. 120). Hannah et al. (2009) state that the different forms the threat manifests itself as, physical, material loss, or psychological will most likely bring about

differing effects upon leadership. Leadership must then be prepared to respond in specific ways to best cope with these effects upon their person as well as the needs of their followers (p. 908).

Campbell et al. (2008) have noted that the universal approach to defining in-extremis leadership situations hinges upon the presence of danger and how it significantly affects the leader-follower relationship. The danger changes the context of the leadership dynamic and bestows characteristics not found in management scenarios without the danger (Campbell et al., 2008, p. S6). Crichton et al. (2005) found a very similar result; that time constraints and the presence of personal risk were the prime situational constraints on leaders' decision-making process (p. 164). Another study came to nearly identical conclusions where a leader's decision-making process in extreme context situations was most affected by their appraisal of the threat to people and their assessment of their ability to control and mitigate the circumstances (Sjoberg et al., 2011, p. 211).

Two studies discussed threat in a specific instance. Barsky et al. (2007) conducted a study which looked at volunteers showing up at the scene of large disasters and how this posed concerns and possible threats to the dispatched responders. This convergence phenomenon of professional responders and volunteers brought countless people trying to assist to the aftermath of Hurricane Katrina and the World Trade Towers but also brought logistical nightmares. The attempt to establish emergency scene barriers was futile for days in New York and weeks in the Gulf Coast. Emergency command centers had no idea how to verify the volunteers' credentials as to who to utilize in the rescue/recovery efforts but they also had little security for their own teams and equipment. Campeau's (2008) study investigated how paramedics control the emergency scene. He found that the paramedics assessed the scene and divided their attention between the patient and factors which could assist or hinder their efforts or pose a threat on scene

to those involved (Campeau, 2008, p. 298). The paramedics performed a systematic process of ‘what if’ so they would be prepared for threats before or as they materialized.

Gantt and Gantt (2012) brought forth a concern for threat familiarization over time and experience. They state that past experience with similar emergency scenes can become problematic because it allows responders to quickly engage these past actions when they may not be best suited for the current emergency. The leaders and crews who believe there is a threat but that it poses little concern due to prior success in perceived similar situations or a belief that the consequences will not be significant, do less to prepare and train for the future events. The Hurricane Katrina incident is used as an example of the majority of New Orleans’s citizens believing they had already faced similar disasters and made it through them with little damage to show for it (p. 46).

Unalterable/unavoidable factors

The obvious nature of in-extremis situations entails the strong possibility of unalterable/unavoidable factors such as location, timing, access to necessary resources, objectives, preparation, and the presence of threats (Bizjak, 1999; Coleman, 2001; Kolditz, 2007). Military tactics and strategies have been taught for hundreds of years to create competent leaders capable of selecting a battlefield, logistics, and timing in order to mitigate factors that could lead to defeat (Hemingway, 1955). One of the main responsibilities of leading is to come up with solutions to the obstacles which appear to be insurmountable (Hersey, et al., 2008). This is not to say that non-in-extremis circumstances do not have their share of issues which are beyond the absolute control of the leaders tasked with accomplishing a certain objective, whether conducting a contract negotiation, increasing a new product’s market share, or reducing a business’ risk/liability profile. But it will be shown that unalterable factors play a significant role

in how extreme context situations will best be led.

Stephen Rush's interview (2003) with James Cavanaugh, a Federal Bureau of Investigation (FBI) district chief, stated that "dealing with leadership in a crisis is very different from dealing with leadership in your everyday role" (p. 7). This requires leaders to step into a different and unique role with changing decision-making parameters. The leaders who fail to make the necessary adjustments in their leadership style fail to accomplish their missions as effectively and as safely as they should have if they adapted to a new set of rules (Rush, 2003). Uhl-Bien et al. (2007) found that the adaptive leadership style so necessary to performing well in extreme context scenarios was "not amendable to administrative fiat or standard operating procedures". This adaptive leadership style must take into account that many factors are beyond the ability to modify, let alone control, and leaders must be explorative and make crucial adjustments to their course of actions. The authors state there are basic principles which apply to success in in-extremis situations such as understanding that leadership in these contexts is about quickly grasping the essence of what can and what cannot be altered and determining a plan of action from that point forward (Uhl-Bien et al., 2007, p. 300). There is a distinction drawn between management which applies proven solutions to known problems in as efficient a manner as possible and leadership which must "learn their way out of problems that could not have been predicted" (Uhl-Bien et al., 2007, p. 300).

A lack of experience in handling in-extremis situations is a common feature in certain scenarios (Crichton et al., 2005; Militello et al., 2007). The petrochemical and nuclear power industries must prepare for possibly calamitous disaster scenarios but fortunately they rarely ever face the actual situation (Crichton et al., 2005). Though the industries are normally diligent about their preparation, the simulation training is not able to produce the level of anxiety that real-life

circumstances will unavoidably bring to bear and thus the leadership is rarely a 'veteran' to these incidents. The persons who are tasked with becoming the Officer in Charge (OIC) of the facility emergency have normal managerial duties and roles to play and are thus thrust into unfamiliar command relationships during the emergencies (Crichton et al., 2005, p. 157). Militello et al. (2007) found in their study of county emergency operation center (EOC) training scenarios that most of the representatives of the various agencies which were required to be in attendance at the EOC during larger scale disaster drills were very unfamiliar with how to deal with these emergencies. They found that fire, police and the Red Cross were prepared since they usually dealt with small to larger emergencies in the course of normality but that non-public safety governmental agencies, schools, universities, hospitals, larger business and industrial players in the community, and social service agencies were unaccustomed to what roles they were expected to perform under the new set of conditions that large emergencies entail (Militello et al., 2007, p. 27). Longstaff and Sung-Un (2008) expanded upon these assessments and stated that resilience and communication are necessary features for organizations to survive large scale disasters in that there will undoubtedly be significant setbacks to all affected parties, even those that are normally performing emergency functions (p. 1). Inherent to larger emergencies such as natural disasters, pandemics, terrorist attacks, or war, are personnel or material losses which can have a grave short-term effect but long-term sustainability is marked by an organization's resilience.

On the micro scale both Campeau (2008) and Elmquist et al. (2009) found features which are sometimes unavoidable in in-extremis situations. Prehospital emergency care for patients with significant medical or traumatic conditions requires the responders to be in very close quarters with the ill or injured (Elmquist et al., 2009, p. 270). They found that this level of intimacy to the physiological emergency unavoidably causes psychologically embedded

impressions upon the responding paramedics and is inherent in the nature of emergency medical response conditions. Campeau (2008) found that many of the paramedics he interviewed responded with the concern that they must always be cognizant of the threat to themselves because the role of rescuer cannot be fulfilled if they become a victim also (p. 293). Since threats are almost an ubiquitous feature of in-extremis scenarios (Kolditz, 2007), the responders must constantly weigh the necessity and risk of performing life-saving procedures with their own safety so to be able to successfully accomplish their vital functions (Campeau, 2008).

Ambiguity

One of the more referenced aspects of in-extremis contexts is the uncertainty that is inherent in emergencies, sometimes commonly labeled the ‘fog of war’. Since extreme context settings occur at rarely optimal moments combined with the devastation that can occur from emergencies such as natural disasters or larger human induced incidents, ambiguity can become the norm throughout in-extremis incidents (Ward, 2006).

Crichton (2005) found that many previous researchers had concluded that one of the most critical roles to be performed in any emergency are the decision-making processes which must be accomplished during “uncertain, stressful and complex” conditions. This was identified in the military (Cohen et al., 1996; Fallesen, 2000), in firefighting (Fredholm, 1997; Klein et al., 1986), law enforcement (Moore, 2002; Watson, 2010), offshore petroleum platforms (Flin & Slaven, 1995), and in aviation (Orasanu, & Fischer, 1997, p. 157)

Not only is efficient decision-making critical in in-extremis situations but the formal leadership roles and its command and control elements of more traditional bureaucratic models limit the distribution of information so necessary in the modern speed-based environment (Uhl-Bien, 2007, p. 301). Colonel Thomas Kolditz states in his interview (Rush, 2009) that the

ambiguity which is so inherent within in-extremis incidents makes the teaching of specific skill sets obsolete. The better method of indoctrinating new emergency scene leaders is to foster the ability to adapt and make flexible decisions within the framework of that very uncertainty (Rush, 2009). Baran and Scott (2010) discuss 'high reliability organizations' which they give naval aircraft carriers, firefighting companies, and nuclear power plants (p. S43) as examples which must regularly deal with unknowns in their daily activities. The uncertainty of the situations require these organizations to develop rapid sensemaking paradigms which allow changes to course of actions prior to dangerous situations becoming too great of a threat to their personnel (S43). Leadership within these contexts must enhance their ability to discern hazards and other potential conditions as well as utilize their interactions throughout the organization. They further elaborate that this ambiguity necessitates that individuals be able to react quickly to changing and uncertain conditions but that there must be a balance between this and the need for organizational control (p. S51).

Baran and Scott (2010) developed a theory that is based upon the necessarily ambiguous nature of extreme context scenarios which they term Organizing Ambiguity (p. S59). This states that when the responders to in-extremis incidents encounter the ambiguity of the emergency, that they are faced with a constant need to rapidly structure the various stimuli, all of which can threaten harm to the personnel and mission (p. S61). This process is a continuously active feedback cycle because the decisions made and the actions performed themselves have influence on the organization of the ambiguity of the incident.

Berlin and Carlström (2011) studied a series of multi-casualty incidents and found that cooperation and mutual intervention between emergency responder agencies was at times reduced due to the confusion and uncertainty created when organizations like police, fire, and

EMS try to perform tasks they are not familiar or trained for. There was a sense of necessity and a duty to act reported by the interviewees but there was also a strong sense of ambiguity on how to perform these duties since little to no cross-training or preparation had occurred prior to the emergency (p. 163). Longstaff and Sung-Un (2008) also concluded in their study that the effectiveness of an emergency/crisis leader was directly associated with preparation and the ability to coordinate communication and information gathering so to reduce the ambiguity that clouds these type incidents.

In a similar statement, Elmquist et al. (2009) stated that in-extremis role and behavioral decisions are based on expertise and on experiential assumptions in an effort to create organization from the chaos intrinsic to emergencies. Their example is of paramedics who must weigh the encountered uncertainty and to what extent it poses a threat to their safety while trying to administer a systematic course of treatment to the victims (p. 271). The paramedics must always be cognizant of threats to themselves and their patient and balance their actions based upon the creed of life saving is first priority but understanding that if they become injured the victim will by default fail to receive critical care (p. 271). Echoing this sentiment, Campeau (2008) also looked at paramedics and he labeled his findings as a “what if” strategy in which an active monitoring process occurs to detect potential threats to the scene stability and the responding personnel (p.292). The paramedics reported that they were constantly evaluating their surroundings for developments which could produce either positive or negative effects and that uncertainty was an almost universal trait during their emergency responses.

Jensen et al. (2011) studied the timeline of prehospital emergency incidents. They found that there is normally a particular moment early in the incident where there is a high-density of important decisions being made as the patients are first being assessed and specific treatment

modalities are being determined as most appropriate (p. 318). This also was found to coincide with the times when ambiguity was also most impactful and their conclusion was that specific training should be developed to enhance decision-making taking into account the necessity of decisions and actions timed with uncertainty.

A different approach to emergency ambiguity was looked at by King, Khan, and Quan, (2009) when they studied minority status heart patients in Canada. They found that the minority groupings identified were less knowledgeable in self-reports about their medical conditions and were less likely to seek emergency assistance in a timely manner (p. 1371). This lack of fully understanding the particular medical events happening to them, they were also less likely to define their signs and symptoms in a manner which quickly identified to the paramedics that a more serious condition was at hand. This contributes to the need for in-extremis leadership to be able to grasp subtle differences in a multicultural approach to emergency/crisis management.

Time constraints and limitations

A very common element in many in-extremis situations and a part of the definition of an emergency is the aspect that time-limitations are intrinsic and unavoidable but not all in-extremis situations are emergencies so therefore all do not contain time-limitations (Kolditz, 2007). Leading a mountain climbing expedition would be one example but most extreme context scenarios involve time being a crucial factor that must be successfully dealt with somewhere during the incident (Klein, 2009).

Crichton et al. (2005) found the decision-making process was significantly affected by time constraints and analysis of various options became more difficult as insufficient time was allotted to decipher their potential consequences. They researched nuclear power plant supervisors and found that the ones with the most experience relied less upon protocols and more

upon their own experience and expertise in handling similar situations prior. In addition, the procedures for handling many of the plant emergencies had become so protocolized that they were too voluminous to be utilized by the emergency leaders during the incident (p. 163). It was ironic that the less experienced incident commanders (IC) needed to rely more heavily upon these written protocols but were too unfamiliar with them to find what they needed in a timely manner for the procedures to be a useful utensil, but the more experienced ICs actively chose to rely more upon their experience and their abbreviated notes derived from past experience.

Time is a critical element in most combat situations for the military services (Ross et al., 2004). Combat brings about rapidly changing factors which can be extremely decisive in finding a successful solution but the time constraints bring a decision-making dynamic to the fore. The more methodical and analytical models of weighing alternative options and comparing best guess calculations become a hindrance in these scenarios (p. 8). The time limitations degrade the efficiency of methodological analysis and produce an inverse effect (p. 9). It was found that military commanders who had greater amounts of experience and expertise were able to implement successful courses of action by relying upon these characteristics to offset the demand of making an immediate decision (Huffman, 2010). Klein (2009) found the same decision-making dynamic when he looked at U.S. Army tank commanders; he discovered that the less experienced commanders relied more heavily upon analyzing their perceived alternatives where the more experienced commanders normally went with their first judgment of the scenario (p. 90). This meant a significant difference in the time required to make and then implement a critical decision and due to the nature of tank warfare, was often a fatal flaw in training, fortunately (p. 86).

Baran and Scott's study (2010) involving high reliability organizations such as

firefighting companies, found that the majority of their critical, high-impact tasking was performed in a time-sensitive environment. The study showed that most of the critical decisions were made within a period of time where slower deliberate manners of choosing the best course of action were nearly impossible (p. S43). But the study also identified a contradiction in the goals of firefighting where speed, efficiency, and a prime directive to perform life-saving operations as quickly as possible was countered by an organizational culture which also stresses performing these operations as safely as possible (p. S46). Berlin and Carlstrom's 2011 study of collaboration at accident scenes found that time limitations were a significant factor in minimizing mutual aid between responding agencies. When faced with an immediate need to accomplish what is expected of them, ambulance, police, and fire personnel were unable to devote time to coordinating their efforts with each other though the obvious perception is for greater efficiency and thus a better chance for successful outcomes to patients (p. 165).

Elmqvist et al. (2009) found that time's perception by many on scene of an emergency becomes disjointed and a more heightened concern about how long efforts seem to be taking compared to what is normally expected occurs (p. 269). This effect was found to produce greater uncertainty and anxiety amongst even the responders themselves. Jensen et al. (2011) found that the time constraints on paramedics in the field centered on the high-density decision-making periods where multiple critical courses of action had to be chosen with life/limb consequences attached. The decision-making compression caused a greater occurrence of errors/deviations from written medical protocols. But King et al. (2009) found a salient feature to time limitations was that many medical procedures need to be implemented within a specific time window if they are to be successful. They looked at heart attack victims and the treatments they received and found that time constraints played two roles. First, it was critically important that field

recognition of the medical problems occurred quickly before second, the time restricted medical interventions could be implemented (King et al., 2009, p. 1371).

Knowledge/information limitations

Accompanying and intertwined with the issues of time limitations and ambiguity is a lack of reliable information and knowledge within the confines of in-extremis situations (Kolditz, 2007; Uhl-Bien et al., 2007). Though very similar and contributing to the other features of in-extremis conditions, a lack of knowledge is unique. Ambiguity stands as a condition of confusion, referred at times as the ‘fog of war’, but a lack of knowledge or understanding stands as a salient feature affecting in-extremis incidents differently. Berlin and Carlstrom (2011) found that when different emergency agencies responded to the same incident, such as police, fire, and EMS, they didn’t have detailed knowledge of what was needed to be accomplished by the other agencies or how they prioritized their efforts. There was always a general understanding of what the other agencies were responsible for but interagency collaboration was normally reduced because information was lacking or non-existent (Berlin & Carlstrom, 2011). Ultimately, a lack of knowledge and understanding leads to the uncertainty and hesitation which is so common in extreme settings such as accident scenes (Berlin & Carlstrom, 2011). The difference between ordinary management circumstances and in-extremis incidents occurs partially due to the time constraints on having to act quickly and not having the time to wait until more valid information is gathered and confirmed (Coleman, 2001).

Barsky et al. (2007) studied different Federal Emergency Management Agency (FEMA) responses to domestic natural disasters and found that a convergence effect happened in most of these cases where unsolicited volunteers traveled to the disaster scenes to assist. Some of these people were local residents who were affected themselves and others traveled hundreds of miles

to attempt to lend help. But what they found was the FEMA officials on scene who were tasked with cordoning off the area and deploying rescue/recovery teams were unable to use these volunteers due to a lack of reliable information about the intents, credentials, or even identifications of this potential pool of manpower and expertise (Barsky et al., 2007, p. 504). Some of these self-responders were professionals in the field of law enforcement, fire/rescue, emergency medicine, and heavy machine operators but without a means to verify these claims initially, they were barred from assisting in the efforts that their expertise was most needed.

In their study of emergency operation centers, Militello et al. (2007) found that sometimes the lack of information was due to an asymmetry of knowledge between the different key role players in a larger emergency operation. Since many of the agencies in a community which take an active role in the rescue/recovery efforts normally do not have a regular working relationship with each other, there was a lack of understanding or miscommunication concerning what information might be critical to another phase of the operation (p. 29). This isolation of knowledge and expertise without the proper distribution of that knowledge equated to the same condition as not having the information at all; that certain decisions and courses of action had to be undertaken in a shroud of uncertainty. Gantt and Gantt (2012) state that people, both victims and responders, will act on perceptions they believe are true regardless of whether it is ground in actuality or not. That in-extremis situations have a pressurizing effect so that persons involved feel a greater sense of having to act and a lack of verifiable information will not stop this dynamic therefore decision-making becomes based upon whatever information is available (Gantt & Gantt, 2012, p. 45).

Hannah et al. (2009) examined the complexity dynamics found within most in-extremis situations, finding a lack of knowledge meant that the persons involved had to rely more heavily

upon their mutual contributions to the efforts at hand. The interactions between individuals and different agencies became more significant than in normal circumstances. A top-down method of controlling an emergency incident became less efficient because critical information can be generated or attained at any level of the responding organization and thus rapidly made decisions about enacting crucial operations must attempt to coalesce vital information from wherever it currently exists. Longstaff and Sung-Un (2008) found a similar aspect of how a lack of information is organizationally processed. Communication of trusted information leads to greater organizational resilience in both current and future operations. When efforts are not as successful as expected or involve too great a loss, accurate and timely knowledge allows adjustments which lend to greater trust in an organization's leadership. The organization's capacity to learn is bolstered by more valid information which lends itself to greater resilience.

Leadership Dynamics of In-Extremis Contexts

This section of the literature review on in-extremis leadership explores the specifics of the leadership styles and those leaders who operate successfully within that environment. Much has been written concerning management in general but the literature investigating extreme context leadership and the skills necessary to be successful within that environment is limited (Baran & Scott, 2010; Campbell et al., 2010; Dixon et al., 2019; Elmquist et al., 2009; Fisher & Robbins, 2015; Gantt & Gantt, 2012; Hannah et al., 2009; Holenweger et al., 2017; Jensen et al., 2011; Kolditz, 2007; LaViest et al., 2008; Longstaff & Sung-Un, 2008; Santos et al., 2008; Sjoberg et al., 2011; & Sweeney, 2010).

Competence

When describing extreme contexts, Kolditz (2007) stated "Only competence commands respect, and respect is the coin of the realm in in-extremis settings" (p. 11). This sentiment is

expressed in much of the literature in reference to how leadership is evaluated by followers when the threat to their persons is significant. Leadership is contextual and socially bound and the dynamics change significantly in extreme settings so that competence becomes the key player when followers decide whether to trust their leader (Hannah et al., 2009, p. 898). Campbell et al. (2010) found the same element in in-extremis settings and the followers usually go through a reevaluation of their leadership prior to engaging in dangerous circumstances. This is echoed in Sweeney (2010) that followers' trust in their leaders is a constant reaffirming process where evaluation and reevaluation of critical competencies determines the level of trust and thus organizational efficiency. He further found that followers trust could be negatively affected by three circumstances; 1. demonstrated incompetence by leadership, 2. followers unfamiliarity with their leadership, or 3. too little experience with in-extremis situations by either the followers or leaders (Sweeney, 2010, S78).

As the threat level increases to the participants within an in-extremis scenario, the linear aspect of trust becomes transformed and the social setting aspects of normal management become far less important and leadership skills become the decider of trust and respect (Crichton et al., 2005; Hannah, et al., 2009; Kolditz, 2007; Sweeney, 2010). The transactional methods of management become less influential and positional power becomes more irrelevant in circumstances in which ill-thought decisions and poor execution could lead to death or significant injury (Rush, 2003). Competence in action becomes paramount to successfully leading under these circumstances (p. 10). General Montgomery's dictum is still used by the Army Regular Commissions Board (UK) "the two vital attributes of a (in-extremis) leader are decision in action and calmness in crisis. Given these two attributes he will succeed; without them he will fail" (Flin & Slaven, 1995).

Competence has been found to be the number one factor influencing trust by followers in extreme contexts (Sweeney, 2010) and trust in one's leadership is critical at the moment when the threat is perceived to be the greatest (Hannah et al., 2009). Both Sweeney (2010) and Hannah et al. (2009) found that in-extremis organizations should prepare training regimens which mimic the reality of the threat circumstances as much as safely possible because this will instill a sense of trust within the responding crews which more easily transfers to real-world situations.

Military leaders are judged differently depending upon whether the circumstances are combat or peacetime roles. Since we have already shown that demonstrated competence either through realistic training exercises or actual in-extremis experience instills vital trust in leadership, organizations can enhance their emergency operations through increased efficiency, safety, and coordination by developing their leaders' skills with training targeted towards knowledge structures underlying real-world expertise (Crichton et al., 2005). Their study also found that the more experienced incident commanders for nuclear power plants had more comprehensive mental models of what and how to perform emergency operations. These mental models served as prepared references and allowed the commanders to concentrate on the necessary duties at hand and these leaders were able to better handle the significant stressors encountered in such a possible catastrophe (p. 157). Sjoberg et al. (2011) found that a leader's ability to handle the significant stress associated with extreme context situations was positively related to their level of competence. Stress was also counteracted by a leader's ability to rapidly assess an in-extremis situation through recognition of situational characteristics from previous training or actual experiences (Klein, 1998, Ross et al., 2004) which allowed for faster decision-making and implementation of effective courses of action.

Trust

As a companion to the above discussion concerning leadership competence, trust is essential to all in-extremis operations and is embedded in the analysis of both leadership's and followers' competence (Kolditz, 2007; Rush, 2009). Trust is a continual and reciprocal process whereby demonstration and reevaluation of the criteria for enabling trust are reviewed to determine whether the current level of trust is warranted, especially in in-extremis organizations (Campeau, 2008; Hannah et al., 2009; Sweeney, 2010).

Trust is defined by Sweeney (2010) as making oneself willingly vulnerable to another's decisions and actions (p. S71) and applies in both directions on the chain of command. All in-extremis leaders must strive to understand the trust-building process (Sweeney, 2010) and develop 'followership' which means they are able to influence their personnel to follow their decisions and commands in a manner which is motivated, efficient, and timely due to trust in their leadership skills (Ward, 2006). Leaders must also understand the positive or negative effects trust will have on their organization and its in-extremis operations. The greater the levels of trust between leaders and followers, the greater resilience (Longstaff & Sung-Un, 2008) and the better they are able to handle prolonged stress and thus maintain focus and effective efforts (Hannah et al. 2009).

Leaders need to further enhance their trustworthiness by continually enhancing their technical and tactical skills and demonstrating these skills through realistic training exercises and actual in-extremis situations (Rush, 2009; Sweeney, 2010). The threats to life and limb are very real in extreme context situations so leaders need to be able to reinforce the basis of the trust they have earned. Hannah et al. (2009) suggests that leaders are able to earn 'trust credits' through their deliberate actions before/between in-extremis operations and that these credits can be used

to utilize a more directive and autocratic style of leadership at the moment of gravest threat (p. 905).

The discussion on competence showed there is a direct link between followers' perceptions of their leaders' skills during in-extremis operations and the degree of trust they will grant the leaders. Competence has been found in many studies to be the primary factor deciding levels of trust in in-extremis situations such as leading combat patrols or firefighting. Sweeney (2010) suggests that trust becomes evaluated under different construct terms once significant risk is involved to the participants and Hannah et al. (2009) suggests that there is an almost linear relationship between trust-in-leader and follower performance until the point of significant risk of bodily harm or death becomes a possibility (p. 899). As the perceived precipice gets nearer, followers will normally reevaluate their strength of trust and base their compliance upon that degree of trust (Hannah et al., (2009).

Cooperation has also been found to be a decisive factor in developing trust in the in-extremis environment. Plowman et al. (2007) stated that cooperative power sharing based upon both upward and downward organizational trust led to greater destabilization of the status quo of current procedures, increased innovation and ideas, and more productive operational changes. Ross et al. (2004) found that though the military operations are usually commander driven, that the Recognition Primed Decision Making (RPDM) model which allowed a more rapid assessment and implementation of course of actions encouraged greater cooperation between ranks and created a command environment where successful suggestions originated in the lower officer ranks. Berlin and Carlstrom (2011) suggested that this same effort also assists entire organizations when they operate with each other more collaboratively. They found cooperation between emergency responders and their organizations could develop greater trust and

understanding which could at times lead to more synchronous efforts on the emergency scene. This same theme is reiterated in Longstaff and Sung-Un (2008) where they found that trusted sources of information within and between organizations led to a greater reliance on these sources which when accurate, led to faster more accurate assessments and adaptive emergency operations.

In addition to members of in-extremis agencies and between agencies developing trust through cooperative efforts, Campeau (2008) and Elmquist et al. (2009) found that victims and responders at the emergency scene needed to develop this level of trust rapidly. Both studies had similar findings those victims at emergency scenes were prone to quickly grant trust to the responders as long as they were professional, caring, and followed a systematic course of action.

As a consideration within the conversation on developing further degrees of trust, two studies found possible negative aspects to greater trust in in-extremis situations. Hannah et al. (2009) found that when the moment of threat was greatest there is a strong intrinsic motivation to act, and followers who had a strong sense of trust in their leader, allowed themselves to be led with an autocratic style and offered little questioning of the orders given and the rationale behind them. If the courses of action are poorly thought out and ill-prepared, severely drastic consequences could arise from this condition of too much trust at the wrong moment (p. 903). Longstaff and Sung-Un (2008) found that organizations which indicated a greater sense of trust in their leadership and technical abilities, both of followers and leaders, had a greater likelihood of not preparing intently for their next emergency operations. The irony is that if this trust is unwarranted, then the organization and its population it is sanctioned to protect are at greater risk due to the normally positive dynamics of building organizational trust.

Shared risks and hardships

In-extremis leaders are set apart from other leaders maybe most due to their willingness to endure the same risks and hardships as the personnel they lead (Kolditz, 2007). As already established in the previous sections, in-extremis situations have an inherent threat to the persons engaged in these activities. A further separation from other forms of leadership is the factor that leaders will face or have faced similar if not greater chances of death or injury (Klein, 1997, Kolditz, 2007). This concept potentially separates out in-extremis leadership even from their own organizational hierarchy. Each in-extremis organization has it's type of military generals, police commissioners, and fire chiefs and these leaders in most cases likely climbed the ranks within the agency so they too were in-extremis leaders in the past but due to the fact that they now lead from an administrative office and no longer perform field operations, they no longer qualify as in-extremis leaders in their current job-tasking but could be viewed by the 'rank and file' as experienced leaders and thus deserving trust (Bass, 1998; Bass & Steidlmeier, 1999; Hannah et al., 2009; Kolditz, 2007; Rush, 2009). Kolditz (2007) found in interviews with military officers serving in combat zones that this sharing of risk was not a form of hubris or impression management but an internalization of the need for this style leadership and it was apparent to the personnel they commanded as authentic (p. 6).

Hannah et al. (2009) utilized the term Critical Action Organizations (CAO) to delineate those agencies where the responding personnel are actually at some sort of risk during their normal field operations (p. 901). They even draw a distinction between police and fire crews whose normal day does not include an extreme context condition and those busier crews whose typical day does normally involve at least one situation where there is a significant threat to responding personnel, included also in this grouping are Special Weapons and Tactics teams

(SWAT) and line military units. A hallmark to effective leadership within these particular groups is that their leaders potentially share the same risk 'as their men'. In the situations where there is a client/victim, as in the case of a hostage crisis or someone trapped in a burning building or flood, the responding members of the CAO including leaders, share the same/similar risk as the client/victim.

In his interview with Stephan Rush, James Cavanaugh (2003) emphatically stated that an in-extremis leader "cannot hide in their office" (p. 8) but that it is important that the personnel assuming the risk see their leadership in highly visible locations where they are easily identified by their personnel and that risks and hardships are commonly shared to some extent. Colonel Kolditz (Rush, 2009) takes this concept and goes further by stating that in-extremis leaders should not only share the risks and hardships but should never find themselves in a position to take advantage of their personnel or obviously enjoy benefits not shared by the other members of the team (p. 14). He elaborates that in-extremis leaders should lead because they have a strong belief in the organization, mission, and maybe above all, the people they lead (p. 14).

Little (1964) found that military leaders who shared the risks and hardships of their men were seen as more effective by both their followers and their superiors. Bass (1998) had similar findings which showed that actual physical distance from the personnel being led created a lack of credibility for leadership. When leaders were seen as too far removed from the conditions faced by the team, their decisions were potentially slow in response to current threats and unaware of group needs at the time. This situation had a tendency to diminish a leader's ability to issue orders which were viewed as timely and appropriate and negatively impacted credibility.

Situational awareness and scene management

Since in-extremis situations are rarely if ever at the choosing of those participating in the incident (Kolditz, 2007), they are infrequently controllable or stable. The nature of the beast so to speak is that it is an emergent scenario with threats to persons, property or both (Ross et al., 2004). These are novel situations in which correct and rapid assessments are key to guiding judgment concerning the best, most appropriate course of actions to undertake (Ross, 2004, p. 9). These conditions will quite frequently require modifications to action plans and in some cases the adjustments are often and necessary to avoid tragic outcomes (p. 9). Rush (2003) states that these conditions require the people in charge to think like leaders rather than managers (p. 11). The meaning of this is that if the thought process is the same one used in normal everyday operations and not with the clarity that these scenarios are uniquely and categorically different, the decisions made will be inappropriate for the circumstances and the threats faced during the incident. Cavanaugh quotes Winston Churchill appropriately in describing the situational in-extremis leadership dilemma that such leaders stand upon as “a precipice of caution and a precipice of over-daring” (Rush, 2003, p. 12). Intrinsic to in-extremis situations is the fact that leaders will have to always be aware that the decisions they make so to be successful in the mission’s operation may exceed the abilities or resources deployed; when is it prudent and the best solution to put people into harm’s way? (p. 12).

As previously discussed, leadership is contextual and socially bound (Hannah et al., 2009, p. 898) when combined with incident scenes which are inherently dangerous and fluid (Ross et al., 2004) the leader must have greater vigilance, situational awareness, and preparedness (Hannah et al., 2009, p. 900). When these incidents are counter-normative as per the normality of the training and experience the in-extremis teams have acquired, the necessity

for leadership is to be more active and more aggressively manage the situation, threat, and environment (p. 904). Volatile circumstances require greater flexibility and rapid adaptation schemes (Uhl-Bien et al., 2007, p. 305) which necessitates leadership to remain continuously attentive to situational cues and changes that may impact the ongoing operations (p. 312) and to maintain effective information gathering and distribution techniques and open lines of communication (p. 313). Crichton et al. (2005, p. 157) found that situational management required greater cognitive and social skills from the in-extremis leaders so to increase operational performance. The stressors of extreme context events place a greater demand upon the leadership's capacity to make rapid decisions while multiple stimuli are potentially changing.

Uhl-Bien et al. (2007, p. 301) reference McKelvey and Boisot (2003) 'Law of Relative Complexity' that it takes complexity to defeat complexity rather than simplify and rationalize the existing structures. The law further states that a system must contain at least as much complexity as the environment it hopes to be able to function within, stabilize, if not control. In extreme context incidents, this suggests an adaptive leadership style with strong situational awareness rather than a more directive leadership style which may become more singularly focused and fail to gather pertinent information from other sources (Hannah et al., 2009, p. 912). As an organization becomes adept at a complex leadership style, it increases its chances to remain flexible in the face of grave threats and can adapt more rapidly and appropriately for the evolving circumstances (Uhl-Bien et al., 2007). This complexity becomes more helpful when managing the oft overlooked aspect of leading the transitions from mundane to emergency to back to mundane again. If a leader only sees their sole perspective during these emotional, cognitive and physical transitions, they will often fail to understand where difficulties may appear during emergency operations or later back at the firehouse or barracks (Hannah et al., 2009, 902).

Kuisma et al. (2005) found that a distracter to effective decision-making on the scene of an emergency was that resources and expertise at times were limited or unable to be utilized effectively. This situation required the on-scene commanders to be aware of these limiters when devising their course of action. Their study found when medical command was not on the scene of medical/traumatic emergencies that deviations and errors from protocols were higher and safe and effective control of mass casualty incidents (MCI) was inadequate (p. 1532). Berlin and Carlström (2011, p. 162) stated similarly that in larger traumatic emergencies where there was a multijurisdictional response to the scene, command had to actively attempt to synthesize efforts in a more cooperative and collaborative manner for greater efficiency. Campeau (2008) and Elmquist et al. (2009) also investigated emergency medical incidents and found the quality of the care provided and the effectiveness of that care depended upon the responders (and leaders) ability to assess the situation quickly and choose a course of treatment most appropriate for the illness/injury encountered. In some of the scenarios multiple injuries were sustained by the victims and required simultaneous and at times potentially contradictory efforts which necessitated vigilant monitoring of the patient to determine which intervention to be undertaken next.

Intuitive decision-making

Experts (exemplars) in in-extremis situations can have been expected to have developed, through training and experience, a higher degree of domain wisdom that allows them to make successful intuitive decisions (Moilanen, 2015). In information-limited, time-critical scenarios where optimal decision-making is of utmost importance, “even more than normal, a leader’s own expertise, intuition, and creativity as well as their understanding of the environment” is necessary for successful outcomes (HQDA, 2011, p 190).

Scholars have debated the specific role that intuition plays in critical decision-making (Okoli & Watt, 2018) partially due to the ill-defined nature of what exactly is intuition and how it works given individual decision-making differences. Studies have discussed that experts rely upon different decision-making strategies than novices but most do not elaborate a clearly defined process which has evolved within the experts nor the particular mechanism which leads to these decisions (Okoli et al., 2016). But there are also scholarly arguments made that appreciate the existence when intuition can be helpful but state a reliance upon intuition and intuitive judgment can lead to the use of cognitive biases and faulty heuristics, thus missing the advantages of analytical thinking (Kahneman, 2003; Evans & Over, 2010). There are instances where the decision-maker is comfortable with their initial thoughts and will not seriously consider alternative solutions, especially when the time to deliberate is seen as too cumbersome, and thus may decide on a course of action that will have negative consequences (Bakken & Gilljam, 2003). While others (Scott & Bruce, 1995) more completely reject the notion of intuitive decision-making having a proper place in the discussion of optimal methods of finding solutions to complex problems. Since intuitive decision-making delves into the subconscious, relies upon the subjective post-event description by the participant, and is not easily quantified, its inclusion in scholarly debates of cognitive science has caused some degree of controversy (Kahneman & Klein, 2009).

So, a question posed in many academic articles is; what is intuition? It is commonly agreed that intuition is a byproduct of our experiences and involves our tapping into our tacit knowledge (Okoli, et al., 2016). It is not something easily quantified, standardized between people that report using this schema, or availing itself to scientific measurement (Evans & Over, 2010). Klein (2003) sees this as putting our experiences into action without fully contemplating

all available options to which he proposed was most especially pertinent to leaders in high-risk domains where the rapidity of events requires immediate decisions by the leadership of such incidents. Benner (1984), outlines stage developments in emergency room nurses and the final stage, expert, she finds that the expert nurse is able to see more the totality of a situation and responds in a fluid and intuitive manner. That in the earlier four stages, the nurses are bound by the guidelines of protocols through to eventually developing a greater sense of analysis as a 'proficient nurse' but not until they reach the expert level, do they have a tendency to automatically respond, not consciously aware of how their decision process proceeded.

Experienced Cleveland firefighters were studied in 1985 (Klein et al., 1986) and when asked how they came to make immediate decisions on the fireground, many times the answer was "there was no decision". The fireground commanders put an action plan into motion which was what they reported as "the only and obvious choice to make" with a very high success rate. Klein et al. (1986) did not attribute this to there being only one option but that the fireground commanders utilized previous experiences and implemented their first (and correct) intuitive choice. Intuitive decision-making was supported in situations of uncertainty where information is limited and its credibility questionable, affecting variables may change rapidly, and there is limited experience with the specific elements/conditions faced (Shirley & Langan-Fox, 1996).

Bakken and Gilljam (2003) postulate that there are universal demands placed upon incident commanders to recognize, determine the actions' possible efficacy, and act quickly in highly complex and uncertain situations where the possible consequences can be dire. They continue that these circumstances mandate a decision-maker who can react (recognize, think, triage, and implement an action plan) quickly whereby intuitive thinking assists, if not specifically necessary for the successful completion of these tasks. Lyneham et al. (2008) state

that experts make decisions faster and more accurately than all other stages of professional development (p. 381). They conclude in their study that intuitive decision-making is integral in explaining expert clinical practices and the success which comes from their expertise. Moments of crisis that embody complex and dynamic challenges require highly developed critical-thinking and rapid decision-making abilities that derive in part from the commander's intuitive sense-making (Moilanen, 2015, p.101). It is at these times that leaders must combine their experience, training, and intuition to quickly develop a strong situational understanding and institute an effective action plan (p.103).

Emergency incidents (police, fire, EMS) and combat situations in the military contain some degree of ambiguity with potentially changing factors which can vector the incident in a different direction than first perceived. The leadership in these scenarios must be comfortable with the ambiguous nature and frame action plans which address the current concerns yet be able to adapt as conditions and information develops (Kolditz, 2007; Moilanen, 2015). They both found that as these decisions sometimes must be made rapidly to stay abreast of changing dynamics; that intuitive decision-making is necessary for adaptable and effective leadership. Sinclair and Ashkanasy (2005) state that command of fireground situations and their ilk, that not only must the decisions be accurate and beneficial to accomplish the mission's goal, but must also be made intuitively with reduced processing time to reach that decision. Okoli et al. (2016) make the point that decision-making metrics would most likely improve to some degree given time to think through and debate various options available but situations such as found on emergency incidents, this is usually not possible and therefore intuition serves to fill a required niche. They follow up that "consciously deliberating amongst several options under time-pressured and high-staked conditions will therefore definitely prove counter-productive" (p.91)

and an intuitive mode of decision-making processes relevant information more quickly and is more effective.

High acuity emergency incidents such as police, fire, and EMS scenes, involve multiple sources of information, some complete, some smattered, along with the accompanying stressors of such scenes (Flin & Slaven, 1995; Baran & Scott, 2010) and intuitive thinking has been found to be useful in acting as a mental filter to decipher through relevant vs. cursory informational inputs; that experienced commanders of these incidents are able to subconsciously weigh in on the important factors and dismiss the distractors (Militello et al., 2007; Moilanen, 2015; Okoli, et al., 2015).

In a further attempt to gain data concerning whether the participants utilize or rely upon intuitive decision-making processes during in-extremis incidents they have been involved with, I will administer the Rational-Experiential Inventory (REI-40: Pacini & Epstein, 1999) to each member of the Delphi panel. This is a 40-question Likert scale survey which measures the respondents on their self-reported tendency to focus upon rational and/or experiential thinking. The REI-40 is further broken down into four subscales (10 items each). These are Rational Ability – the ability to think logically and analytically, Rational Engagement – reliance on and enjoyment of thinking in an analytical manner, Experiential Ability – the decision-making ability with respect to one’s intuitive impressions and feelings, and Experiential Engagement – the reliance on and the enjoyment of feelings and intuitions in decision-making (Pacini & Epstein, 1999).

The REI-40 was created to test the construct validity of the Cognitive-Experiential Self Theory (CEST) developed by Seymour Epstein (1998). He postulates in CEST that there is a dual-processing mechanism involved in our information-processing and decision-making; one

that is analytical-rational and the other which is intuitive-experiential in nature and that people gravitate towards one or the other in most situations. There are characteristics he defines for each and one of the points of difference between the two is the speed by which they engage. The intuitive processing is meant for more rapid processing and immediate action whereas the rational information-processing is more deliberate and analyzes alternatives but is oriented for situations that do not require instantaneous decisions or actions. The CEST description of intuitive decision-making of holistic viewing, relying upon associative connections, and near-automatic information-processing ties in with similar descriptions within the Recognition Primed Decision-Making (RPDM, Klein, 2009) that will be elaborated upon further in the text.

The collective results from the REI-40 surveys adds greater depth of understanding the participants and how they synthesize information on the emergency scene and how they believe they make decisions rapidly when utterly necessary. The survey data allows a degree of triangulation when added to the Delphi responses and the demographic information.

The REI-40 has shown itself to possess reliability and validity over numerous investigations. The factor structure of the REI-40 has been shown to be reliable on (test-retest and Cronbach's alpha) (Shirzadifard et al., 2018). It's construct and convergent validity has also been demonstrated for evaluating differences that individuals exhibit in how they process information (Bjorklund & Backstrom, 2008; Marks et al., 2008; Pacini & Epstein, 1999; Witteman et al., 2009). The REI-40 has been validated in various studies to include subject populations of paramedics (Jensen, et al., 2016), cardiologists (Sladek, et al., 2008), and emergency physicians (Calder, et al., 2012). In addition, Pacini and Epstein (1999) found that there was a reliable factor structure for the experiential versus rational processing of information and the decision-making arising from this.

Conceptual Frameworks

This study proceeded forward utilizing a grounded theory mixed-methods Delphi approach which more heavily weighed in the qualitative methodological paradigm which relies upon gathering data from the natural settings to serendipitously form the basis for propositions and theories (Baran & Scott, 2010). Rather than impose a preexisting theory or analytical presumption upon the data, it is an inductive method meant to develop thematic schemes which are cultivated from the raw data and allow an initial look at the subject matter (Sjoberg et al., 2011). This mixed-method Delphi approach is situated upon the concept that the researchers should avoid deductive analysis and existing theories; that the scholars should remain distant from establishing the foundation of their research on previous work and its findings (Strauss & Corbin, 1990). Research into in-extremis leadership traits and decision-making paradigms is still new and exploratory-based theory is applicable as evidenced by Baran and Scott's statement (2010, p. 897) "... and in fact, leadership in extreme contexts may be one of the least researched areas in the leadership field."

The manner of research that this study undertook more closely resembled the 'Grounded Theory' approach (Glaser & Strauss, 1967). This method has many times been modified and added on to by following researchers since the original publication in 1967, and even its two initial authors have published their disagreements as to the specifics of how it should best be applied (Coven, 2010). There have developed a few different methodologies within the grounded theory paradigm such as 'Constructivist', 'Critical Realism', and 'Abductive Reasoning' which differ from one another to some extents but the basic philosophy remains very similar (Thornberg & Dunne, 2019).

Grounded theory basically utilizes an inductive approach to the research such that the

gathered data is the starting point for developing coding, themes, and categorizations which can ultimately lead to theory creation (Covan, 2010; Glaser & Strauss, 1967). The research is to obtain data which may lead to further insight into the issue at hand and from there to propose preliminary models and a conceptual framework to better understand the studied dynamic (Rieger, 2019). Rather than using established and shared theories which may dominate within the sphere of study, the data is analyzed to determine if new explanations can be incubated. This process also applies to areas of study and concern where little theory or research presently exists (Thornberg & Dunne, 2019). As I have elaborated more than once in this writing, the literature applicable towards the core of this study is not robust at this moment (Gantt & Gantt, 2012; Hannah et al., 2009; Holenweger et al., 2017). Which makes a study evaluating a select group of identified exemplars in fire service field command (in-extremis scenarios) as a very good candidate for proceeding with the tenets of a grounded theory approach.

The addition of using the Delphi method of attempting to come to a consensus among recognized ‘experts in the field’ can be a force multiplier as the study moves through the sequence of initial data gathering to study conclusion (Ogden et al., 2016). As Glaser and Strauss (1967) describe the grounded theory approach, the analysis by the researcher is a continuous ‘work in progress’ whereby additional data is laid over top of the existing thought processes and can confirm, modify, or null the first thoughts and lead in another direction. Instead of only the researcher developing this mechanism of theory development, the very nature of the Delphi systematic approach clearly can (and hopefully) produce solid waypoints for research conclusions and compass settings for future exploration (Creswell, 2009).

I would like to further suggest the appropriate nature of a grounded theory approach to this dissertation by bringing ‘Hands-On’ leadership into the discussion. Some of the already cited

references have mentioned the in-extremis leadership dynamic of performing or being prepared to perform the taskings assigned to their crews/units (Kolditz, 2007; Baran & Scott, 2010). I refer to this leadership/management style as 'Hands-On' leadership. In searches utilizing Google, Google Scholar, RefSeek and Summon, it becomes difficult to discover much in the way of peer-reviewed material covering the subject. The majority of publications discussing such are found in industry publications and not specifically academic-driven journals.

There are many peer-reviewed published leadership theories that relate to the hands-on style but are limited in their application to in-extremis circumstances or are only cursorily similar to what the essence of my operational definition of hands-on leadership is. Gilbert Fairholm (1994) describes hands-on leadership as unified actions involving both leaders and followers where leadership is not a starring role but expected to be able to perform alongside the members they lead. Satterthwaite and Millard (2017) detail their explanation of hands-on leadership to include the term found in athletics, player-manager. They state that management, in some circumstances, is increasingly being asked to not only perform their formal administrative duties but to also step forward and perform technical-functional duties as necessary. That the dual role of a player-manager is similar to actively coaching a collaborative effort/team. This is not to be viewed as micromanaging which normally has a negative connotation but to be seen as working side by side in both mental and physical tasks (Fairholm, 1994). Lauby (2016) writes that the difference between hands-on and micromanaging is the trust developed among the various corporate levels within the group and building relationships which benefit both parties and the organization. As the leader then shoulders the same duties as their followers, this can build enthusiasm/inspiration and can lend a greater sense of importance to the tasks being performed by all as long as the leader does so with a degree of passion and commitment rather than as a

perfunctory job requirement (Golm, 2017).

Many situations encountered during in-extremis incidents require technical skills to be performed rapidly and proficiently if successful outcomes are to be achieved (Coleman, 2001; Kolditz, 2007). Police, fire, EMS, and military in-extremis scenarios can involve the necessity of simultaneous technical procedures being accomplished for the success of the mission which involves responders and may also involve victims. Leadership at this moment must be able to demonstrate their technical proficiency when the situation dictates which instills greater creditability in the eyes of the people they lead under those circumstances (Fairholm, 1994). In addition, when leaders show a willingness to perform the same work as their employees, it can encourage team member initiative and creativity to solve issues or potential problems since these are now seen as joint obstacles to be overcome (Lauby, 2016).

A direct application of hands-on leadership in in-extremis circumstances promulgates from the U.S. military in the form of 'Warrior Ethos'. Both the U.S. Army and Marines have a strong organizational statement which reflects the absolute necessity of their officers demonstrating fighting elan with the same professionalism and willingness to sacrifice as their men and women; to develop 'esprit de corps' which goes hand-in-hand with combat success.

The U.S. Marines have a very well-known saying 'Every Marine, a Rifleman' (Mundy, 1993). This has more than one meaning but it describes a sense that regardless of rank or organizational assignment, if the situation dictates, that each Marine will shoulder their rifle and perform the basic tasks they all were taught at the beginning of their careers; to get into the foxhole and demonstrate skill and proficiency like all other Marines (Mundy, 1993). The fundamental trust and camaraderie which drives the mission success of the U.S. Marines depends heavily upon the belief in the commitment and skill of every other Marine.

The U.S. Infantry motto states a simple message, 'Follow Me'. This too reflects a similar ethos when compared to the Marines. The 'stock-in-trade' that every U.S. Army soldier is trained in and must retain robust proficiency at is basic infantry skills and tactics (Department of the Army [DA], 2008). Not only does it mean that the Infantry branch is the core and fundamental mission of the U.S. Army but it also means in the context of hands-on leadership, that Army officers are expected to demonstrate a lead-from-the-front leadership style, even in the face of grave danger. That they must be able to perform the technical tasks required at the moment where little else matters. The hands-on leadership implications to both of these ethos statements easily transfer to other in-extremis organizations. If members of high reliability organizations (HROs) are to perform at a highest level of competence and commitment during in-extremis scenarios when their well-being is at stake, then their leaders must be willing to work alongside as needed and expose themselves to the same conditions and hazards that their commands face (Kolditz, 2007).

My attempt to find hands-on leadership style led to looking at a few of the existing theories in the literature that I felt might be compatible reference points to start with. As I have traveled this research path, I have found that there are valuable and similar talking points with what I'm labeling as hands-on leadership but direct comparisons fell short of describing this leadership dynamic. Participatory leadership was the first direction I headed assuming that the titling was a winner but this leadership style involves a joint decision-making process between multiple corporate levels of employees (Somech, 2003). This can include more affective commitment to organizational change and to greater motivation in ongoing operations as employees feel empowered and involved in the direction their efforts will manifest towards (Koopman & Wierdsma, 1998) but no mention of having to perform the duties of one's

subordinates. I found nearly identical results as I investigated Servant Leadership (Spears, 1995), Authentic Leadership (George, 2003), Empowering Leadership (Pearce, et al., 2003), Transformational Leadership (Bass, 1990; Eisler & Carter, 2010; Masood et al., 2006), and Situational Leadership (Hersey & Blanchard, 1969). This is not to say that there are not significant to subtle differences between these schools of thought and contributing aspects but that I wasn't able to find specific writings on what is the effect upon the leader-follower relationship when actual duties may have to be shared jointly rather than the emphasis being placed upon the character of the leader-follower relationship.

We can all imagine when a production manager at a manufacturing plant must fill in on the line for an absent critical employee or the whole line gets shut down, a law firm partner might actually have to research in Westlaw due to an impending deadline prior to trial the next day, or the restaurant general manager might have to help out the kitchen crew due to a sudden dinner rush; these are scenarios that fall within the category of hands-on leadership where the leadership component must act to accomplish duties/tasks/chores normally performed by the staff they manage. I realize that this 'hands-on' leadership style is most likely more of a subset of the larger theories mentioned above but there may be a unique dynamic which occurs when the leader, in the performance of their responsibilities, must act in accordance with the assignments they normally supervise. In the in-extremis circumstances, this might mean a police Captain who's crews are requesting immediate backup might have to become actively involved with a violent situation if next on scene, an Army Brigadier General might have to return enemy fire if ambushed with his men without sufficient firepower to quickly overcome the threat, or a fire Battalion Chief might have to perform CPR on victims brought out from a burning building when EMS is not on scene yet. These situations and the civilian ones listed above, require that

the leader, at that moment, must perform the skills as adequately as the men and women they normally supervise. How does this effect the leader-follower relationship and what does it require of the leader to be effective as a leader under these circumstances? Many managers and supervisors in leadership positions have risen through the ranks and at one time were most likely quite proficient with the skill sets of their previous positions but might not have retained that level of competence as they were promoted and assumed a new job description. But in-extremis incidents may necessitate the on-scene leadership to become directly involved in the physical activities required for success and to perform these as well as any other participant in the incident (Kolditz, 2007).

That said, there is also wisdom in understanding the existing knowledge base which has come before this study and the advantages it could potentially bring to bear on future research within the same field. The prior academic work has laid a comparative foundation from which I was able to anticipate some of the general themes that arose from the data while still pursuing an inductive process model (Baran & Scott, 2010).

I used the Complexity Leadership Theory (CLT) as a lens to view the data because one; it has been applied to extreme context situations (Baran & Scott, 2010; Hannah et al., 2009) and two; it holds a certain surficial appeal to me as if there is an intuitive truth to it. In defense of my statement, qualitative research is somewhat based upon calculated intuitive approaches and this starts that very process within the design stage.

Complexity Leadership Theory focuses upon the interactions of the individual and organizational elements involved in creating the dynamic called leadership (Uhl-Bien, et al., 2007). CLT distinguishes between the leader and leadership. The leader is the individual but leadership is the combination of many interactive complex parts such as organizational culture,

individual personality traits, situational demands, threats/rewards to persons, short/long-term goals, and relational dynamics. Leadership is then defined as a process rather than the overly emphasized approach of looking at the leaders (Uhl-Bien, et al., 2007, p. 300).

This theory states there is a balance to be achieved between administrative organizational leadership and adaptive emergent leadership (Uhl-Bien & Marion, 2009). That an unrealistic artificiality occurs when predetermined responses to known responsibilities are applied in a linear or sequential direction and become counterproductive to the extent they are implemented (Uhl-Bien & Marion, pp 633, 2009). The formal bureaucratic form of management is sometimes in conflict with the informal social and potentially creative dynamic that occurs within most organizations. According to CLT, this force of human organizational nature should not be seen as a negative factor but be encouraged and collaborative efforts to combine both the formal and informal approaches to leadership can produce distinct advantages (Uhl-Bien & Marion, 2009).

Many of the challenges that are faced in in-extremis situations are fluid and unique in their presentation which requires leadership to rapidly evaluate the given incident and develop a course of action within the circumference of a dangerous scenario. CLT states that administrative leadership or management involves applying proven solutions to known problems but adaptive leadership requires critical thinking to devise answers which are a combination of learned successful responses and innovative actions (Uhl-Bien et al., 2007). This provides a good description of in-extremis situations. CLT suggests that, when actors within an organization share information and then are able to respond to that information rather than having specific responses dictated, new and creative options are possible through this emergent self-organization (Plowman et al., 2007, p. 351).

A second existing theory that has been applied to in-extremis circumstances is the

Recognition Primed Decision-Making model (RPDM) developed by Gary Klein (1986). This theory states that under stressful situations where time limitations are a confounding factor, leaders more often than not, use a decision-making paradigm which relies upon recognition of cues which are similar to previously successful experiences (Klein et al., 1986; Klein, 1997; Ross et al., 2004). Skilled decision-makers in the form of experienced fire ground commanders (FGC) were shown to choose a successful course of action over 80% of the time in the field without contemplating alternative options (Klein et al., 1986). Additionally, they found that when the FGCs abandoned their first course of action, they had a much lower success rate. The RPDM model suggests that intuitive decision-making processes resulted in higher performance than did analytical method of choosing a successful course of action (Klein et al., 1986, p. 6).

The RPDM model successfully builds upon experience and expertise and might even be a significant obstacle for less experienced leaders since the pivotal mechanism for this model was the rapidity that an experienced FGC was able to subconsciously find a memory which fit the current circumstances. Junior leaders without this internal data bank may fail this process due to little or no relevant experiences to recall immediately. These leaders might best be served by following a more formal decision-making procedure in which they determine the positive and negative consequences of potential courses of action (Klein, 1997). The RPDM model is compatible with the Complexity Leadership Theory because they both gain in performance when the decision-making process utilizes expertise regardless of positional rank or where it might be found within the organization (Ross, et al., 2004, p. 9). Though the RPDM is “commander driven” since it relies upon quick recognition of cues, its success still rests upon the ability to correctly assess the situation. Thus, quality courses of action are best developed by employing experience and expertise as quickly as possible regardless of rank.

I have illustrated these two existing theoretical models to highlight their close fit with exploring in-extremis leadership through a mixed-methods Delphi approach. By themselves, I do not believe that either adequately addresses the specific research goals and questions of this study but together they add illumination to the efforts I have detailed for conducting this study. Also, since this is primarily an inductive study approach, the data may point more clearly in one or neither of these two directions once the data analysis has been completed.

Summary

The literature review found that in-extremis leadership was lacking when compared to leadership involved in more general management circumstances. Leadership and management have been studied for over a century but comparatively few researchers have explored the area in which competent leadership can mean the immediate difference between positive outcomes and negatively significant consequences to life or limb (Kolditz, 2007). Much of the literature within the field of in-extremis leadership first relied upon closely related areas of studies such as business and organizational management or military research which more commonly dealt with strategic and global leadership schemes rather than the tactical (in-extremis) levels (Campbell et al., 2010; Flin & Slaven, 1995; Hannah, et al., 2009; Hayes & Omodei, 2011; Kolditz, 2007; Sweeney, 2010). This study explored the individual on-scene decision-making traits among the Delphi panel in-extremis leaders to analyze their unique aspects and developed possible cross-case themes which could provide inferences beyond the individuals.

In-extremis leadership is a particular niche within the leadership/management field which deals with situations that involve rapidly changing conditions, decisions those outcomes can have life or limb consequences, significant stressors, time constraints, threats to responding personnel, uncertainty and ambiguity, and information deficits (Klein, 2009; Kolditz, 2007; Uhl-

Bien et al., 2007).

As has been stated repeatedly in Chapter 2, there are gaps in the in-extremis literature. The use of a qualitative/quantitative mixed-methods Delphi study approach is then appropriate due to the exploratory nature of the current research. This approach works well for gathering expert panel in-depth evidence to establish a foundation to further the field of research (Glesne, 2011). A mixed-methods Delphi study allows for a detailed examination of the individual in-extremis leaders and their decision-making processes.

The following chapter will encompass the research design and its rationale. The issues of the role of the researcher, researcher subjectivities, ethics, and study trustworthiness are detailed also. The research procedures including on-line questionnaires, data evaluation and document protocols and the study's piloting efforts are detailed in addition.

CHAPTER 3: METHODOLOGY

Introduction

My area of research interest revolves around a subset of leadership situations which involve potentially dangerous, time-critical, information-limited, and emergency-oriented circumstances. The study will refer to this subset as 'in-extremis' leadership (Dixon et al., 2016; Fisher et al., 2010; Kolditz, 2007). This is to further the concept that these specific moments require guidance through difficult decision-making processes specifically aimed at avoiding the possible dire consequences that can occur while achieving successful resolutions. It is obvious and assumed that emergency incidents involve some degree of threats to people's well-being, both responders and victims, but the emphasis of investigating the qualities of leadership during these moments should be focused towards what thought/decision-making processes create success, rather than the negative consequences potentially endemic to these scenarios. Much has been written about leadership and management in general but little has been researched in the areas of emergency management and incident decision-making processes during the moments when success hangs in the balance and is so absolutely necessary (Baran & Scott, 2010; Hayes & Omodei, 2011).

The military, the public safety services (police, fire, and EMS), and various industrial settings such as the petrol-chemical industries perform many ordinary and mundane managerial functions on a daily basis. The majority of any leader's decisions are more common in nature and do not require an immediate thought process which has lives and limbs weighing in the balance (Olsen et al. 2006; Ward, 2006). Often, these decisions are made with the time needed for deliberation and the information necessary to determine viable options and weigh their relative strengths. These decisions can then be made with a greater degree of confidence in the

expected outcome (Coleman, 2001; Ward, 2006). The area of in-extremis decision-making is governed by a different set of circumstances; the fire chief who gives orders in the fire station concerning training or daily chores must assume a different decision-making process which maybe is unique to in-extremis circumstances once on the emergency scene (Hersey et al. 2008). Situational awareness becomes mandatory and the quality of the leaders' assumptions and expectations becomes paramount to the success of the operations (Perez, 2011).

The purpose of this study is to investigate leadership dynamics found within the framework of in-extremis scenarios found in career fire departments' emergency scenes. As stated earlier in the proposal, in-extremis situations are characterized by a significant threat to life and/or limb to those involved. Not only is there a possible threat, but those involved must know and understand that there is a threat to their persons, therefore there is an expectation and demand of greater skill in their leaders to get them safely and successfully through the incident (Kolditz, 2007). The study will attempt to develop a better understanding of whether there are commonalities found in successful leaders who must work in an environment of personal danger to those involved. Much of the literature on the subject indicates there is a substantial shortage in studies to be found that have specifically looked into the leadership traits and decision-making dynamics required during in-extremis situations versus management and supervisory mechanisms in general (Baran & Scott, 2010; Campbell et al., 2010; Dixon et al., 2016; Fisher et al., 2010).

This chapter describes the mixed-methods study research design utilizing the Delphi method and the reasoning behind its appropriateness and discusses the role of the researcher within this study. Also, I detail the selection process for choosing the participant organizations and their exemplar in-extremis leaders. The chapter describes the data collection and analysis

procedures and postulates possible ethical concerns and researcher subjectivities which could affect the study. Finally, the chapter outlines the attempts to maintain trustworthiness through rigorously following the study's protocols and discusses possible expectations for the study's outcomes.

Rationale for a Mixed-Methods Research Design

Much of the literature on in-extremis leadership suggests that there are significant gaps that need to be addressed (Baran & Scott, 2010; Dixon et al., 2016; Elmqvist et al., 2010; Fisher et al., 2010; Flin & Slaven, 1995; Holenweger et al., 2017; Plowman et al., 2007). These statements indicate that the continuing research efforts are possibly still in more of an embryonic phase and an emphasis should be placed upon exploratory endeavors rather than explanatory approaches (Creswell, 2007). To achieve a more comprehensive understanding of in-extremis leadership, its fundamental characteristics need to be further investigated so that eventually confirmatory studies (i.e., quantitative studies designed to test specific hypotheses) might be attempted based upon these initial academic efforts (Kuisma et al., 2005). A holistic perspective combined with greater context sensitivity is desired at this stage of the research (de Vaus, 2001; Patton, 2002). Bringing a more comprehensive and exploratory view to the analysis is most beneficial during these initial research endeavors (Creswell, 2009). It is one of the research goals of this mixed-methods Delphi study into in-extremis leadership that successful in-extremis leaders are introduced by identifying their basic demographic characteristics and determining what commonalities and differences exist amongst these leaders.

Mixed-methods studies are an emergent and progressive design whereby new paths to the research goals are discovered throughout the entire process (Greene et al., 1989; Teddlie & Tashakkori, 2009). As additional data are collected, the iterative nature of qualitative Delphi

research combined with the greater specificity of quantitative methods, allows for the continual adjustment of the design process (Creswell, 2007). This triangulation of data adds concepts which become more applicable and may not have been realized to be relevant at the start of the research. Reconfiguring the theoretical framework as the study progresses and possibly adapting the data collection process to accommodate unforeseen ramifications of the growing body of data are benefits of triangulation (Creswell, 2009).

Mixed-Methods Delphi Study Methodological Approach

The study will utilize a mixed-methods Delphi approach because it appropriately accommodates the research goals and the circumstances of initial data gathering. The aim of this exploratory study into identified successful exemplars in-extremis leaders is threefold; to look at the demographic information for consistencies and differences on who were identified as exemplars, to examine on-scene decision-making processes and whether they rely upon their own experience, knowledge, wisdom; their own intuition; and to assess the participants' scores on the Rational – Experiential Inventory (REI-40) quantitative instrument (see Appendix D). As stated earlier in the proposal, there is a deficit in the literature referencing in-extremis leadership characteristics, so the direction of this study is to lay exploratory groundwork for understanding and identifying the phenomenon of rapid and critical decision-making by skilled subject matter experts (SMEs). Since a mixed-method study approach is well-fitted for in-depth multi-source examination of the subject matter; it stands as an appropriate methodology for undertaking this research project. In addition, since this research is in its relative infancy, I will use a theory-building approach rather than a theory-testing approach (de Vaus, 2001; Glesne, 2011). Without any well-established theories to create hypotheses, the research must be grounded in the data it finds and possibly amalgamated with indirectly-related theoretical perspectives. The theory-

building approach starts with research questions and maybe a basic proposition of expectations and develops theory and specific sets of propositions “as a result of examining actual cases” (de Vaus, 2001, p. 223). The study will first examine each individual set of responses to the initial Delphi questions in detail and develop internal themes, then perform a cross-case analysis looking for convergent themes as they might apply beyond the individual case (Creswell, 2007).

The use of the Delphi Method in this dissertation is appropriate due to the lack of published research into the field of in-extremis leadership (Dixon et al., 2016; Kolditz, 2007). When the circumstances of the area of research are limited in the ability to gather and analyze data in a more traditional research process, the Delphi method can provide the manner by which highly reliable research information can be collected through the use of consensus-building and multi-staged questionnaires with feedback between consecutive rounds (Franklin & Hart, 2007). The strength of the Delphi method relies upon an iterative process which synchronizes the opinions of a panel of defined experts to attempt to reach a collective truth or agreement in the field of study (Pill, 1971). The Delphi method is an effective research technique to capture information in subject areas that do not have a solid historical or comprehensive base of well-defined research data collected over time (Skulmoski, Hartman, & Krahn, 2007). The use of SMEs to gather data from and then coalesce a collective summation of existing conditions at times is more succinct than what can be gleaned from the existent literature (Franklin & Hart, 2007). Thus, the application of the Delphi method to gain exploratory research information from the collective judgement of experts in the field of study is appropriate. de Vaus (2001, p. 220) stated that the case in qualitative research is the object of the study; the unit of analysis from which we gather data and hope to bring about a better understanding of the whole. The case can be an individual person but may also be larger such as an event, an organization, or a specific

subset of a more encompassing entity (Creswell, 2009). This study developed multiple individual cases utilizing the Delphi method through the course of this research because a “single case design is normally less compelling” (de Vaus, 2001, p. 226) and does not lend itself to theory testing or development.

I have chosen to research the subset of in-extremis leadership taken from the greater whole of management and leadership in general but this subset is further divided for this research into only investigating subjects who now or recently demonstrated superior skill at performing leadership tasks during in-extremis scenarios in the fire service/EMS situations. Creswell (2007) points out that qualitative case studies, such as a Delphi approach, should involve a bounded system which applies the limitations intended by the researcher. Creswell (2007) refers to bounded systems as the limitations which the researcher applies to their case studies as per persons, objects, time etc. as the parameters of the subject matter of study. These limitations, such as people or organizations to be involved or timelines for the study, guide the research through the process. In the case of this study, the delimitations I have applied are that I only researched in-extremis leaders who were identified by their commanding officers as meeting the traits detailed in the study’s peer-checked exemplar leadership characteristics and experience lists combined with the professional judgment of the Selecting Officers who are Fire Chief Officers overseeing the operational branches of their fire departments. Exemplar status was bestowed based upon the developed Character Trait and Experience/Positional lists as well as demonstrating exemplary skills during in-extremis emergency scenes for their fire departments.

This mixed-methods study will rely upon parallel and melded data gathered from both a quantitative and qualitative methodology. This research design is both parallel in that the first round of the Delphi interviews and the REI-40 online survey were conducted simultaneously but

the REI-40 results were then utilized into the second and third Delphi rounds, thus creating a sequential design also. A convergent parallel, or concurrent parallel or simultaneous design have their quantitative and qualitative research strands occurring at the same time and they investigate the same construct (Teddlie & Tashakkori, 2009). The effort with a convergent parallel study is to collect the quantitative and qualitative data simultaneously and then combining and comparing the results; to merge them to find if they complement each other (Edmonds, & Kennedy, 2017). My parallel and melded data is similar to convergent but I specifically use the term ‘melded’ to illustrate the difference between ‘dual-methods’ and mixed-methods’ of research. This research was not to have the two different types of data stand alone and be compared but to have them meld into each other as a true mixed-methods design.

Though the on-line surveys took place during different dates, there was less than a six-month span between the first and the last initial set of in-extremis leader initial responses. The follow up on-line conversations with the participants took place after the coding and thematic development has been completed and that added another few months after the completion of the initial cycle of responses; the difference of the few intervening months still fell under the heading of a parallel design (de Vaus, 2001).

The quantitative portion of this study involves the REI-40 survey which investigates the respondents self-reported tendency to focus upon rational/analytical and/or experiential/intuitive thinking. This 40-question Likert scale survey measures the respondents’ ability to utilize and their comfort level of using either or both a slower, logical contemplation or more rapid, intuitive information processing scheme.

The Delphi participants were given the REI-40. This was for two purposes; one, to add to the depth of description of the expert panel to gain a more comprehensive insight into defining

who these persons are and possibly develop more probing Delphi questions in the successive rounds and two, to perform a comparison to a random group of fire service officers who have not been identified as exemplars.

The REI-40 administration had three parts. The first was to administer the REI-40 to the Delphi panel participants. The second, since the number of Delphi participants is too small a sample size to draw ideal quantitative comparisons from, I asked fire departments to identify exemplars that only partook in the demographic survey (see Appendix E) and REI-40 instrument and not the Delphi panel process. These scores then were added to the Delphi participants' scores and were enough to quantitatively compare with the scores of the general population of fire officers' scores. The third was to have fire departments ask all their fire officers to logon to a provided link and take the survey. Since there will be no pre-determination of any of the identifying parameters as to whether these participating officers have achieved 'exemplar' status, it was considered a random, general population of fire service officers to which I compared the exemplar scores to.

It is necessary to address the issue of mixed-methods vs. multi-methods (dual-methods) research designs so to illuminate the proper labeling of this research. A multi-methods design utilizes different sources of data of which they can all be either quantitative or qualitative or a mix of both but are gathered and analyzed as separate entities of data (Bloor et al., 2015). Whereas, mixed-methods designs normally combine quantitative and qualitative data to meld into each other so that the analysis is enriched by the two different methods of gathering data and is greater than the sum of the two separately (Johnson et al., 2007).

This study pursued a mixed-methods approach. The Delphi panel members will be asked to take the REI-40 survey after their first round of questions. These results will be tabulated and

then utilized to create additional questions for the second and any further subsequent Delphi rounds so to meld the quantitative and qualitative data into a true mixed-methods approach rather than a multi-methods design.

The quantitative analysis derived from getting sufficient responses to the REI-40 from exemplars and general fire officer populations. Additional exemplar candidates were identified that were not part of the Delphi panel but were asked to take the REI-40 so that at least 30 participants responded. Then, fire officers not identified as exemplars by their respective departments (general fire officer population) were asked to take the REI-40 survey and were utilized for quantitative comparison. This quantitative analysis was further used in the Delphi process to elicit feedback from the panel. Thus, the quantitative data fed into the Delphi process (qualitative) to further explore the in-extremis decision-making process as per intuitive vs analytical processing.

Delphi Participants

The Delphi method portion of the study investigated fourteen in-extremis leaders who have been identified as being superiorly competent at being able to lead their personnel in situations where personal danger was a reality for those involved. The number of participants was based upon the concept of data saturation in which thematic analysis becomes more readily apparent (Maxwell, 2005). When too many cases are chosen, the depth of investigation lessens in any single case and the data can become too diluted without gaining the desired feature of generalizability as quantitative studies strive to attain (Creswell, 2007, p. 76). I want to evaluate the outstanding exemplars within this particular field of leadership and not those who would be rated as average (or less than) by their superiors/peers/subordinates. The Delphi method has its greatest significance when the panel is populated by members considered to be experts. This

required the selection process be well-defined with specific written details for the selecting administrative personnel to refer to when determining which fire service officers to ask to participate in the study. All selections to the Delphi panel were made at an 'arm's length' process whereby the researcher explained in detail to the Selecting Officers the goals of the Delphi panel and the selection criteria but applied no input to the actual decisions of who was asked to join. Since the researcher has had professional interactions with some of the fire departments represented on the Delphi panel, it was important to follow the selection and interview process carefully to eliminate or reduce possible threats to validity from garnering data from these panel members (Maxwell, 2005).

I enlisted career fire departments those jurisdictions cover municipal/urban areas and have a greater frequency of in-extremis incidents, such as structure fires, mass casualty incidents (MCI), weapons incidents, highway traffic accidents, and technical rescues. Qualifying agencies were asked to agree to participate in the research and then to ask their appropriate personnel if they would voluntarily agree to be involved in the study. I was not interested in utilizing participants who were ordered or 'strongly encouraged' to participate which is not beyond the realm of possibility when specifically investigating 'chain of command' type organizations. The study selection instructions emphasized this point and each participant had the right to remove themselves at any time without notice or explanation to their department.

The peer-checked list of target traits was given to all participating agencies which allowed them to more clearly determine which individuals to ask to participate since the study's assumption is that the research is only looking at exemplars in the field. The study's data is applicable only if this process is well-prepared and executed properly. The study was based upon evaluating experienced and competent leaders, who represent a higher degree of operational

excellence. The criteria list was specific enough to reduce wide-ranging interpretative variance by the different agencies' administrative personnel. The list of traits included: (a) persons of command rank, (b) 15+ years of experience in an in-extremis organization, (c) 5+ years of in-extremis command experience, (d) currently or recently (within 5-years) assigned to these command responsibilities, (e) and a greater density of experience (they performed these duties more frequently) (see Appendix C).

For this research utilizing the Delphi method to be true to the intended purpose of bringing together experts in the field, the selection process of the panel must be specific enough that the respective selecting administrative personnel will know which candidates to hone in on. This step of the research must be well understood by each participating selection officer. A detailed description of what exemplar character traits have been determined by the prior chief officer survey as well as an explanation of the purpose of the research accompanied the request for names. The accuracy of this research was dependent upon populating the panel with the correct candidates.

Also, if the first selected people are not interested in volunteering, the second tier of selections would have to also meet the same rigorous specifications. As stated before, this research using the Delphi method is not intending to evaluate 'normal or average' officers but those who have proven themselves as superior in real-world in-extremis situations when compared to their contemporaries as evaluated by their administrative command officers using the study's literature-reviewed and peer-checked characteristic and experience lists and relying upon the professional opinion of the Selecting Officers. The two lists are somewhat straightforward and specific but the professional opinion falls into a 'grayer' area. But I fall back on the essence of his written opinion which Supreme Court Justice Potter Stewart made in 1964,

that “I can’t define it, but I know it when I see it’ (Worthley & Grumet, 1983). The professional and experienced judgments of subject matter experts cannot be discounted because they cannot be quantified.

I anticipated some of the contacted agencies might express a reluctance to participate since this is beyond the pale of their normal operations. The study most likely would come as an unusual request by comparison to the regular interagency relations the departments have on a regular basis. Many governmental departments have continually striven to become more efficient now that fiscal resources are scarcer and the public expects leaner more cost-effective delivery of services (Osborne & Gaebler, 1992). In the organizations I work with, this “Do more with less” operational mantra has created an environment where such outside requests for time and effort can be seen as an inconvenience too great to accommodate rather than an opportunity to further research. I had to ‘sell’ this research program to these in-extremis organizations as an opportunity to generally benefit all involved and perhaps as a current fire department Battalion Chief and a practitioner within the field of in-extremis command, I experienced a little more success than failure in my recruitment efforts. As an additional note since this paragraph was first written, the COVID-19 pandemic affected daily life and how academic research was able to be conducted and became a significant factor in how some of this study’s research proceeded such as relying upon online Zoom interviews rather than face-to-face encounters which were the method first imagined.

REI-40 Participants

The REI-40 survey will be administered to evaluate the respondents use of rational and experiential information processing specifically during in-extremis circumstances (Pacini & Epstein, 1999). It will be given online to all participants. The Delphi subjects will be given the

survey during their first round of Delphi questions along with the demographic information survey. Then to increase the exemplar sample size for more accurate quantitative comparison purposes, additional fire officers that have been identified as exemplars by their career departments will be given the REI-40 also. There was a study explanation and protocols as an introduction to the REI-40 for all those not involved in the more in-depth Delphi method. Completion and submission of the survey was stated and considered to be permission to use their results. Then for comparison, I had some career fire departments, that agreed to participate, send an online link to the survey to all their officers to complete regardless of promoted rank or experience level. This group of respondents that have not been triaged as per their candidacy for qualification into the exemplar grouping were considered the 'general fire officer population' for quantitative comparison purposes to the identified exemplar fire officers.

Role of the Researcher

The researcher in a mixed-method study is an integral part of the process. The researcher actively participates throughout the study from design to data collection to data analysis to writing the results. But unlike a strictly quantitative methodology which is similar in these categories of researcher participation, mixed-methods studies utilize the researcher in an interpretive manner. Researcher bias is the pejorative phrase in quantitative studies which refers to the negative empirical condition whereby the researcher influences the process (Mertler & Vannatta, 2010). The qualitative portion of the study differs from quantitative methodology and utilizes the researcher's subjectivities (vs. the term bias) as part of the process whereby the researcher attempts to understand their thoughts, emotions, and experience with the subject matter and accept that their predilections are not able to be removed completely from the research process (Creswell, 2007).

Qualitative methodology relies heavily upon the Constructivist paradigm, at times referred to as Interpretivism (Glesne, 2011; Teddlie & Tashakkori, 2009). One of the basic tenets of Constructivism is that there are multiple realities which exist and these are based upon individual cognitive/mental constructions that each of us create through our interactions with other people and the world in general. In this manner, the researcher and the study participants are interconnected and their specific interactions create the reality which transforms the data for the study. This tradition is inductive and produces an iterative and emergent design which relies upon continual feedback throughout the research process (Creswell, 2007, p. 341).

This researcher's default beliefs are somewhere between Constructivism and Post-Positivism which uses the scientific/empirical methodology to measure and assess our social world and its constructs but believes that reality does not exist in only one version and cannot be known without uncertainty (Glesne, 2011, p. 6). Therefore, my role as a researcher is to strive to uncover a consistent truth in the belief that such may exist while understanding I may never find this truth and that my existence within the study parameters itself changes that very truth I am attempting to discover and define.

The role of the researcher conducting a Delphi method study is first, (and obviously) to stay true to the specific design of the methodology. The Delphi method attempts to establish a consensus derived from a panel of qualified experts within the field of study without having to bring the participants together, while providing confidentiality to all participants, and avoiding the negative factors of group think or alpha-member persuasion (Fish & Busby, 1996). Since the researcher plays a significant factor in 'seeing' the consensus develop, it is crucial that the evolution of the consensus be through the efforts of the participants and not too closely molded by the researcher as they think they interpret the findings (Powell, 2003). This is very important;

as the researcher engages the study, they must always remember that as the iterative Delphi process moves forward, it is facilitated by the researcher but not determined by them. The researcher should always remember and focus on the methodology's benefit; that the Delphi method is a flexible and iterative process which is ideally meant for the discovery of problems or phenomenon that knowledge is in its infancy or incomplete and direct the research towards a better understanding of those issues (Skulmoski, et. al., 2007).

Ethical Issues

As a researcher utilizing a mixed-methods Delphi approach, I have a significant ethical responsibility to the participants, the research process, and the academic endeavor itself. I used a Delphi study approach which required the researcher to become actively integral to building the research environment and determining the interpretive results (Creswell, 2009). This process entailed that I become involved in interpreting, coding, developing themes, and categorizing their responses to the open-ended pre-structured questions and then through the repetitive iterative process, reinterpret, analyze, and possibly recategorize the information they provide as the Delphi method moves forward.

The Delphi study researcher who investigates individuals as the unit of analysis is required to be vigilantly on guard against taking actions that could harm or demean or fail to act to preserve the integrity of the participants and the academic nature of the process (Landeta, 2006). I was introspective of my intentions and actions throughout the research process due to the fact that as the researcher, I was an active participant within the scope of the study by reshaping the individual responses into a collective summation during the consecutive stages of the Delphi method. Since a qualitative Delphi study utilizes the researcher to formulate and present the interview questions, evaluate, categorize, and code the responses, and ultimately

assess and reevaluate these data sets, I was entrained in the study as much as the participants. It was ethically necessary for me to strive to be non-judgmental, unbiased in my analysis, and treat the participants as I would hope and expect others to treat me in a similar circumstance. An ethic of care, justice, and critique (Starratt, 1991) for the participants should always be the focus of my actions throughout the entire process including what happens with the data and results long after the research is finished.

The initial effort to ensure ethical treatment involved complete disclosure of the study's purpose, protocols, expectations, and results. No participant could sign off on an "*informed consent*" form without understanding the study's process and intention and being given all pertinent information. This information must also be in an easily understandable format that does not rely upon jargon or statements meant to be vague or confusing. This must be a straightforward approach to guarantee each of the possible participants fully understands what they are agreeing to take part in. A packet was provided to each participant which included a copy of the signed informed consent form plus a written description of the study's parameters and a withdraw form in case they voluntarily decide to stop their participation in the study. Additionally, open communication between researcher and participant helped to stem the possibility of ethical concerns becoming an issue before they can be addressed. The packet also included my contact information so that these and any other issue related to the study would be handled quickly and succinctly.

Before the data collection process begins, the Bowling Green State University (BGSU) Human Subject Review Board (HSRB) reviewed the study's parameters and determined what, if anything required modification from what is described in the initial application. Each of the participating organizations, either through its own or through any larger entity it may be

associated with (e.g., city or county governments or legally established fire districts), may have an Institutional Review Board (IRB) or similar process which the study must also receive acceptance before moving forward. I found that three fire departments stated they needed to get 'clearance' from their Law Department/Bureau before agreeing to participation in the research. Two of those three fire departments ultimately agreed to participate.

This study must also provide confidentiality for the individual participants to the extent that it reasonably can and should. Each of the participants will be given a number and only be identified by that number to assist in adding to the strength of the confidentiality efforts. A consideration once considered was to not use all participants in the study so to give plausible deniability to all participants similar to the older tradition of one person in the firing squad being issued a blank cartridge instead of real ammunition. I chose against this procedure and instead used all participants either as the pilot group or the fourteen Delphi panel members.

The participating organizations were only named in the Acknowledgment section of the dissertation and not named in the narrative sections. The only identification of individual fire departments within the narratives were concealed by referring to their particular characteristics such as size of city, approximate size of the organization, and/or geographical region of the country. One master list was kept with the cross-reference information, and this was kept electronically on a password protected computer within a password protected folder. The electronic and written responses will be kept until the dissertation process is completed and then destroyed.

A final note that ensured ethical treatment of the study process and its participants is found in the nature of the Delphi study method. This process helps to guarantee the participants' voices are accurately heard throughout the research and into the analysis and results stages. It

possibly can be viewed as a mere obligation to satisfy a procedural requirement but ethical research techniques necessitate that the study earnestly try to capture their meaning and intent as well as their words (Birt et al., 2016). The consecutive iteration process of the Delphi method is similar to the member-checking technique so that it provides additional opportunities for the participants to clarify their particular story and its nuances (Landeta, 2006). Participants were able to stand pat or modify their previous responses thus ensuring further clarity of their individual thoughts.

On-Line Delphi Interview Procedures

The mainstay for this study was the on-line Delphi interviews and the data derived from them. The follow-up rounds of online interviews with the identified exemplars were necessary to the Delphi process and were advantageous to clarify or elaborate issues brought forth from the first interviews that later required refining or separate emergent issues developed throughout the course of the research (Skulmoski et al., 2007).

Many of the specifics of the interview process are discussed in some of the other sections of Chapter 3 but I will globally cover them here again. I developed a set of specific qualifying parameters that the research study had the participating organizations utilize when choosing their exemplar in-extremis leaders for possible participation in this research. Since this study was specifically investigating positive exemplars of successful in-extremis leadership, the adherence to the study's selection template was mandatory for maintaining the authenticity and validity of the study's purpose and goals and reliability for any future studies.

The on-line Delphi questions for the exemplar participants were composed of open-ended questions which meant to allow the participants some flexibility in developing the manner and the direction of the conversation about the leadership issues. Some of the questions were more

general in focus but some described typical in-extremis situations found in the fire service to elicit responses delving into the decision-making processes during emergency incidents. The nature of the general questions was to pose more global and comprehensive directions for discussion rather than preselect the specific topics, whereas the scenario-based questions were meant to hone into more particular course of action development schemes. The research was designed to head towards understanding the dynamics of leading in dangerous situations and therefore must have formulated general interrogatives to take the conversation there but these should always be flexible enough to allow the individual subjects to create the picture that most represents their interpretation of their intentions, thoughts, and actions during these scenarios.

The fire departments were contacted through either their published general business phone numbers or through email contact information listed in their official websites. It was necessary to identify the particular administrative officer who is most appropriate for being able to grant permission for their department to participate in the study (which normally was the Fire Chief or equivalent rank) and to also identify the administrative command officer who either picked their department's exemplars or assigned a person-of-contact to fulfill that role. The officer making the participant selection was either the Field Operations Chief (usually an Assistant or Deputy Chief rank) or a ranking officer within the Field Operations Bureau due to their familiarity with the performance of the members they are recommending.

The study's research was conducted mostly on-line. The study's design was to conduct the actual Delphi interviews online either through the participants' fire department or their personal email and online access depending upon their preference, availability, or organizational policy. The administrative officers were contacted through official fire department channels and the following communications with these officers were conducted through the same channels.

The study's initial method of contacting the selected officers was through fire department channels (phone, email, mail, etc.) which may have led to a greater probability of research participation. Some of the fire departments superseded this request and placed parameters such as excluding department email addresses for this study. As that became two of the cases or the individual officers instead chose to utilize their personal email accounts and internet access, then the research was collected in a manner convenient for the panel members.

Once a fire department officially agreed to participate, this was documented through emails stating such. Then the next step was based upon how the individual fire department wanted to participate. Some decided that specifically choosing exemplar officers was not how they would proceed so they sent the REI-40 link for the General Fire Officer survey out to all their promoted fire officers. Some fire departments decided that they would draw a distinction between Exemplar and General Fire Officers and sent the respective REI-40 links to the separate groups. Other fire departments selected out their exemplar fire officers and just sent that REI-40 link to those individual fire officers.

The on-line Delphi research questioned their level of intuitive decision-making; to what degree and under what conditions these in-extremis leaders do or do not deviate from written organizational protocols when making their on-scene decisions during in-extremis situations. In some chain-of-command structured organizations such as the military, fire and police departments, EMS organizations, openly discussing voluntary breaches in designated and maybe required procedures may have disciplinary consequences or career implications and thus either the interview becomes necessarily cloistered or uselessly guarded. Therefore, it is understandable that some participants wanted to have their responses sent from their personal email accounts and internet access providers rather than from their fire department provided email accounts. These

means of communication might be retrievable based upon their governmental jurisdiction's policies and applicable open public records laws.

Document Protocols

The issue of utilizing documents within the scope of this study had not been formalized at the time of writing the research proposal. There are a few types of documents which could enhance the data for this research but there are some concerns that I anticipated might be 'deal breakers' in their inclusion. The particular agencies which agreed to participate in the study most likely have stringent policies about releasing their documentation and thus the issue will not be determined until specific organizations had been solicited for this study.

Some of the documents which might have a particular bearing upon this research into exemplar in-extremis leadership deal with individual performance reviews. In a comprehensive analysis of successful in-extremis leaders, a helpful tool would be the manner in which they are evaluated by their own superior officers over the course of their careers. These would include annual performance evaluations, promotional assessments, and also include disciplinary actions taken. These documents would include the in-extremis leaders as the recipients and maybe as the administrator of these actions also. These documents might be insightful for this study but are most likely considered non-accessible to personnel outside the organization. Therefore, their addition to the study will only be determined after conversations with the particular agencies.

In addition to the above-mentioned documents, in-extremis leaders produce documents such as run reports for the emergency or military incidents that they operationally conduct. In the cases of public emergency services, the incident reports are public documents governed by individual state 'open public record laws' ('Sunshine laws') but certain aspects of personal and medical information must be redacted prior to public release. These documents might be useful

in terms of management, organizational and task analysis of the in-extremis leaders. At a minimum these documents will provide additional data to enrich the perspective analysis of these leaders. In addition to these documents, most U.S. fire departments have written procedure manuals on how to conduct response operations. Some are very specific and others offer generalizations on what is expected of the responding crews and the Incident Commander (Coleman, 2001). It is beyond the ability of this research study to conduct an analysis of each participating fire department's response protocols but they can be utilized as a resource for particular issues which might arise throughout the course of the Delphi process and might be a foundation for future research.

As the research proceeded, it became evident to the researcher that the inclusion of any significant quantity of written documents was beyond the scope and capacity of this particular study. The Delphi panel members referenced their own fire department's protocols during their interviews at times but I chose not to request physical copies of these documents. As stated above, their addition to future research might add further data which could prove relevant.

Data Collection and Analysis Procedures

The research for this study was conducted through on-line demographic questions, three rounds of Delphi interviews, and the REI-40 quantitative instrument with the chosen participants, and as warranted for member-checking, a follow up round to the Delphi summations.

This study utilized both a concurrent and sequential mixed-method approach. Johnson and Turner (2003) state that for mixed-methods to function most appropriately, the two methods must be used in a manner to create "data triangulation". Rather than have the two methods stand apart as if they are two different studies but published together, the potentially opposing research approaches should meld and create a synergistic outcome (Creswell, 2009). This study charted

the initial responses from the demographic information, the Delphi questions, and the REI-40 assessments and determined themes that derived from them to establish follow-up Delphi questions. Thus, both the quantitative and qualitative responses were combined to potentially provide a research direction that neither could develop alone (Johnson & Turner, 2003). This provided an enriched data set when compared to the participant interviews or REI-40 assessments separately.

The Delphi interview data was the primary source of data for this study in that the study was most interested in the self-reported decision-making rubrics the officers place on themselves during in-extremis situations. But the demographic and REI-40 data are descriptive and become resources of information to further enhance the Delphi process. The online Delphi interviews were semi-structured in format with broad based general leadership questions that hopefully led to coalesced responses (multiple Delphi rounds were required to reach this stage) to better delve into how the individual exemplar made critical decisions under circumstances of duress. The follow-up sets of Delphi questions were modified over the course of the research as is essential with the iterative nature of qualitative research as particular issues develop or become moot as the data is collected (Creswell, 2009; Patton, 2001). The number of in-extremis leader participants were hoped to number at least eight and expanded to fourteen so to achieve response saturation and themes were easily apparent without losing the depth of interpretive analysis per individual case (Creswell, 2007).

The Delphi questions were pilot tested on in-extremis leaders who met similar characteristics to determine their ability to understand and interpret the direction of the intent of the questioning. Feedback was elicited from these pre-study participants to see if they have any suggestions on the lines of questioning or specific questions to derive more comprehensive

answers. The study utilized local fire department officers for this preliminary validation phase for convenience purposes and they were not utilized beyond this stage in the study.

The data from the initial and follow-up Delphi interviews was digitally documented and reread to evaluate the individual in-extremis leader's responses and then to discover overarching themes, both explicit and implicit. This was accomplished by deconstructing and then reconstructing the data (Creswell, 2009). The first task was to code the individual Delphi interview responses to identify the specifics which were conveyed by the participant. It is important to the research process to correctly interpret responses prior to adding them to the general summations. The mixed-methods Delphi study approach must do justice to the singular case before attempting to move forward with the multi-case analysis of common elements and themes amongst the participants (de Vaus, 2001). Next was to look for general abstract concepts of in-extremis leadership that may be common to more than one of the respondents. Following this, I broke down these themes into their more basic elements looking for consistency and then finally placed them back into conglomerates to see if the first themes were maintained throughout (Maxwell, 2005).

Further analysis was performed through a process similar to a group member-checking. The second round of Delphi interviews started with member-checking their first responses to ensure accuracy up to that point, then each individual participant reviewed the consensus answers so far developed and confirmed how they felt their answers. This comparison of responses differs from the typical case study method (Teddlie & Tashakkori, 2009). The Delphi method had each participant receive the summarized responses in the hope that the panel members' second set of responses merge towards a central answer, or answers, to each of the questions; to develop a 'collaborative expert' answer to the issue. The Delphi process may steer

the 'expert panel' towards relatively common responses through the iterative process but it may also at times lead to more than one distinct direction so that a singular answer doesn't solidify but creates acceptable options (de Vaus, 2001).

Narrative Structure

The results of the study are presented in Chapter 4 describing the sequential outcomes of the Delphi process and how the collective responses were categorized, coded, sent back to the participants through three rounds, and how the summarized interpretations were derived. The primary goal of a Delphi study was to utilize an expert panel sequestered from each other so their responses are in isolation and without knowledge of the other respondents prior to developing overarching themes between the experts (de Vaus, 2001). The narrative was written using a generalized template which allowed the reader to follow the progress of the study's findings in a standardized approach. But there are also differences between expert responses even after the follow-up opportunities for the participants to gravitate towards a collective answer and these outlier or possibly additional collective responses are unique and equally important to the Delphi process.

An essential stage in a mixed-methods Delphi study is developing themes from the expert panel responses which has been discussed earlier in the proposal. The results chapter has the themes displayed in matrices. This manner of exhibiting these results allows the reader to compare and contrast the expert responses and summarize the findings easier (Creswell, 2007) and is the origin for drawing inferences. Though qualitative research of this sort does not uncover "truths or realities" such as Positivistic quantitative research strives/claims to achieve (Creswell, 2007; Maxwell, 2005) greater credibility and authenticity are created by rigorously conducting the research and then writing narratives which are rich with in-depth information.

This allows the reader to evaluate the research and determine whether the inferences are applicable and link to their own experiences within the field of study.

Preliminary Pilot Findings

There is a benefit to testing a study's design before engaging in the actual data collection. Rather than expending time and resources through research procedures that will surely benefit from adaption from their initial form and since the exact delivery of the Delphi questions should be well devised, I piloted the process on local in-extremis organizations to determine at least gross changes that need to be considered and/or implemented.

The study hinged upon the written Character Traits and Experiential/Positional lists and the professional opinions of the Selecting Officers of the fire departments to properly identify the desired participants. If this part of the process is inaccurately applied and the participants are not engendered with the specific characteristics assumed by the study, then the remainder of the study stands on a diminished foundation and cross-case thematic analysis becomes inaccurate (Creswell, 2007). The strength of a Delphi study is hinged upon the appropriate rostering of its expert panel (Pill, 1971) and thus the entire research project is suspect if the population of the panel was poorly achieved.

The written list of in-extremis leadership qualifications/characteristics benefited from having a pilot run with local fire department officers who have commanded in-extremis incidents and viewed as experts in the field of evaluating the performances of in-extremis leaders. The feedback on the list of traits served to refine the list and process which should give greater consistency to its application during the actual data gathering stage.

The second pilot testing was conducted by performing a few on-line Delphi interviews with officers from local fire departments chosen by their fire departments from the established

selection template. The purpose of these interviews was similar to the earlier piloting in that it is better to discover unexpected issues prior to the real data collection efforts (Teddlie & Tashakkori, 2009). This pilot testing process aimed to determine if the basic questions in the Delphi protocol were ample to cover the desired topics while not being too vague or confusing and might lead to answers that do not touch on the needed material. As my experience in the fire service has reinforced over 29 years, the more training and practice that can be achieved before the real event usually leads to greater success and more desirable outcomes. There was an assumption on the part of this researcher that this would equally apply to academic research.

Researcher Positionality

I must state a '*mea culpa*' in the form of acknowledging my active career participation in emergency scene response for the last 29+ years has formed what could be expected to be a natural choice of how best to function within these circumstances. As a leader of Fire Service personnel, technical rescue teams, and EMS crews, that at times, I put into 'harm's way' (in-extremis situations), I believe that I must exhibit and truly internalize a strong sense of self-confidence. If my firefighters and paramedics are to believe in my ability to make the correct decisions, in circumstances in which their life and safety can sometimes 'hang in the balance,' they must not see indecisiveness, which can be viewed as a lack of competence on my part at the moment of truth so to speak. Therefore, as a practitioner of the leadership subject under study, I have developed my managerial/supervisory/leadership skills in a manner which I feel best approaches the in-extremis scenarios. This should be obvious and be accepted as normal personal and professional development but as a researcher, I must always be cognizant that this may subtly lead to a biased interpretation during the study process and assessment of the data.

My experience has taught me various lessons which focus on the benefit of a combination

of personality traits and acquired skills. I have observed many leaders throughout my career (in the fire service, business, and the military) and used them as benchmarks for my own development. Even in the best leaders, I have found traits or tendencies which I felt could have been improved. This research topic is of personal interest and a certain degree of pre-occupation due to the close fit with my career. That stated, I understand that I stand a chance of losing sight of objectivity and had to continue to be reflective and introspective throughout the course of the research.

Trustworthiness

This mixed-methods Delphi study, like most others, needs to be concerned with alternate explanations for the witnessed data. I am unable to eliminate all possibilities and to reduce those known to a zero factor but I devised two methods to quell some foreseeable threats to validity.

The first concern is the truthfulness and thus the accuracy of the responses due to participants concern over the intentions of the study and the accessibility to the raw data. This threat to validity is respondent reactivity to the researcher, the research environment, and the perceived goals of the research. One of the questions this study asked identified exemplar in-extremis officers is if they deviate from prescribed protocols to use personal initiative and if so, how often and to what extent. As mentioned earlier, in military and paramilitary organizations which emphasize conformity, uniformity, and standard approaches to typical responses, officers who admit they no longer follow protocols could be putting themselves in the 'hot seat' if this were to be acknowledged and their administrative superiors were to know. In some organizations this could be viewed as sufficient evidence to pursue disciplinary actions or at least have career ramifications for officers who are seen as not following orders or standard operating procedures (SOPs) issued by superior officers or the organization. Thus, this study emphasized a complete

confidentiality of all data, in all forms, gained from this research. The participants must believe that this study is not the property of, funded, or supported by their agency other than simply allowing their officers the chance to participate in the research. The participant in-extremis officers had to feel comfortable enough with the research process to give complete and honest answers to the interview questions. This hopefully helped to reduce that threat to the validity of the data and conclusions drawn from them.

The second set of activities to reduce threats to trustworthiness has previously been discussed. I have concerns about my own researcher bias towards best practice principles for commanding in-extremis situations. The processes of piloting the interview questions to ground them with other leaders helped to reduce my personal inclination about what needs to be asked and what does not. The Delphi study itself created a process of individual and group member-checking after the initial interviews by following up with each participant concerning their own responses and with the collective group answers and confirming the individual's thoughts to those culminated responses.

Expected Outcomes

This study developed research questions and does not involve hypothesis testing and therefore contains no null hypothesis whereby the researcher must remain neutral towards all possible outcomes as witnessed commonly in quantitative research. Not unlike the aforementioned scientific methodology, I did not have any specific expectations for the data or the results which derived from them.

As a practitioner in the field of in-extremis leadership, I obviously have personal ideas about what I believe is the most appropriate manner to handle in-extremis emergency situations. My years of experience in the fire service and the military have developed a strong sense of what

constitutes best practice and what does not. As I have discussed in the earlier *Ethics* and *Positionality* sections, I did strive to maintain an unbiased approach to the study and what turned out to be its eventual findings.

Summary

In this chapter, I have reintroduced the nature and significance of the research and described the rationale for the mixed-methods study while outlining the reasoning for choosing a Delphi study research design. The chapter also includes descriptions of the participant pool and my role as a researcher which led into the ethical concerns which were of importance when this proposed research was conducted. These previous sections lead to the ‘meat of the matter’ which are the discussions of the data collection and analysis. Following this, are descriptions of the procedures for the series of online Delphi interviews. Finally, the chapter concludes with explanations of the efforts for piloting the research prior to going ‘full scale’, researcher subjectivities and how to ensure trustworthiness throughout the study, and ultimately a brief explanation of the expected outcomes for the research.

CHAPTER 4: REPORT OF RESEARCH RESULTS AND FINDINGS

Introduction

The goal of this research was to utilize a mixed-method approach to investigate decision-making during in-extremis situations and whether intuitive vs. analytical thinking or a combination of both is relied upon most and what style of leadership behavior leads to success in those situations by career fire service officers who were identified by their respective fire departments as ‘exemplars’ in commanding emergency incidents in the field. This entailed the collection of both qualitative and quantitative data, its separate analysis, and the final process of integrating both data sets for a more comprehensive view on the researched subject. Unlike a dual-method research design, which gathers both qualitative and quantitative data and maintains a degree of separation, a mixed method study merges the two data sets together so that they develop a broader, more distinctive understanding of the issue at hand (Creswell, 2009).

The emphasis of this research fell upon the Delphi panel and their online interviews. The quantitative data from the Rational-Experiential Inventory (REI-40) online survey was gathered in a relatively simultaneous manner with the Delphi panel interviews. After the first round of Delphi interviews took place, then the quantitative data was analyzed and presented to the Delphi panel and discussed in the second and third rounds of interviews and the panel’s feedback was garnered. As Teddlie and Tashakkori write (2009), this is indicated by QUAL + quan → Mixed Method. This illustrates that the qualitative portion of the research has emphasis over the qualitative portion but the two methods ‘mix’ to produce a synergistic outcome unique to the sums of their parts.

This chapter presents the results and the findings of the research. It begins by describing the demographics and the characteristics which drove the selection process of the participants of

both the quantitative research; the online REI-40 survey, and the qualitative Delphi panel of exemplar fire officers. Then the chapter continues with the description of the results from the quantitative research, the findings from the quantitative research, and finally the summation of the mixed methods compilation.

Statement of the Problem

In-extremis circumstances (in the fire service, many times referred to as immediately detrimental to life and health – IDLH) contain the threat that severe ramifications may result from the consequences of them. When people’s lives and limbs are in the balance, the significance of the decisions and actions made are perceived as greater than those demonstrated in normal, everyday life (Kolditz, 2007). So what attributes are ideal and most valued in leaders who command in these situations? Are there differences between those who manage successfully in more ordinary social or work circumstances compared to situations where time-critical and information-limited decisions must be made?

Researchers have written there is not enough focus on studying this specific area of leadership. That there is not enough peer-reviewed literature and there is a significant need to further the academic and practitioner knowledge of ‘leadership under fire’ (Baran & Scott, 2010; Jager & Kernic, 2017). The further studying of the circumstances of and the leaders involved in in-extremis situations will have the beneficial effect of better preparing future leadership, who must follow in the footsteps of those who now command in these environments. Bringing about a better understanding of the dynamics of successful decision-making and commanding the following actions under stressful, dangerous conditions when there isn’t time to consider, let alone, analyze multiple options, would only create better outcomes for our communities (Coleman, 2001).

Research Questions

Quantitative Research Question:

- RQ1 - Are there statistically significant differences between the identified in-extremis exemplars and the general fire officer population in the REI-40 scores?

Qualitative Research Questions:

- RQ2 – How do the identified in-extremis exemplars report they make decisions during emergency situations?

Do they rely upon self-initiative and independent decision-making paradigms, do they become more fluent and proficient with established policies, protocols, and procedures over the duration of their careers, do they combine these two approaches, do they actively deliberate possible options, do they consult others as to their opinion, or do they utilize other decision-making paradigms?

- RQ3 – Based upon the Delphi panel responses, to what extent did the three leadership theories (i.e., Recognition Primed Decision Making, Complexity Leadership Theory, and Hand-On Leadership) emerge as themes within the context of decision-making during in-extremis circumstances?
- RQ4 – What were the Delphi panel responses to whether organizational change within their respective departments and the U.S. fire service as a whole is needed?

Are there significant changes in the short-term and/or long-term that should be pursued? In an industry which is commonly referred to as strongly ‘tradition-based, is this a positive or negative to the fire service overall? What is the ease or difficulty of implementing changes in the fire service?

Review of Methodology

The first stage of the research required developing a schematic to assist with the standardization for the identification of exemplars in field command in the fire service. A literature review was conducted for characteristics/traits of command officers from military and public safety services journals and publications; a list of twenty-five characteristics/traits were identified. An online survey was created which was sent out to Ohio fire chief officers to rank these traits 1-25 as to which were most important for exemplar fire officers to possess to command in the field. In addition to these traits, generalized demographics such as time in the fire service, time as a promoted officer, frequency of emergency incidents encountered, were asked of these respondents as to what was also intrinsic in their exemplar officers. Sixty-eight fire Chief Officers completed the survey. The results were tabulated and the thirteen traits which scored in the positive standard deviations were combined with the suggested generalized demographics to create an officer trait list. This list then was used as a primary component for selecting the exemplar fire officer group in this study. Realizing that other intangibles, that may not be able to be written as a check-off list or concretely defined, are involved in the make-up of exceptional performance (Dracup & Bryan-Brown, 2004), each participating fire department's selecting officer was asked to use the characteristic/trait list as a reference guide but their professional knowledge of their officers was to be factored into the selection process also. Depending upon the individual department's situation, some departments only identified their exemplars for possible participation, some included all their officers as a general group, and others split their officer cadre into exemplars and non-exemplars for the study's purposes.

Career municipal fire departments in the Midwest were contacted via phone and email to the Office of the Fire Chief/Commissioner to find out initially whether their department would

be interested and willing to participate in this study's research. Twenty career departments were contacted and seventeen agreed to participate. Based upon how the department wished to be involved, a departmentally chosen selecting officer (in most cases, either the Fire Chief or a Deputy Chief in his/her staff) emailed the voluntary participation request to their officers to complete the online survey (REI-40) and demographic questions or be involved in the Delphi panel.

This research followed a mixed methods approach to gathering and analyzing the data. The quantitative portion of the research was collected through a survey Rational-Experiential Inventory (REI-40) which was electronically distributed through the online website, Qualtrics.com. The REI-40 is explained in further detail in the following section. The quantitative data was 'crunched' through the use of the IBM® SPSS® Statistics (SPSS) statistical software platform. The Qualtrics REI-40 survey actively gathered data from participants from March 1, 2021 to July 8, 2021.

The qualitative portion was collected through multiple rounds of Delphi-style interviews via the Zoom.com online meeting software. Fourteen members made up the panel and they were each selected by their respective fire departments as 'exemplars' in field command. The qualitative data was evaluated through the process of identifying expressed codings and then utilizing those codings to develop overarching themes from the interviews (Creswell, 2009).

The mixed methods portion came about by analyzing the results of the survey and bringing that back to the Delphi panel to ask their feedback of the results and how they interpreted those results as far as their own understanding of how impactful critical and intuitive thinking is to achieving success during in-extremis circumstances versus reliance upon rote or analytical thinking.

Quantitative Data: Statistical Analyses and Results

Demographics of survey respondents

The REI-40 was administered utilizing the Qualtrics software; access was gained through Bowling Green State University (BGSU). The participants were grouped into three categories, Exemplar Fire Officers, General Fire Officers, and the Selecting Fire Officers. The online surveys had a specific link for each category so to keep the data separate and the analysis accurate. The criteria for the designations were determined in three manners. The Exemplar Fire Officer category was determined as described above. The General Fire Officer category was just that; fire departments which chose to send out the survey invitation/link to all their promoted fire officers, without distinguishing between their exemplars and non-exemplars, used this category. The Selecting Fire Officer category was made up of the departmental officers who assisted this research by determining how their department would participate and which categories and/or individuals they would involve in the process.

All three sample populations consisted of career full-time fire officers employed by a municipal fire department in eastern United States. Seventeen fire departments agreed to participate in the online survey which represented seven states. The Qualtrics survey included a demographic section prior to starting the REI-40. The Consent Statement was the requisite first step and then the demographic section had to be completed before the REI-40 survey was offered. Each demographic question fed into the following question. A listwise approach was taken for this data collection. This method has a disadvantage; if the incomplete data derives from another independent variable's effect vs. a completely random phenomenon, it can go unrecognized (Peugh & Enders, 2004). Most of the incomplete surveys not utilized in this study's dataset were from the potential participants not agreeing to the initial consent statement;

thus, no data was provided nor could a determination for the reason for ceasing the survey be drawn (Table 1).

Table 1. REI-40: Counts of completion and consent variables.

	Completed Entire Survey	Did Not Finish	No Consent Given
Exemplars Fire Officers	62	0	2
General Fire Officers	339	9	16
Selecting Fire Officers	6	1	0

For the purposes of this study, demographic data was collected about Rank, EMS Certification, Education Level Attained, Years in the Fire Service, and Uniformed Size of their Fire Department (Tables 2, 3, and 4). Though this demographic data was not specifically collected so to perform quantitative analysis, it was gained to cursorily view whether it might be of interest for future research. A surficial look at the demographic data shows a possible point of interest in the distribution across ranks. An issue for further investigation might be whether exemplars excel in getting promoted or do administrative officers who selected their exemplar candidates view higher ranks as more encompassing of leadership traits?

Table 2. REI-40: Demographic variables and frequency by category (%).

Demographics	Exemplars (n=62)	General (n=339)	Selecting (n=6)
Rank			
Other	1 (2%)	2 (<1%)	0
Lieutenant	14 (23%)	235 (69%)	0
Captain	19 (31%)	52 (15%)	0
Chief Officer	28 (45%)	44 (13%)	6 (100%)
Fire Chief	1 (2%)	6 (2%)	0
EMS Certification			
None	0	6 (2%)	0
First Responder	0	11 (3%)	0
EMT (B & I)	29 (47%)	159 (47%)	1 (17%)
Paramedic	33 (53%)	161 (48%)	5 (83%)
Other	0	2 (<1%)	0
Highest Level of Education			
High School Diploma	1 (2%)	20 (6%)	0
Some College	10 (16%)	114 (34%)	0
Associate Degree	16 (26%)	70 (21%)	0
Bachelor's Degree	24 (39%)	105 (31%)	1 (17%)
Master's Degree	10 (16%)	28 (8%)	4 (67%)
Terminal Degree	1 (2%)	2 (<1%)	1 (17%)

Table 3. REI-40: Years in service of fire departments with descriptive statistics.

	Min	Max	Mean
Exemplars ($n=62$)	11	34	24.90
General ($n=339$)	9	41	22.97
Selecting ($n=6$)	15	31	26.17

Table 4. REI-40: Uniformed size of fire departments with descriptive statistics.

	Smallest	Largest
Exemplars ($n=62$)	62	2000
General ($n=339$)	66	2500
Selecting ($n=6$)	130	1729

Rational-Experiential Inventory (REI-40) explanation

The quantitative section of this research used a validated psychometric tool, the Rational-Experiential Inventory-40 (REI-40) survey (see Pacini & Epstein, 1999) for a detailed explanation of validity and reliability studies. This self-reported survey was developed by Rosemary Pacini and Seymour Epstein (1999) to measure two different modes of thinking; one slower and deliberate (rational-analytical) and the other fast and almost automatic (experiential-intuitive). It is based upon Epstein's work; the Cognitive-Experiential Self-Theory (CEST). The premise of this work postulates that people continually use two different and independent manners of decision-making and information-processing (Epstein, 1991). The intuitive mechanism is based upon our experiential learning and is rapid, holistic, and requires less cognitive processing. It is used for the majority of our daily information processing since most interactions with our environment require a lesser degree of analysis. The rational mechanism is

less emotional, more contemplative and systematic, and requires more time to adequately process in-depth solutions. Social and personal rules become more involved and analysis of alternatives and options also become part of the processing (Pacini & Epstein, 1999).

The REI-40 has four subparts, each with 10 items measured on a 5-point Likert scale (see Appendix F).

- Rational-Ability (RA)
 - This measures the respondent's ability to utilize rational-analytical thinking. "Refers to reports of a high level of ability to think logically and analytically, (e.g., "I have no problem thinking things through carefully")" (Pacini & Epstein, 1999, p. 974).
- Rational-Engagement (RE)
 - This measures the respondent's reliance to utilize rational-analytical thinking and their willingness to use this method of problem-solving. "Refers to reliance on and enjoyment of thinking in a logical, analytical manner, (e.g., "I enjoy thinking in abstract terms")" (Pacini & Epstein, 1999, p. 974).
- Experiential-Ability (EA)
 - This measures the respondent's ability to utilize intuitive thinking based upon impressions and quick associations. "Refers to a high level of ability with respect to one's intuitive impressions and feelings, (e.g., "When it comes to trusting people, I can usually rely upon my gut feelings")" (Pacini & Epstein, 1999, p. 974).
- Experiential-Engagement (EE)
 - This measures the respondent's utilization of experiential-intuitive thinking and

their willingness to use this method of problem-solving. “Refers to reliance on and enjoyment of feelings and intuitions in making decisions, (e.g., “I like to rely upon my intuitive impressions”)” (Pacini & Epstein, 1999, p. 974).

Choice of statistical tests and associated assumptions

The REI-40 is a self-reported 40-question survey that was given to 407 research participants who were categorized into three groups, exemplar, general, and selecting, of which exemplar and general fire officers were compared. The exemplar and general fire officers’ responses were compared for each of the four subgroups of the REI-40, Rational Ability, Rational Engagement, Experiential Ability, and Experiential Engagement (see Appendix F). Each subgroup of the REI includes 10 questions with specific targets. The Rational-Ability (RA) subgroup looks at the person’s ability to utilize analytical and logical thinking. The Rational Engagement (RE) subgroup asks the responder to answer about their confidence and propensity to use rational-analytical and logical thinking. The Experiential Ability (EA) subgroup looks at the self-reported competence of the respondent at using their experience and intuition during decision-making and their ability to attain knowledge or certainty without discernable reasoning or thought processing (Gladwell, 2010). The Experiential Engagement (EE) subgroup looks at the self-reported reliance of the respondent at using their experience and intuition during their decision-making.

As the goal of the analyses is to compare whether there is a difference in the summed subgroup scores between exemplar and general fire officers, a logical statistical test choice would be the Independent Samples t-test (see Appendix G). The Independent Samples t-test compares mean scores between the two groups. However, the two-sample t-test has many assumptions that must be met for the test results to be valid. The first assumption of the two-

sample t-test is that the measurement scale needs to be an interval or ratio scale for determining the central tendency of the mean. An alternative test, the Mann-Whitney U test can be used to analyze ordinal scales in addition since it ranks the scores to perform its calculations. At first glance, the Likert Scale appears to be an ordinal scale with no set quantitative interval between the choices on the scale. But there are academic arguments postulated that a Likert scale survey that employs more than four related questions to develop an overall answer, can be used as an interval scale and thus can have quantitative analysis performed (see Appendix D).

A second assumption is that the sampling is random and independent. This assumption is supported by the methodology utilized to conduct the research and discussed in detail in Chapter 3. The data are random in that any or all fire officers that were provided with the online link for the survey could have participated if they so choose. The data are independent in that each participant only was able to partake once and without knowledge of any other scores for the survey, was not a participant in the other group, and the scoring didn't affect any other participant scores.

A third assumption is that the data are normally distributed. These data would be close to symmetrical around its mean with minimal kurtosis and skewness (though this is rarely found in social science research; Pallant, 2020). The normality of the distribution was checked in several ways; through histograms, Q-Q plots, and Box plots for visual reference and tests for skewness, kurtosis, and the Shapiro-Wilk test. When normality is met, the Independent Samples t-test is the most powerful and appropriate test. When the data do not have a normal distribution or the sample sizes of the two groups are substantially different from each other, the non-parametric Mann-Whitney U test is the more appropriate and robust test (Delacre et al., 2017). The null hypothesis for the Mann-Whitney U test is that the medians of the two groups are equal but there

is the assumption of similar distribution shapes that must be met. If this assumption cannot be met, then the null hypothesis is that the mean ranks are equal.

A fourth assumption is that the samples' variance is relatively equal to each other. The distribution of the scores should be similar and near equal if accurate conclusions are to be made using the Independent-samples t-test. If the Homogeneity of Variance principle is violated, then the Welch's t-test (also called unequal variances t-test) is the appropriate analytical test. Like the Mann-Whitney U test, the Welch's t-test is also applicable when sample sizes are substantially different from each other.

An additional concern is that of the sample size. It should be large enough to determine whether a normal distribution occurs (see third assumption above) and typically, the larger a random sample size, the smaller the sampling error and the greater the precision of the sample to the population (Pyrczak, & Oh, 2018). Smaller sample sizes can be less desirable due to the increased likelihood of committing a Type II error for a fixed alpha value (Mertler, & Vannatta, 2010).

Results of statistical analyses

For all of the tests on differences between the exemplar and general officers, at least one assumption of the Independent Sample t-test was violated (see Table 5, Figure 1, & Appendix H). Therefore, the Mann-Whitney U test was used to evaluate differences between the fire officer groups for the rational ability and rational engagement subgroups while the Welch's t-test was used to evaluate differences between the fire officer groups for the experiential ability and experiential engagement subgroups. All tests were two-tailed with $\alpha=0.05$.

Table 5. Summary of the characteristics of the data, statistical tests, and choice of comparisons.

REI-40 Subgroup	Normally distributed?	If non-normal, similar shape?	Equal Variance?	Statistical Test	Statistical comparison
Rational Ability	No; normal for exemplar Fire FO, left-skewed for General FO	No, but skewed data associated with larger n	Similar and larger variance associated with larger n	Mann-Whitney U	Mean ranks
Rational Engagement	No; both are generally hump shaped but General FO group is platykurtic	Yes, similarly shaped	Sufficiently equal, larger variance associated with larger n	Mann-Whitney U	Medians
Experiential Ability	Yes, both groups	N/A	Not equal, but larger variance associated with larger n	Welch's t-test	Means
Experiential Engagement	Yes, both groups	N/A	Not equal, but larger variance associated with larger n	Welch's t-test	Means

The exemplar and general fire officers differed in their scoring on three of the four REI-40 subgroups. The exemplar fire officers' scores in the Rational Ability subgroup were like those of the general fire officers ($\text{Mean}_{\text{Exemplar}}=43.4$, $\text{MeanScore}_{\text{General}}=42.6$) suggesting that general and exemplar fire officers perceive their ability to utilize analytical and logical thinking in similar capacities with no significant difference between them. A Mann-Whitney U test indicated that the mean ranks of the two groups were not statistically significant, $U(n_{\text{Exemplar}}=62, n_{\text{General}}=339)=10056.5$ $Z=-.540$, $p=0.59$ (Figure 1, left).

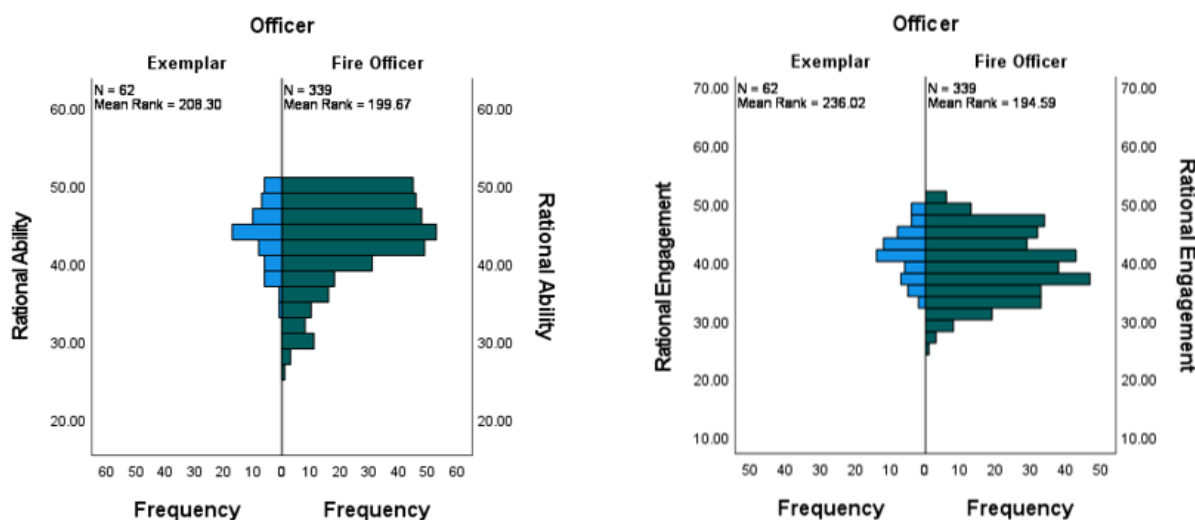


Figure 1. Histograms and summary statistics from Mann-Whitney U tests on the summed Rational Ability (left) and Rational Engagement (right) REI-40 subgroup scores.

The exemplar fire officers' scores in the Rational Engagement subgroup were higher than those of the general fire officers ($\text{Median}_{\text{Exemplar}}=41$, $\text{Median}_{\text{General}}=39$) suggesting that exemplar fire officers were more confident in their ability to use and had a higher propensity to use rational-analytical and logical thinking. A Mann-Whitney U test indicated that the median of score of the Rational Engagement subgroup for exemplar fire officers was higher than for general fire officers, $U(n_{\text{Exemplar}}=62, n_{\text{General}}=339)=8337.5$, $Z=-2.59$, $p=0.01$ (Figure 1, right).

While statistical significance examines whether the findings are likely to be due to chance, calculating effect size helps understand the magnitude of differences found. The effect size for a non-parametric Mann-Whitney U test cannot be calculated on SPSS and must be performed by hand. The formula used for this research is $r = |Z| / \sqrt{N}$ (DataTab Team, 2022; Pallant, 2020; Tomzcak & Tomzcak, 2014). For the comparison of Rational Engagement of general and exemplar fire officers, the Z score is -2.592 and n is 401 respondents, so the effect size is small at 12.9% (Cohen, 1988). The small effect size indicates that though there is a statistical difference between the two groups, there is little actual noticeable difference in the two groups reliance and enjoyment of using rational-analytical deliberation when decision-making.

The mean Experiential Ability score for the Exemplar Fire Officer group was much higher for the exemplar fire officer group ($\text{Mean}_{\text{Exemplar}} = 43.5$) than for the General Fire Officer group ($\text{Mean}_{\text{General}} = 37.2$) and the scores from General Fire Officers varied more than from Exemplars ($\text{SD}_{\text{Exemplar}} = 2.5$, $\text{SD}_{\text{General}} = 5.4$). This suggests that the Exemplar Fire Officers perceive their ability to effectively utilize their experience and personal intuition to a greater extent than do the General Fire Officers. Welch two-samples t-test showed that there was a statistically significant difference between the means of the two groups, $t(184.3) = 14.5$, $p = <0.001$. A large effect size of $\text{delta} = 1.17$ was calculated using the Glass's Delta since there is a significant difference between the two group's standard deviations (Ledesma et al., 2009). This large effect size suggests that the Exemplar Fire Officer group relies much more heavily upon their ability to utilize their personal experiences and intuition during decision-making than does the General Fire Officer group.

The mean Experiential Engagement score for the Exemplar Fire Officer group was much higher for the exemplar fire officer group ($\text{Mean}_{\text{Exemplar}} = 42.3$) than for the General Fire Officer

group ($\text{Mean}_{\text{General}} = 33.2$) and the scores from General Fire Officers varied more than from Exemplars ($\text{SD}_{\text{Exemplar}} = 3.1$, $\text{SD}_{\text{General}} = 6.5$). This suggests that the Exemplar Fire Officer group is more confident in their ability to rely upon their personal experience and intuition than does the General Fire Officer group. Welch two-samples t-test showed that there was a statistically significant difference between the means of the two groups, $t(177.9) = 17.2$, $p = <0.001$. A large effect size of $\text{delta} = 1.4$ was calculated using the Glass's Delta since there is a significant difference between the two group's standard deviations (Ledesma et al., 2009). Again, as in the Experiential Ability attribute, there is a large effect size. This suggests that the Exemplar Fire Officer group purposely relies upon and enjoys using their personal experiences and intuition more heavily than does the General Fire Officer group during decision-making moments.

Qualitative Semi-Structured Delphi Interview Findings

Delphi methodology

The qualitative portion of this research utilized the Delphi panel method of interviewing the fire service subject matter experts. This method uses a panel of experts and has the advantage of separating all of the interview participants into individual interview sessions so that the group interpersonal dynamics will not include a potential senior or domineering voice/presence which can affect the trajectory of the discussions and conclusions made by the panel. In addition, the COVID-19 pandemic's effect on limiting public interaction during the time of the interviews meant that these interviews appropriately used the Zoom Video Communications (<https://zoom.us>) software platform to conduct the interviews. Remote interview sessions might possibly lose some of the less pronounced nuances but with both video and audio with Zoom, there was sufficient interaction to capture the stated responses and to view when to continue the line of questioning further. In addition, with recorded video and audio interviews, the following

interview rounds benefited from increased analysis allowed by reviewing the interview material in its entirety.

The Delphi panel of subject matter experts consisted of 14 members, who were all identified by their fire departments as Exemplar Fire Officers. The Delphi interview process involved three rounds of interviews, which took place over a five-month period of time (May 2021 - October 2021). The interviews took from 24 minutes to 177 minutes, with each progressive interview round generally taking less time to complete (see Appendix I for the Delphi interview questions). All interviews were recorded via the Zoom software and were stored on a password protected external drive, reviewed, notes and quotes written down, and finally were deleted as per the Institutional Review Board (IRB) and interview agreement (see Appendix J).

The participants are only identified by the number assigned to them at the start of their first-round interview (i.e., 1, 2, 3, ..., 14) and only the individual panel member and the researcher know who the numbers correspond to. The Delphi panel roster has been kept confidential and the panel members do not know who the other members of the panel are. All 14 members of the Delphi panel were active fulltime career fire officers for their respective municipal fire departments at the time of all three of their interview rounds. Their experiences ranged from 18 to 33 years with their career departments with four panel members serving/served as volunteers with another fire department also. Their time as promoted officers with their career fire departments ranged from 7 to 22 years. The Delphi panel was made up of 13 men and 1 woman of which they identified themselves as 10 Caucasians, 2 African Americans, and 2 Hispanics. Their promoted ranks included Lieutenants, Captains, Battalion Chiefs, and an Assistant Chief. The 14 members were made up of 10 Paramedics (EMT-P), 3

Emergency Medical Technicians (EMT) and 1 First Responder (FR). Their fire departments ranged from 80 to 1850 uniformed members. These characteristics were not put into a table with the participant numbers since some of these would possibly identify the specific participant and their comments to their respective fire departments.

First round interview themes

The first round of the Delphi interviews was established with 14 semi-structured questions. They were designed so that nine questions addressed RQ2 and RQ3 and the other five questions were aimed at investigating RQ4. The questioning was 'semi-structured' so that the tone of the individual interview would set the direction and follow-up questions would arise as the interviewee's answers led towards further clarification (Maxwell, 2005).

The first round of Delphi interviews took a more general direction when compared to the second and third rounds since the line of questioning was devised prior to engaging the panel members and was more based upon the literature and researcher's own experience versus the following two rounds which delved from the previous interviews extensively. The researcher used a metric of having 10 of the 14 panel members mention and discuss a theme to be labeled as a theme representing the panel in general. There were seven general themes came from the first-round interviews (Table 6).

Table 6. Interview themes: First round of Delphi panel interviews.

Themes/Sub-Themes	# of respondents who mentioned	Frequency of times mentioned
Need for actual in-extremis (IE) experience	14	68
Advocacy for your command / take care of your people	14	61
Diversity and inclusion are needed in the Fire Service	14	50
Fire Service adapts / rate of change is slow	14	36
Hands-on leadership is essential to command IE	13	46
In-extremis circumstances are hard to reproduce for training	12	44
Shared risk taking / either now or in the past	11	51

The need for actual in-extremis experience

All 14 panel members discussed this theme. The governing thought was expressed that to be able to lead/command during in-extremis situations, one must have personal experience dealing with these types of circumstances. It was expressed that the learning process, either through classroom education or practical hands-on training does not equate to the human experience of actually facing real personal danger. Panel Member #11 stated:

I have run across officers who seemed to think that their textbook learning was somehow equal to living the real thing. They were the ones you had to watch out for because they could get you into trouble in the middle of a structure fire and then not know how to get you out. (Panel Member #11)

Along the same lines, Panel Member #3 expressed that experience is what truly develops the leader:

Experience is the fire that forges the leader. I expect all my fellow officers to learn their trade through education and training but that is just the beginning of the journey. It is not until the person faces real danger in in-extremis situations, where people's lives and limbs are at risk. That we find out what the leader is really made of. This isn't to say that it's an 'either you got it or not' condition but that without actual experience, you are still missing the main ingredient. (Panel Member #3)

Panel Member #1 also stated that experience is the essential requirement to being successful when in-extremis circumstances are beyond the scope of written procedures:

Protocols are the basis or foundation by which we as fire officers must conduct ourselves most of the time, but they were written by people and hopefully stand as 'industry best practices' but none were written so that you are supposed to follow them exactly in every situation. The author of any procedure or protocol could never anticipate all complexities that could be encountered, especially when people's lives are at stake. (Panel Member #1)

And Panel Member #1 further added:

There are times when written protocols and procedures are actually a hindrance. They sometimes spell out sequential tasks that might make sense the majority of the time but are completely ridiculous and will get people hurt in others. That is when your experience needs to kick in and the wise decision is to deviate from the protocols for the better of your crew and maybe the citizens you hope to save. (Panel Member #1)

The rules and regulations written in the Fire Service can have the wording of 'shall' or 'should'. The difference between the two is that 'shall' is a requirement and will always be

followed as written whereas the 'should' component resembles more of a guideline which the person is expected to follow the written procedure but leaves flexibility to make the best choice depending upon the circumstances (Coleman, 2001). Panel Member #6 discusses this point:

Fire departments, to their credit, try to proceduralize their institutional memory so that there is less occurrence of having to relearn mistakes. This seems to happen quite often based upon more tragic events like 'line of duty deaths' (LODD). But those very in-extremis situations are the ones when flexibility maybe needed the most. 'Shall' procedures are best meant for administrative type of circumstances like uniform policies but not so much on the fireground. With a greater degree of uncertainty found on the fireground, 'should' procedures are more applicable. Know the procedure but make the best decision at that moment! (Panel Member #6)

Panel Member #9 summarized his thoughts on what exactly makes up some of the important differences between officers in in-extremis circumstances:

Incidents are handled by humans, not protocols. There are good to very good fire officers and on the other side, there are poor to worse than that fire officers. It is the understanding of the elements of the in-extremis situation and what best to do, or not do, which comes from one's experience that makes up a big part of the differences between the two groups of officers. (Panel Member #9)

Advocacy for your command / take care of your people

It was expressed by all 14 panel members that when they lead their men and women into situations that might have dire consequences for them, that they should always be concerned about the welfare of their crew. Leadership should never lose sight of the responsibility of taking care of the people who have been entrusted to them. When public safety crews are expected to

act upon the need of others, which can contain a significant degree of danger for those who must attempt these tasks, such as searching a burning structure fire, crawl into a collapsed building, perform emergency medical care on a victim of a contagious disease, or try to calm and treat a large combative patient, they need to believe that their leadership is evaluating their safety also.

Panel Member #10 expressed this thought:

Being a good leader means being an advocate for your people, all the time. Not just when it is convenient or serves some particular purpose. This is extremely important when it comes to developing the trust needed when in in-extremis circumstances. In general, people are smart and know whether their leadership is sincere or not. This is something that must be demonstrated on a daily basis. If you are the Captain who will lead your crew onto an uncertain emergency scene with multiple gunshot victims or the Battalion Chief running a high rise fire in the middle of the night, your crews have to trust that you give a damn about their welfare and will make the best decisions to get them through the incident in one piece. (Panel Member #10)

This was echoed by Panel Member #3:

In the Fire Service, we see many things the general public doesn't. Some of these moments are heart-rending and hard to emotionally deal with so we develop a sense of callousness to protect ourselves and get the job done. But this should never be the case for the people you work with. The firefighters I command need to know that I am tied to their fate and will never let them down. (Panel Member #3)

It was also mentioned that there is a practical aspect to this philosophy. That firefighters and paramedics will be more reluctant to enter into situations where they might become injured or killed if they felt that the decision-makers on the incident did not have a concern for their

health when calculating an action plan. There is a range of capabilities when dealing with the issues of emotional intelligence and fire officers are no different. Whether fully enthusiastically onboard or just realizing the pragmatic need for displaying a bond of concern, panel members expressed the necessity of crews believing they will make it through the in-extremis incident intact. Panel Member #7 stated to this point:

Officers must have a solid work ethic and must care for their crews. Even if they have difficulty emotionally bonding with the people they lead, they must still care for their well-being so that the crew is ready to perform when called upon. ... Officers need to have a higher degree of emotional intelligence not only for the public they serve but also for the crews they will place into harm's way. If for no other reason, there is a practical reason for being an advocate for your men and women; keep them supplied with what they need and they will accomplish what the public needs. (Panel Member #7)

Diversity and inclusion are needed in the Fire Service

Again, all 14 members of the panel reached a relative consensus in the first round and stated that they felt there were historical failures in American society by not allowing all citizens, regardless of their ethnicity, race, or gender, to equally participate in certain aspects of economic and occupational life within our country. It was stated by all, that the Fire Service had not been exempt from these actions and minorities had been excluded from employment in most municipal fire departments until legal actions were undertaken over the last half century. To this end, the members expressed the need for the Fire Service, in general, to become more proactive in furthering its internal diversity and inclusion measures. The Civil Rights Act of 1964 was the landmark federal legislation which opened the door for many efforts to end hiring discrimination but the panel felt that needed efforts must still be pursued and better outcomes can still be

achieved. This was reflected by the statements made by Panel Member #5:

The (American) Fire Service clearly failed minorities, just like all other aspects of our society did for over a hundred years plus and even when the courts decreed those things had to change, there were and are fire departments who linger in the past. Our country has changed for the better and all fire departments, especially career departments, must continue to be the voice of change. (Panel Member #5)

It was mentioned by the panel that the under-privileged areas of our cities are usually over-represented by run volume and many times have a higher percentage of minorities living in these very areas. Just like law enforcement, it has become apparent that public safety forces who provide these essential services, must be able to have productive relationships with the communities they serve. One of the ways to achieve this is through the inclusion of all on the department's roster. Panel Member #13 stated:

When I first joined my department almost 30 years ago, there were few fellow firefighters who looked like me. Most were nice or at least pleasant enough with me but there was a distance from the people we were running on regularly. Personally, I was glad to feel like I was giving back to where I came from when we went into the neighborhoods but I could tell some of the firefighters and paramedics seemed to almost resent this. There were times when I would be asked by the citizens, 'why weren't there more like me?'. One of the more productive efforts some departments can make is to make serious inroads towards making this happen. (Panel Member #13)

This was echoed by Panel Member #1:

Diversity and inclusion are part of society and the Fire Service. This is a dynamic which is common across the board in all aspects of our society. There is no reason to fight the

efforts to bring this to fruition because we can only gain by bringing on all that truly want to help in our efforts and the more, we represent all groups within our jurisdictions, the better we will be able to perform the duties we've been given. (Panel Member #1)

There was some divergence in the comments made by the panel. The question was raised by some in the panel as to how high a priority and at what cost should diversity and inclusion be achieved. Some felt that their departments were being pressured to hire quotas that reflected previous under-hirings and that these directives might lead to eventually creating public safety forces who might be less capable and/or motivated to perform under in-extremis situations. Panel Member #7 stated:

We seem to be focused upon equal outcomes rather than equal opportunities but societal pressures seem to be pushing in this direction. The Fire Service and organizational proficiency does not improve just because we include everyone based upon categorical preferences. We surely can hire without prejudice and discrimination but we must hire people who are actually prepared to do our job. It is not an easy occupation to perform well in so hiring the correct people, which means those able and willing, is so important. (Panel Member #7)

Similarly, as said by Panel Member #4:

Fire departments should reflect their communities for the most part and actively recruiting people maybe the best way to achieve this. But since there is almost a sacred duty performed everyday by fire departments across this country, the standards should never be lowered to accomplish diversity and inclusion. There are many qualified and capable candidates out there from all sectors of our society who could be brought into and through the hiring process and still keep the department proficient, if not improve it

as you do. (Panel Member #4)

And even more bluntly stated by Panel Member #3:

All (fire) departments have problems and these issues will not go away because we wish them to. Perception helps to form people's sense of reality and appearance affects perception. Modern fire departments must adjust to and include current trends in our society and this can be and should be done to the betterment of the Fire Service. (Panel Member #3)

Not all members were so outgoing in stating that diversity and inclusion should remain a goal behind organizational effectiveness. Some members stated that using such terms as achieving change but not at the risk of performing less than satisfactorily were possible white lies. Panel Member #14 was clear about this:

I've heard the reasons and don't buy into them, why some fire departments seem to be stuck in a mindset from years ago. That we cannot make severe changes too quickly or everything will go to hell. I, for one, believe that the Fire Service needs to do better at including, which means recruiting, those who have been excluded from these opportunities for so long. ... Of course, I agree that the mission of most fire departments is essential for our communities and shouldn't be compromised, especially since the majority perform EMS (emergency medical services) to neighborhoods who need it most but that can be maintained while bringing on new members from the very neighborhoods we serve. (Panel Member #14)

Fire Service adapts / rate of change is slow

This was another subject where all panel members seemed to agree during the first round of interviews. A comment made by more than one panel member, which I have heard in fire

stations myself in one form or another goes something like this, ‘the American Fire Service is 200 years of tradition unimpeded by progress’. As disparaging as this appears on the surface, the comments were not negative in the majority. Many panel members stated that their jurisdictions were ‘Rust Belt’ cities of the Midwest and that reduced tax revenue from shrinking populations and manufacturing industries that have left their cities. This has led to constant money issues for which there is little cure to adapting to organizational needs that cost significant amounts of additional income. As unions ask to maintain quality of life standards for their members, as training requirements increase to meet professional qualifications, and as the equipment needed rises in cost substantially (aerial ladder trucks now average over 1.5 million U.S. dollars), the ability for fire departments to institute changes becomes limited. Panel Member #2 stated:

We are way behind the curve compared to corporate America. We are barely out of the pen and paper era and in some areas, we still are killing trees. Things like digital preplans, drones, and HazMat (Hazardous Materials) meters would be nice to have and increase efficiency and safety for our members. (Panel Member #2)

Panel Member #6 elaborated further:

The Fire Service adapts to changes occurring in society in general. As innovations are developed in the business world which lend a competitive edge to companies, government agencies like the Fire Service pay attention to these changes but usually take longer to incorporate them into their arsenal. Fire departments have a monopoly on their jurisdictions and therefore do not need to reform their ‘business plan’ quickly. No one is going to put them out of business because someone else does it better, faster, or cheaper. Whereas businesses know that they must stay competitive and maintain their niche in the marketplace, which cost money at times, fire departments will argue that they don’t have

the budget to update to more modern technologies. (Panel Member #6)

Panel Member #14 was a little more emphatic about the speed or lack thereof of change:

My (fire) department is always telling the public how cutting edge it is and how well we serve the community. That they have one of the best departments in the state and how we are always improving our methods of service delivery. But we still use paper staffing, scheduling, and overtime sheets, receipts for inspections, and performance reviews to name a few. Not that these didn't work for decades but the world has passed these by. In a city our size, it is a pain in the ass to try to find an inspection report from a few years ago for a customer within a reasonable period of time. My fire department is like most in our area and knows that it can keep performing at this level because no one can make them change otherwise. (Panel Member #14)

Another dynamic of change is the rapidity of technological and digital changes which have overtaken our society in general. There is normally an increased efficiency which is the reward that comes with these changes, but they also come with increased cost. Also, it was commented that there is almost a clear divide between older members on the department who did not grow up with the digital age but have had to personally adapt.

Panel Member #5 expressed this issue:

The computer era is clearly and obviously more efficient than the old method of pen and paper. The retrieval and archival advantages are without question. The electronic manner of doing business is far superior but a computer costs far more than a pen. Also, when the computer goes down, it goes in for repairs or you buy another, whereas, you just go get another pen out of the supply closet when yours dries up. ... This issue of adapting to the digital age brings up another issue; the older guys on the department didn't grow up with

cell phones and laptops so they are lagging in catching up with the new hires who have known nothing different. It's like we took the seniority system in play in most departments and turned it upside down. And unfortunately, the old guard is still in the positions of leadership and seems to defend the 'old-school' methods of doing business at times. (Panel Member #5)

Hands-on leadership is essential to command in-extremis situations

This line of questioning and discussion revolved around when leadership must partake in the physical tasks that need to be performed. Firefighting and EMS are both very labor-intensive and require a strong degree of manual involvement. There are tasks that need to be performed on an emergency scene such as pulling hose lines, engaging in fire attacks inside buildings, searching for victims, and performing emergency medical procedures (between 80-90% of municipal fire department incidents are EMS runs, not fires) and there are non-emergency chores such as cleaning the vehicles, fire stations, cutting grass, etc. The Hands-On leadership dealt with both categories of duties and how they affected commanding in-extremis situations. One point that was brought up repeatedly, was that how the officer acts and performs in the non-emergency circumstances plays a tremendous factor in their ability to lead their crews in incidents where there is a significant risk of danger.

Panel Member #9 said that a Hands-On leadership style is fundamental to achieving his goal of efficient teamwork:

When I lay hands on the tasks being performed by my crews, it imparts value to what they are doing. It signifies that I am not above what I am asking them to do. All officers in my fire department have risen through the ranks so each one has had to perform all duties of a firefighter. Some officers either feel that assisting with duties assigned to

others is not in their job description or that they are promoted and they no longer have to help out. This applies to duties around the fire station such as cleaning and training maybe more than duties on the fireground because that is where you earn your reputation the most often. Refuse to lend a hand around the station, and your crews will know who you are. (Panel Member #9)

A comment which was expressed by all panel members was there are times where a Hands-On approach is not appropriate. This is when leadership is required to attend to other, more important matters such as organizing and managing the emergency efforts.

Panel Member #7 stated:

Hands-On leadership is both a yes and no answer. On the fireground, I want the IC (Incident Commander) to be handling command and resource management issues; those are enough during critical situations. Taking a Hands-On approach while crews are involved emergency operations that there is an imperative to immediate success, is not what Command is paid to do. Things can turn poorly very quickly if someone isn't paying close attention to how the situation is unfolding and able to quickly order the changes necessary to be successful and keep people safe. The BUT to this is when the emergency phase of the incident has been mitigated and there are still many duties to be performed, an officer can gain credibility by helping to pick up hoses, clean off equipment, etc. This is when a Hands-On approach to leadership pays off. When your people know that you are part of the team and will help them when you do not have to, they will trust and have respect for you and your command presence. (Panel Member #7)

Panel Member #6 expressed this as in the common verbiage found in many fire stations:

A Hands-On leadership style makes a shit-ton of sense in our business. I am sure there

are business management structures where the manager should not be performing the tasks they give to their underlings, but that is not the Fire Service. A ‘Come-On’ versus a ‘Go-On’ style of supervision helps to make the difference between a leader and a manager. Yes, there are times during emergency incidents when leaders must perform critical, essential tasks that coordinate and lead the effort. This is not when Command is to grab and start pulling hose lines. Everyone’s safety on the fireground relies upon the IC doing their job well. But the little things add up and helping out whenever appropriate goes a long way to establishing one’s ability to command. It is an essential part of how I lead the men and women who will count on me when their well-being is at stake. (Panel Member #6)

Panel Member #11 also stated:

Your people aren’t stupid. They can tell when you no longer want to help out. It can be three in the morning (0300 hr.), it’s raining and cold and there is 800’ of LDH (large diameter hose used to supply water from a fire hydrant to a fire engine) to drain and load before the crews can head back to the station and an officer who just gives the order to pick up and just watches, doesn’t get credit for being a leader. The officer who says ‘come help me and let’s get this done’ earns the chops he/she deserves. Of course, your best officers take a Hands-On style because they remember where they came from. (Panel Member #11)

In-extremis circumstances are hard to reproduce for training

The Fire Service, just like the military and law enforcement, engage in activities which find their members in harm’s way as a course of performing the duties expected of them. Many of these tasks require technical and manual skills to be successful. These fields of endeavor strive

to prepare as best as possible for the actual moments when the threat is real and negative consequences are a possibility. Therefore, constant training becomes the watchword for those times between actual events. Fortunately, the military does not find itself at war on a regular basis (24/7-365) but both law enforcement and the Fire Service find themselves performing dangerous duties on a not so uncommon basis.

So, the panel discussed how to best prepare for in-extremis situations. It seems reasonable to duplicate in-extremis circumstances as closely as possible without making the threat too real. Most fire departments either have or have training access to a 'burn building' (usually a masonry building specifically designed to have interior fire training). This gives training recruits up through seasoned veterans the chance to practice their firefighting skills against a real fire under protected circumstances. But over the decades, American firefighters have lost their lives fighting practice fires so ever-increasing limitations have been placed upon how the fires are set, how large, what materials are allowed to be burned, etc. This has greatly tempered the experience of a training fire versus the real event. The same is true when training for HazMat, Active Shooter, Swiftwater Rescues, and unstable EMS incidents. Panel Member #10 suggested:

Trust is a necessity for leading our people into IDLH environments (Immediately Dangerous to Life and Health). As officers, we need to trust in their commitment to the task at hand and they need to trust in our ability to have good situational awareness and competence to guide them through the incident. Training helps to develop this trust in each other as well as furthering everyone's skills but our training scenarios will never equate to the real thing. We are required to eliminate or lessen all threats in a practice burn. When our crews enter a real structure fire, there are so many unknowns and nothing

is scripted. (Panel Member #10)

Panel Member #13 echoed similar thoughts about his department:

We try to make training as realistic as possible so all involved are gaining in their proficiencies. For our recruits, we take it a little easier on them since they haven't developed a strong skill set yet but for our more senior firefighters, they sometimes say it is a waste of their time. They feel it is so dumbed down that it no longer resembles what they might face later in the day. (Panel Member #13)

Panel Member #1 stated that his time working with technical rescue teams also frustrated him at times:

The Fire Service realizes that it cannot put its members in situations of grave risk for mere training. No one can justify a LODD (Line of Duty Death) during a training exercise. The argument sometimes heard that the closer we make our training exercises, the better our people's skills become, and the less chance of someone getting killed during real fires. When I trained specialty teams, we had the same concern. To use real agents during HazMat training and you introduce real anxiety and you start to develop the stress inoculation that comes with actual threats but you can hurt someone badly while doing something that realistic. It seems like it will always be a dilemma of how far to push things. (Panel Member #1)

Panel Member #2 brought up the contradiction that might occur when limited-risk training situations are interpreted as equating to real in-extremis incidents:

Training is good, and the majority of the time, will lead to better outcomes. Trust and teamwork are developed through repetitive interactions of which training plays a big part. But I have never been involved in a training exercise that was the equal to fighting a fire

in a structure none of us had ever been in, not knowing how badly the fire had already damaged the structure, not knowing when the backup crews would arrive on scene, or whether the nearest fire hydrant would actually give us enough water to effectively fight the fire. These are just a few of the things that must go through our heads in a very short period of time while we may already be on our knees in zero-visibility inside the building. Training exercises remove all that doubt and create a larger safety barrier around bad decisions and actions, and we get away with thinking that we are capable of handling real incidents that start to go wrong. Especially, for fire departments that don't see much fire and rely upon a few training exercises a year; they might fall into the trap of having misplaced faith in their ability to get out of situations that turn deadly so very quickly. (Panel Member #2)

Shared risk taking / either now or in the past

This issue was somewhat summed up by one of the panel members who gave an analogy of World War I officers on the Western Front, some at the battleline in the trenches with the men and others miles to the rear away from the bullets and artillery shells giving orders that would affect a great number of soldiers they did not know and would never meet. Maybe military historians would refute such a simplistic analysis of the leadership conditions a hundred years ago in France, but the analogy truly works for this issue.

Firefighters, like the majority of people in general, enjoy creature comforts and do not enjoy when they have been removed. They understand when serious threats towards their well-being are presented. When firefighters find themselves in conditions, such as standing outside, soaking wet in turnout gear (structural firefighting gear) in below freezing weather or searching for possible victims in a room over 400° F as examples, and their officers are not or have not

experienced the same conditions, there is a gap in the teamwork psyche and personal dedication towards 'leadership' wanes. There is something to the simple concept, 'been there, done that'. Most panel members repeatedly said that officers that have been through the fray so to speak, that have been in the busy sections of town, on the busy response companies, have earned a large degree of respect and an expectation that they are better prepared to handle the unexpected in-extremis situation that might occur at any time during an emergency.

Second round interview themes

The second round of the Delphi panel interviews brought the mixed-methods portion of the research to bear. At the time of these second interviews, I had the results from the online REI-40 surveys tabulated and asked the panel their thoughts on the survey outcome. As stated earlier, rather than running a dual-methods research where the quantitative and qualitative stand-alone under the guise of a singular research, the goal of this research was to also explore the significance of the online survey results from the perspective of the expert panel.

As with any follow-up interviews, there was the need to clarify previous answers upon further deliberation after the first round was completed. Also, since the Delphi interviews are conducted individually, general lines of inquiry develop throughout the process and thus the follow-up interviews contain directions not initially anticipated (Howard, 2018). This research was no different and clarification and elaboration were part of both the second and third round interviews.

Though some issues had appeared to reach a general consensus during the first round, a stronger attempt to 'hit the center' of the topics was my effort in the second round of interviews (Table 7). Using the first-round results to point the interview direction, less general and more specific discussions took place. The interviews took less time to complete as the issues revolved

more around leadership qualities and what makes up a very competent in-extremis leader.

Table 7. Interview themes: Second round of Delphi panel interviews.

Themes/Sub-Themes	# of respondents who mentioned	Frequency of times mentioned
In-extremis (IE) leadership is earned / leadership vs. management	14	68
IE situational understanding is essential	14	50
More experience = more critical and intuitive thinking	13	38

In-extremis (IE) leadership is earned / leadership vs. management

This theme revolved around the idea of earned leadership versus appointed positional power and was mentioned many times during the second round interviews. All of the fire departments represented by the members of the Delphi panel have a hierarchal administrative structure to their organization; a Chain of Command. As one increases in rank, one gains more organizational power and command responsibility just like military organizations. With this increased command responsibility, members stated that there was the implied thought that there was also increased competence in being in control of departmental missions such as emergency incidents; that a Deputy Chief knew more than a Battalion Chief, who was better than a Captain, who had more solid skills than a Lieutenant, who could quote procedures far more fluently than an Engineer, etc. Repeatedly, during the interviews, this was negated by the panel members.

Panel Member #10 stated:

Most firefighters and EMTs believe that there should be an inherent validity to the promotional process. That those who get promoted to higher ranks have shown

themselves to be of a higher skill level than those who were not promoted. But that is not always true and sometimes, it is blatantly obvious that some in higher command ranks might get you killed because they don't have the skill set to run a tricky incident. If these officers understand their actual skill level and experience, they should know to rely upon those on scene who can get the job done but that maybe too painful for a command officer to do. (Panel Member #10)

Along the same lines, Panel Member #13 also stated that competence in a larger organization comes in many forms:

My fire department has many officers in the chiefs ranks due to our size and if one was to assume that everyone one of them could run a 2-alarm fire with citizens' lives on the line and a dozen or more fire crews performing multiple tasks at the same time, they'd be wrong! Like every fire department, we have officers who have the experience, knowledge, and respect of their crews to command in any situation, but we also have those that do not have that ability.

The department has [about 50] fire stations with [about 1800 firefighters] so there are logistical and administrative duties that are demanded every day. These require a skill set which is different than running a fire but still need to be performed well or the department would start to fall apart. I see this as the difference between organizational management and command leadership. Each person has a job top do and hopefully they do it well. It's just that in the field, this can mean the difference between someone's life or death. (Panel Member #13)

Panel Member #3 used an analogy to explain this point:

I like to use the example of an NFL quarterback to show a similarity to the development

of fire officers. As the quarterback starts as a rookie, he studies his opponents' defensive formations and plays but is heavily guided by his coaching staff as to what plays they will run. As he gains years in the league, he learns to more independent choices and can audible offensive plays on the line of scrimmage due the formations which present themselves. But only a few report that they 'see' through the play and motion seems to slow for them and they are able to make better game decisions within a few seconds window of opportunity. This is what happens to fire officers that experience various in-extremis incidents. Eventually they become 'calm in the storm' and are able to analyze what's happening and make rapid and successful decisions. Some officers never reach this stage anytime in their careers and crews listen to them because they have to. (Panel Member #3)

Panel Member #2 qualified his statement such that decision-making in in-extremis situations in comparison with administrative tasks requires a qualitative difference honed through actual experience:

Not all emergency incidents require making decisions where people's lives 'are on the line'. Many are ordinary without severe consequences such as a 911 call reporting a sore throat for the last two months. The officer and crew still need to make the correct decision on how to treat and whether to transport to a hospital, but no one is going to lose a limb or die over these types of runs. But other 911 calls bring us to IDLH moments (in-extremis) and especially when there is limited-information available and time is very critical and the first responders' lives are ordered into danger, that is when the quality of the Commanding Officer pays huge dividends. Crews know who they want making those decisions because they know who has earned it! (Panel Member #2)

Panel Member #14 drew a difference that experience alone isn't the only factor:

Just because a person has been through enough fires that could have led to serious problems or that actually hurt or killed firefighters, doesn't mean they learned the right lessons. There has to be a degree of introspection and understanding of what the real factors were that caused the problems and made things go south. Many people will say they were there so now they know what to do but there is a difference between knowing what not to do and knowing what to do. (Panel Member #14)

Panel Member #7 stated that it is the personal make-up and motivation of the person as to whether experience turns the 'coal into a diamond' and produces the exemplar:

A good officer, one who can handle in-extremis situations that involve their men and women, is one who is always self-evaluating their performance and competency. If one is not increasing their knowledge through professional development, then they are not preparing for success. The in-extremis situations can happen at any time and will find those not best prepared wishing they were and is unfair to those that are led into those situations. Not everyone learns the same lessons though they experience the same situation. Our best officers not only have the experience but have learned the valuable lessons that make the difference. (Panel Member #10)

In-extremis situational understanding is essential

The Delphi panel reached complete consensus on this issue. It was discussed that there are too many factors happening in such a rapid sequence that hoping to control the outcome requires the incident commander to have as much a comprehensive view on the situation as possible. The in-extremis situations rarely allow human intervention to control the situation itself. Large fires, airplane crashes, building collapses, natural disasters, terrorist attacks,

industrial accidents, active shooters are all types of severe incidents that can cause responding personnel to be into harm's way immediately. The responding jurisdictions have little hope of controlling the catastrophe but can strive to control the conditions which the crews must actively perform their duties. Only through situational understanding, having a mind's eye on the entirety of the incident as much as possible, can leadership make decisions which stand a better chance of leading to success. There is an old joke said in the firehouses that all fires go out, whether those on scene knew what they were doing or not. This highlights a similar thought that all emergencies eventually are no longer emergencies but what was the outcome? Was it closer to optimal or not? Leadership at in-extremis moments needs to be prepared before the fact and needs to combine those related KSAs (knowledge, skills, and abilities) with understanding as many contributing factors at the scene to develop an incident action plan which mirrors the need of the situation. Panel Member #8 summed up this point:

That is the role of the IC (Incident Command). Command must have a broad view until all the IDLH moments have passed. It is too easy to miss something important when things are coming at you at one hundred miles an hour. Command training for in-extremis situations is essential and damn-near negligent if fire departments don't do this. This helps Command avoid the inevitable anxiety and stress that will occur during in-extremis circumstances. If Command falls into the trap of getting overly excited or becomes too anxious, their focus becomes limited and the 'whole picture' is missed. It is important for decisions to be made rapidly but not recklessly. When Command has the ability to calmly survey the situation that is happening in front of them, through training and experience, they are able to make wise and safer decisions quickly. (Panel Member #8)

Panel Member #1 explained that in unique circumstances, where the textbook and experience maybe both lacking, the reliance on weighing risk/benefit, probability of success, ability to control or confine the hazards, as examples, means that the more Command understands the incident, the better to devise the plan that will work:

My fire department had a unique grain rescue/recovery a few years back. Our technical rescue teams had training on grain rescue but this incident was far larger and not along the lines of what we had trained for. The textbook hadn't been written to cover these conditions, our training hadn't specifically prepared us for this, and we had no actual field experience in performing this type of rescue. But as we all know; the fire department is always the one who has to solve these situations; there is no one else to call! So, it was all about thinking through the problems as quickly as possible, learning on the go, and teamwork. The rescuers' lives were clearly at risk to the same hazard which had already killed two workers so Command had to take the 10,000-foot view and continuously devise, monitor, and revise the plan as the situation evolved. Yes, Command has to have an understanding of the factors involved in in-extremis moments or people will eventually die! (Panel Member #1)

Panel Member #5 made a similar statement but offered an exception to an absolute rule to follow:

It depends upon the timing. Of course, fireground leadership needs to understand the elements of the incident which affect the safety and success of the mission at hand but there are times when more focused attention on a critical task can be more beneficial. There are times, especially during in-extremis conditions, when things have to get done now. This could be a second hose line needs to be charged with water so that the interior

crews won't be burned now or a ladder needs to be put in a window so victims can escape from a burning room now [#5 emphatically stressed the word now in this usage]. As a fireground commander, I instantly ask myself at those moments, will my immediate actions make a significant and beneficial difference? If so, for that brief moment, I give up the 'stand back' comprehensive view and take action but as soon as it is complete or enough resources are also tasked to it, I'll return to an overall command presence. (Panel Member #5)

Panel Member #4 brought up the point that very good fireground commanders are already prone to take action and have most likely done so throughout their career:

When the crews are involved in unstable conditions, there are times, that officers who have spent their career being 'hands-on' must fight the urge to join the fray. Most exemplars, that I know, in handling in-extremis situations are Type A or even A+ personalities and it goes against every instinctive fiber in their body to stand back and let others do the physical tasks. It takes training and dedication to remain in the position of Command. (Panel Member #4)

I asked him to clarify the situations which were described by #5 above [the second and third round interviews were not conducted in numerical order as the first round had been]. #4's response acknowledged the circumstances to which Panel Member #5 described and stated:

That somewhat goes to the heart of what I mentioned. People who are always highly motivated have a hard time watching others work. The IC has to have a firm grasp on what is going on and more importantly, anticipate what may happen. When the IC switches to physical tasking, they diminish that viewpoint. But there can be situations where 'all hands' are needed for a critical moment, but these are clearly the exception.

After the fire is out, then it is time to help out and officers gain so much ‘street cred’ with their crews when they lend a hand at that time. (Panel Member #5)

More experience = more critical and intuitive thinking

It was stated by all panel members that their respective fire departments had written administrative protocols and emergency procedures. It was stated by some of the members that this was to conform with ‘industry best practices’ and to standardize how individual emergency situations are handled in the field. The written procedures allow the administrative command structure of the fire departments to be able to determine how to respond and act under specific conditions. An example given by Panel Member #14 was, this could be what fires will be fought by going interior on buildings and greatly increasing the risk to the involved crews versus which fires will be fought from a safer exterior vantage point. It was expressed in the interviews that this also provided the jurisdiction with legal defenses as to the conduct of the fire department at the emergency scene. Panel Member #11 said that fire departments are publicly stating their intent to take action and what actions that will be. Panel Member #11 gave the example that his/her department was sued for cutting holes in a roof to ventilate the byproducts of fire (heat, smoke, and soot). The department had the suit dismissed since they had a written procedure on the books which clearly stated this fireground operation and the reasons for it. Panel Member #3 that said that without written protocols, how could fire departments have consistency of action, abide by best industry practices, and comply with NFPA (National Fire Protection Association) standards?:

If there were no written guidelines on how to conduct oneself during an emergency, it would be utter chaos. The term was ‘freelancing’ which meant people sometimes did what they wanted. The Fire Service and the emergency medical field have learned many

valuable lessons over this last century and those lessons are the basis of most written procedures. Medical treatment algorithms and drug dosage amounts have been studied and refined over years. No paramedic should take unto themselves to start experimenting in field. Many, if not most fire and rescue related procedures have been learned at the cost of human lives and countless dollars of property. These lessons are best learned by current firefighters without having to pay such a price. (Panel Member #3)

Panel Member #3 further explained the National Fire Protection Association when asked for clarification:

The NFPA is the national non-governmental organization which publishes hundreds of codes and standards relating to fire extinguishment, protection and equipment. These are voluntarily followed or in some cases, the individual state legislatures adopt them as their legal fire codes. They are seen as the industry best standards and each has a technical advisory committee who reviews and rewrites every few years. Though these codes may not be legally binding in many cases, fire departments ignore these standards at their own risk.

But that said, written procedures and national standards are only part of the equation. The success of response crews is always based upon the wisdom they have gained through their experience. No procedure should be followed so strictly that it puts responders in harm's way unnecessarily or without sufficient gain. Critical thinking during the emergency situation, especially during dangerous circumstances, cannot be underestimated. Officers are paid to think, not blindly follow sequential charts. (Panel Member #3)

Panel Member #6 stated that his fire department utilizes their written protocols in a formal and

informal manner:

All departments have written protocols and mine is no exception. They serve multiple purposes. New firefighters to the department or newly promoted officers that have been on for a while are required to become very familiar with them. They are part of the recruit and promotional process. Our firefighters who have little experience to guide them or officers with little command experience in the field are expected to follow the procedures as written. But as they gain insight that comes with experience, they learn to assess situations for what is needed most and decide on the best course of action for all involved. I'm not suggesting that the department allows our officers and crews to go rogue and make up policies on the fly, but I am saying that no written procedure can anticipate all circumstances encountered in the field. Our best officers use their brain and make good decisions that are based upon the procedures and how best to modify them when necessary. (Panel Member #6)

The results of the quantitative online survey were inserted as the mixed-methods topic to the panel interviews. The results were most germane to this issue of critical and intuitive thinking. The REI-40 online survey evaluates the participants analytical and intuitive thinking which has already been described in greater detail. There was almost complete consensus on the subject. Thirteen of the panel members stated that experience in the field develops an anecdotal learning which becomes part of the process. Panel Member #9 stated:

The written procedures that his/her department uses are very useful for new officers and for some senior officers who never developed a sense of 'reading' the situation. It provides the groundwork for handling most scenarios, but it produces a linear direction of thinking. Especially when procedures are written in a sequential format, some officers

feel they have to follow each step in the order it was written. As long as things don't go sideways, they will be able to get through the incident just fine. But if the incident has problems to solve not addressed by the procedure, these officers have difficulty troubleshooting their way out. (Panel Member #9)

Panel Member #4 expressed the same thought:

Following procedures almost seems like rote memory activities. There is little actual thought that goes into learning a procedure and then when the time comes, implementing it in the field. All you have to do is make sure you are using the right procedure.

It doesn't surprise me at all that the results showed that exemplar fire officers rely upon intuitive thinking more than the general fire officer population. If you are going to excel in field command, you better use critical thinking. I personally relied upon the department's written procedures heavily as a new officer. I still use them now but I also make them fit the incident by applying what's applicable, when its applicable. (Panel Member #4)

The lack of a statistically significant difference between the exemplars and the general fire officers in the area of analytical thinking was explained by Panel Member #12 as to be expected:

The Fire Service teaches its fire officers to be analytical. The situations we find ourselves in almost require a degree of thoughtful analysis, even when using prewritten procedures. Some incidents are not clear cut and deciding which procedure to use involves a decision. You can be sent on a drunk, injured, and pregnant patient; which procedure do you use?

It does not come as a surprise that the two groups both scored high in the analytical thinking questions. It also seems natural that analytical thinking improves for

most of us with experience. The first thing an officer has to assess on scene is whether it is safe for the crew to approach the scene. There are many times where the incident has unexpected threats and rapid accurate deliberation is a must. (Panel Member #12)

Panel Member #14 was the lone exception to the consensus on experience:

I agree that experience is utterly vital in the Fire Service, but I do not believe that it is the overriding factor which makes an officer an exemplar. It would be tough to reach exemplar status in the eyes of fellow firefighters without experience. Doubt anyone would take you seriously otherwise. But I have seen senior officers who I would not want to follow into tricky, let alone dangerous situations. Just because you have many years' experiences doesn't mean you learned the right lessons from those experiences. It takes something more than just being there. (Panel Member #14)

Third round interview themes

The third round of Delphi panel interviews was very similar to and a continuation of the second-round interviews. But the third round also emphasized the effort of 'member-checking' their answers and general thoughts. Prior round issues were discussed to reaffirm that my interpretations were accurate and that there was not any migration on the subjects. No issue was exempted from further discussion as obviously, they are all interrelated (Table 8).

Table 8. Interview themes: Third round of Delphi panel interviews.

Themes/Sub-Themes	Frequency	
	# of respondents who mentioned	of times mentioned
IE leadership must be flexible / know protocols also	14	48
Education, training, & experience are all required	14	41
Belief in leadership's competence / trust and respect	14	34

In-extremis leadership must be flexible / know protocols also

The definition used by this research for an in-extremis situation is ‘at the farthest point’ which more roughly translates to ‘at the point of death’, where those involved face significant threats to their life or well-being (see Chapter One). The panel pointed out repeatedly throughout all three interview rounds, in their experience, that there is very little that is scripted when it comes to in-extremis scenarios. Panel Member #5 pointed out:

Sometimes it is the subtleties that will make the difference between success and tragedy and the timely recognition of those factors, may make the difference between a good day and a bad day. If you don’t adjust for those aspects of the incident, things will go wrong quickly. (Panel Member #5)

The panel members stated that written procedures are well-intended and based upon collective experience but are never meant to apply exactly to all situations uniformly. A better term was suggested while discussing flexibility. Panel Member #8 staunchly expressed:

You have to have it (flexibility)! The fireground officer who believes that because he/she has memorized their procedures is armed with all they need to know is going to get people hurt. It is critical that our on-scene leadership are always thinking. You come up

with an initial plan based upon limited information and as you gain more info and monitor how things are proceeding, you issue adjustments so to keep people safe and the plan on track. (Panel Member #5)

Panel Member #12 compared the fireground to his/her military experience:

When I was overseas (in the U.S. military), my unit was assigned to route recons in Humvees and trucks. We would run across situations that appeared friendly when they weren't and those that you swore were going to be ambushes but didn't happen. It took split-second decisions at times whether to open fire or not. I suppose it might be what cops face at times.

The fireground and many EMS and rescue scenes remind me of the same thing. The things that can cause you grief in getting the job done seem to change as you find out more information. I've run fires where bystanders are insisting that people are still trapped inside so I put my crews inside the building to affect a rescue, when the fire conditions were too far along to justify that action except to save a civilian, only to find out the bystanders were just guessing. I would never have wanted to start a firefight in Afghanistan because someone said they thought those were bad guys. (Panel Member #12)

Education, training, & experience are all required

This issue, in a more nebulous form, was discussed throughout all three interview rounds but coalesced into a specific issue in the third round. Experience had been talked about repeatedly and developed as two stand-alone issues; the Delphi panel reached consensus that no fire officer could reach exemplar status without experience being involved and eventually leading in-extremis situations and that the more experience a fire officer had in the field, the

more they developed a strong sense of critical and intuitive thinking.

This theme developed as some members of the panel broached this issue as the combination of three separate aspects of preparation for handling the 'next' in-extremis incident during the second round so it became an agenda item for the third-round interviews. Education was summed up as the totality of formal education achieved. This includes high school, college, seminars, conferences, continuing education, etc. Some of these obviously are not targeted at the Fire Service specifically but were pointed out as strong influencers for the thought processes that each officer has in their arsenal. Panel Member #6 stated:

Having a college degree is thought by many in the fire stations as having little to do with our jobs. Even worse is having a liberal arts degree. But this is a situation of not knowing what you do not know. I think we all agree that any formal education adds to the person's repertoire or as said in our business, 'adds another tool to the mental toolbox'. I see this play out in my fire department where many members end their professional development once they graduate from the fire academy in the beginning of their careers. (Panel Member #6)

The second part in this theme, training, was discussed as the physical portion of preparation. It goes without saying that the Fire Service, in all aspects of the job in the field, to include fire suppression, rescue, and EMS duties is heavily a manually-oriented occupation, even in its more technical skills. Most fire departments will put significant time into physical training so to hone and maintain skills. This is also how team building is created since most skills, whether individually completed or through crew efforts are usually part of a collective effort.

Panel member #11 expressed:

We all sat through the training academy and took the same certification exams to get

hired. The basic information was given to all members. One of the differences, a big difference, is when we get to our fire stations and then we still work hard at practicing our trade or some seem to give it up like they already are skilled enough. It is a test for the officer and a chance for the officer to earn respect. Not too many people enjoy drilling on fire operations in their turnout gear when it is 90°F and the officer will catch [grief] when he gives the order to train but once it is over, most crews are glad they did and are better off for it. But just as important, is an exemplar officer doesn't just give the order and then stands by and watches, he/she gets in there with the crew and performs the same training drills as them. Be part of the team and earn the ability to lead them when it counts the most! (Panel Member #11)

Panel Member # 12 gave an example:

The Golden Glove shortstop in Major League Baseball (MLB) practices taking ground balls almost every non-game day during the season. Why should he have to do this when he is the best in the majors? Because it's all about maintaining and strengthening skills. The same is true about fire crews. If they stop training, they sure as hell don't get any better. This is where a good officer, but especially our very best officers (exemplars) know what has to be done so they train alongside their people so to be able to perform well on emergency scenes. (Panel Member #12)

The third part of the theme, experience, seems somewhat repetitious to themes already covered but this theme is different in that the members discussed the necessity of attaining all three parts or something intrinsically would be missing. There wasn't a formula supplied in the discussions about how much of each to make the recipe work best but that each was a key ingredient. Panel Member #7 explained:

When we break down the elements of the make-up of an exemplar officer, we can identify these three and each is needed to make the officer. I'm not saying that everyone needs a bachelor's degree or has to be a HazMat Tech (Hazardous Materials Technician) or be a Senior Paramedic. The time that an officer puts into their career and prepares for the situations they will someday face, the better they become for their crews and for the community they serve. Some exemplar officers will concentrate on training while others will get their master's degree. It doesn't matter because this is an individual decision but our best officers will have all three and it is the combination of education, training, and experience that makes the exemplar. (Panel Member #7)

Panel Member #1 stated a frustration that he/she felt hampered this combination effect:

I remember as a recruit in the academy, being told by the instructors that when we graduated and reached our fire stations, that we were not supposed to forget what we were taught and learn all those bad habits that the veterans would teach us. Then at our stations, sure enough, senior firefighters would say ignore that rule and this is how you really should perform a task. This goes to the heart of many in the Fire Service of not understanding that each member needs to learn the educational/academic side of the job and train on how to practically do things efficiently. Then, hone those very skills through experience to the best of our ability. Someday, someone's life might be at stake and it'll be the skill level and the teamwork demonstrated that will make the difference. (Panel Member #1)

Belief in leadership's competence / trust and respect

This theme was summed up by two of the members who used the exact same phrase during the discussion. They both stated that 'Competence is the Coin of the Realm'. When I used

the phrase during following third round interviews, it was agreed that it hit the mark. This theme also reached complete panel consensus with all 14 members. I have heard this in my past with my father and grandfather, who were both West Pointers, echoing this same sentiment.

This theme is different from ‘exemplar officers in field command need to be competent’ of which the panel has already agreed is necessary in a few forms and similar to a mathematical axiom, seems so obvious that it doesn’t need to be proven to be accepted as fact. This theme is about perception. The crews being led, being assigned dangerous tasks, being ordered into situations where they face the possibility of getting injured or worse, need to believe in the skill and motivation of the person doing that ordering. As with the very beginning of this research when trying to come up with the best process to determine which candidates to utilize as exemplars, there is not a litmus test which quantifies who is who. So, some learning is anecdotal, without statistical evidence to back up what we know, though we know it. This tacit knowledge is what the panel was stating. The crews need to believe that their officers, from Lieutenant to Fire Chief, are competent in handling the situations that they will order their people into. The crews need to trust that their command will always consider their well-being and care about how they figure into the outcome of the emergency. No fire officer will have their crew’s cooperation if the crews feel they’ve been assigned a suicide mission with little hope of being successful.

Panel Member #2 stated along these lines:

Not only do officers need to be good at their jobs, but they need for the crew(s) that will have to follow them, believe that they know what they are doing. Perception is reality to some extent. There is no leadership without an accompanying followership. If your people aren’t going to follow you, you really aren’t a leader. When we are talking about IDLH conditions but even worse than that, in-extremis situations, your people are looking

for you to provide competent leadership immediately. And really, before they'll even get to that point, they need to believe that you have it in you to successfully command the situation. (Panel Member #2)

Panel Member #1 also stated:

Many in the Fire Service like to think of themselves as hero-material. For some, it is true that they will knowingly put themselves into dangerous circumstances and sometimes they must pay a price for that but they do it anyway. No one does this thinking they are going to get hurt or killed. They do it thinking they have the ability to make it through with 10 toes/10 fingers so to speak. A big part of this belief system is the leaders who are on scene making the decisions, whether out on the sidewalk or crawling on their knees in high heat alongside their crew. Firefighters know who they want there is they are going to put their lives on the line! (Panel Member #1)

The panel brought this theme around to the fact that an exemplar officer must be seen as that commodity in the eyes of the fire department personnel. As with being an advocate for their people, being a 'Hands-On' leader, or not shirking away from the risks that their crews must face, as discussed earlier in the research, an in-extremis leader must have instilled trust, earned respect, and conveyed an image of strong competence. Panel Member # 10 proposed:

To some degree, there is a little of the salesman's job required of a good officer. If you did everything right but no one knew that you might not have people's faith in your ability to lead. I'm not suggesting that it becomes a popularity contest, but people need to know that you are capable and do the right things. Given time and common experiences, crews will learn this on their own but many administrative things a very good officer does are in the background. These may not be seen by the members who's benefit your

working for and thus don't gain the trust and respect brownie points sometimes needed to cement that bonded relationship. (Panel Member #10)

Panel Member #5 stated:

Trust is everything when the crews are in IDLH situations. They have to trust in your level of experience and competence to make the right decisions when everything is on the line, they have to trust that you will be there for them regardless of the risk, and they need to trust that you are consistent. (Panel Member #5)

Panel Member #8 quoted (or paraphrased) a famous American to make the point:

To quote Colin Powell 'Trust is the essence of leadership and for people to follow you, they must trust you first'. The crews must trust in the officer's competence and their sincerity of concern. And any violation of that trust might mean it will never return. But trust is also a two-way street. A leader should expect their followers to demonstrate through their attitude and actions that they are willing and prepared to complete the mission required for the community's safety. (Panel Member #8)

Mixed-Methods Analysis

Mixed-methods explanation

Teddle and Tashakkori (2009) state that all research falls with the 'Inductive-Deductive Research Cycle' (p. 27) and that mixed-methods research typically involves both, and "can simultaneously address a range of both confirmatory and exploratory questions" (p. 26). Some researchers believe that real-life issues are best addressed by looking through a more comprehensive lens so that any analysis should view from a totality when possible. Teddle and Tashakkori (2012) further state that the combination of both qualitative and quantitative methodologies produces a richer and more descriptive picture of complex social dynamics. But

at times, this advantage of mixed-methods research can be confounded in that researchers sometimes present their quantitative and qualitative data sets separately and fail to combine them into a synergistic manner where the sum is greater than the individual parts and a meaningful relationship is illustrated between the two (Bryman, 2007). Using mixed methods requires more than the separate collection and analysis of the data (dual-methods) but the integration of both which “includes intentionality of wedding the two in a meaningful way” (James & Slater, 2014, p. 173).

It was the goal of this research to look at the subject through both the lens of quantitative and qualitative data. As stated above, it was the intent to add further depth to the study by enhancing the two aspects of analysis and combine them into a symbiosis of understanding and create a third, more comprehensive component unique from the others (Creswell, 2009). As in land navigation, the term triangulation is used to describe the process of more accurately pinpointing a position and in this case, more accurately investigating the research subject (Heale & Forbes, 2013).

Mixed-methods methodology

The main thrust of this research was the Delphi panel interviews of exemplar fire officers. This supplied an excellent cache of data looking at how exemplars think through their decision processes, both on emergency scenes emphasizing in-extremis moments but also how they those incidents are affected by non-emergency relationships. This created the qualitative data, but the research was able to go beyond this.

The Rational-Experiential Inventory-40 (REI-40) Likert scale survey was created by Pacini and Epstein in 1999 to investigate slower, rational decision-making and faster, more automatic intuitive decision-making (see Appendices F & G). The survey remained active on

Qualtrics from March 1, 2021 until July 28, 2021.

Once online survey results were no longer being collected, the data was quantitatively analyzed and compared between the Exemplar Fire Officers and the General Fire Officers. The second round and third rounds of the Delphi interviews discussed these results and delved into the quantitative data to explore the panel's thoughts and to give insight from their perspective as exemplar fire officers. This produced a synergism by combining the quantitative research results into the qualitative process.

The quantitative results and qualitative findings were in line with each other. The qualitative responses from the Delphi panel agreed with the differences found between the Exemplar and General Fire Officer groups in the REI-40 quantitative survey. The Delphi panel developed three mixed-methods themes which reached complete consensus with the 14 panel members (Table 9). The panel members each stated that they rely upon their own sense of how to handle the individual emergency situation to certain degrees. They also stated that when they have been involved in in-extremis situations, their experience becomes more applicable to finding a beneficial solution, both from the successes and failures of the past.

Table 9. Mixed-methods themes: Second & third rounds of Delphi panel interviews.

Themes/Sub-Themes	# of respondents who mentioned	Frequency of times mentioned
Less time for analysis in in-extremis situations / critical decision-making, reliance upon intuition	14	54
Analytical thinking is fundamental and necessary also	14	49
Need to train officers to enhance decision-making processes	14	33

In general, the Delphi panel stated that the REI-40 results were in-line with what they thought they'd be. They said that the Rational/Analytical portion of the survey coincided with what they have observed over their careers, that all Fire Service officers need to view each emergency through the lens of critique and analysis. The higher Rational/Analytical scores of each group and the less than notable difference between the two group's scores made sense. The Experiential/Intuitive portion of the survey also followed with what they have come to observe during their careers. They stated that the best officers in field command not only understand the procedures, have relevant experience, but also are able to 'think outside the box' and come up with appropriate solutions not found in the department's text.

Mixed-methods themes

Less time for analysis in in-extremis situations / critical decision-making and intuition

As discussed earlier in Chapter Two, emergency incidents, especially those that experience in-extremis circumstances rarely contain conditions which are fruitful for prolonged evaluation and interpretation of the influencing factors involved (Kolditz, 2007; Ward, 2006). Many of the decisions to be made and the actions to be performed are time-critical with delays only working against best outcomes. The information to base these decisions and actions can be limited at best at the time when they must take place. Anxiety and stress-overload must be contended with because the consequences of these decisions and actions can be severe for those involved, both civilian and responder. And the initial goals are generic; such as 'put out the fire and save lives' but the specifics of exactly how to achieve success in that particular circumstance are defined on the fly. Panel Member #5 explained this:

Given the nature of what we do, textbooks and protocols are never the complete answer.

The dynamics of the emergency scene can be overwhelming and often we do not know

the whole story when decisions must be made. True enough, a quick reliance upon learned experiential lessons can lead down the wrong path but when in IDLH conditions and facing an in-extremis scenario, there is little time for in-depth analysis. You must rely upon your best judgement. (Panel Member #5)

Panel Member #8 emphasized the need to deliberate rapidly and mentions RPDM:

The analytical side of the equation is more book-based. We read the same textbooks and articles, watch the same training videos, and attend the same seminars but don't come through this the same. Longevity does not equal experience and experience does not equal ability. In-extremis situations require the decision maker to understand what is going on and what will happen depending upon what we do and don't do. This requires analysis of the conditions at play. This isn't standing in front of a whiteboard talking through options with your management team about what we should do next quarter. It's about making critical decisions right now! Recognition Primed Decision-making (RPDM) hits the nail on the head. We (emphasizing exemplars) have a cache of possible solutions in our head that we have dealt with in our past. Usually, without much conversation or deliberation, we develop an action plan and assign tasks to our crews to get the job done. (Panel Member #8)

Panel Member #6 also commented on RPDM on the emergency scene:

Both groups (Exemplar Fire Officers and General Fire Officers) being analytical is no surprise. Analyzing the emergency scene is intrinsically part of command and is taught to all officers. It is expected that they will accomplish this with some degree of skill. And Recognition Primed Decision-making does involve analysis. Though RPDM allows for rapid decision-making, it also involves one understanding which prior experience applies

best to the current circumstances. Otherwise, you are just guessing at what might work. Also, one's fire department procedures cannot be totally forgotten so we make decisions based upon our experience, our procedures, and a certain degree of ingenuity required by the incident in front of you. (Panel Member #6)

The panel members all stated, in one form or another, that conducting analysis of life's situations is a good thing and something they quite often do in making decisions in their daily lives. That pondering what options might be the best path to take, to weigh what are the costs versus benefits, and then choose the best course of action only makes sense. But during emergency events, in the case of the 14 panel members, where usually a 911 call requesting public safety forces to respond to a perceived crisis has happened, there might be little time to deliberate or information to deliberate about once arriving on scene. In addition, many emergency incidents contain possible threats to the victims, bystanders, and responders of which some threats are not fully understood or known until almost too late. Panel Member #12 related a personal experience:

We stress to our crews that you have to have your head on a swivel because bad things can happen so fast. An emergency scene can seem stable and straightforward but suddenly things change. Early in my career as an officer, I was on an EMS run of a possibly broken arm. The female patient and her friends all said it was an accident falling off the back porch. That was what had been told to the 911 operator so the police were not sent with us. Something seemed wrong with that story because of the short answers we were getting and looks they were giving each other. Then a larger man came out of the house while we were treating her, fighting ensued as it turned out that he had hit his girlfriend and now the family was there for payback, and we were involved in the middle

of a dozen people trying to hurt each other. That was a valuable lesson for me for the rest of my career. You have to evaluate your surroundings but also trust your intuition. (Panel Member #12)

The assessment of risk is performed through both analysis and through affect (Slovic et al., 2004). We think about the risk but we also rely upon our feelings of the risk. Two people can have very similar thoughts about the risk of skydiving. One jumps and the other stays inside the plane because they have two very different emotional reactions to the induced threat to their well-being. Humans have the capacity to employ these two different methods of assessing threats and then choosing what actions to take. Like the rapid cognitive processing explained in Recognition Primed Decision-Making (RPDM), affective assessment of risk is quicker and emotive. The risk assessment is typically more accurate when the two are combined together to synthesize available information since either analysis or affect can overweight or underemphasize the true threat faced (Peters & Slovic, 2000).

Panel Member #3 stated how he/she views making decisions about scene safety:

Early in my (promoted) career, I saw myself as nearly invincible because of the number of near-misses I had made it through. I understood the danger, but I felt my ability to overcome these would see me through. But my overly aggressive behavior got a personal reassessment when my department experienced a multiple LODD incident. I realized that what I thought was teaching my younger firefighters to be better at their jobs was really being partially fueled by my own ego.

...Experience should lend itself to a greater set of options to choose from during crisis, but it should also modify the decisions we make. Experience can develop skill-hardening and stress-inoculation which are huge in our business, but risk/benefit and

margins of safety must be considered every time we enter an environment which could turn for the worse. I always give thought to what might happen if things go wrong. I look at the obvious, what I can see, and think about what I don't, what does my gut tell me.

(Panel Member #3)

Analytical thinking is fundamental and necessary also

The Fire Service is most likely no different than most fields of human endeavor. It relies upon analysis and data-driven metrics to help determine best courses of action in its administrative, logistical, and operational functioning. It would seem wise, almost to the point of no debate, that investigating alternative means of completing tasks and weighing the benefit of those methods would reap greater and continued success. Humans are inherently analytical to some extent and thus our organizations constantly change as better designs and processes, and eventual outcomes are employed.

The Delphi panel found the results of the Rational-Analytical portions of the survey consistent with what they believe to be the truth in the Fire Service. All 14 panel members stated that it was imperative that incident commanders, regardless of the size of the incident, analyze what is going on in 'front of them.' As stated in the first mixed-methods theme (limitations to analysis during emergencies, especially involving in-extremis circumstances), while long deliberation is not always a possibility, it doesn't exclude the need for processing the factors affecting the situation. Panel Member #4 stated this:

Deliberation depends upon time and circumstances. Some executive decisions on the fireground need to be made now, with the emphasis on now! Whatever information you know at that time helps in making those decisions but there is a time-critical nature to making those plans happen now. But that said, we're not talking about putting together

incident action plans (IAP) without consideration of the information that might be available. Only a fool would do that, and they would get that chance only once. You should deliberate when the time to deliberate is there. But in our business, a bad decision is usually better than no decision. An officer who stands stupefied unable to make a decision has taken themselves right out of the game plan. (Panel Member #4)

Panel Member 7 gave a longer reiteration of this same thought and gave examples of how this can happen in real-life situations:

Deliberation is situation driven. In-extremis and non-in-extremis situations are both found on emergency scenes and administrative decisions not involving emergency scenes have to be made daily in the Fire Service. So, the need and the time to deliberate to some degree is usually there for most of these decisions. When fire officers are able to adequately process all the information presented to them, they make better informed decisions and normally, these will make for more effective outcomes. But emergency incidents don't always allow that to happen. There are times when a victim is found unconscious and no one there knows what happened or the house on fire at 3am has no bystander who knows if anyone is home. These incidents require immediate action and there is not a whole lot of information to go on.

Then there are the other circumstances, such as an apartment fire in the middle of the day which might have dozens of people around the scene, all giving slightly different stories of what is happening. Some shouting, some yelling, some sitting on the curb crying, some talking to the cops a block away, some trying to run back into the building, cars pulling up at high speed, the media already on scene, the wind blowing the fire onto the next apartment building, and some of your fire crews already performing tasks they

think need to be done now, and your job, your responsibility, is to bring this all under control and devise an effective plan in the next minute.

Factors that must be considered so to deploy your limited resources; are there injured victims outside who need immediate medical attention by your crews rather than them being assigned to firefighting duties, are there still people trapped inside the structure who need those same crews to go interior immediately and save those lives rather than attend to the injured, should the next apartment building be evacuated immediately by those same crew members so no one there gets injured or killed, is this arson or an accidental fire so that evidence needs to be preserved rather than destroyed in the firefighting efforts, how should the rapidly incoming fire apparatus be arranged because once they position and pull hoses, there is usually no moving them, where do the aerial trucks need to be placed so to cover the fire but avoid power lines and trees but still be effective fighting the fire now and in 30 minutes if the fire cannot be contained but also not be too close in case the building collapses later on but not be too far away that their water streams become ineffective in the wind, where are the hydrants on the 6" water main versus the 12" water main, is this just a room and contents fire which can be quickly handled or has this gotten into a common attic and a 2nd-Alarm compliment is needed? These are great training questions to be deliberated on during a tabletop drill but during a real incident, they need to be addressed in a matter of a minute or two as best as you can. (Panel Member #7)

Panel Member 7 followed up on this explanation of possible factors found on the emergency scene by a summation of how he wants his officers to learn to command:

Herein lies the crux of the difference between my exemplar fire officers and the other fire

officers. Regardless of how complicated a scene is at the start or how it progresses, actions will take place and eventually the emergency is no longer. The question becomes, were there smart decisions made based upon information, protocols, experience, and unique circumstances that determined the course of actions? Was there a coordinated effort that still made sense after the fact? This is what I call, 'Reaction versus Decision'. I have found that Type-A personality firefighters will, without question, react and solve problems. But were these actions collaborative and effective? This command dynamic is what we hope to train and instill in all of our officers. (Panel Member #7)

Multiple panel members brought up in the interviews with that the first determination that must be made is whether it is safe for the responders to approach and then as the incident proceeds, remain on scene. As pointed out, whether the typecode is injuries from assault, gunshot victims, dog bites, car accidents on the interstate, or a fire in a chemical plant, it is essential to determine if the fire crews are threatened beyond what they can mediate. This requires quick analysis by the fire officers, firefighters, and paramedics. This evaluation of the scene was repeatedly stated as not an option. Panel Member #12 stated:

There is no advantage for the engine company or the victim, for the crew to roll up onto the scene of a gunshot victim only to find the suspect standing in the front yard still holding his gun and the police nowhere to be found. Fire officers must be making wise decisions about putting their people in harm's way. This is a must! I agree there is little time to deliberate on the emergency scene but some things cannot be overlooked or eventually we have LODDs (Line of Duty Deaths). (Panel Member #12)

Along similar lines, Member #3 said:

We can make decisions too quickly. There are times when the first arriving crew is

getting information over the radio and on their MDT (mobile data terminal) in the rig and believes the situation necessitates them to act very quickly. Nine out of ten times this works successfully, and fast actions were appropriate and are glorified by the public. There are also times when this backfires and even the responders can turn into victims. Everyone responding, especially first-in crews, need to be aware of the circumstances they are walking into. Analysis is hugely important in our business. Tough to do when there is little time to do it, but we still must always be reading the scene. (Panel Member #3)

Two examples were given that relate to the need for analysis during EMS incidents. It was stated that most EMS protocols have been written by medical doctors who are commonly known as the Medical Director for that fire department. These are based upon the current standards of care for the particular illness or injury presenting itself; thus, there is sometimes little flexibility in the algorithms to follow such as which drug and what dosing to give. These parameters are based upon scientific studies through multiple cases studies and are not at the whim of paramedics to change.

That said, it was stated that not everything is 'black and white' when arriving on the scene. There are times when multiple medical events are happening or the signs and symptoms are not following the textbook description of what should be occurring. The responders (EMTs and Paramedics) need to quickly decipher and then treat before the patient's condition worsens. Panel Member #11 stated:

As a paramedic for around twenty years, I have seen my share of patients who are in need of medical treatment immediately or else. The universal endpoint for any severe condition is cardiac arrest. As you know, this is where the heart is no longer effectively

working as the pump for the person's blood and there is no palpable pulse. For all intents and purposes, the person is dead.

We assess, and then we go into our CPR (Cardiopulmonary Resuscitation) protocol as anyone who has ever watched TV knows. But unlike TV, this doesn't fix the person and they do not get up and walk away. This only buys time. We act like the person's pump while we do other things like intubate, start IVs, administer medicines to keep the heart trying to work, stop major bleeding, to name a few. But again, this only buys time. Success is all about finding out what caused the cardiac arrest in first part. Part of the CPR protocol involves determining which of the 'Hs and Ts' are occurring (see Appendix K for comparable protocol) and correct them, if possible. This is called a differential diagnosis and can, and often means, whether the person lives or dies. Not only is good CPR essential but accurate and rapid analysis of what caused the episode to happen is key to saving the person's life and this has to happen on the emergency scene or there is little chance of survival. (Panel Member #11)

Panel Member #14 stated a similar tone to analysis on EMS incidents:

The vast majority of my department's runs are medical in nature. I believe the day of fire departments just being fire departments is long over with. So, when you ask about analysis during incidents, I think of all the medical assessments that are done on a daily basis, not so much the stereotypical fireground scenario where a building is burning down and people are hanging out of windows when the fire engine arrives. That is important and always will be but equally important are the actions taken on the EMS runs.

My department stresses that there is a difference on EMS runs between a 'technician' and a 'clinician.' The good technician is one who memorizes the protocols

and can initiate them on scene without looking them up on their phone and also performs the technical side of the protocols. A good clinician does this and more. They also understand the pathophysiology of what is happening to the patient. They understand what the medicines are doing for the patient, how they will react with meds and drugs the patient has taken, why certain dosings are given depending upon the patient's condition, and can accurately know what may happen next.

Yes, analysis is very important to performance in the field in the Fire Service. Officers who fail to perform this task are doing themselves, their crews, and their communities a grave disservice. (Panel Member #14)

The Delphi panel suggested that even rapid decision-making is assisted by whatever analysis can be brought to bear, whether incomplete or not. It was stated that analysis, even marginal, helps to reduce the ambiguity normally found on emergency scenes. This then helps the decision-making process and can develop more accurate solutions. One of the panel members talked about having to tell whether the snake which suddenly appears at your feet, is a Scarlet King Snake (non-venomous) or a Coral Snake (venomous) [they look very similar]. That a rapid, if not instantaneous, analysis is required for a beneficial outcome to one's predicament. The person may not have time to determine which species it is, but they may know enough about herpetology to step back immediately in case it is the Coral Snake. Though the analysis was incomplete, it was good enough to induce action that avoided definitively finding out. Fortunately, most Fire Service members will not face this dilemma, but the analogy suggests that responding crews will face threats which appear into view quickly and the best course of action may have to be decided upon without any protracted debate of which option to choose. Panel Member #10 stated in the 2nd round:

An officer's experience and education lead to a greater understanding of the idiosyncrasies of each incident. Since not all dangers will be obvious or appear at the start of the incident, initial and ongoing analysis is necessary. As I stated earlier, there are times on an emergency scene when things progress rapidly and simultaneously, so any kind of exact analysis will never happen. Even after the incident is over, I have discovered things that would have had a bearing on actions to be taken had I known then. But that is the nature of many emergency scenes and analysis is an important part of what we expect an officer to do, especially an exemplar officer. (Panel Member #10)

Need to train officers to enhance decision-making processes

The results of the REI-40 survey brought about one other consensus issue. The fact that there was a statistically significant difference between the Exemplar Fire Officer group and the General Fire Officer group in the two experiential categories, brought up the concern of how to diminish this difference in a positive manner. As all the panel members indicated, they felt that there was something in their experience and decision-making which leads to better outcomes now versus earlier in their careers. That they, many times, are able to make a noticeable difference on emergency runs than some of their compatriots. The exemplars 'bring something to the table' that is either missing or reluctant to come to the surface in their fellow officers. Panel Member # 1 brought up:

I have been involved with our Training Bureau for quite a few classes of Firefighter/EMTs and the candidates usually run in the ages of 20-30 for the most part and they come with a variety of life experiences. We try hard to bring unity of purpose and group identity early in their training. We push them physically and mentally and this unity helps the trainees cope with the conditions we put them through. This unifying

process is successful for most and those who do not adopt this philosophy usually do not last through the training. Our fire department believes this helps to create firefighters who are willing to undertake our mission through a unity of comradeship and purpose but it may also help to develop a mindset of group think which may linger through their career. We teach them to think like one.

Our department does not make the effort to train these same firefighters later in their careers when they become our officers to counter this programmed mindset. We have them memorize our protocols as recruits and then later in their careers, test for their promotional exams on them. The expectation is for the new officers to act as the protocol book just instructed them to do. Deviation is not encouraged and may lead to discipline. So, when and how do they learn to branch out and make decisions based upon their own thoughts? When do these officers become the exemplars, we hope they will develop into?
(Panel Member #1)

Panel Member #13 similarly discussed this point:

My department requires a strong academic commitment to becoming an officer. The number of resources which are tested on is quite staggering. This includes in-house materials and textbooks. Somewhere in the range of a thousand to two thousand pages of written material. They are then tested on how well they memorized this information so the advantage goes to the person who is able to read, store, and regurgitate later.

By itself, this is not a bad process to make candidates go through. The more they know, hopefully, the better they will perform, but this only goes so far. As we all find out later on, we should not expect that reading books and procedures leads to real leadership. It takes more than that and our department, like many others I have dealt with as a

promotional board member, don't follow up and train them to be leaders. As I said, stuffing a bunch of academic information into the officers' heads doesn't transform them into the leaders you want them to be. (Panel Member #13)

Panel Member #11 mirrored these same thoughts:

I've trained newly promoted officers that seem to have the gift of natural leadership. They just are able to bring about a sense of confidence in their decision-making ability and develop a team. The majority of the new officers I have worked with do not possess this quality and must actually strive to achieve it. Or worse, they don't bother to become a leader and they forever rely upon their rank for getting the job done and the fire department lets them get away with this. Either the fire administration doesn't think that it is necessary or they don't know how to go about changing these officers, but either way, it makes for a less capable department and less safe for our crews out there. (Panel Member #11)

The emergency scene is not the location nor the time to experiment with new procedures that have not been practiced to the point of proficiency or even worse, that crews have never attempted and have little knowledge of (Coleman, 2001). There are advantages to written procedures that all involved in, have trained on and can expect others to do likewise. Consistency does have its strengths and through repeated skill development to achieve skill proficiency, it hones a team effort (Jensen et al., 2011). There is an ease of application of common tasks which are a known part of a crew's repertoire. Officers that initiate innovative assignments that are in contradiction with established procedures can add to the situation's stressors and possibly start things down the wrong path when crews are not able to perform these new tasks at the expected and necessary high level of proficiency due to little or no familiarity with them.

The panel members were asked to explain why they believe in personal initiative rather than repeated practice can promote a stronger degree of rote competence. Why train constantly and then deviate from those developed skills? Panel Member #7 expressed:

Our written procedures are a good foundation. A good starting off point which gives you a general direction to head in on an emergency run. But these same written policies can handcuff the officer and crew from performing what is best for the public at that moment due to unique circumstances and depending upon the exact makeup of any given crew on any given day, the decisions on the action plan could be different from tomorrow.

I ask my crews to first and foremost, take care of the public who is counting on you to solve their problem. That should be our first priority. I have officers who see the procedures as if they are checkoff lists and if they have completed the list by the end of the incident, then they have done their job well. This is the wrong attitude to take when serving the public. I expect that my best officers go beyond the 'checklist' mentality and will do what it takes to benefit the public first and the department next. And as you asked, to avoid this becoming a problem while on the scene of the emergency, the officer and crew need to go through how they will expand the department's procedures on scene at times. It will not be a surprise on scene, if they have also trained on the unwritten procedures and alternatives, and it makes for a better crew when they are all asked to think rather than just memorize. (Panel Member #7)

Panel member #4 explained this contradiction:

These two approaches do not really oppose each other. I can see why you ask this but as I said before, all fire officers are taught and are expected to be analytical during emergency runs. It is something they need to do and get better at over their careers. This analytical

aspect at the emergency scene then leads to understanding what is happening, what is the stage it is happening on, and what needs to be done to successfully solve the situation. Therefore, this leads to following procedures for that particular problem whether it is a gas leak in a house, a car accident, or an asthma attack at a school.

My crews practice but they are usually busy enough they actually perform these procedures on a regular basis in the field. The difference in what you asked is the good officers, and their crews, are able to look beyond the procedural algorithms and add something more to the solution. There isn't a procedure written which can handle every situation you will find in the field and our very best officers understand this and adapt the trajectory of their decisions. So, I don't see this as a contradiction. All our officers take a moment to analyze the circumstances they have arrived upon but our best officers go beyond and find the best answer to that particular problem by using procedures, their experience, and their intuition. (Panel Member #4)

The Delphi panel discussed that they have developed a sense of personal power and dedication towards the job they have agreed to do, especially for the emergency scenes they find themselves on. The panel stated that this is a must when trying to develop exemplar officers in the Fire Service. They felt that when there is a strong reliance upon the written procedures that their fire departments provide them, there is also a lessening of personal responsibility for the outcomes. When their officers follow a plan of action that they are told to follow, these same officers are able to expunge themselves from any liability for poor outcomes because they 'followed orders.'

Panel Member #5 stated this thought:

Exemplars are high-energy, take-charge kind of people. They are Type-A or A+

firefighters. It is evident in how they handle themselves in stressful situations but also can be seen in how they handle everyday relationships in the firehouse. Some of these officers needed little prodding to develop this but others gained through experience and being shown how to lead. I believe leadership can be taught and great leadership blossoms from both nature and nurture.

There are officers, unfortunately there are more than a few, that almost 'just get by' doing the minimum so they don't get disciplined. These same officers, on the fireground, don't take chances and just follow the protocols. A one-size fits all approach which solves most problems but is never the best solution for some situations. Officers need to take charge and believe that they can make an individual difference. That is what you will find in every exemplar! (Panel Member #5)

Panel Member # 8 stated in the second round interview:

The educational component is absolutely necessary for all officer candidates. Full knowledge and understanding don't come until there is the command experience to go with it. It is through the combination of these two that we get to see a good officer. But to get an exemplar, there needs to develop a personal growth in how they command and take personal responsibility as a leader. No exemplar sits back and says 'the book says we shouldn't do that' though the circumstances may require it. Exemplars are not afraid to make the hard decisions that some situations will demand. Every time the public calls for them to solve a serious problem, an exemplar looks for solutions, within their ability to provide, that are the most beneficial for the people in need. They don't rely solely upon some written course of action that might not fit the situation well at all. (Panel Member #8)

Panel Member #14 gave an example:

My department had an incident which reflects this issue. Years ago, a crew got a call on a possible person injured around three in the morning. They found a slightly intoxicated female who had fallen on the sidewalk in front of someone who had taking their dog out to relieve itself. The woman had scrapped knees but no other significant injury. She denied any medical treatment, signed an AMA (Against Medical Advice), and had no plan on how to get home which was miles away. The officer did not call for the police since he felt there wasn't a need for them and with the crew, left the scene. They were called on an Injuries from Assault run about 30 minutes later and found the same woman badly hurt after being robbed and assaulted. This became a significant media moment for our department which was quite embarrassing and costly. The officer claimed that he followed and had not deviated from the department procedures. He had a hearing and was found innocent of any charges because he had followed the procedure.

Herein lies the truth of the question you asked. I have found in my career that any person of average intelligence and motivation can study for a promotional test and possibly pass. They may eventually get promoted and from that point on, they are an officer making decisions on emergency scenes. During that career, they may find themselves having to make decisions in in-extremis circumstances. When those decisions are then based upon a written procedure that never could take into account all possible factors that would be involved, then do not expect that only good things will come from those decisions. We must do a better job of training our officers to be real leaders. (Panel Member #14)

Panel Member # 12 gave another example of the consequences of following procedures 'to a

tee':

My fire department had a poorly written procedure about when to enter a burning structure. It stated that certain tasks had to be completed prior to entry by the firefighting crews. There was an incident with a small fire from a person smoking. The victim was inside and actually on fire as verified by people who had already fled the house. The officer decided to follow the written procedure exactly and thus delayed sending in his/her crew to save the victim. The victim was quickly found once the crews entered and the fire was put out immediately but the victim died from his burns. The officer was disciplined but later had his/her rank restored because the Hearing Officer found they followed the procedure as written. Even the Hearing Officer agreed that that was the wrong course of action to be taken under those circumstances but it was the written policy at that time.

We are in the business where people's lives are at stake. The Fire Service needs officers who know their procedures but have room to make wise decisions when they are needed most. (Panel Member #12)

CHAPTER 5: CONCLUSIONS, INTERPRETATIONS, AND RECOMENDATIONS

Introduction

The research goal was to perform a mixed-methods design towards investigating how fire service officers that were identified as ‘exemplars’ made their decisions in the field during emergency incidents. As a mixed-methods design, this encompassed both quantitative and qualitative data collection and analyses, and then a final combining of these two data sets to determine if that created further and unique conclusions.

The quantitative portion of the research derived from conducting an online survey through the Qualtrics software platform. Demographic questions and the Rational-Experiential Inventory-40 (REI-40) were provided through a link passed on by the respective 17 fire department administrations, who had agreed to participate in this research, to their promoted fire officers. The REI-40 survey has been confirmed as being valid and reliable and evaluates a person’s self-reported skill at using and relying upon rational/analytical thinking and experiential/intuitive thinking.

The qualitative portion of the research came from a Delphi panel of 14 identified exemplar fire officers selected from the same 17 fire departments. The Delphi panel completed three rounds of semi-structured interviews, during which questions focused on the mechanics of their decision-making during emergency situations. Broader questions involving the Fire Service were also asked as frames of reference.

The mixed-methods portion of the research was developed from the second and third rounds of the Delphi interviews. The online survey quantitative data had been analyzed and the Delphi panel were asked their thoughts of that analysis and how it applied to the Fire Service.

This chapter presents the conclusions, interpretations, and recommendations derived from

this research. It begins by providing a quick review of the research problem, questions, and methodology. The research limitations and delimitations are then discussed, followed by the interpretations of the research data by each individual research question. General conclusions and implications for leadership are explored, followed by recommendations for possible future research, and finally ending with concluding remarks and thoughts.

Statement of the Problem

In-extremis circumstances (in the Fire Service, oft times referred to as immediately detrimental to life and health – IDLH) possess the threat that severe consequences may result. This is when the people (responders and victims) involved are at great risk and the significance of the decisions and actions made are far greater than those found in normal circumstances (Kolditz, 2007). So, the question arises, what are the characteristics which are more ideal in the leaders who command in these situations? Are there unique attributes found in those who successfully manage situations where time-critical and information-limited decisions must be made?

Many researchers in many publications suggest there is not enough emphasis on studying this specific area of leadership. More specifically, that there is not enough peer-reviewed literature and there is a significant need to further the academic and practitioner knowledge of ‘leadership under fire’ (Baran & Scott, 2010; Jager, & Kernic, 2017). It is possible that further studies of the circumstances involved in in-extremis situations and their leaders will have the positive effect of better preparing our future leaders, who must follow in the footsteps of those who now command under these circumstances. Understanding of the dynamics of successful decision-making and better preparation of incident commanders to lead during in-extremis conditions should bring about better results for the communities we live in (Coleman, 2001).

Research Questions

Quantitative Research Question:

- RQ1 - Are there statistically significant differences between the identified in-extremis exemplars and the general fire officer population in the REI-40 (Rational-Experiential Inventory-40) scores?

Qualitative Research Questions:

- RQ2 – How do the identified in-extremis exemplars report they make decisions during emergency situations?

Do they rely upon self-initiative and independent decision-making paradigms, do they become more fluent and proficient with established policies, protocols, and procedures over the duration of their careers, do they combine these two approaches, do they actively deliberate possible options, do they consult others as to their opinion, or do they utilize other decision-making paradigms?

- RQ3 – Based upon the Delphi panel responses, to what extent did the three leadership theories emerge as themes within the context of decision-making during in-extremis circumstances?
 - Recognition Primed Decision-Making
 - Complexity Leadership Theory
 - Hands-On Leadership
- RQ4 – What were the Delphi panel responses to whether organizational change within their respective departments and the U.S. fire service as a whole is needed?

Are there significant changes in the short-term and/or long-term that should

be pursued? In an industry which is commonly referred to as strongly 'tradition-based, is this a positive or negative to the fire service overall? What is the ease or difficulty of implementing changes in the fire service?

Review of Methodology

An initial challenge during this research was how to identify 'exemplar' fire officers. It is important that there was a relative continuity or standard as to who the research was investigating. Since there isn't an actual rank or achievement level in fire departments which is labeled as 'exemplar', it was key to define who these people were, differentiate them from 'general' fire officers and confidently group them together. A literature review was conducted for characteristics/traits of command officers from military and public safety services journals and publications, and from this literature review, a list of twenty-five characteristics/traits were identified. An online survey was conducted with 64 Chief Officers participating, who were asked to rank in importance, the 25 traits as to what they believed were the characteristics held by fire officers who are exemplars in field command. Additionally, the Chief Officers were asked if other demographic traits such as time in the fire service, time as a promoted officer were also important in developing exemplar fire officers.

The Chief Officers' responses were calculated and the twenty-five traits were placed in positive and negative standard deviations. There were thirteen traits which scored in the positive standard deviations (see Appendix B). These thirteen traits were selected and were combined with the suggested generalized demographics to create an officer trait list which was then used as a primary component for selecting the exemplar fire officer group for this research. The researcher realizes there are other intangibles, that may not be able to be written as a check-off list and are involved in the components of exceptional performance (Dracup & Bryan-Brown,

2004). Each participating fire department's selecting officer was asked to use the characteristic/trait list as a reference guide, but their professional knowledge of their officers was factored into the selection process as well. Depending upon the individual department's situation, some departments only identified their exemplars for possible participation, some included all their officers as a general group, and others split their officer cadre into exemplars and non-exemplars for the study's purposes.

Career municipal fire departments in the Midwest were initially contacted via phone and email to the Office of the Fire Chief/Commissioner to find out whether their department would be interested and willing to participate in this study's research. Twenty career departments were contacted and seventeen agreed to participate. Based upon how the department wished to be involved, a departmentally chosen selecting officer (in most cases, either the Fire Chief or a Deputy Chief in his/her staff) emailed the voluntary participation request to their officers to complete the online survey (REI-40) and demographic questions or be involved in the Delphi panel.

This research followed a mixed methods approach to gathering and analyzing the data. The quantitative portion of the research was collected through a survey Rational-Experiential Inventory (REI-40) which was electronically distributed through the online website, Qualtrics.com. The REI-40 is explained in further detail in the following section. The quantitative data was analyzed using the IBM® SPSS® Statistics (SPSS) statistical software platform.

The qualitative portion was collected through multiple rounds of Delphi-style interviews via the Zoom.com online meeting software. Fourteen members made up the panel and they were each selected by their respective fire departments as 'exemplars' in field command. The

qualitative data was evaluated through the process of identifying expressed codings, and then utilizing those codings to develop overarching themes from the interviews (Creswell, 2009).

The mixed methods portion analyzed the results of the survey and brought the survey results back to the Delphi panel in the second and third interview rounds. Participants were asked their thoughts on the results of the survey and how they interpreted those results based on their own understanding of the relative importance of critical and intuitive thinking versus reliance upon rote or analytical thinking to achieve success during in-extremis circumstances.

Study's Limitations and Delimitations

Limitations

Most research has its limitations and this study is no exception. As stated above, there is not an official designation in the Fire Service in general, or any of the participating fire departments of an exemplar rank, certificate, or paygrade. Thus, it became important to the research to establish parameters for the term exemplar. The researcher developed a set of traits and demographic stipulations, but also left the final decision up to the tacit knowledge of the Selecting Officer of each participating fire department. This could possibly lead to varying picks between the fire departments, which in turn could hinder generalizations to be made from the study's results and findings.

Another limitation of this study occurred in the larger participating fire departments. There were fire departments which have over 1000 personnel. The Selecting Officer is not familiar to any great extent with many of their officers and thus could not possibly know how each individual officer should be placed against the trait checklist. This is a normal phenomenon of large human organizations and was expected by the researcher. In the case of the larger participating fire departments, the Selecting Officer utilized additional operational fire officers to

confirm with or only put forth those officers he/she was positive fit the exemplar description.

The individual participating fire departments chose how they would participate in this research. The research and its process were explained to the Selecting Officers, both verbally and electronically. Some of the Selecting Officers felt that differentiating between 'exemplar' and 'general' officers would be too time consuming. Some fire departments chose to send the 'exemplar' link only to their chosen few exemplars, others chose to separate the online survey links between their exemplars and general officers, while other fire departments decided to send the 'general' link to all their promoted officers. This limitation of the research did not interfere with the process of the study since the exemplars were chosen as such and the 'General Fire Officer' group for the online survey did include both exemplars and non-exemplars thus fitting the definition of 'General Fire Officer.'

Two other limitations of this study involved the Delphi panel portion of the study. The panel members were asked 'big picture' questions concerning the Fire Service as a whole. The researcher understood that each individual would have had some experience outside their specific fire department but most likely would not have extensive dealing with departments in all regions of the United States. The thoughts expressed by the exemplars on the Delphi panel might be limited in the scope of applicability to the entirety of all U.S. fire departmental jurisdictions.

The other limitation found with the Delphi panel is the question of how accurate self-reported diagnosis are, especially after the fact. It seemed to the researcher, over the course of the three rounds of interviews, that each panel member was introspective in how they answered the questions and appeared well-versed in why they had chosen their courses of action during their encounters with in-extremis circumstances. As a researcher, I do believe that there is a truth to this since my personal experiences when involved in in-extremis situations are they leave a

strong and lasting impression upon one's self that is not hard to recall.

Delimitations

This study's design was meant only to investigate those fire officers who were exemplars in field command. This limitation set itself apart from those fire officers who may excel in administrative, logistical, or training capacities for their departments. Each of these has its essential need in leading organizations and this study did not intend its research to be an implied critique of those endeavors by comparison.

The research was only conducted on municipal career fire departments. The majority of firefighters in the United States are rostered on volunteer fire departments. According to the U.S. Fire Administration, of the 27,000+ fire departments in the United States, approximately one third are career departments but they cover about 70% of the population. It is possible that there might be a difference in what the data would have shown if this included volunteer fire officers also or was exclusively volunteer fire officers. Due to the frequency of incidents and the level of experience that increased frequency affords; this research was exclusively limited to career fire officers.

The research included 17 municipal career fire departments, all of which are located in states east of the Mississippi River. Since no departments were recruited in western regions of the U.S. it is possible that if there are particular regional differences in in-extremis decision-making, they would not show in the results and findings found in this research.

A final delimitation in this research was that I, as a researcher, revealed to the Delphi panel members during the first round of interviews that I was an active career fire officer with the rank of Senior Battalion Chief going on 29+ years of experience. This led, hopefully, to fuller and more dynamic discussions with less explanation of terms and fireground circumstances but

may have also led to a differing variety of answers compared to if I hadn't informed them.

Research Results and Findings by Research Question

Research question #1

Are there statistically significant differences between the identified in-extremis exemplars and the general fire officer population in the REI-40 (Rational-Experiential Inventory-40) scores?

As explained earlier in the dissertation, Pacini and Epstein's (1999) Rational-Experiential Inventory (REI-40) looks at two different cognitive processing mechanisms; the rational/analytical and the experiential/intuitive modes of decision-making. Each of these is divided into two separate subscales of 'Ability' and 'Engagement'. The 'Ability' subscales evaluate the self-reported level of skill by the subject. The Rational Ability (RA) asks 10 questions aimed at looking at the participant's ability to think analytically and logically whereas the Experiential Ability (EA) asks 10 questions to gauge the participant's skill at using their intuition and past experiences to think through problem-solving.

The other subscale, the 'Engagement' evaluates the subject's reliance upon using that mode of thinking. The Rational Engagement (RE) looks at the subject's tendency to utilize and enjoyment in using logical, rational thought processing whereas the Experiential Engagement (EE) measures the person's reliance upon intuition and a 'sense of a feeling' to process decision-making.

The independent variable, Fire Officer group had two categories; Exemplar Fire Officer and General Fire Officer. The two groups had 62 and 339 participants respectively. The qualitative analysis on the REI-40 online survey results did have some significant differences between the two groups responses. The Rational Ability scoring was similar with the Exemplar

Fire Officers having a higher score but it was not of a statistically significant difference. The Rational Engagement also did have a higher score for the Exemplar Fire Officers but this time there was a statistically significant difference between the two groups. The evaluation of the strength of the effect size though indicated a small effect. The Experiential Ability subscale had the Exemplar Fire Officers with higher scores than the General Fire Officers. This difference was statistically significant and the effect size was large. The Experiential Engagement subscale again had the Exemplar Fire Officers with higher scores and the effect size for this difference indicated a large effect.

Research question #2

How do the identified in-extremis exemplars report they make critical decisions during emergency situations?

Many types of decisions must be made throughout any given day by all on-duty fire officers, like most other people, in most other occupations. Some, if not most, are rather mundane while others can have a greater impact upon those these decisions affect. Even the fireground will invoke situations where decisions must be made that do not fall into any critical category that has life or limb hanging in the balance. But those decisions are not what this research was investigating. This has been a study meant to evaluate how do the Exemplar Fire Officers make decisions under high-speed, high-risk circumstances where the consequences deriving from these decisions can be severe in their positive or negative aspects. The fourteen Delphi panel members reached a strong consensus concerning how they personally make decisions during emergency incidents, most especially during the higher risk moments of in-extremis circumstances.

The Delphi panel stated repeatedly that it is very important for any good fire officer, but

essential for someone to reach an exemplar level of proficiency, to have a strong knowledge of the educational/academic foundation of what the Fire Service typically performs. In most municipal fire departments, this includes the eponymous firefighting, but also EMS, technical rescues, fire prevention with its associated fire codes and laws, public relations and education programs to name the more obvious. Not that an individual fire officer must be an expert in each of these fields, but that a more comprehensive outlook on the mission of their fire department gives them a more critical, fundamental understanding of the mission at hand. Knowing the physics of fluid mechanics, the pathophysiology of cardiac and respiratory disease processes, and the economic and ethnic makeups of the neighborhoods within your district to name a few, all lend themselves to developing a more useful wisdom. As Panel Member #10 succinctly stated, “know and understand all of what your job entails if you hope to do it extremely well.” Thus, the panel stated that a fundamental level of competency started with how well a fire officer has a basic fluency of the myriad of missions the Fire Service is tasked with, and an Exemplar would have a keener, more in-depth understanding of these duties.

The panel stated that beyond the assortment of textbooks that every fire department is educated on, there are the specific emergency procedures of their fire department. These are the written instructions of what actions should take place under certain circumstances. An Exemplar must know these and be able to recall them in the field with a high degree of accuracy. The officer, his/her crew, and their fire department can and have been held accountable to these procedures. These are written standards that can be brought forth in court actions, disciplinary hearings, and after-action critiques as the expected template to be followed. These are the sequential algorithms each member of that fire department is expected to learn and follow during their careers. The panel members did not waver on stating that Exemplar Fire Officers must

know their particular fire department's emergency procedures extremely well and know how to implement them rapidly and successfully.

The Delphi panel members expressed that there is another ingredient in their decision-making process beyond understanding the academic basis of their job and knowing the emergency procedures of their fire department. More than just performing 'by the numbers.' The panel, in a few forms, brought forth the question, what is to be done with the wisdom gained from experience if actions are to be solely dictated by prewritten procedures? They explained a dynamic, gained from their experience, which they described during the interviews as 'following their gut feeling,' 'having faith in their intuition,' 'just knowing what to do,' 'thinking outside the box,' and 'the decision was obvious.' In addition to the academic and procedural steps in determining what action should be taken, the panel members stated there is an element which is personally intrinsic to the decision-making mechanism.

It was expressed that they assess each incident with a broad, generic viewpoint, such as arriving on the scene of a vehicular accident with injuries, in terms of the written departmental procedures as the foundation by which all responders have a common knowledge of expected actions to follow. This allows their crews to initiate emergency actions without being specifically prompted. An example given by Panel Member #12 was when a fire crew arrives on the scene of a multiple car accident and simultaneous tasks should be performed quickly. All fire crews know to block traffic, assess, triage, and treat for injuries, extinguish any fires, contain any fuel/fluid leaks for environmental concerns, notify other needed agencies such as law enforcement, request medical transports, if needed, and call for tow trucks for vehicles too badly damaged to be driven. These are all tasks that are commonly found in written procedures and are pertinent to most injury accidents. They are very useful in instructing recruit firefighters and standardizing

responding crew's actions throughout their careers. The 'But' to Panel Member #12's example was that it covers the basics but not the particulars and the unique factors affecting the emergency that might be pivotal to responder safety and mission success. Some emergency scenes have only a few factors while others have many features which influence the direction and the outcome of the incident. These should be considered as best as the information is available while making the on-scene decisions on how to proceed and time allows. The Exemplars agreed this can only be accomplished by evaluating each incident in broad terms and also for what is unique to the individual circumstances.

The Exemplars stated they will go beyond a 'follow the algorithm' mentality. It was stated many times by each panel member that they eventually reached a point in their career as a promoted fire officer where they started to rely to a greater degree upon their 'gut feeling' about the circumstances that were happening in the emergency scene. They stated there aren't definitive indicators to tell them what exactly is going on during a complicated emergency incident nor is there a convenient list of all factors affecting the outcome of the incident that can be referenced. No two incidents are exactly the same. Panel Member #1 stated "that even when you go back to the same diabetic patient for the fourth or fifth time, the circumstances of the run can be very different from the last time we were there." Panel Member #5 expressed this same concern of ambiguity, "there are times when we find out a bit of information days later that would have affected some of the decision-making on-scene had we known then." The Exemplars stated that they rely heavily upon their experiences, both successful and not, that have gotten them to this point in their career.

The Delphi panel generally described their decision-making process as based upon the preparatory stepped sequences of education, procedures, and experience and the active phase of

critical and intuitive thinking. As explained earlier, there is the necessity of attaining the basic knowledge of the Fire Service and the multitude of the functions it is asked to perform. This knowledge forms the foundation of competence. Then, there are the specific written procedures that each of the panel members' fire departments have in place. The panel members were in full agreement that fire officers must know their fire department directives and procedures which contain the manner and method to discharge their duties on the emergency scene. But Panel Member #9 pointed out a sentiment expressed by a few other panel members:

My fire department has binders full of protocols, directives, and procedures. Some have not been updated in a decade or more. It is impossible for any one person to have these all memorized and be able to perform them all with total compliance in the field, even if they wanted. (Panel Member #9)

Panel Member #12 was more succinct, "My department has over a hundred emergency procedures which are written with a sequential order to be followed. Only an idiot believes crews follow these directives exactly."

The next two steps of the decision-making process, experience and intuition, were described as individual or personal components of their decision-making. Each panel member stated that their experience is essential to understanding emergency situations rapidly and devising and implementing successful action plans. These plans need be able to address unknowns as they might appear and meet the timeframes dictated by hastily evolving circumstances. Their career paths have given them a cache of mental alternatives and as Panel Member # 2 stated, has allowed them to use and depend upon pulling out the most appropriate tool from their mental toolbox to solve the problem at hand.

The Delphi panel also described something that goes beyond their experience — their

critical thinking and intuition. As Panel Member #8 stated:

There are times where the textbooks, journal articles, the department's procedures, and your personal experience do not have a definitive answer for the situation in front of you, but you must come up with a solution. You may be facing circumstances or problems somewhat unique to that incident. That is when one relies upon your intuition, your gut feelings, to come up with the plan that will work. (Panel Member #8)

This sentiment was repeated by all panel members. They stated, they as Exemplars, have developed a sense of reliance upon their own judgement and their grasp of the factors in play during the emergency incident.

There will be emergency situations which will surely arise that might be similar to ones experienced in the past and resemble the lessons learned from the texts but present distinctly different obstacles to success. The Delphi panel described these incidents as when they rely upon their intuition, their best guess, as the determinate for making their decisions. It was brought up by Panel Member #14 that not all experience gives you the correct answer to the question. There are those times when the experience was not a success, if not a downright failure. Then, experience can only tell one what not to attempt or how not to attempt. This is when the Exemplars must use their best acumen, their intuition, to decipher what solution to put into action.

The Delphi panel stated in a variety of terms, that when the circumstances of the incident are simple and straight-forward or are more completely known and the information is trusted, they were able to rely more heavily upon the department's written procedures. They did not have to interject as much of their personal interpretation of how to proceed. They were able to use a standard approach to handling the situation. But as the emergency incident became 'trickier', the

more uncertainty that crept into the mix, the more they had to rely upon the personal components of their decision-making process. Some panel members acknowledged in hindsight, that though these decisions may have been successful in the middle of the emergencies, their results were possibly not the approach they would take if those conditions presented themselves again. Thus, the range of their experience has increased. But when further queried on this, Panel Member #7 explained that there was no other option; that the department's procedures are at times, inadequate for the particulars of the incident and you must rely upon your own thoughts of how best to take action.

The Delphi panel members, to a person, expressed that they had all taken time and effort to educate themselves on the written materials of their trade. They had all been successful through their fire department's promotional exam process and had continually followed up with additional learning opportunities. As Panel Member #4 said in his/her 1st interview, "one must forever be a student of our trade or one slowly becomes less relevant." But the Exemplars clearly expressed that there was more to their decision-making than memorizing and that success hinged upon their ability to read and understand the miscellaneous cues involved. They agreed that rapid analysis is very necessary and must be mastered but using one's intuition to foresee the possibly different directions the emergency incident might take is just as critical.

Research question #3

Based upon the Delphi panel responses, to what extent did the three leadership theories/concepts emerge as themes within the context of their decision-making during in-extremis circumstances?

Recognition primed decision-making

As stated in Chapter One of this dissertation, the direction taken by this research was intended to be exploratory. But Recognition Primed Decision-Making (RPDM) has been researched within and applied to public emergency services in past studies. Thus, this portion of the research has an element of confirmatory analysis. A difference occurs, maybe somewhat subtle to some readers, in that this research specifically deals with fire officers who have been identified by their respective fire departments as exemplars in field command whereas the previous studies did not draw that differentiation, (see Klein et al., 1986).

The RPDM theory, deriving from the field of Naturalistic Decision Making and from the research of Dr. Gary Klein and others, was actually mentioned by four of the panelists during their interviews, with two other panel members acknowledging their recognition of the theory after the researcher commented on their answers. RPDM was developed partially through research of fireground commanders and how they quickly developed successful plans of action without weighing options, especially in light of the possible consequences of these decisions (Klein et al., 1986). This research found that Incident Commanders on the Cleveland Fire Department did not use a decision-making process where they contemplated different options of actions to be taken during the emergencies they commanded. The experienced fire officers were able to implement their first thought with a high success rate, whereas the less experienced fire officers contemplated various options and took longer to put an incident action plan (IAP) into operation.

The Delphi interviews indicated characteristics of the RPDM model of decision-making. Similar to the previous research findings, many of the Exemplar panel stated they are able to make rapid decisions during emergencies based upon their experience and 'just knowing what to

do.’ The fact that they have experienced or commanded emergency situations which either closely resemble or have many comparable traits, allows them to react faster than other fire officers. As panel members pointed out, there are times when the speed of the decision and the speed of the actions can mean life or death for the victims of the emergency.

There is more to this as stated by the panel members. Panel Member #8 stated, “There is more than just experiencing something, one must learn from that experience and integrate it into your decision-making abilities.” Not only does the quickness of the decision have importance, but the efficacy of the decision has a lot to do with whether there will be success or not. Panel Member #12 stated that there are fire officers on his/her department who can make quick decisions also because they have memorized the procedures thoroughly and will follow them with little deviation regardless of the incident’s circumstances. These fire officers were not described in a favorable light. Panel Member #3 reflected on this also:

The fire officers I work with that use the procedures as if they were the Ten Commandments, are adequate at best. You give them a complex situation and they stumble to come up with a good solution to their problem and their crews recognize this.

(Panel Member #3)

As repeatedly mentioned by the Delphi panel, their decision-making on an emergency scene, especially during in-extremis events, is a combination of what they have been taught and what they see in front of them. It takes similar experiences, a quick and critical understanding of the current incident, and some degree of personal intuition.

Panel Member #1 told me he knows of and agrees with the RPDM model; “There are times when the decisions come from almost a mental or muscle memory basis. Little active deliberation is needed.” Though RPDM might appear to be an automatic decision maker, it is

not. When a situation seems to resemble previous experiences, it might not be the correct comparison and the wrong conclusions about the threat might be made. Panel Member #3 mentioned he also finds the decision-making far easier due to his experience, but that risk/benefit analysis and margins of safety must still be evaluated during each in-extremis situation:

Decisions must be made quickly at times if people are to be saved and my crew members kept as safe as possible. That said, this isn't a sprint through the front door of a burning building to see who can get there first. That's how crews get hurt or worse. There is wisdom in the 'slow down, to go faster' philosophy. (Panel member #3)

Gary Klein (1998) describes intuition as stemming from the use of experience which allows the recognition of subtle and important patterns. Some of these patterns are only noticed at a cognitive level that defies even the participant from fully understanding their origin. He describes an interview with a fire officer who told of having a sense of ESP to 'know' when to order his crew out of a burning house before it collapsed. Panel Member #7 stated this in his terms:

My experience leans towards the RPDM model. I have found myself in emergency incidents where I knew something was going to happen even though there were not any obvious cues pointing in that direction yet. This sense of knowing something without knowing why is extremely helpful to an Incident Commander. Yes, I believe the RPDM model plays a key role in many of the circumstances we find ourselves sent to. (Panel member #7)

Complexity leadership theory

Complexity Leadership Theory (CLT) is derived from natural science studies and hinges upon the concept of complex adaptive systems (CAS). Complex adaptive systems are

characterized by having separate units within the organization, these units interact with each other, and this interaction helps to define and evolve the overall organization (Uhl-Bien et al., 2007). Career fire departments can be defined as such since there are multiple bureaus found within municipal career departments. One Delphi member has 14 different divisions/bureaus within his/her fire department's table of organization. These typically include the Command Staff, IT, Facilities, Mechanical Shop, Operations, Special Operations, EMS, CFO/Billing/Accounting, Internal Affairs, HR, etc. All these separate agents are intertwined for an overarching common mission but have quite different daily tasks and evaluate their performance on metrics that might only apply to their bureau.

An additional characteristic of CLT is it is assumed that there is an unavoidable tension between the administrative management and the front-line entrepreneurial thrust of the organization. This relationship of tension would appear on the surface to be a source of conflict, but when harnessed properly, becomes a beneficial incubator. The administrative side is the rule-provider, establishes standardization, and drives production. The entrepreneurial side of the equation in CLT provides the innovation and strives for increased learning and growth (Arena & Uhl-Bien, 2016). The emergence of new organizational dynamics then derives from the interplay of these two driving forces as long as there is room in the organization's culture for adaptability and change (Kok et al., 2021).

The CLT was first applied to the evolving world of knowledge-based industries more than to traditional manufacturing or the service industries (Uhl-Bien et al., 2007). There was greater room for flexibility and there was also a necessity for adaptation as the digital world has overtaken us in the last few decades. But the Delphi panel responses indicated the similar dynamics were happening within their fire departments as well. The front-line crews'

interactions with their communities were driven primarily by circumstances at times, rather than by procedures or policies. As has been covered already, the Exemplars will fashion the best solution to the problems facing them during emergency incidents by creative and adaptive answers in conjunction with standing procedures. These adaptive organizational behaviors can possibly be favorable for the fire department if they are performed for the correct reasons. As Panel Member #4 stated, “Officers don’t have license to just ignore written procedures because they do not feel like following them. Being lazy, forgetful, or just not agreeing with one, are not valid excuses for not following them.” If these adaptive interventions still achieve the procedural goals, advocate for the individual involved, and benefit the community as a whole, then they can be the innovations that are the impetus for the emergence phase.

The Delphi panel described actions on their part which represent the front-line aspects of CLT but differed in their statements about the administrative management handling of their ‘emergent’ solutions. CLT is less of a top-down hierarchical command structure and it flattens out the source of change in the organizational chart and places the emphasis of leadership upon the process of aggregation and emergence (Marion & Uhl-Bien, 2002, December, p. 8). CLT needs an interconnectedness of its parts to blossom, but static organizational structures and rigid leadership styles will impinge on the process of emerging trends. As Panel Member #11 pointed out, “There are times when the situation in the field was ripe for a deviation from the standard protocol so one does what is best, but you do not go back and announce for the administrative staff to hear your new idea. It’s usually wise to keep that to yourself.”

CLT describes an enabling style of leadership which allows the process of innovation to take place. A balance is struck between leaders implementing control of the organization and their facilitation of the natural conflict created by compliance and non-compliance with the rules

and regulations of the organization. As illustrated by Milgram's research into obedience to authority (1963) and Arendt's research into the trial of Adolf Eichmann (1963), a total compliance with authority and a lack of personal responsibility can have negative consequences for the individual and at its worse, grave ramifications for society in general. Front-line providers of emergency services must be granted some degree of discretionary power for the implementation of procedures based upon the circumstances they find themselves in which can also become the innovation for improved organizational fitness (Kok et al., 2021). Panel Member #2 said:

I have heard good suggestions of how to handle situations in the field from fellow officers who are out there 'doing it'. These aren't found in the procedures manual but are discussed over coffee in the stations' kitchens. I believe the Fire Chief might be surprised how things are really being handled on runs versus what is written in the manuals. It's a shame it has to be this way. (Panel Member #2)

The Delphi panel described an informal process whereby the CLT is partially implemented and mostly one-sided. The Exemplars indicated they incorporate critical-thinking and innovation to solve the circumstances they are faced with on emergency runs. These sometimes go outside the scope of the applicable written procedures. If discipline and recrimination are the results of these actions, then the CLT model falls apart and the individual fire departments, in these cases, fails to find a more beneficial and efficient manner to deliver their services to the public. As on a microlevel, complexity on the emergency scene requires solid situational awareness, on the macrolevel, complexity requires situational understanding, creativity, and teamwork. As the old saying goes, 'none of us are as smart as all of us!'

Hands-on leadership

An initial *mea culpa* for full disclosure; it is not accurate to refer to Hands-On Leadership (H-OL) as a theory. Instead, it is more of a creation of the researcher's experience and observations over the course of a 29-year career that led to its inclusion in the interview questioning and has shown promise based on a consensus of responses. The Delphi panel agreed with the use of this term to describe leaders who participate in the physical tasks he/she commands others to complete. The panel broke it down into two categories; when the participation is optional and when it is necessary.

The panel members described various situations when leadership must aid the efforts to complete tasks essential to the success of the mission. Most of these were situations involving emergency incidents where the available resources were insufficient for the tasks at hand. The panel members indicated repeatedly that these moments were the exception and not the rule. Panel Member #7 stated, like many of the other members, that "the Incident Commander (IC) has a crucial role to accomplish that directly impacts the safety of all involved and the overall success of the efforts on the emergency scene". It was stated that to forsake this specific role and focus on completing physical tasks, the IC becomes too narrow in their focus and loses the 'larger picture' perspective. Colin Powell (2012) mirrored this dichotomy when he answers the question of where should the commander be on the battlefield; "Where he can exercise the greatest influence and be close to the point of decision — the place where personal presence can make the difference between success and failure" (p. 56). He illustrates this point as applicable to the public sector and corporate world as much as to the military. He further states a commander should not become 'decisively engaged' so that he/she no longer has the ability to view the conditions on the battlefield and affect the outcome other than as an individual. Panel Member

#3 stated, as if he/she had read General Powell's words:

There are times, especially during in-extremis moments, that it is inappropriate for leadership to be 'Hands-On'. That is when a leader needs to be on their A-game and running the entire incident. But there are definitely other times when a leader needs to get their hands dirty and join his/her crew. (Panel Member #3)

The Delphi panel did agree that there are times when participating is not an option. They referred to the National Fire Protection Association (NFPA) policies of 'Passing Command' and 'All Hands'. These basically state that there are particular circumstances where the immediate need to save lives takes precedence over established chain-of-command and incident command structures. Panel Member #13 gave a personal example; he was the officer on the crew that was 'first in' on a working structure fire. There were confirmed juvenile victims still inside the house and the next fire engine in the running order was delayed. He passed command over the radio and his entire crew went inside to make the saves. This goes against the normal standard of the first arriving officer taking command (outside), walk around the structure to view all sides, and then assign incoming crews specific duties based upon his/her external size-up of the structure fire. This is a clear example of when a fire officer must perform the very duties that he/she is meant to supervise. Panel Member #11 gave an equally descriptive example where he/she was involved in an incident with multiple gunshot victims but not enough Fire EMTs and Paramedics were on scene to immediately perform needed medical interventions. As a Paramedic, he/she became involved with the physical tasks of saving one of the victims because to do otherwise, was most likely to let that person die. Panel Member #8 gave the interesting historical military example of the Battle of Rorke's Drift Station. This involved a greatly outnumbered British contingent of about 150 holding off an estimated 3,000 to 4,000 Zulu warriors. This was a no

quarter asked or given battle during the two-day battle at Isandlwana which resulted in thousands of casualties. This was an example of when leaders must no longer just command but must also participate in the actions of their subordinates if success is to be achieved.

As these examples would indicate, when the time comes that leadership must join the fray for success to happen, then leaders must maintain their technical skills also. Panel Member #6 said one of the benefits to leaders taking a 'Hands-On' style is they keep their technical expertise current. He/she clarified this:

I have found the longer I have been in a supervisory capacity, the rustier my personal technical skills have become. As a paramedic, I used to know the medical protocols very well and was able to perform our more complicated interventions pretty well but as I got farther away from the 'doing side' of things, the weaker those skill sets became. I take advantage of the opportunities to get dirty and help out the crews whenever it is appropriate so I can remain capable of helping when the situation will become necessary.

(Panel Member #6)

Panel Member #5 stated something similar:

One of the reasons I help the crews out, other than they deserve a leader who won't think twice about doing so, is it also demonstrates that I still am competent at the duties I command them to do. It's simple; if they don't believe I can still do the job, why should they follow me? (Panel Member #5)

In addition to the moments when hands-on leadership is a requirement of the situation, the panel stated there are those times when it is optional. The panel agreed that these times are when leadership can make a significant impact of their crews. Leadership is tied to the hip with Followership — helping the crews a leader commands when it is not required or expected, is one

way the panel said would strengthen that dynamic. When a leader has something that needs to be completed, such as a meeting or a report that must be submitted then, at the same time as other duties are being performed by their crews, there is not a choice. But panel members indicated that when they had nothing pressing, they should help their crews out. Panel Member #10 indicated that whether it was cleaning his/her own office, helping to wash the fire rigs (vehicles), or training with the crews, this went a considerable distance towards developing a greater loyalty to his/her command presence. Panel Member #5 stated similarly that:

When crews see me taking time to physically help out, they know that I do not feel like I'm above them. They understand that I'm just one of the crew and I have their backs. My job duties have changed but not my attitude towards them. (Panel Member #5)

These statements led to follow-up questioning of how does this affect in-extremis situations? How does emptying a trash can or washing a fire truck mean that they could command emergency situations better? The answer by all panel members was that it establishes who they are and creates stronger unit bonding. The fact that there become shared efforts to accomplish the overall mission, even if just small duties, means a clear delineation between leaders and those led, becomes somewhat gray. Panel Member #1 said:

When a leader is passionate about the job, this helps to inspire the people they lead. And when they also take the time to help out around the station house with simple chores, they show that they are one of the team. The crews then start to believe in the leader more as a person, than as a rank. This is when an officer starts to become a leader rather than a supervisor. (Panel Member #1)

The Delphi panel indicated that the orders they give sometimes put the men and women under their command into harm's way. They stated this is very different from the more common

management/labor relationships in that the consequences of things going wrong during an in-extremis event can have lifetime effects. All fire crews know this. Their crews have to believe their leadership is competent and advocate for them and their well-being. Panel Member #4 stated that:

Good leadership is not a 'class status' but a job responsibility to be taken very seriously when people's lives are at stake. I'm not any better than those I lead and I better not show otherwise to my crews. They need to know that I'm their advocate and when I'm helping out, what you called 'Hands-On', they see that I am not too good to be part of the team effort. They'll trust me more when the sh.t hits the fan and they have to follow my lead.

(Panel Member #4)

Cooperation and collaborative efforts are what the panel described as they would work alongside their crews. Panel Member #2 stated:

The best way to create a team is to work in the trenches with the men and women you lead. If there is hard work to be done, a true leader is in the middle of that helping to get it done. So, if you want an in-extremis situation to go well when it happens, you have to have developed your people to believe in you and themselves. (Panel Member #2)

Another advantage which comes from the 'Hands-On' approach to leadership was brought forward by Panel Member #9:

Succession development is a benefit of conducting oneself as part of the crew whenever possible. This way you are able to mold the next generation of your fire department's leaders at the same time you demonstrate how it is done. There are enough officers out there who don't show the same drive after they got promoted as before they were given bars (the rank of Lieutenant). (Panel Member #9)

Research question #4**What were the Delphi panel responses to whether organizational change within their respective departments and the U.S. fire service as a whole is needed?**

As acknowledged as a limitation of this research, individual Delphi panel members may be somewhat limited in their scope of comprehensive criticism of the Fire Service in the United States in its entirety. That said, the thrust of this aspect of the research was not to develop a survey that would stand the test of statistical analysis but to develop a scope of themes coming forth from the Delphi panel of expert field commanders. This line of questioning about organizational change was also an attempt to elicit whether a consensus would appear over the course of the three rounds of interviews. The initial discussions during the first round of the Delphi interviews did bring forth some change issues which were clearly individual issues of the members' fire departments or municipal jurisdictions but many of these were able to be broadened into general themes affecting the Fire Service over the next two rounds.

The initial consensus which appeared, even in the first round of interviews, was that their individual departments and the Fire Service are both too slow to embrace and adopt change. The expressed feeling was that the corporate world and the military have to remain on the cutting edge and thus adapt quickly or become vulnerable to competition. There were some reasons given during the interviews for individual departments and the Fire Service's failure to adopt timely change. A few of these reasons reached consensus by the third round of interviews. The panel members agreed that these factors were in play, but their influence might vary based on an individual fire department's circumstances.

One of these factors to which all agreed, was that municipal fire departments do not face any competition and little, if any real evaluation of their performance. There are normally no

alternatives for their services. When people have choices on how to spend their money, market dynamics usually prevail. When tax dollars are proportioned in only one manner for an essential need, necessary change loses its imperative. Panel Member #6 stated that his/her fire department clearly has a monopoly over the services it provides within its jurisdiction: "It's not as if someone can call 911 and request a different fire department or EMS provider to show up instead. It's us or it's no one. We have a solid monopoly without any other option." Panel Member #11 similarly stated, "If you don't like Home Depot, you can go to Menards or any other hardware store around, but we are the sole provider of our services within my city. If our citizens have an emergency, they get us."

In addition to monopolization of services, there is the concern that professional evaluation of the manner and method these services are provided falls back on the very fire department being assessed. Panel Member #4 elaborated:

Fire departments rarely publicly criticize each other so who really tells the community how well we are actually doing our job? The phrase sometimes heard in the stations 'all fires eventually go out' is on target. There is little to no oversight of how departments conduct business outside our own organizations." (Panel Member #4)

But Panel Member #4 also pointed out that there is an exception to this though:

EMS is the one area where other organizations can weigh in, such as hospitals, clinics, and doctors, but their critiques almost never are done in the public eye and normally take the form of complaints made over the phone or via email. Basically, it would have to be terribly egregious to go beyond that. (Panel Member #4)

Numerous other factors which stall change in the Fire Service were mentioned. These include tradition, intransigence, lack of incentives, limited resources, and an industry-wide blue-

collar mentality. Panel Member #14 stated in his/her third interview that:

Most times, the Fire Service views itself as fundamentally a physical set of job duties and therefore why change? An axe, a ladder, and a pike pole haven't changed in over a hundred years. Even though EMS is now 80-90% of what we are asked to do, we still call ourselves firefighters. (Panel Member #14)

On the heels of Panel Member #14's comment, EMS was repeatedly brought up as the area which all panel members believe will continue to change the Fire Service. Since the National Academy of Sciences groundbreaking paper, *Accidental Death and Disability: The Neglected Disease of Modern Society* was published (National Academy of Sciences & National Research Council, 1966), EMS has become progressively more involved in the U.S. Fire Service. In the researcher's own fire department, the initial paramedic protocols in the mid-1970s were 42 pages long and in 2022 they now they exceed 1000 pages. EMS was reported as the area of services which will and must change. Panel Member #9 mentioned:

As newer techniques and technologies are developed in the medical field, our communities will expect them to be utilized at the scenes of the emergencies if capable, especially if it means life or death or even if it just means better comfort care. (Panel Member #9)

Panel Member #14 again weighed in on this issue:

Though few circumstances exist where fire departments get criticized openly, if they fail to add better life saving interventions into their EMS protocols but their neighbor departments do, they face the chance they will explain that in court. (Panel Member #14)

Community paramedicine and interventional clinics were brought up during the interviews. Both of these are usually combination efforts between fire departments and other

medical providers to bring better medical care to the community and reduce the number of 911 calls for non-emergency incidents. The involvement of multiple agencies within the community can also develop a greater faith among community members in the organizational intent and motivation to provide these services (Roman, et al., 2008). Each panel member said that their fire department has only seen an increasing demand for their services even though some of the panel members indicated that their jurisdictions have lost population over the last few decades. As some cities face fiscal concerns, which some of the panel members come from fire departments in 'Rust Belt' cities, increasing the number of fire stations and firefighters is not a feasible consideration. Thus, employing alternatives to the standard method of sending fire ambulances and trucks to all EMS calls was mentioned by most on the panel as advisable if not soon to be essential. Panel Member #2 discussed the increasing number of runs he/she goes on during their tour of duty:

The runs keep increasing as people call for everything and anything, especially for minor medical issues. My city will have problems increasing our response capabilities to match this growing issue as people and industries leave town. That is why we have started our Paramedicine program to be proactive and bring the appropriate treatment to those not in need of big red trucks with lights and sirens. (Panel Member #2)

Another issue which the Delphi panel agreed will bring change to the Fire Service is the concern of limited fiscal resources. All Delphi panelists agreed that their revenue projections do not match the expected needs of the future. Union contracts, increasing call volume, decreasing tax bases, aging populations, and added responsibilities were all discussed as pertinent factors which will require adaptation and change in the foreseeable future. Panel Member #8 stated that he/she believes the municipal Fire Service, except for those few cities currently with a financial

surplus, will have to change in some manner:

The Fire Service is the 'All Hazards' service provider for most communities and as another task is assigned, it increases the financial, equipment, and human burden upon the system. My fire department just added grain rescue, active shooter, and pandemic response protocols to our already lengthy list of duties. I'm not bitching about providing these services but when do we find the time and money to equip and become proficiently trained so that we do some good for the community and don't hurt ourselves in the process? (Panel Member #8)

The panelists commented most of their jurisdictions would be hard-pressed to approve increased tax proposals to offset the differences between what can be paid for and what is being asked. It was stated that a tipping point might not be too far off in the future. Panel Member #11 stated:

It won't be a popular option, but my department, and some of those around us, might have to reduce what we respond to. We cannot keep going to people that have been ill for 3-4 weeks, or stubbed their toe two days ago. Society has reached a point where calling 911 seems to be the panacea for all their problems but they don't want to have to pay more for this service. Things will have to change eventually. (Panel Member #11)

Panel Member #5 echoed this sentiment:

Fire apparatus, equipment, training certificates have all become more extensive and thus cost more. Somewhere along this path, things become too expensive to continue as is. The fire departments are the 'All Hazard' catchall organization for their cities and have always taken on the next project with a smile. But I'm not sure how long this can last. (Panel Member #5)

The last issue which a consensus was reached by the Delphi panel concerning change in the Fire Service is diversity and inclusion (D&I). Hiring decrees have been in place for many fire departments over the last 3-5 decades. This researcher's fire department had a federal court decree ordered in 1974 to rectify discrepancies in hiring and promoting. As the panel mentioned in their interviews, seeking better ethnic and racial diversity and inclusion has been a concern over their careers but became more of a 'hot topic' since the events of 2020. As Panel Member #5 stated:

The Fire Service should, no, is required, to adapt to societal changes and the past few years has brought about escalating changes that must be matched by service providers such as our fire departments. For all the possible reasons the Fire Service is slow to change, none are as important as the need to stay current with what our communities expect of us. (Panel Member #5)

Panel Member #14 stated:

None of us really like being told what to do and the Fire Service is no exception. But how do you justify conditions which are no longer acceptable in our country. What was wrong a century ago is wrong today and needs to be corrected. (Panel Member #14)

There are moral imperatives and legal precedents which address the reasons for giving everyone equal opportunities to those things found in our society. The Fire Service has had to deal with its share of addressing these concerns. Panel Member #10 said of his/her fire department:

We don't see many applicants other than white males so we pursue recruiting candidates who will help to make us more inclusive of our community as a whole. Some might see this as an added burden but doing the right thing is always the best approach. (Panel

Member #10)

Some departments have had specific and detailed directions handed down to them on how best to solve this issue. Panel Member #12 stated:

My department had both a court order handed down in 1985 and directions from the city enforced on how many of each race and gender would be hired and moved into the promoted ranks. This wasn't greeted with much enthusiasm but was the right thing to do in the end. Since we reached an acceptable level of compliance a few years ago, the court order has been vacated. (Panel Member #12)

Similarly, to all other panel members, Panel Member #1 stated:

Fire departments rely on gaining the trust of their communities if they hope to accomplish their mission. People let us walk right into their houses and start performing medical assessments and treatments though they have no idea who we were minutes beforehand. They have to trust us without any concerns. When the fire department doesn't look like, or understand the culture of their community, they slowly lose that trust they had built up. (Panel member #1)

There was one other caveat to the diversity and inclusion issue. All fourteen panelists commented that D&I is very important but should never take priority over organizational competence. The mission provided by career municipal fire departments has a sanctity which cannot be forsaken. The need for D&I is obvious and essential for fire departments to accomplish their duties in modern society but must be achieved through hiring and promotional methods which ensure quality candidates are put in those positions. Panel Member #9 stated:

Nothing should ever stand in the way of the Fire Service effectively completing their missions. People count on us getting to their emergency and solving their problem

quickly, safely, and absolutely. Diversity and inclusion need to be achieved and maintained but through processes which brings on the best people possible. (Panel Member #9)

This idea was repeated by Panel Member #1:

Diversity and inclusion are important and essential in modern societies but cannot dictate how we operate. Trust, confidence, competence, and motivation are not tied to a race, gender, or religion. They need to be achieved but not at a sacrifice in mission performance. (Panel Member #1)

Panel Member #5 reiterated that he/she couldn't agree more with the push for D&I:

The candidates need strong basic qualifications before being considered for hire or promotion; then diversity concerns can come into play. Diversity and inclusion can be achieved without any decrease in organizational performance. That is just the old tired argument from people who don't want to see change. (Panel Member #5)

Some of the Delphi panel used different tones when discussing this issue, some seemed to emphasize the need for continued change at a more rapid pace. Panel Member #12 said:

We have been waiting too long in some fire departments for them to do the right thing and it has taken the courts to force what should have been done voluntarily. Yes, I agree with the other panelists' comments that all fire departments need to rollout on emergency runs and do their very best but that can be accomplished with a department that looks like the community itself! As I have always said, give everyone an equal chance and choose the best. (Panel Member #12)

Implications and Recommendations

Implications for leadership practices and policies

The Delphi panel indicated there is a need to develop professional development programs for fire officers that would better prepare and sustain professional improvement throughout their careers. The Delphi panelists repeatedly stated that there was little to no preparatory training prior to being promoted or continuing education in the area of leadership once they were promoted. The promotional process described by many of the panelists involved a reference list of materials which was established by a committee or the Human Resources Department. They were tested on their rote memory capacity of the materials rather than their ability to synthesize and apply this knowledge. Panel Member #9 said:

We were given a list of books and in-house materials to study. There were almost 2,000 pages to read and try to memorize. If you scored well enough on the exam, you were eligible to continue down the promotional path but no one seemed to officially give a damn whether you really understood the material or not. So consequentially, you get officers who seem to struggle throughout their careers. (Panel Member #9)

Some panelists stated their fire departments are busy and the required training hours for maintaining Fire, EMS, and Technical Rescue certifications plus the normal daily emergency runs takes most available time. Panel Member #3 mentioned:

Training officers, either before they get promoted or after, seems to be such a low priority that it never happens in my department. We are told by Headquarters that we are just too busy to make something like that work.” Panel Member #6 said, “Officer development falls on the responsibility of each individual officer. My department acts as if you passed the promotional test, you must know your stuff. (Panel Member #3)

As the fields of Management and Leadership have expanded their knowledge and more theories come into practice, the Fire Service needs to stay abreast of these changes. As the more recent cohorts/generations, especially the digital age new hires, are hired onto the departments' rosters, how departments manage the future will need to adapt to be successful. The advent of the 'information age' means the methods which succeeded a few decades ago, might not produce the same results. Post-digital cohorts react to and succeed utilizing different personal motivations and stimuli than their parents did two decades prior (DiRomualdo et al., 2018).

Another implication for leadership in the Fire Service which follows in the footsteps of officer development is the particular style of decision-making outlined by the REI-40 survey and the Delphi panel. The panelists discussed their reliance of using their personal initiative as a capable resource during emergency incidents, especially when facing in-extremis moments. They stated they are required to know (and do know) the written procedures their fire departments have instituted. These are the actions the responding crews are expected to follow based upon the nature of the emergency. Many of the panelists stated their departments take an administrative view which conveys the organizational philosophy that these procedures are immutable and deviation is unofficially discouraged, if not outright officially disallowed. An example might be, that a medical run on a diabetic patient should look the same from a response perspective as per following the sequential procedure regardless of the circumstances of the run; whether the patient was involved in a car accident, structure fire, just sitting at home, intoxicated, overdosing, denying aid, or any number of other possibilities which could affect a best-case solution.

The panel members repeatedly mentioned during their interviews that they believe the best actions they can take for the community member who called 911, is to weigh the factors involved in the incident and proceed accordingly. None of the panel members suggested they

would not properly treat a patient or any emergency scene for that matter; they just said that no procedure can anticipate all conditions to be encountered and thus individual factors must be determined as to how they affect the needed solution.

The Exemplars who responded to the REI-40 online survey and on the Delphi panel, indicated they have a preference for utilizing critical thinking and personal intuition. They responded that they have gained a faster ‘sense’ of what is going on in the emergency incident and can better anticipate what is needed and will be needed as events proceed. This heightened situational understanding and awareness is best augmented with the flexibility to take the most appropriate decision-making direction the circumstances demand. Specifically outlined procedures which allow little freedom at the ‘point of attack’ can only address generic issues. Nor can they fully grasp the synergistic effects that multiple factors can play on each other and cause unforeseen consequences. The wisdom gained through experiential success and failures must be allowed its place in facilitating the best response at the moment. The fire officers on-scene must be afforded the capability of making crucial decisions when they are the ones faced with the real-life emergency and its possible impacts. But these decisions and actions must always be professional and must also meet the reality of after-action review and liability concerns. Fire officers who are motivated, conscientious, and well-trained should be expected to utilize their discretion and intuition to achieve better outcomes on the emergency incidents they are asked to resolve.

On the heels of these first two implications is the suggestion that the organizational management practices in the Fire Service should become more inclusive of on-scene decision-making flexibility. There will always be the need for departmental regulations in the forms of procedures, protocols, policies, directives, rules, etc. Any organization must have a basis for

continuity and common direction but there must also be acceptance of when deviation from these achieved a better outcome. Fire Service commonly refers to itself as a semi-military structured industry with its clearly delineated rank structure and chain-of-command. Personally, I have heard this comment dozens of times throughout my career. Ofttimes, with this comes a form of authoritarian leadership style which can require adherence to all orders given which would also include written standing orders such as procedures. Since there is a natural propensity to encounter a limited tolerance for unique decision-making within such an organizational hierarchy, it becomes important that acknowledged efforts and internal departmental mechanisms are emplaced to counter this dynamic. Fire officers should know that they will not be summarily disciplined for creative solutions that meet the test of intent and success.

Efforts can be instituted, such as establishing standing, not ad hoc, procedure review committees comprised of all levels of decision-making within the department, an incident review process of the intention and outcome of deviations from procedures prior to initiating disciplinary proceedings, and initiating actual efforts to increase organizational knowledge by incorporating lessons learned from the creativity displayed by their own officers during emergency incidents. These are all examples of how the Fire Service can develop an organizational philosophy to encourage the wisdom which can come from the experience which is inherent in the job itself.

The Fire Service can still rely on regulations for many of its administrative actions while still nurturing the experience and intelligence of its response personnel. Panel Member #8 gave the example of the story where California Highway Patrol officers (CHP) were involved in a gun battle in 1966, known as the Newhall Incident. They had been instructed throughout their careers to always reload all 6 bullets in their revolvers and to collect the spent brass casings. This was a

procedure stemming from the annual weapons qualification on practice ranges. One of the criminals approached the officer while he was reloading his revolver and killed him. The officer was found to have already collected the six fired casings and had five bullets reloaded and was attempting to reload the last round. Why didn't the officer use the five bullets already loaded? Why did he take the time to collect the fired casings? Because he was taught a procedure that was strictly enforced by the CHP and not to think beyond that! This drives home a lesson about organizations which decide their policies and procedures are to be considered sacrosanct and not up for debate, even during in-extremis moments. The Exemplars in this research have given a clear direction for the Fire Service to consider merging into their current manner of conducting business. Panel Member #1 made a comment which hit to the heart of this thought, "I have always considered the phrase, 'None of us are as smart as all of us' to describe how I, my crew, and my fire department should view our leadership philosophy." The Exemplars repeatedly expressed how the experience they gained over their years of leading others in in-extremis situations has provided them with the ability to apply successful solutions not found in their written procedures manuals and this decision-making process should not be hindered but encouraged and developed.

A final implication for leadership during in-extremis circumstances in the Fire Service is the strength that experience plays as a catalyst for leadership development. This research understands that the Delphi process is information garnered through self-reporting and is therefore subject to the potential frailties of qualitative analysis rather than utilizing strict quantitative data and its associated metrics. When the Delphi panelists report that they make better quicker decisions through the lens of accumulated experience, they are stating what they 'feel' is going on with them. There are two factors which lend creditability to these self-reports.

The Delphi panelists were consistent throughout all three interview rounds that their experiences play a pivotal role in their development and their Selecting Officers specifically picked these Delphi panelists as demonstrating exemplar skills on emergency scenes for their fire departments.

All of the Delphi panel members indicated that they developed better critical thinking skills over time and their ability to rely upon their own intuition strengthened as they gained more experience in the field, especially involving emergency scenes which required them to think through procedures and create a modified solution. As this would strike most as relatively self-evident and not truly note-worthy to any great extent, there was the point brought forth that experience does not always produce the same desired outcomes. So, the question was discussed, why is experience a seemingly essential requirement for the development of exemplars but has little effect on other fire officers? As Panel Member #13 pointed out bluntly:

Some of our officers have gotten lazier the longer they have been on the job. They seem to attract firefighters to bid over to them who develop the same damn bad habits. You know who they are and you sure as hell don't count on them when things get tricky.

(Panel Member #13)

The panelists talked of a period of transition in their promoted careers when they were still uncomfortable with deviating from the established departmental procedures. A time where they felt that they needed to implement a different action to solve the situation but were reluctant to go that direction because it was against standing orders. Panel Member #1 stated:

There is that time when you know that you should change the course of action to have a better solution to the problem at hand or it is safer or it seems to be more efficient. But it goes against the procedures I have learned and trained on for years. At first, I didn't make

any drastic moves in my decision-making but eventually, I grew more comfortable making my own decisions on scene. (Panel Member #1)

This sense of decision-making evolution was duplicated by Panel Member #9:

There was almost a sense of breaking through when I came to the point where I was ready to implement the best actions regardless of written procedures. Not that I was purposely saying to hell with what the department has established as standard actions to be taken but there are incidents where we realize other things should be done and 'just following orders' is the wrong thing to do. (Panel Member #9)

Panel Member #8 brought up his/her thoughts on why some fire officers don't develop a better ability to make be creative:

Not all average fire officers are so because they do not have the capacity to be better. Some never get out of the mindset that they have to adhere to a strict set of procedures despite what they know to be a better course of action to take. Some officers eventually give in to their 'better angels' and start making decisions which make more sense while others wallow throughout their careers following what they learned at the very start of being an officer. Some officers don't seem to have the ability to grow beyond their administration stating they know best. (Panel Member #8)

Although all firefighters know established procedures and could therefore be expected to react in the same way to a given situation, a fundamental question is whether it is actually better and safer for fire officers to rely more heavily on their own intuition. Is deviation away from what is written and known by all is more productive on emergency scenes? The Delphi panelists, in relative unison, stated that they made better, more efficient and appropriate decisions later in their careers as they used a modicum of flexibility. As James Cavanaugh stated in his interview

(Rush, 2003), procedures can be the ‘great equalizer’. As new officers are taught procedures, they gain from learning current industry best practices but if they are required to follow those same procedures throughout their careers without deviating from them, then they have failed to take advantage of the wisdom gained through experience. The officer, the department, and the community they serve all lose out.

This research implicates a strong recommendation for the Fire Service about what role experience should play in in-extremis leadership and leadership in general. As the Delphi panel repeatedly said, their experience was a needed ingredient which transitioned them from an officer of moderate competency to what they are today (note: all panelists indicated a degree of modesty being named to represent their department as an Exemplar, but each agreed they perform their job duties well during emergency incidents). There are two aspects to enhancing this dynamic other than by chance having individual fire officers get called to in-extremis situations more frequently.

The first concern is to steer officers in the correct direction as their careers develop. As Panel Member #8 previously stated, some fire officers have the potential to develop their own decision-making sense of best direction during emergencies but become stymied due to an overarching management position that this is unacceptable. If fire administrations incorporated an official stance of acceptance for ‘in the field’ decision-making; to acknowledge that some emergency scenarios require critical-thinking and implementation of field-expedient means of solving the problem faced, this could enhance a department’s overall success. This ‘success rate’ involves improving many different departmental dynamics; efficiency, safety, morale, and innovation to name a few. Fire departments need to administratively acknowledge that the tacit knowledge gained by their officers and crews throughout their experiences can actually be a

significant benefit to furthering their operations.

The second concern involves the practical issue of how to gain more experience so to augment the path of becoming an Exemplar or at least improving one's skill set so to perform at a higher level. No one wishes that their community suddenly has a higher frequency of emergency incidents so that experience is easier to come by. This is not the first choice of how to rectify this dilemma. There are options which can be explored and fire departments can find what works best for them. There are some programs which could be implemented to accelerate this growth towards gaining experience without facing the real situation. Mentorship is a method whereby a senior officer who has developed the skill of successful impromptu decision-making is assigned to junior officers. The goal is to instruct through anecdotal learning and gain the wisdom and understand the thought-process of how to develop options when faced with a variety of circumstances. The old adage applies to this method. It is good to learn and become wiser from our mistakes but it is better to learn through someone else's mistakes.

Quite similar to mentorship are the strategies of using shadowing and officer-exchange programs. These are two methods mentioned by Delphi panelists of gaining experience through observation, discussion, and comparison. Shadowing initially involves a junior officer actually going on real incidents with a more senior training officer and his/her crew to observe how and discuss why decisions are made in real-time. As the junior officer develops, the direction changes and the senior officer observes the junior officer with his/her crew. Officer-exchange programs usually would involve different fire departments having their officers ride with 'exchanged' department's crews to gain further perspective on how to accomplish similar goals. This can be quite beneficial for fire departments who run mutual aid incidents on a frequent basis but it also broadens the officer's critical-thinking as they observe other department's methods of

solving common problems. Both of these methods allow wisdom from experience to be transferred and remain as viable organizational knowledge. Panel Member #11 stated that each time one of their department's better senior officers retires, a wealth of experiential knowledge walks out the door and his/her department "has to relearn lessons already bought and paid for."

A final method of more rapidly developing experience is through more realistic training drills. Stress inoculation is quite important for enhancing decision-making during in-extremis circumstances. During emergencies where people's lives are at risk, it is a natural tendency for anxiety to start to infringe on an Incident Commander's situational awareness and his/her full understanding of the factors affecting the emergency scene. Panel Member #14 commented on an incident which he/she had personally experienced:

I had a fire early on as a Lieutenant where lots of bystanders were yelling at me that there was a family still inside the house. The bravo exposure (house next door to the left) was catching on fire and was also still possibly occupied. I didn't have enough crews on-scene to address everything needed to be done immediately which caused the bystanders start to intervene themselves, which got the police physically involved. This took the chaos scale to max. I would handle that situation differently today and hopefully the two people who died would still be alive. (Panel Member #14)

Tactical decision games simulate emergencies encountered in real-life and can stimulate decision-making skills growth. In the Army Reserve, we called them 'sand table exercises' where large tables were set up with terrains and then a variety of training scenarios would be played out. This gave the officers multiple chances to make tactical and strategic decisions and see how they worked out. This provided experience without the cumbersome need to actually engage all components necessary to bring the scenario to real-life. It was much faster, cheaper,

and safer to run through a dozen training scenarios in a day rather than take weeks to plan the logistics required to make one scenario happen in the field. In the digital age, actual tables can be replaced with visual and audio tools. The idea behind these training evolutions is to develop a cache of almost automatic options without having to wait for the individual officers to have to really experience these conditions. They become better prepared to deal with these emergencies before they must face the consequences of the real occurrence. The goal of more realistic training would be to enhance the officers' decision-making prowess and to further develop their critical-thinking and intuition through greater exposure to less frequent events. Panel Member #5 summed this up:

When a fire officer faces a unique and stressful situation which requires them to make rapid decisions and initiate action plans, they will rely upon their experience or their protocols. If they have no experience to draw from, they will fall back to what they know. Ingenuity and 'out-of-box' thinking are usually referred to as positive traits but are pretty much non-existent when the officer gets anxious and has no experience to help him/her out. (Panel Member #15)

Recommendations for future research

This research has investigated a few areas of possible concern within in-extremis leadership and still, additional issues can be explored to further illuminate this subset of leadership. This lens of discovery has been far from comprehensive in its view of in-extremis leadership. There would be a benefit to further researching other aspects of this circumstance of leadership and what training and experiences would reap the better/best outcomes.

This research looked exclusively at municipal career fire officers. There are 1,063,900 registered active firefighters in the United States from over 27,000 different fire departments

deployed in over 50,000 fire stations (U.S. Fire Administration, 2022). Of these one million plus firefighters, only a little over 360,000 (34%) were career firefighters. The rest are made up by volunteer and part-paid positions. Since this research did not include any participants whose primary firefighter position is volunteer or part-paid, a large sector of the firefighting community was excluded. Future studies should investigate the volunteer and part-paid portion of the industry to determine if the leadership dynamics are similar or different.

The sampling of participant fire departments came from 17 departments east of the Mississippi River and mainly located in the Midwest region of the United States. Though these departments came from seven different states, they could possibly involve a regional sway to the answers given. It might be possible that there are inherent differences in how leadership reacts during in-extremis situations and is expected to personally perform on a regional or state-by-state basis. It is up to each state to certify the firefighters in their state. Though there are national ‘best industry standards’ which impact what the states include in the required training of firefighters, there are obviously 50 different established regulations to contend with. A future study looking into leadership during in-extremis events could take a more comprehensive geographical approach and get respondents from a wider berth in the United States.

The Delphi panel was comprised of five members who were either a minority or a woman. This equaled 35% of the membership and the researcher believes this can stand the test of critique but it might further help a more comprehensive understanding of in-extremis leadership for future studies to include a greater percentage of both minorities and women. Research which expands the representation of these categories or might create a Delphi panel exclusively rostered with just minorities or women might bring an additional interesting light to in-extremis leadership.

This research split the REI-40 online respondents into two categories which was dependent upon how their respective fire departments were willing to assist. Some separated out their 'Exemplar Fire Officers' from the 'General Fire Officer' group, some did not. It may have been a monumental task to attempt to accurately define all of their fire officers in the larger fire departments who participated. This study was true to the definition of 'General Fire Officer' so that that grouping was indeed general, which then did include fire officers of all leadership skill levels. A future study might make the effort to separate the two categories more completely. Such a study would be investigating the groups of 'Exemplars' versus 'Non-Exemplars' rather than the category of 'General Fire Officer.'

The Delphi panel for this research was composed of 14 fire officers whose fire departments had labeled them as 'Exemplars' in field command. The fire departments utilized the research-provided criteria plus their own knowledge of their personnel during the selection process. The criteria drew a distinction between fire officers who might excel in staff/administrative duties but were not exemplars at 'commanding in the field' and those who achieved greater success on-scene at emergency incidents. Two different methods of approaching similar research would be, one, have a Delphi panel composed of fire officers who are proficient at staff/administrative aspects of their job and/or two, have a Delphi panel made up of fire officers who have been identified as being 'non-Exemplars'. Would these two panels reach similar consensus as did the Exemplar panel or would there be a difference?

Due to the need to realistically keep a Delphi panel at a manageable number, the questions and discussions oriented towards changes possibly needed in the Fire Service are limited in their applicability 'across the board'. Are their responses truly representative of the U.S. Fire Service in general? Some of the panel members stated they have been or are on more

than one fire department or they are familiar with the operations of their surrounding fire departments. This would help give a more comprehensive perspective while answering these issues but does not give a quantitative view on the subjects. Another possible endeavor for future study would be to develop a survey based upon the initial Delphi panel thoughts and deliver it through an online system such as Qualtrics or its ilk to multiple fire departments to give a wider look at the need for changes in the Fire Service.

A final consideration for future research cannot overlook that this study was conducted exclusively on fire officers. Since in-extremis situations are not the sole domain of the fire departments in the United States, there are many other organizations which can be tapped to add to the academic discussion of in-extremis leadership. This research was oriented towards occupational leadership, not the statistically rare circumstances where the average citizen finds themselves suddenly involved in circumstances which place them in in-extremis situations. These conditions are no less threatening to those involved but they typically do not involve training, preparation, and experience in such circumstances as to how they will be handled. But there are agencies which do deal with in-extremis situations on a somewhat regular basis such as law enforcement, EMS (only EMS as compared to fire-based EMS), the military, and higher risk industries, such as the petrochemical industry. Research conducted along the lines of this study but conducted with these other organizations would also bring an enlightening perspective upon in-extremis leadership.

Concluding Remarks and Thoughts

In 2021, 141 U.S. firefighters died in the line of duty (LODDs) according to the U.S. Fire Administration. This number is greater than the 20-year average (see Appendix L) and to some extent, can be attributed to the SARS-COVID 2 pandemic, as responders have fallen ill and died

from treating patients with this disease. But the occurrence of LODDs is also indicative of a dynamic which seems to be subtly accepted as part of the Fire Service in America as part of 'doing business'. When I went through my fire academy in 1993, I was told by more than one instructor that "about 100 firefighters die each year" as if that was a fact that needed to be accepted and now move on.

The rate of LODDs has slowly decreased over the last two decades (with the years 2001, 2020, and 2021 hopefully being anomalies). There has been an increased emphasis on safer tactics, better firefighting equipment, and the development of more robust personal protective equipment (PPE) in the Fire Service (Klaene & Lakamp, 2020). This, combined with less frequent structure fires nationwide might lead one to believe that this slight decrease in LODDs is not appropriately reflective of what might or should be expected from these efforts. A key factor in determining how successful navigating through in-extremis events will be, is the incident leadership that develops the plan and guides the actions of all involved.

During my 29 years as a career firefighter, my fire department has suffered three LODDs. There was at the time of each of these tragedies, and still occurs to a lesser degree, a strong organizational introspection which led to increased training and implementation of newer methods and equipment for interior firefighting and performing emergency medical services. These efforts came with the hope that they will ensure a much greater degree of safety and efficiency while performing our tasks in in-extremis situations. But there is another ingredient which is a major factor in performance and safety, and that is the leadership at the moment it may matter most. When people's health and lives are in jeopardy, both citizens of our communities and the responders, competent leadership is absolutely necessary. It should be 'the coin of the realm' as mentioned already by panel members.

The findings of this research indicate that without highly competent on-scene leadership, efforts to reduce injuries and deaths of fire service responders, may fail. Leadership that is more capable of leading the men and women who are tasked with entering dangerous situations, is needed and should be delivered. The findings of this research can illuminate a better path to preparing, training, and evaluating fire officers who will command in the field. The themes and characteristics which have been identified through this research cannot be magically inserted into all fire officers through a 'one-size fits all'. But these can be targeted as worthwhile metrics to attain with the understanding that the role of leadership will have a tremendous effect on the success of actions taken under in-extremis circumstances.

REFERENCES

- Andrulis, D. P., Siddiqui, N. J., & Gantner, J. L. (2007). Preparing racially and ethnically diverse communities for public health emergencies. *Health Affairs, 26*(5), 1269-1279.
<https://doi.org/10.1377/hlthaff.26.5.1269>
- AlKnewy, B. (2018). Leadership in times of crisis. *BMJ Leader, 3*, 1-5.
<https://doi.org/10.1136/leader-2018-000100>
- Arena, M. J., & Uhl-Bien, M. (2016). Complexity leadership theory: Shifting from human capital to social capital. *People and Strategy, 39*(2), 22.
- Arendt, H. (1994). *Eichmann in Jerusalem : a report on the banality of evil*. Penguin Books,
- Bakken, B.T., & Gilljam, M. (2003). Dynamic intuition in military command and control: Why it is important, and how it should be developed. *Cognition Technology and Work, 5*(3), 197-205.
- Barsky, L., Trainor, J., Torres, M., & Aguirre, B. (2007). Managing volunteers: FEMA's urban search and rescue programme and interactions with unaffiliated responders in disaster response. *Disasters, 31*(4), 495-507.
- Baran, B. E., & Scott, C. W. (2010). Organizing ambiguity: A grounded theory of leadership and sensemaking within dangerous contexts. *Military Psychology, 22* (Suppl. 1), S42-S69.
<https://doi.org/10.1080/08995601003644262>
- Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3): 19-31. [https://doi.org/10.1016/0090-2616\(90\)90061-S](https://doi.org/10.1016/0090-2616(90)90061-S)
- Bass, B. M. (1998). *Transformational leadership: Industrial, military, and educational impact*. Lawrence Erlbaum Associates.

- Bass, B. M., & Steidlmeier, P. (1999). Ethics, character, and authentic transformational leadership. *The Leadership Quarterly*, *10*(2), 181-217.
- Benner, P. (1984). *From novice to expert, excellence and power in clinical nursing practice*. Addison-Wesley.
- Berlin, J. M. & Carlström, E. D. (2011). Why is collaboration minimised at the accident scene?: A critical study of a hidden phenomenon. *Disaster Prevention and Management*, *20*(2), 159-171.
- Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, *26*(13), 1802-1811. <https://doi.org/10.1177/1049732316654870>.
- Bizjak, G. (1999). *Fire and emergency services instructor* (6th ed.). Fire Protection Publications: Oklahoma State University.
- Bjorklund, F., Backstrom, M. (2008). Individual differences in processing styles: Validity of the Rational-Experiential Inventory. *Scandinavian Journal of Psychology*, *49*, 439-446.
- Bloor, M., Sampson, H., Baker, S., & Dahlgren, K. (2015). Useful but no Oracle: reflections on the use of a Delphi Group in a multi-methods policy research study. *Qualitative Research*, *15*(1), 57-70. <https://doi.org/10.1177/1468794113504103>
- Boone, H. N., & Boone, D. A. (2012). Analyzing likert data. *Journal of extension*, *50*(2), 1-5.
- Bryman, A. (2007). Barriers to integrating quantitative and qualitative research. *Journal of Mixed Methods Research*, *1*(8), 8-22. <https://doi.org/10.1177/2345678906290531>
- Buchanan-Smith, B.M., & Scriven, K. (2011). *Leadership in Action: Leading Effectively in Humanitarian Operations*.
- Calder, L. A., Forster, A. J., Stiell, I. G., Carr, L. K., Brehaut, J. C., Perry, J. J., Vaillancourt, C.,

- & Croskerry, P. (2012). Experiential and rational decision making: a survey to determine how emergency physicians make clinical decisions. *Emergency Medicine Journal*, 29(10), 811-816.
- Campbell, D., Hannah, S., & Matthews, M. (2010). Leadership in military and other dangerous contexts: Introduction to the special topic issue. *Military Psychology*, 22(Suppl. 1), S1-S14.
- Campeau, A. (2008). The Space-Control Theory of paramedic scene-management. *Symbolic Interaction*, 31(3), 285-302.
- Carifio J & Perla R. (2008). Resolving the 50-year debate around using and misusing Likert scales. *Medical Education*, 42(12), 1150-1152. <https://doi.org/10.1111/j.1365-2923.2008.03172.x>
- Clason, D. L., & Dormody, T. J. (1994) Analyzing data measured by individual Likert-type items. *Journal of Agricultural Education*, 35(4), 31-35.
- Cohen, J. (1988). Set correlation and contingency tables. *Applied Psychological Measurement*, 12(4), 425-434. <https://doi.org/10.1177/014662168801200410>
- Cohen, M., Freeman, J., & Wolf, S. (1996). Metarecognition in time-stressed decision making: Recognising, critiquing and correcting. *Human Factors*, 38, 206-219.
- Coleman, J. (2001). *Managing major fires*. PennWell Corporation.
- Collet, B. (2007). Islam, national identity and public secondary education: Perspectives from the Somali diaspora in Toronto, Canada. *Race, Ethnicity, and Education*, 10(2), 131-153.
- Connerley, M., & Pedersen, P. (2005). *Leadership in a diverse and multicultural environment: Developing awareness, knowledge, and skills*. SAGE Publications.
- Covan, E. K. (2007). The discovery of grounded theory in practice: The legacy of multiple

- mentors. In K. Charmaz and T. Bryant (Eds.), *The Handbook of Grounded Theory* (pp. 58-74). SAGE Publications.
- Creswell, J. (2007). *Qualitative inquiry & research design: Choosing among five approaches*. SAGE Publications.
- Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). SAGE Publications.
- Crichton, M., Flin, R., & McGeorge, P. (2005). Decision making by on-scene incident commanders in nuclear emergencies. *Cognition, Technology & Work*, 7, 156-166.
- DATAtab Team. (2022). DATAtab: Online Statistics Calculator. DATAtab e.U. Graz, Austria. as retrieved from URL <https://datatab.net>.
- Delacre, M., Lakens, D., & Leys, C. (2017). Why Psychologists Should by Default Use Welch's t-test Instead of Student's t-test. *International Review of Social Psychology*, 30(1), 92-101. <http://doi.org/10.5334/irsp.82>
- de Vaus, D. A. (2001). *Research design in social research*. SAGE Publications
- Department of the Army. (2008). The warrior ethos and soldier combat skills. (FM 3-21.75), <https://fas.org/irp/doddir/army/fm3-21-75.pdf>.
- DiRomualdo, A., El-Khoury, D., & Girimonte, F. (2018). HR in the digital age: how digital technology will change HR's organization structure, processes and roles. *Strategic HR Review*, 17(5), 234-242. <https://doi.org/10.1108/SHR-08-2018-0074>.
- Dixon, D. P., Weeks, M., Boland, R., Jr., & Perelli, S. (2016). Making Sense When It Matters Most: An Exploratory Study of Leadership In Extremis. *Journal of Leadership & Organizational Studies*, 24, 294-317.
- Dixon, D. P., Weeks, M., Boland Jr, R., & Gaskin, J. (2019). In extremis leadership: A study of

- the effects in different contexts. *American Journal of Management*, 19(3), 35-63.
- Dracup, K., & Bryan-Brown, C. W. (2004). From novice to expert to mentor: Shaping the future. *American Journal of Critical Care*, 13(6), 448-450.
- Duggan, B., & Moyer, J. (2010). *Resilient leadership*. Infinity Publishing.
- Edmondson, D. (2005). Likert scales: A history. In Proceedings of the Conference on Historical Analysis and Research in Marketing,(12), 127-133.
- Eisler, R., & Carter, S. (2010). Transformative leadership: From domination to partnership, *Revision*, 30(3&4), 98-106.
- Elmqvist, C., Brunt, D., Fridlund, B., & Ekebergh, M. (2009). Being first on the scene of an accident: Experience of 'doing' prehospital emergency care. *Scandinavian Journal of Caring Sciences*, 24, 266-273.
- Epstein, S. (1991). Cognitive-experiential self theory: Implications for developmental psychology. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self processes and development* (pp. 79-123). Lawrence Erlbaum Associates, Inc.
- Epstein S. (1998) Cognitive-Experiential Self-Theory. In: Barone D.F., Hersen M., Van Hasselt V.B. (eds) *Advanced Personality*. The Plenum Series in Gladwell, M. (2010). *Blink: the power of thinking without thinking*. Hachette Audio.Social/Clinical Psychology.
- Evans, J. & Over, D. (2010). Heuristic thinking and human intelligence: A commentary on Marewski, Gaissmaier & Gigerenzer. *Cognitive Process*, 11(2), 171-175.
- Fahy, R., & Petrillo, J., (2021, October), Firefighter Fatalities in the US in 2020, National Fire Protection Association, <https://www.nfpa.org/%2F-%2Fmedia/Files/News-and-Research/Fire-statistics-and-reports/Emergency-responders/osFFF.pdf>
- Fairholm, G. W. (1994). *Leadership and the culture of trust*. Westport, Conn: Praeger.

- Fallesen, J. (2000). Developing practical thinking for battle command. In McCann, C. & Pigeau, R. (Eds.). *The Human in command: Exploring the modern military experience*. New York, NY: Kluwer/Plenum, 185-200.
- Fish, L. S., & Busby, D. M. (1996). The Delphi method. In D. H. Sprenkle & S. M. Moon (Eds.), *Research methods in family therapy*, 469-482. The Guilford Press.
- Fisher, K., Hutchings, K., & Sarros, J. C. (2010). The “Bright” and “Shadow” Aspects of In Extremis Leadership. *Military Psychology (Taylor & Francis Ltd)*, 2289-116.
doi:10.1080/08995601003644346
- Fisher, K., & Robbins, C. R. (2015). Embodied leadership: Moving from leader competencies to leaderful practices. *Leadership*, 11(3), 281-299. doi:10.1177/1742715014522680
- Flin, R., & Slaven, G. (1995). Identifying the right stuff: Selecting and training on-scene emergency commanders. *Journal of Contingencies and Crisis Management*, 3(2), 113-123.
- Flin, R. H., & Slaven, G. M. (1995). Identifying the right stuff: selecting and training on-scene emergency commanders. *Journal of contingencies and crisis management*, 3(2), 113-123.
- Fredholm, L. (1997). Decision making patterns in major fire-fighting and rescue operations. In Flin, R., Salas, E., Strub, M., & Martin, L. (Eds.). *Decision making under stress: Emerging themes and applications*. Farnham, Surrey, UK: Ashgate Publishing.
- Gantt, P., & Gantt, R. (2012). Disaster psychology: Dispelling the myths of panic. *Professional Safety*, 42-49.
- Geier, M. T. (2016). Leadership in extreme contexts: transformational leadership, performance beyond expectations?. *Journal of Leadership & Organizational Studies*, 23(3), 234-247.
- George, B. (2003). *Authentic leadership: Rediscovering the secrets to creating lasting value*. San

- Francisco: Jossey-Bass.
- Gladwell, M. (2010). *Blink: the power of thinking without thinking*. Hachette Audio.
- Glaser, B. G., & Strauss, A. L. (1967). *Discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Glesne, C. (2011). *Becoming qualitative researchers: An introduction* (4th ed.). Boston, MA: Pearson Education.
- Göb, R., McCollin, C. & Ramalhoto, M.F. (2007). Ordinal Methodology in the Analysis of Likert Scales. *Quality & Quantity*, 41, 601–626. <https://doi.org/10.1007/s11135-007-9089-z>
- Golm, N. (2017). Hands-on Leadership: Norman Golm. *Research-Technology Management*, 60(6), 60. <https://doi.org/10.1080/08956308.2017.1373054>
- Greene, J., Caracelli, V., & Graham, W. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3), 255-274. <https://doi.org/10.2307/1163620>
- Hannah, S., Uhl-Bien, M., Avolio, B., & Cavarretta, F. (2009). A framework for examining leadership in extreme contexts. *The Leadership Quarterly*, 20, 897-919.
- Hayes, P., & Omodei, M. (2011). Managing emergencies: Key competencies for incident management teams. *Australian and New Zealand Journal of Organisational Psychology*, 4(1), 1-10.
- Headquarters, U.S. Department of the Army. (2011). *Commander and staff officer guide, army tactics, techniques, and procedures*. Washington DC: Department of the Army.
- Heale, R., & Forbes, D. (2013). Understanding triangulation in research. *Evidence-Based Nursing*, 16(4), 98-98.

- Hemingway, E. (Ed.). (1955). *Men at war*. New York, NY: Bramhall House.
- Hersey, P. and Blanchard, K. H. (1969). *Management of Organizational Behavior – Utilizing Human Resources*. New Jersey, Prentice Hall.
- Hersey, P., Blanchard, K. H., & Johnson, D. E. (2008). *Management of organizational behavior: Leading human resources* (9th ed.). Upper Saddle River, NJ: Pearson Education.
- Holenweger, M., Jager, M. K., Kernic, F., & Ohio Library and Information Network. (2017). *Leadership in extreme situations* (1st 2017 ed.). Cham: Springer.
- Hoffman, B., Woehr, D., Maldagen-Youngjohn, R., & Lyons, B. (2011). Great man or great myth? A quantitative review of the relationship between individual differences and leader effectiveness. *Journal Of Occupational & Organizational Psychology*, 84(2), 347-381.
- Howard, K. J. (2018). Emergence of a new method: The Grounded Delphi method. *Research Methodology in Library and Information Studies*, 42(126), 5-31.
- Huffman, W. B. (2010). A short comparison of military leadership with law school leadership: More similarities than differences? *University of Toledo Law Review*, 4, 315-325.
- IBM, (2022), Summarize Statistics. as retrieved from <https://www.ibm.com/docs/en/spss-statistics/SaaS?topic=summarize-statistics>.
- James, E. & Slater, T. (2014). Are you ready to write up your mixed methods data?. In *Writing your doctoral dissertation or thesis faster* (pp. 214-223). SAGE Publications.
<https://www.doi.org/10.4135/9781506374727>
- Jahn, J. L. S. (2019). Shifting the safety rules paradigm: Introducing doctrine to US wildland firefighting operations. *Safety Science*, 115, 237–246.
<https://doi.org/10.1016/j.ssci.2019.02.002>
- Jensen, J., Croskerry, P., & Travers, A. (2011). Consensus on paramedic clinical decisions

- during high-acuity emergency calls: Results of a Canadian Delphi study. *Canadian Journal of Emergency Medicine*, 13(5), 310-318.
- Jensen, J., & Thompson, S. (2016). The Incident Command System: A literature review. *Disasters*, 40(1), 158–182. <https://doi.org/10.1111/disa.12135>
- Jensen, J. L., Bienkowski, A., Travers, A. H., Calder, L. A., Walker, M., Tavares, W., & Croskerry, P. (2016). A Survey to Determine Decision-Making Styles of Working Paramedics and Student Paramedics. *Canadian Journal of Emergency Medicine*, 18(3), 213–222. <https://doi.org/10.1017/cem.2015.95>
- Johnson, B. & Turner, L. (2003). Data collection strategies in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods research in the social sciences* (pp. 297-319). SAGE Publications.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*, 1(2), 112-133. <https://doi.org/10.1177/1558689806298224>
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58(9), 697-720.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist*, 64(6), 515-526.
- Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- Kim, H. (2013). Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics*, 38, 52-54.
- King, K., Khan, N., & Quan, H. (2009). Ethnic variation in acute myocardial infarction presentation and access to care. *American Journal of Cardiology*, 103(10), 1368-1373.

- Klaene, B. J. & Lakamp, T. C. (2020). *Structural Firefighting: Strategy and Tactics includes Navigate Advantage Access: Strategy and Tactics*. Jones & Bartlett Learning.
- Klein, G., Calderwood, R., & Clinton-Cirocco, A. (1986). Rapid decision making on the fire ground. In: *Paper presented at the human factors society 30th annual meeting, 1*, San Diego, CA.
- Klein, G. (1997). Developing expertise in decision-making. *Thinking and Reasoning*, 3(4), 337-352.
- Klein, G. (1998). *Sources of power: How people make decisions*. Cambridge, MA: MIT Press.
- Klein, G. (2003). *The Power of Intuition: how to use your gut feelings to make better decisions at work*. New York: Doubleday.
- Klein, G. (2009). *Streetlights and shadows: Searching for the keys to adaptive decision making*. Cambridge, MA: MIT Press.
- Kok, K. P. W., Loeber, A. M., & Grin, J. (2021). Politics of complexity: Conceptualizing agency, power and powering in the transitional dynamics of complex adaptive systems. *Research Policy*, 50(3), 104183. <https://doi.org/10.1016/j.respol.2020.104183>.
- Kolditz, T., (2007). *In extremis leadership: Leading as if your life depended on it*. San Francisco, CA: Jossey-Bass.
- Koopman, P. L., & Wierdsma, A. F. M. (1998). Participative management. In P. J. D. Drenth, H. Thierry, & C. J. de Wolff (Eds.), *Handbook of Work and Organizational Psychology* 2nd ed. Vol. III (pp. 297-324). East Sussex: Hove Psychology Press.
- Kouzes, J. M., & Posner, B. Z. (2007). *The leadership challenge* (4th ed.). San Francisco, CA: Jossey-Bass.
- Kuisma, M., Hiltunen, T., Maatta, T., Puolakka, J., Boyd, J., Nousila-Wiik, M., & Hakala, T.

- (2005). Analysis of multiple casualty incidents: A prospective cohort study. *Acta Anaesthesiologica Scandinavica*, 49, 1527-1533.
- Lakamp, T. C. (2020). *Structural Firefighting: Strategy and Tactics includes Navigate Advantage Access: Strategy and Tactics*. Jones & Bartlett Learning.
- Landeta, J. (2006). Current validity of the Delphi method in social sciences. *Technological Forecasting & Social Change*, 73(5), 467-482.
<https://doi.org/10.1016/j.techfore.2005.09.002>
- Larsson, G., & Eid, J. (2012). An idea paper on leadership theory integration. *Management Research Review*.
- Lauby, S. (2016). *Manager Onboarding: 5 Steps for Setting New Leaders Up for Success*. Alexandria, VA: Society for Human Resource Management.
- LaVeist, T., Richardson, W., Richardson, N., Relosa, R., & Sawya, N. (2008). The COA360: A tool for assessing the cultural competency of healthcare organizations. *Journal of HealthCare Management*, 53(4), 257-267.
- Ledesma, R. D., Macbeth, G., & Cortada de Kohan, N. U. R. I. A. (2009). Computing effect size measures with ViSta-The visual statistics system. *Tutorials in Quantitative Methods for Psychology*, 5(1), 25-34.
- Light, A. M. (2016). *An examination of the ascension to and experiences in the metropolitan chief fire officer position: Implications for leadership, policy and practice* (Doctoral dissertation, Bowling Green State University).
- Little, R. (1964). Buddy relations and combat performance. In Janowitz, M. (Ed.). *The new military: Changing patterns of organization*. The Russell Sage Foundation.
- Longstaff, P., & Sung-Un, Y. (2008). Communication management and trust: Their role in

- building resilience to “surprises” such as natural disasters, pandemic flu, and terrorism.
Ecology and Society, 13(1): 3: <http://ecologyandsociety.org/vol13/iss1/art3/>
- Lucas County Emergency Medical Services, (2021). *Lucas County EMS Protocols*.
<https://www.co.lucas.oh.us/420/Lucas-County-EMS-Protocols>
- Lyneham J, Parkinson C, & Denholm C. (2008). Explicating Benner's concept of expert practice: Intuition in emergency nursing. *Journal of Advanced Nursing*, 64(4), 380-387.
- MacInnis, J. (2012). *Deep Leadership: Essential Insights from High-risk Environments*. Knopf Canada.
- Marion, R., & Uhl-Bien, M. (2002, December). Complexity v. transformation: The new leadership revisited. In *Managing the Complex IV-Conference on Complex Systems and the Management of Organizations*, Ft. Meyers, Florida, USA.
- Marks, A. D. G., Hine, D. W., Blore, R. L., & Phillips, W. J. (2008). Assessing individual differences in adolescents' preference for rational and experiential cognition. *Personality and Individual Differences*, 44(1), 42-52. <https://doi.org/10.1016/j.paid.2007.07.006>
- Masood, S. A., Dani, S. S., Burns, N. D., & Backhouse, C. J. (2006). Transformational leadership and organizational culture: The situational strength perspective. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*. 220(6), 941-949.
- Maxwell, J. (2005). *Qualitative research design: An interactive approach* (2nd ed.). SAGE Publications.
- McKelvey, B., & Boisot, M. (2003). Transcendental organizational foresight in nonlinear contexts. *Paper presented at the INSEAD Conference on Expanding Perspectives on Strategy Processes*, Fontainebleau, France.

- Mertler, C. A. & Vannatta, R. A. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4th ed.). Pyrczak Publishing.
- Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 67(4), 371-378.
- Militello, L., Patterson, E., Bowman, L., & Wears, R. (2007). Information flow during crisis management: Challenges to coordination in the emergency operations center. *Cognition, Technology & Work*, 9(1), 25-31. <https://doi.org/10.1007/s10111-006-0059-3>
- Moilanen, J. (2015). The wisdom of tacit knowing-in-action and mission command. *Adult Learning*, 26(3), 101–108.
- Moore, T. (2002). Police commander – the Notting Hill riot. In: Flin, R., & Arbutnot, A. (Eds.). *Incident command: tales from the hot seat*. Farnham, Surrey, UK: Ashgate Publishing, 69-87.
- Mundy, C. (1993), “Every Marine a Rifleman,” *Marine Corps Gazette* (January 1993) 12–13, as retrieved from <https://www.marines.mil/Portals/1/Publications/MCWP%206-11%20Leading%20Marine.pdf>.
- National Academy of Sciences & National Research Council. 1966. *Accidental Death and Disability: The Neglected Disease of Modern Society*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/9978>.
- National Fire Protection Association, 2018. <https://www.nfpa.org/News-and-Research/Data-research-and-tools/Emergency-Responders/Firefighter-fatalities-in-the-United-States/Firefighter-deaths>.
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education: Theory and Practice*. 15(5),625-632.

<https://doi.org/10.1007/s10459-010-9222-y>

- Ogden, S. R., Culp, J., William C, Villamaria, F. J., & Ball, T. R. (2016). Developing a checklist: Consensus via a modified delphi technique. *Journal of Cardiothoracic and Vascular Anesthesia*, 30(4), 855-858. <https://doi.org/10.1053/j.jvca.2016.02.022>
- Okoli, J., Weller, G. & Watt, J. (2016). Information processing and intuitive decision-making on the fireground: Towards a model of expert intuition. *Cognition Technology and Work*, 18, 89-103.
- Okoli, J. and Watt, J. (2018). Crisis decision-making: The overlap between intuitive and analytical strategies. *Management Decision*, 56(5), 1122-1134.
- Olsen, O., Eid, J., & Johnsen, B. (2006). Moral behavior and transformational leadership in Norwegian naval cadets. *Military Psychology*, 18, S37-S56.
- O'Meara, P., Tourle, V., & Rae, J. (2012). Factors influencing the successful integration of ambulance volunteers and first responders into ambulance services. *Health & social care in the community*, 20(5), 488-496.
- Orasanu, J., & Fischer, U. (1997). Finding decisions in natural environments: The view from the cockpit. In: Zsombok, C. & Klein, G. (Eds.). *Naturalistic decision making*. Mahwah, NJ: Lawrence Erlbaum, 343-359.
- Osborne, D., & Gaebler, T. (1992). *Reinventing government: How the entrepreneurial spirit is transforming the public sector*. Reading, MA: Addison-Wesley.
- Pacini, R., & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology*, 76(6), 972-987. <https://doi.org/10.1037/0022-3514.76.6.972>
- Pallant, J. (2020). *SPSS Survival Manual (7th ed.)*. Taylor and Francis. Retrieved from

<https://www.perlego.com/book/2194248/spss-survival-manual-pdf>.

Patton, M. (2002). *Qualitative research & evaluation methods* (3rd ed.). SAGE Publications.

Pearce, C., Sims, H., Cox, J., Ball, G., Schnell, E., Smith, K. and Trevino, L. (2003).

Transactors, transformers and beyond: A multi-method development of a theoretical typology of leadership. *Journal of Management Development*, 22(4), 273-307.

<https://doi.org/10.1108/02621710310467587>

Perez, C. (2011). A practical guide to design: A way to think about it and a way to do it. *Military Review*, April-May 2011, 41-51.

Peters, E., & Slovic, P. (2000). The Springs of Action: Affective and Analytical Information Processing in Choice. *Personality and Social Psychology Bulletin*, 26(12), 1465–1475.

<https://doi.org/10.1177/01461672002612002>

Peugh, J., & Enders, C. (2004). Missing data in educational research: A review of reporting practices and suggestions for improvement. *Review of Educational Research*, 74, 525-556.

Pill, Juri. (1971). The Delphi method: Substance, context, a critique and an annotated bibliography. *Socio-Economic Planning Sciences*. 5. 57-71. 10.1016/0038-0121(71)90041-3.

Pimentel, J. L. (2010). A note on the usage of Likert Scaling for research data analysis. *USM R&D Journal*, 18(2), 109-112.

Plowman, D., Solansky, S., Beck, T., Baker, L., Kulkarni, M., & Travis, D. (2007). The role of leadership in emergent self-organization. *The Leadership Quarterly*, 18(4), 341-356.

Powell C. (2003). The Delphi technique: myths and realities. *Journal of advanced nursing*, 41(4), 376–382. <https://doi.org/10.1046/j.1365-2648.2003.02537.x>.

- Powell, C. L. (2012). *It worked for me: In life and leadership*. Harper Collins.
- Pyrzczak, F., & Oh, D. M. (2018). Making sense of statistics: A conceptual overview. Routledge.
- Rieger, K. L. (2019). Discriminating among grounded theory approaches. *Nursing Inquiry*, 26(1). <https://doi.org/10.1111/nin.12261>
- Roman, J., Griswold, K., Smith, S., & Servoss, T. (2008). How patients view primary care: Differences by minority status after psychiatric emergency. *Journal of Cultural Diversity*, 15(2), 56-60.
- Ross, K., Klein, G., Thunholm, P., Schmitt, J., & Baxter, H. (2004). The recognition-primed decision model. *Military Review*, 84(4), 6-10.
- Rush, S. (2003). Coolness under fire: A conversation with James Cavanaugh. *Leadership In Action*, 23(5), 7-12.
- Rush, S. (2009). In the danger zone: A conversation with Colonel Thomas A. Kolditz. *Leadership In Action*, 29(1), 13-16.
- Salka, J. (2005). *First in, last out: Leadership lessons from the New York Fire Department*. Penguin.
- Santos, M., Russo, J., Aisenberg, G., Uehara, E., Ghesquiere, A., & Zatzick, D. (2008). Ethnic/racial diversity and posttraumatic distress in the acute care medical setting. *Psychiatry*, 71(3), 234-245.
- Satterthwaite, F., & Millard, J. (2017). *Becoming a can-do leader: A guide for the busy manager*. Alexandria, VA: ATD Press.
- Scott, S., & Bruce, R. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement*, 55(5), 818-831.
- Shirley, D. & Langan-Fox, J. (1996). Intuition: A review of the literature. *Psychology Reports*,

79(2), 563-584.

Shirzadifard, M., Shahghasemi, E., Hejazi, E., Naghsh, Z., & Ranjbar, G. (2018). Psychometric Properties of Rational-Experiential Inventory for Adolescents. *SAGE Open*, 8(1), 1-11.

<https://doi.org/10.1177/2158244018767219>

Sinclair, M., & Ashkanasy, N. M. (2005). Intuition: Myth or a decision-making tool?

Management Learning, 36(3), 353-370.

Sjoberg, M., Wallenius, C., & Larrson, G. (2011). Leadership in complex, stressful rescue operations: A quantitative test of a qualitatively developed model. *Disaster Prevention and Management*, 20(2), 199-212.

Skulmoski, G.J., Hartman, F.T. & Krahn, J. (2007). The Delphi Method for Graduate Research.

Journal of Information Technology Education: Research, 6, 1-21. Informing Science

Institute. Retrieved April 24, 2018 from <https://www.learntechlib.org/p/111405/>.

Sladek, R. M., Bond, M. J., Huynh, L. T., Chew, D. P., & Phillips, P. A. (2008). Thinking styles and doctors' knowledge and behaviours relating to acute coronary syndromes guidelines.

Implementation Science, 3, 23. <https://doi.org/10.1186/1748-5908-3-23>

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis: An International Journal*, 24(2), 311-322.

International Journal, 24(2), 311-322.

Somech, A. (2003). Relationships of Participative Leadership with Relational Demography

Variables: A Multi-Level Perspective. *Journal of Organizational Behavior*, 24(8), 1003-

1018. www.jstor.org/stable/4093751

Spears, L. C. (1995). *Reflections on leadership: How Robert K. Greenleaf's theory of Servant-leadership influenced today's top management thinkers*. New York: J. Wiley.

- Starratt, R. J. (1991). Building an ethical school: A theory for practice in educational leadership. *Educational Administration Quarterly*, 27, 185-202.
- Strauss, A. & Corbin, J. (1990). Basics of qualitative research. SAGE Publications.
- Subramaniam, C., Ali, H., & Mohd Shamsudin, F. (2010). Understanding the antecedents of emergency response: A proposed framework. *Disaster Prevention and Management*, 19(5), 571-581. <https://doi.org/10.1108/09653561011091904>
- Sullivan, G. M., & Artino, A. R., Jr (2013). Analyzing and interpreting data from likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541–542. <https://doi.org/10.4300/JGME-5-4-18>
- Sweeney, P. (2010). Do soldiers reevaluate trust in their leaders prior to combat operations?. *Military Psychology*, 22(S1), S70-S88.
- Teddlie, C. & Tashakkori, A. (2009). *Foundations of Mixed Methods Research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE Publications.
- Teddlie, C., & Tashakkori, A. (2012). Common “Core” Characteristics of Mixed Methods Research: A Review of Critical Issues and Call for Greater Convergence. *American Behavioral Scientist*, 56(6), 774–788. <https://doi.org/10.1177/0002764211433795>
- Thornberg, R., & Dunne, C. (2019). Literature review in grounded theory. In A. Bryant & K. Charmaz (Eds.), *The Sage handbook of current developments in grounded theory* (pp. 206-221). SAGE Publications.
- Toldson, I., Ray, K., Hatcher, S., & Louis, L. (2011). Examining the long-term racial disparities in health and economic conditions among Hurricane Katrina survivors: Policy implications for Gulf-Coast recovery. *Journal of Black Studies*, 42(3), 360-378.

- Tomczak, M., & Tomczak, E. (2014). The need to report effect size estimates revisited. An overview of some recommended measures of effect size. *Trends in Sport Sciences, 1*(21), 19-25.
- Turner, N., Barling, J., Epitropaki, O., Butcher, V., & Milner, C. (2002). Transformational leadership and moral reasoning. *Journal of Applied Psychology, 87*(2), 304-311.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity Leadership Theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly, 18*(4), 289-318.
- Uhl-Bien, M., & Marion, R. (2009). Complexity leadership in bureaucratic forms of organizing: A meso model. *The Leadership Quarterly, 20*(4), 631-650.
- Uhr, C. (2017). Leadership ideals as barriers for efficient collaboration during emergencies and disasters. *Journal of Contingencies and Crisis Management, 25*(4), 301-312.
- U.S. Fire Administration, (2012, July), Firefighter Fatalities in the United States in 2011, https://www.usfa.fema.gov/downloads/pdf/publications/ff_fat11.pdf.
- U.S. Fire Administration, (2020, October), Firefighter Fatalities in the United States in 2019, <https://www.usfa.fema.gov/downloads/pdf/publications/firefighter-fatalities-2019.pdf>.
- U.S. Fire Administration, (2022, January), National Fire Department Registry Summary, <https://www.usfa.fema.gov/downloads/pdf/registry-summary-2022.pdf>.
- Vandergriff, D. E. (2019). The mind and spirit are decisive weapons. *Revista Científica General José María Córdova, 17*(28), 847-868.
- Wall, T. D., Cordery, J. L., & Clegg, C. W. (2002). Empowerment, Performance, and Operational Uncertainty: A Theoretical Integration. *Applied Psychology, 51*(1), 146-169. <https://doi.org/10.1111/1464-0597.00083>

- Ward, M. (2006). *Fire officer: Principles and practice*. Jones and Bartlett.
- Watson, A. (2010). Research in the real world: Studying Chicago Police Department's crisis intervention team program. *Research on Social Work Practice, 20*(5), 536-543.
- Wenger, D., Quarantelli, E. L., & Dynes, R. (1990). Is the Incident Command System a plan for all seasons and emergency situations. *Hazard Monthly, 10*(10), 8-9, 12.
- Witteman, C., van den Bercken, J., Claes, L., Godoy, A. (2009). Assessing rational and intuitive thinking styles. *European Journal of Psychological Assessment, 25*(1), 39-47.
<https://doi.org/10.1027/1015-5759.25.1.39>
- Worthley, J. A., & Grumet, B. R. (1983). Ethics and Public Administration: Teaching What "Can't be Taught". *The American Review of Public Administration, 17*(1), 54-67.

APPENDIX A: EXEMPLAR DEFINITION AND CHARACTERIZATION

Justification of “Exemplar Fire Officer” Group Assignment

The literature which delves into leadership in 'In-Extremis' situations discusses personality characteristics and behavioral traits which are indicative of successful leaders. Though there is room for discussion concerning the philosophy of the 'great man' leadership syndrome (Carlyle, 1899; Hoffman et al., 2011) through to whether the essence of leadership is basically a learned capacity (Headquarters, 2011), there appears to be a degree of agreement to argue the inclusion of certain traits. Some of these traits can be construed as more nature or inherent within the person and others can be categorized as more nurture in development so I am going to include both sets of traits in the first phase of delineation. The personality characteristics and behavioral traits might seem so obvious that citing would seem unnecessary due to the reader's personal life experiences, but the research process must stand up to any rigorous scrutiny of how the research decisions were made. Below are the 25 characteristics/traits that were gleaned from the literature review.

List of the Potential In-Extremis Leadership Qualities

- *Trust:*
 - This quality involves developing a sense of commitment and bonding between members of the team/crew through demonstrated responsible actions.
 - An exemplar In-Ext remis leader is perceived as consistently authentic and sincere in their statements, intentions, and actions.
 - An exemplar In-Extremis leader is an advocate for their team and displays selflessness and humility more often than not.

- References: Kolditz, 2007; Subramaniam et al., 2010; Sweeney et al., 2010; Uhr, 2017).
- **Competence:**
 - This quality involves superior skill at performing the technical tasks assigned to the team/crew.
 - An exemplar In-Extremis leader must have strong knowledge of the organizational procedures, emergency scene tactics, and how to employ them and have demonstrated these skills in real-world incidents.
 - References: Buchanan-Smith & Scriven, 2011; Kolditz, 2007; Light, 2016; Subramaniam et al, 2012; Sweeney et al., 2010.
- **Confidence:**
 - This quality involves the individual sense of inherent personal abilities to successfully accomplish assigned responsibilities and duties.
 - An exemplar In-Extremis leader must believe in their abilities to achieve what they and their team/crews are expected to complete.
 - This quality must be apparent to their charges without being exceedingly obtrusive.
 - References: Buchanan-Smith & Scriven, 2011; Kolditz, 2007; Salka, 2005; Vandergriff, 2019.
- **Honesty/Integrity:**
 - This quality involves a personal commitment to expressing the truth and being consistent with the stated organizational and one's own principles.
 - An exemplar In-Extremis leader must display moral conduct and accept

personal accountability and responsibility.

- References: Kolditz, 2007; Salka, 2005; Sweeney et al., 2010; Turner, et al., 2002.

- ***Fairness:***

- This quality involves creating and maintaining a uniform set of standards for all team/crew members.
- An exemplar In-Extremis leader utilizes a non-coercive leadership style.
- An exemplar In-Extremis leader respects and treats all members equally.
- Reference: Sweeney et al., 2010.

- ***Loyalty:***

- This quality involves creating a strong sense of support and allegiance which is perceived to continue in future circumstances among the team/crew member.
- An exemplar In-Extremis leader must behave in a manner which displays an ongoing commitment to the well-being of the members.
- An exemplar In-Extremis leader will develop a strong sense of team/crew camaraderie and morale.
- References: Buchanan-Smith & Scriven, 2011; Subramaniam et al., 2010; Sweeney et al., 2010.

- ***Sense of Duty:***

- This quality involves a strong commitment in statements and actions to the organizational responsibilities and goals.
- An exemplar In-Extremis leader must continually display a genuine

diligence to successfully accomplishing the tasks assigned to themselves and their team/crew.

- References: Kolditz, 2007; Salka, 2005; Sweeney et al., 2010.

- ***Courage/Bravery:***

- This quality involves an internal sense of taking action despite risks and the personal behavior which derives from such.
- An exemplar In-Extremis leader must demonstrate personal actions which go beyond a sense of self-preservation at all costs.
- Not that this quality requires reckless, foolish, or near-suicidal actions but shows a behavioral commitment and a solid belief in the National Fire Academy's "I will take great risk to save a life."
- References: Kolditz, 2007; Sweeney et al., 2010.

- ***Empowerment:***

- This quality involves developing members' leadership skills and delegating responsibilities to subordinate members as situations allow.
- An exemplar In-Extremis leader will be a strong team builder and will demonstrate a willingness to take a cooperative team approach when the scenario dictates.
- References: Kolditz, 2007; Sweeney et al., 2010.

- ***Shared Hardships & Risks:***

- This quality involves a willingness to assume personal risk and participate in team's activities to relatively the same extent as all members.
- An exemplar In-Extremis leader will be involved in the assigned tasks such

that there is little difference between their exposure to risk and those they lead.

- References: Kolditz, 2007; Salka, 2005; Sweeney et al., 2010.

- ***Respected by Followers:***

- This quality involves the leader being perceived by the team/crew as worthy of their rank and responsibility.
- An exemplar In-Extremis leader's skill set will be evident to those they lead and manifests as genuine appreciation for their leadership abilities.
- Reference: Subramaniam et al., 2010.

- ***Interpersonal/Social Skills:***

- This quality involves the ability to communicate and interact with fellow human beings and understand the idiosyncrasies of social dynamics.
- An exemplar In-Extremis leader should be able to demonstrate the overt and subtle skills of managing people in a variety of social and emergency settings.
- Reference: O'Meara, et al. 2012.

- ***Decisive under Stress:***

- This quality involves the ability to maintain self-control and make effective, quick, and safe decisions under circumstances that are mentally and/or physically demanding or adverse conditions.
- An exemplar In-Extremis leader should be able maintain composure and display confidence in the face of multiple stressors which can be regularly experienced on emergency scenes.

- References: Flin & Slaven, 1995; Kolditz, 2007; Salka, 2005; Sweeney et al., 2010; Vandergriff, 2019.
- ***Internally Motivated:***
 - This quality involves the ability to demonstrate self-drive to complete tasks as assigned and to determine and take necessary actions which are not assigned.
 - An exemplar In-Ext remis leader will display perseverance and sincere enthusiasm for properly finishing the assignments given to them and their team.
 - An exemplar In-Extremis leader may display or be interpreted as having a competitive nature to their actions due to staunch dedication to success.
 - References: Kolditz, 2007; Duggan & Moyer, 2010; Sweeney et al., 2010.
- ***Embraces professional development:***
 - This quality involves the desire to continually learn throughout a career and understand that as industry 'best practices' change, so must the organization.
 - An exemplar In-Extremis leader should exemplify the need for career development; to learn from one's experiences, including mistakes/failures to move personally and organizationally to better performances.
 - References: Kolditz, 2007; Larsson & Eid, 2012; Light, 2016.
- ***Situational Awareness:***
 - This quality requires the ability to rapidly determine the basic conditions being faced in a variety of circumstances and then continually reassess the emergency environment.

- An exemplar In-Extremis leader should be able to quickly develop a solid risk/benefit determination and create an action plan that will solve the problems encountered.
- An exemplar In-Extremis leader is able to rapidly make reliable decisions which can have significant consequences during emergency incidents.
- References: Flin & Slaven, 1995; Macinnis, 2012; Salka, 2005; Vandergriff, 2019.
- ***Physical Capacity:***
 - This quality involves the ability to physically perform the tasks beyond a minimum standard which are assign to themselves and/or their team/crew.
 - An exemplar In-Extremis leader must be able to complete the assignments given to their team/crew better than the standard required for all members.
 - An exemplar In-Extremis leader is not required to be the 'fittest' individual but must be capable of setting a strong personal physical expectation for performing assignments.
 - References: Kolditz, 2007; Macinnis, 2012; Subramaniam et al., 2012.
- ***Mental Resilience:***
 - This quality involves being able to mentally overcome various obstacles that they may encounter, both on an emergency scene and within organizational situations.
 - An exemplar In-Extremis leader must have the mental and cognitive capacity to strive for superior performance from themselves and their team regardless of less than ideal circumstances.

- An exemplar In-Extremis leader must usually be optimistic and doesn't avoid adversity.
- Reference: Larsson & Eid, 2012; Macinnis, 2012, Salka, 2005.
- ***Strong Communication Skills:***
 - This quality involves the ability to exchange information through verbal, non- verbal, and written means of communication.
 - An exemplar In-Extremis leader must be able to accurately express their intentions, assignments, and expectations.
 - An exemplar In-Extremis leader must be able to demonstrate focused listening to better understand the communication exchange.
 - Reference: Baran & Scott, 2010.
- ***Active Role-Modeling:***
 - This quality involves leading by example and creating the behavioral and social patterns to be mirrored by the team.
 - An exemplar In-Extremis leader must exhibit through the potential dangers that emergency incidents may present, an assertive 'lead from the front' mentality and back it with personal actions when appropriate.
 - References: Baran & Scott, 2010; Kolditz, 2007; Sweeney et al., 2010.
- ***Adaptability:***
 - This quality involves being able to quickly maneuver through obstacles and ambiguity and determine a successful course of action. It is similar to Situational Awareness but differs in that this quality is more based upon having to 'switch gears' to evolving conditions.

- An exemplar In-Extremis leader must be able to devise multiple actions plans based upon on ever changing environment.
- An exemplar In-Extremis leader must be able to quickly sift through limited information and determine its credibility and act upon it.
- References: Baran & Scott, 2010; Duggan & Moyer, 2010; Salka, 2005.
- ***Use of Personal Initiative:***
 - This quality involves the ability to internally recognize solutions to presenting situations which might not be standard written policies.
 - An exemplar In-Extremis leader must be able to evaluate the specific circumstances of the given situation and devise a successful course of action.
 - An exemplar In-Extremis leader must be aware of written protocols but have the experiential wisdom to modify procedures to develop the best incident action plan during emergency incidents with potentially significant consequences.
 - References: Flin & Slaven, 1995; Duggan & Moyer, 2010; Okoli et al., 2016; Vandergriff, 2019.
- ***Sound Judgment:***
 - This quality involves making decisions which have a high likelihood of success upon experience, wisdom, and knowledge.
 - An exemplar In-Extremis leader must account for margins of safety, yet-to-be- known factors, previous success/failure actions, to name a few considerations.

- An exemplar In-Extremis leader must be aggressive but not reckless.
- Reference: Duggan & Moyer, 2010.
- ***Operationally Experienced:***
 - This quality involves the necessity that actual time successfully performing under duress is required for the operational wisdom to conduct command duties at the exemplar level.
 - An exemplar In-Extremis leader must have a past track record of successfully navigating emergency incidents where actual acute danger was present and resolved.
 - An exemplar In-Extremis leader must have spent time at operational districts where these incidents were common.
 - References: Baran & Scott, 2010; Kolditz, 2007; Macinnis, 2012.
- ***Command Rank:***
 - This quality requires that the leader must have specific organizational acknowledgment of this responsibility.
 - An exemplar In-Extremis leader must have attained a designation (promotion or appointment) which carries formal duties of leadership unlike informal leadership which is common among senior personnel.
 - References: Sweeney et al., 2010.

APPENDIX B: FIRE CHIEF SURVEY – EXEMPLAR CHARACTERISTIC RESULTS

A Qualtrics online leadership trait survey had 68 fire chief officers participate from various fire departments. The survey consisted of 25 personality characteristics with short descriptions that were taken from a literature review of articles and books about leadership. The chief officers were asked to rank these characteristics in importance when identifying their exemplar fire officers in field command.

The goal of the survey was to create a basic template for choosing exemplar candidates by identifying 1) which of these characteristics are most commonly found in fire service officers who excel in field command (exemplars) of emergency scenarios and 2) which of these characteristics are viewed as being essential traits in becoming exceptionally successful in commanding emergency incidents. All of the personality characteristics were described as positive traits displayed by leaders but the online survey was designed to filter out those that are most significant for a consistent high degree of success in field command.

Pilot Survey:

Prior to putting the survey out for the Fire Chiefs and Chief Officers, it was necessary to pilot the survey to ensure that it would achieve what it was meant to achieve. This was accomplished through a convenient survey sample. A Qualtrics survey link was sent to (52) Toledo Fire and Rescue Department Lieutenants and Captains. There were (38) respondents for a 73% response rate. The average years of fire service among these respondents was nearly 24.5 years. The email sent by the Toledo Fire & Rescue Department to these fire officers prefaced that the survey was entirely voluntary, anonymous, a submitted survey would be considered to be permission to utilize the results, and that I would not know whether the individual fire officers even responded or not.

I asked the respondents to take the survey and to make any comments as to how long the survey took to complete and whether the questions were understandable. I used this feedback to make minor modifications to the final survey. One of the changes was that I went from using a 5-point Likert scale to a 7-point Likert scale. I found the traits were all viewed as desirable and the scores were bunched up closely to the positive extreme of the Likert scale.

Fire Chief and Chief Officers Survey:

This survey was conducted also by sending out a Qualtrics survey. It was sent to the Northwest Ohio Fire Chiefs' Association and the Lucas County Fire Chiefs' Association. This includes (54) and (106) members respectively, made up of Fire Chiefs and Chief Officers (Assistant Chiefs, Deputy Chiefs, District Chiefs, and Battalion Chiefs). There were (68) respondents for a 42.5% response rate. The average years of fire service among these respondents was 30 years. Some chiefs are members of both so the survey instructions asked for only one response per individual so the actual response rate might be higher. The instructions, as with the pilot survey, stated that the survey was entirely voluntary, anonymous, a submitted survey would be considered to be permission to utilize the results, and that I would not know whether the individual chief officers even responded or not.

The online survey was held open for two weeks. The responses were tabulated and the characteristics which fell within the positive standard deviations were put forward as the factors to be strongly considered in determining which fire officers to identify as exemplars in field command for this research. It is also understood that basic personality characteristics are just one of multiple reasons why individuals are successful so the identified traits are to be a primary guideline for selection but flexibility must be realized as necessary. The fire department officers who supervise the operational crews and will select the candidates, will utilize their experience

with their exceptional officers, which might not always exactly correspond with the identified traits.

This research was to gather data from exceptionally successful incident commanders. The primary investigator understood that properly identifying candidates for the research partly hinged upon the use of the personality characteristics list and partly upon the well-versed opinions of the ranking fire officers commanding the operational crews. The demonstrated successful actions of their 'best' fire officers must be the ultimate litmus test of who are their department's exemplars in field command.

The online instructions given to the participating chief officers were:

Investigating Qualities of Experts in Fire Service Incident Command:

This is a quick survey to investigate which qualities/traits/characteristics are the most necessary for exceptional fire service field commanders (Exemplars).

This survey is confidential and anonymous. Participation is strictly voluntary and for academic purposes only. Submission will be considered voluntary participation and used for results calculation purposes only.

Leadership Qualities:

Please judge these (25) individual qualities, as per your experience, to what degree they are critical for exceptional fire service incident commanders to possess 'in the field' at all types of incidents (fire, rescue, & EMS).

This study is investigating how these traits affect the command of emergency incidents only, - NOT - staff or administrative duties.

Every one of these traits are advantageous and beneficial, - BUT - this survey is interested in clearly differentiating which are the most essential and critical in the

highest quality field commanders in the fire service.

The online survey consisted of a 7-point Likert scale with 1 as 'Critical and absolutely required' and 7 as 'Useful but not essential'. The summary results from the 68 chief officers who participated follows in Table B-1.

Table B-1: Individual qualities as scored from 1 (critical and absolutely required) to 7 (useful but not essential). Average scores are ranked beginning with 1 as scored as the most desired qualities. Scores were placed within the positive and negative standard deviations.

Individual Qualities	Rank	Average score	St Dev
Situational Awareness	1	1.31	+2
Honesty/Integrity	2	1.34	+2
Decisive under Stress	3	1.36	+2
Sound Judgement	4	1.48	+2
Trust	5	1.5	+2
Strong Communication Skills	6	1.52	+1
Embraces Professional Development	7	1.55	+1
Adaptability	8	1.67	+1
Mental Resilience	9	1.73	+1
Empowerment	10	1.88	+1
Sense of Duty	11	1.89	+1
Active Role-Modeling	12	1.92	+1
Fairness	12	1.92	+1
Confidence	12	1.92	+1
Use of Personal Initiative	15	1.94	+1

Individual Qualities	Rank	Average score	St Dev
Internally Motivated	16	2.00	(-1)
Loyalty	17	2.06	(-1)
Competence	18	2.17	(-1)
Operationally Experienced	19	2.19	(-1)
Interpersonal/Social Skills	19	2.19	(-1)
Respected by Followers	21	2.34	(-1)
Shared Hardship	22	2.61	(-2)
Command Rank	23	2.70	(-2)
Courage/Bravery	24	2.73	(-2)
Physical Capacity	25	2.95	(-3)

APPENDIX C: EXEMPLAR FIRE OFFICER CANDIDATE SELECTION CRITERIA



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School of Educational Foundations, Leadership & Policy

Exemplar Fire Officer Candidate Selection Criteria

Premise Description of Exemplar Candidates:

Experience has shown the candidate demonstrates exceptional command skills, a noticeably greater degree of operational excellence, and is highly capable in demanding emergency situations.

As the primary investigator, I understand that the lists below are only one aspect of multiple reasons why individuals are successful. So, the criteria lists are to be a guideline for selection but a degree of flexibility is realized as necessary. I understand that properly identifying candidates for the research partly hinges upon the use of the Character Traits List and Experience/Positional List and also upon the well-versed professional opinions of the ranking fire officers commanding the operational crews which might not always exactly correspond with the identified lists.

The demonstrated successful actions of their 'best' fire officers must be the ultimate litmus test of who are their department's exemplars in field command and thus, the most appropriate candidates for this study.

These are suggested guidelines for selecting your emergency scene 'exceptional fire officers' and not meant as an absolute or exclusionary list of criteria. No one person will possess every one of these listed below. This research's goal is to investigate your 'very best' field commanders.

Suggested Exemplar Selection Guideline Lists

A prior step in developing the direction of the research was to conduct a leadership trait survey. This was given to 68 chief officers from various fire departments. The survey resulted in 15 of these traits consistently being rated as necessary for exceptional command ability.

Character Trait List: (in order of ranked responses from Fire Chiefs' survey)

1. Situational Awareness
2. Honesty/Integrity
3. Decisive Under Stress
4. Sound Judgment
5. Trust
6. Strong Communication Skills
7. Embraces Professional Development
8. Adaptability
9. Mental Resilience
10. Empowerment
11. Sense of Duty
12. Confidence
13. Active Role-Modeling
14. Fairness
15. Use of Personal Initiative

Experience/Positional List:

- Has attained a promoted/command rank (Lt. - Capt. – Bat. Chief – Dep. Chief)
- 15+ years of experience in the fire service.
- 5+ years of command experience.
- Currently or recently assigned in a field command position.
- Had a 'greater frequency' of emergency experience.

For Questions Concerning Participant Rights:

BGSU Institutional Review Board; (419-372-7716) or (orc@bgsu.edu)

Sincerely,

Bryce Blair

Sr. Battalion Chief, C-Shift

Toledo Fire & Rescue

(419) 350-4085 (cell)

bryceb@bgsu.edu

APPENDIX D: JUSTIFICATION FOR QUANTITATIVE USE OF LICKERT SCALES

Peer-reviewed literature can be found to demonstrate an agreement among researchers that a Likert scale survey is an ordered instrument, when 5 or more points of choice are used (Göb et al. 2007). But some researchers state that Likert scales are without question, only ordinal scales and therefore are limited in the quantitative utilization available in their usage (Sullivan & Artino, 2013). As such, they argue that employing methods like t-tests, ANOVA, SD, and Cronbach's Alpha are not supported by the manner that the data was gained. That the difference between each point on a Likert question does not indicate a specific and equal measurement which would lend itself to a more robust quantitative analysis. They also point out that parametric tests usually make an assumption about the normal distribution of the general population their evaluated sample comes from and that Likert scale questions sometimes have a tendency to 'bunch up' at the extremes. The magnitude of scale between 'Dislike' and 'Strongly Dislike' shows no consistency of interval when compared to 'Like' and 'Strongly Like' (Edmondson, 2005). To a certain degree, this is such an obvious conclusion that even novices in data collection would surely adhere to that logic. Norman (2010, p. 627) states it clearly: "it does not take a lot of thought to recognize that Likert scales are ordinal."

So why do some published and experienced researchers in the social sciences perform parametric analysis on data they have collected via the use of Likert scale surveys? It is understood that the numeric application to the various responses possible on a Likert scale question merely correspond with a greater or lesser degree of the item of inquiry and do not differentiate a quantitative or measurable span between responses (Clason & Dormody, 1994).

Boone and Boone (2012) draw a distinction between 'Likert-type' data and Likert Scale data. Wherein a Likert-type question utilizes a Likert scale for the responses and the individual

questions stand alone and therefore should be analyzed as data on an ordinal scale. They write that Likert Scale data is based upon multiple questions which evaluate a given trait; that a composite score based upon at least four related questions and should be recognized as an interval scale. As such, Mean, Standard Deviation, Pearson's r , ANOVA, t -tests, and regression are applicable and appropriate (Pimentel, 2010). Norman (2010, p. 631) summarizes in his article that "parametric statistics can be used with Likert data, small sample sizes, with unequal variances, and with non-normal distributions, with no fear of coming to the wrong conclusions." Carifio and Perla (2008, p. 1150) also state that multiple studies of Likert scales (collection of Likert items addressing the same test parameter) versus a single Likert item, have shown "the Likert response format has produced empirically interval data, and in fact, can approximate ratio data."

Rosemary Pacini and Seymour Epstein developed the Rational-Experiential Inventory-40 (REI-40) in 1999 based upon the Cognitive-Experiential Self-Theory (CEST). This measures the slower, more methodical and deliberate analytical-rational style and the faster, more automatic and emotionally-driven intuitive-experiential decision-making tendency (Kahneman, 2011). These two thought processes do not operate separately from each other but people can rely upon one, more than the other or in combination with each other. There are four subsets, Rational Ability (RA), Rational Engagement (RE), Experiential Ability (EA), and Experiential Engagement (EE). Each subset is evaluated by (10) items. The manner of the data collection in using the REI-40 is consistent with Likert scales rather than individual Likert items and thus is supported in its use of parametric statistics.

APPENDIX E: ONLINE SURVEY DEMOGRAPHIC QUESTIONS



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Demographic Questions

1. Rank:
 - Fire Chief
 - Chief Officer
 - Captain
 - Lieutenant
 - Other

2. Years in the Fire Service: _____

3. Your Department:
 - Career Only
 - Combination
 - Volunteer Only

4. Size of Fire Department: _____

5. EMS Certification:
 - None
 - First Responder
 - EMT
 - Paramedic
 - Other

6. Education Level (highest attained):
 - High School Diploma
 - Some College
 - Associate's Degree
 - Bachelor's Degree
 - Master's Degree
 - Terminal Degree (Ph.D., Ed.D., etc.)

APPENDIX F: RATIONAL-EXPERIENTIAL INVENTORY SURVEY (REI-40)

Rational-Experiential Inventory–40 Example Question

(From Pacini & Epstein, 1999)

Instructions: Using the following scale, please rate the extent that these items refer to you.

1	2	3	4	5
<i>Definitely</i>				<i>Definitely not</i>
				<i>true of myself</i>
				<i>true of myself</i>

Rationality Scale*Rational Ability*

- 1) I'm not that good at figuring out complicated problems*
- 2) I am not very good at solving problems that require careful logical analysis*
- 3) I am not a very analytical thinker*
- 4) Reasoning things out carefully is not one of my strong points*
- 5) I don't reason well under pressure*
- 6) I am much better at figuring things out logically than most people
- 7) I have a logical mind
- 8) I have no problem thinking things through carefully
- 9) Using logic usually works well for me in figuring out problems in my life
- 10) I usually have clear, explainable reasons for my decisions

Rational Engagement

- 11) I try to avoid situations that require thinking in depth about something*
- 12) I enjoy intellectual challenges
- 13) I don't like to have to do a lot of thinking*

- 14) I enjoy solving problems that require hard thinking
- 15) Thinking is not my idea of an enjoyable activity*
- 16) I prefer complex problems to simple problems
- 17) Thinking hard and for a long time about something gives me little satisfaction*
- 18) I enjoy thinking in abstract terms
- 19) Knowing the answer without having to understand the reasoning behind it is good enough for me*
- 20) Learning new ways to think would be very appealing to me

Experientiality Scale

Experiential Ability

- 21) I don't have a very good sense of intuition*
- 22) Using my gut feelings usually works well for me in figuring out problems in my life.
- 23) I believe in trusting my hunches
- 24) I trust my initial feelings about people
- 25) When it comes to trusting people, I can usually rely on my gut feelings
- 26) If I were to rely on my gut feelings, I would often make mistakes*
- 27) I hardly ever go wrong when I listen to my deepest gut feelings to find an answer
- 28) My snap judgments are probably not as good as most people's*
- 29) I can usually feel when a person is right or wrong, even if I can't explain how I know
- 30) I suspect my hunches are inaccurate as often as they are accurate*

Experiential Engagement

- 31) I like to rely on my intuitive impressions
- 32) Intuition can be a very useful way to solve problems

- 33) I often go by my instincts when deciding on a course of action
- 34) I don't like situations in which I have to rely on intuition*
- 35) I think there are times when one should rely on one's intuition
- 36) I think it is foolish to make important decisions based on feelings*
- 37) I don't think it is a good idea to rely on one's intuition for important decisions*
- 38) I generally don't depend on my feelings to help me make decisions*
- 39) I would not want to depend on anyone who described himself or herself as intuitive*
- 40) I tend to use my heart as a guide for my actions

Note: Labels should be removed and items randomized prior to administration. Items marked with an asterisk (*) should be reverse coding prior to scoring. Subscale scores are computed by averaging the 10 composite items.

(As retrieved from https://www.researchgate.net/publication/319444554_Rational-Experiential_Inventory-40_REI-40)

** The Rational-Experiential Inventory-40 (REI-40), described in Pacini and Epstein's article (1999), can be used by researchers as long as the original paper and authors are acknowledged and cited.*

APPENDIX G: RATIONALE FOR SELECTION OF STATISTICAL TESTS

Test for normality:

Skewness: This is a statistical test which measures the difference in distribution of a data set around the sample's mean. It tests for asymmetrical distribution and evaluates the direction and amount of the deviation from horizontal bilateral symmetry. Perfect symmetry around the mean is scored as a 0, while scores beyond 1 and -1 are considered badly skewed. Skewness looks at the overall shape of the data distribution.

Kurtosis: This is a statistical test which measures the 'tailedness' of a data sample. It evaluates whether the sample's tails look similar to the expected bell curve. The null hypothesis of this test is that the data is normally distributed.

Shapiro-Wilk Test: This test tests whether a continuous variable is normally distributed. Its null hypothesis is that the sample is normally distributed. Normality is rejected if below the 0.05 level. Passing the normality test only allows the researcher to state that there is a not significant departure from normality and cannot claim as proof of a normal distribution.

Tests for Homogeneity of Variance:

Levene's Test: An inferential test to determine equality of variances for two or more samples (Homogeneity of Variance). It is used for between-subjects research designs.

The Levene's test's null hypothesis is that there are equal variances across all samples.

Homogeneity of variance is rejected if the p-value of the Levene's test is below the 0.05 level. Meeting this assumption is important for the use of the Independent-samples t-test.

Selected Statistical Tests:

Independent Samples t-test (Student's t-test): This test is used for hypothesis testing to

determine if there is a significant statistical difference between two independent variables. This parametric test assumes the population has a normal distribution and an equal variance for the given variable. This test is also known as a two-sample t-test.

Welch's t-test: This test is used for hypothesis testing between two independent samples of whether their means are significantly different from each other. This test is also known as the unequal variance t-test. It is more reliable than the Student's t-test when the variances and sample sizes are unequal. This test does assume a normal distribution of the data.

Mann-Whitney U test: A hypothesis test which is the non-parametric equivalent to the two-sample t-test. This test does not make the assumption of a normal distribution of the population data. It has greater power than two-sample t-tests when the data is not normally distributed. This test does assume that the two samples display a similar shape to their distribution.

Effect Size (d family of tests):

Cohen's d: A measure for effect size between two samples. It compares the difference between the means and divides this by the standard deviation of the population the samples were taken from.

Hedge's g: A measure of effect size which is similar to Cohen's d but can be more accurately used than Cohen's d with smaller sample sizes (<20).

Glass's delta: A measure for effect size which should be the preferred choice when the sample's standard deviations are significantly different from each other.

Cited from (Kim, 2013; Mertler & Vannatta, 2010; Tomczak & Tomczak, 2014)

APPENDIX H: ADDITIONAL STATISTICAL ANALYSES RESULTS FROM REI-40

Rational Ability Subgroup:

Table H-1: Descriptive statistics for the sums of the rational ability subgroup (FO = Fire Officer).

	n	Mean	SD	Range	Skew	Kurt	Shapiro-Wilk
Exemplar FO	62	43.42	3.775	33-50	-.385	-.067	.199
General FO	339	42.58	5.438	26-50	-.813	.198	<.001

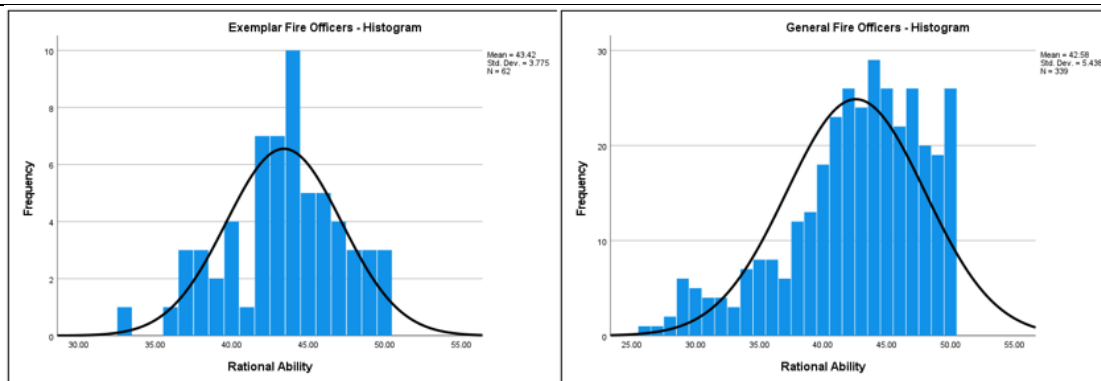


Figure H-1: Histograms illustrating the distribution of the sum of rational ability scores for Exemplar (left) and General Fire Officers (right). For reference, the bell-shaped lines are the expected normal distribution.

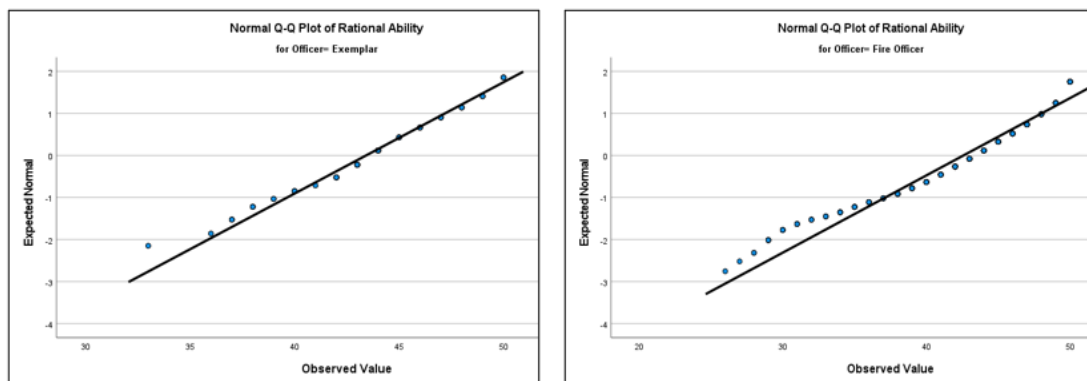


Figure H-2: Q-Q plots illustrating the distribution of the sum of rational ability scores for Exemplar (left) and General Fire Officers (right). Deviations from the solid line indicate non-normal distribution.

Rational Engagement Subgroup:

Table H-2: Descriptive statistics for the sums of the rational engagement score (FO = Fire Officer).

	n	Mean	SD	Range	Skew	Kurt	Shapiro-Wilk
Exemplar FO	62	40.90	4.056	33-49	-.066	-.614	.209
General FO	339	39.00	5.561	25-50	-.029	-.773	<.001

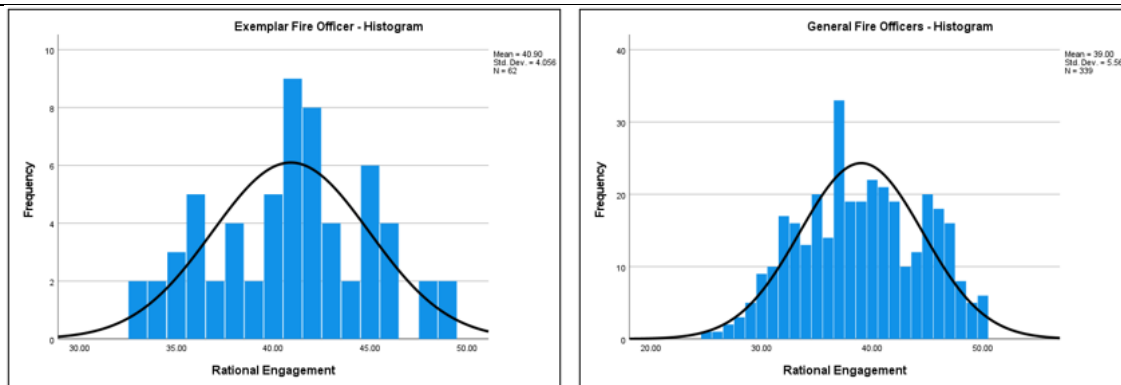


Figure H-3: Histograms illustrating the distribution of the sum of rational engagement subgroup scores for Exemplar (left) and General Fire Officers (right). For reference, the bell-shaped lines are the expected normal distribution.

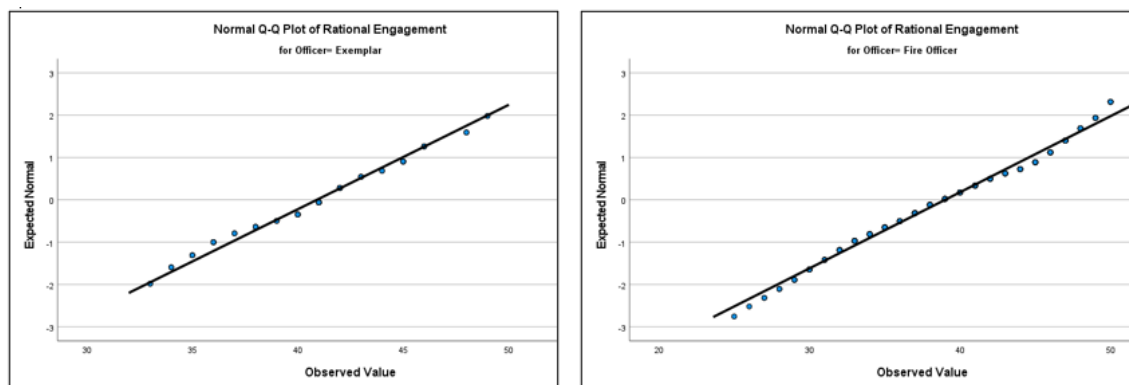


Figure H-4: Q-Q plots illustrating the distribution of the sum of rational engagement subgroup scores for Exemplar (left) and General Fire Officers (right). Deviations from the solid line indicate non-normal distribution.

Experiential Ability Subgroup:

Table H-3: Descriptive statistics for the sums of the experiential ability subgroup (FO = Fire Officer).

	n	Mean	SD	Range	Skew	Kurt	Shapiro-Wilk
Exemplar FO	62	43.48	2.488	38-48	-.287	-.658	.061
General FO	339	37.24	5.355	22-50	-.108	-.202	.085

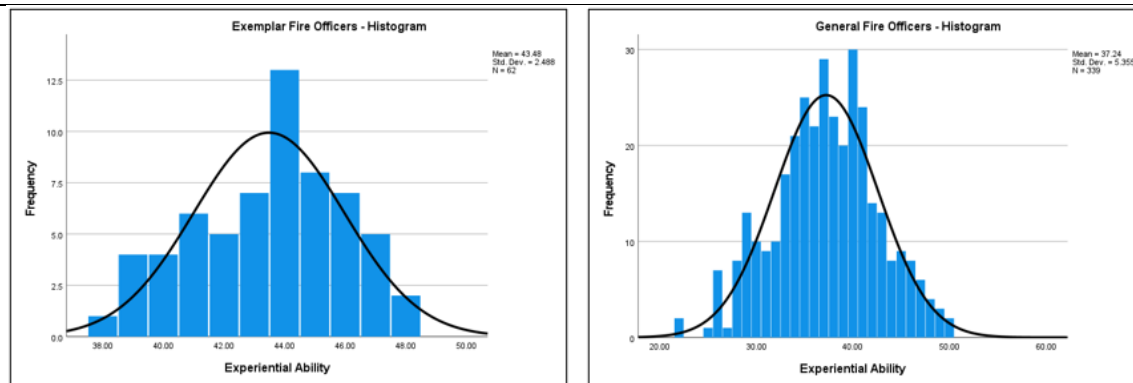


Figure H-5: Histograms illustrating the distribution of the sum of experiential ability subgroup scores for Exemplar (left) and General Fire Officers (right). For reference, the bell-shaped lines are the expected normal distribution.

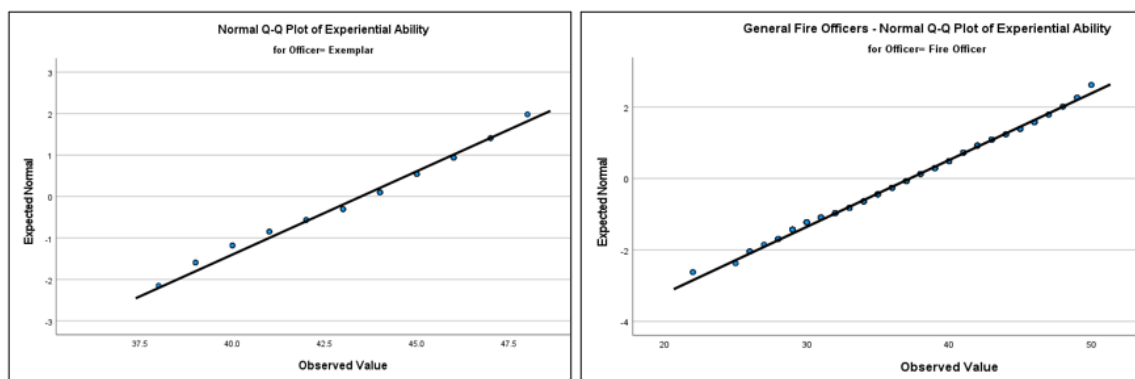


Figure H-6: Q-Q plots illustrating the distribution of the sum of experiential ability subgroup scores for Exemplar (left) and General Fire Officers (right). Deviations from the solid line indicate non-normal distribution.

Experiential Engagement Subgroup:

Table H-4: Descriptive statistics for the sums of the experiential engagement subgroup (FO = Fire Officer).

	n	Mean	SD	Range	Skew	Kurt	Shapiro-Wilk
Exemplar FO	62	42.31	3.092	35-48	-.435	-.201	.094
General FO	339	33.23	6.486	17-50	-.008	-.192	.064

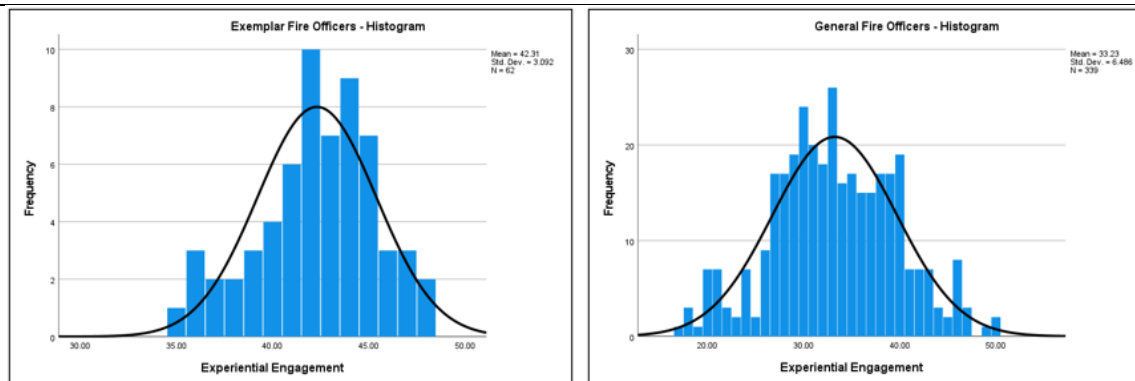


Figure H-7: Histograms illustrating the distribution of the sum of experiential engagement subgroup scores for Exemplar (left) and General Fire Officers (right). For reference, the bell-shaped lines are the expected normal distribution.

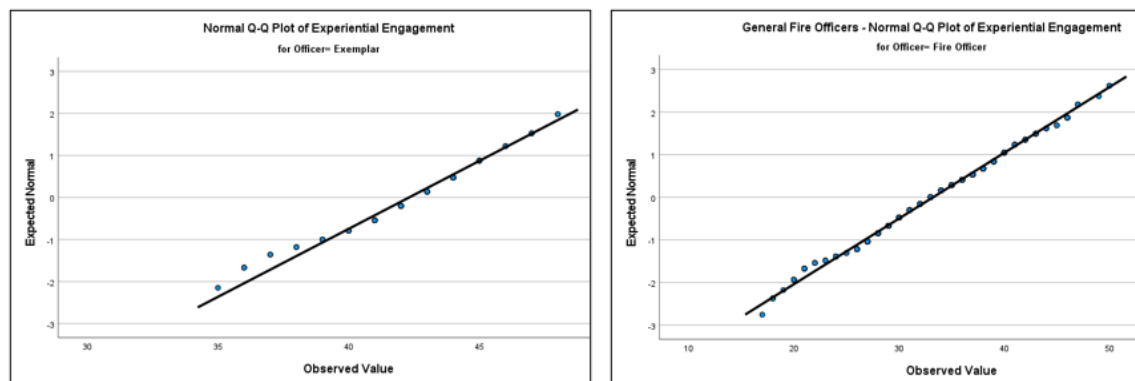


Figure H-8: Q-Q plots illustrating the distribution of the sum of experiential engagement subgroup scores for Exemplar (left) and General Fire Officers (right). Deviations from the solid line indicate non-normal distribution.

APPENDIX I: DELPHI PANEL INTERVIEW QUESTIONS

Delphi Panel Questions

The nature of the Delphi Panel Interview process necessitates that a preplanned direction of questioning is established but must also allow for the specific interview to head in its ‘natural tendency’. Thus, these are the formal structured questions which will be asked of each participant but it is also understood that each of these may lead to a contingent line of questioning.

Delphi Panel Interview Questions – First Round

To be read to the Delphi Panel Participants:

In this dissertation research study, I am using the term ‘In-Extremis’ (a Latin phrase for “at the point of death” or “in extreme circumstances”) to describe situations that involve the very possible threat of harm to victims and/or the responders such as fireground operations, highway accidents, patients with highly contagious diseases, domestic violence calls, etc. The next few questions are directed on how you make decisions during In-Extremis situations.

1. Most fire departments have written protocols/procedures for handling many emergency situations, does yours? If so, are they ‘shall’, ‘should’, or ‘guideline’ procedures in how they must be followed?
2. There are many similarities to emergency scenes but also factors which make them unique from each other; How well do written procedures prepare you for making decisions on an emergency scene? Can they possibly hinder successful decision-making?
3. Some authors, in fire service publications, have used the military term of “fog of war” to describe stressful emergency scenes. Does successful emergency scene decision-making require that you adapt your course of actions and remain flexible to the situation or do standardized organizational procedures that can be memorized beforehand lead to the best outcomes?
4. An author wrote that procedures are the “great equalizer” in that they give the newly promoted officer a very good basis to lead their crew(s) in tricky situations but later in a career the very same procedures limit experienced officers by dictating a course of action. Do you personally rely upon pre-established procedures for determining your emergency scene decisions or do you rely upon your own initiative or a combination?
5. If you were the instructor of new fire officers in your department, what would be your thoughts about what is most important for on-scene decision-making during the crisis moments of an emergency? Is there a style of leadership best suited for handling In-Extremis scenarios?
6. How does experience play a role in In-Extremis situational leadership?
7. Is personal emotional control a necessary component to the decision-making process during emergency situations? If so, why and how do you accomplish this?
8. How important is trust, both you in your crew and them of you, to being able to make most appropriate decisions and carry them through successfully on the emergency scene?

9. How important is taking a ‘Hands On’ approach to your leadership success? Is it important that the men and women you lead to know that you can/will assist as needed versus taking a solely supervisory role?

To be read to the Delphi Panel Participants:

This research study is also investigating what exemplars in the fire service field command see as the ability/need for change in the fire service. A common statement in fire service publications is that the American fire service is ‘200 years of tradition unhindered by progress’. This is a cute catch-phrase spoken in many firehouse kitchens but is there truth to the comment? The American fire service has developed from an insurance crew-based response to the current municipal/township/county style organization. Most fire departments have evolved from only fire related responses to adding rescue situations to becoming the EMS provider for their jurisdiction and this has led to increased training, frequency of responses, and responsibilities. The following questions are directed on how you perceive stability and change in the fire service.

1. Do you believe your department needs to institute changes to be more effective? Does the U.S. fire service need to change in general?
2. Has your department kept up with technological innovations occurring? Has the U.S. fire service in general?
3. Are there any role changes as a service provider that your department should implement? Is there any the U.S. fire service should strive to undertake?
4. There are many fire departments that face financial concerns from competing issues and/or reduced revenues; should the fire service change to meet these problems?
5. Our country has and is going through societal dynamics of a social, equality, diversity, and inclusion nature and there is increased review of how our institutions interact with the various components of our communities. Has your department addressed these concerns? Should the U.S. fire service adapt to these current societal concerns?

Delphi Panel Interview Questions – Second Round

To be read to the Delphi Panel Participants:

As a reminder, in this dissertation research study, I am using the term ‘In-Extremis’ (a Latin phrase for “at the point of death” or “in extreme circumstances”) to describe situations that involve the very possible threat of harm to victims and/or the responders such as fireground operations, highway accidents, patients with highly contagious diseases, domestic violence calls, etc.

This second round of interviews is aimed at further exploration and clarifying some of the issues discussed in the first round, both by yourself and the Delphi panel as a whole.

1. Many of the Delphi panel mentioned in the first round of interviews that experience is an important factor in developing successful in-extremis leadership. Is it a key element in producing the characteristics of a solid leader during these critical moments?
2. If so, how does experience mold officers and make them into exemplars? What qualities are enhanced through experience?
3. Some of the first-round interview discussions hinged upon the qualities of leaders and their leadership traits versus a purely management approach to handling emergency and non-emergency situations. Is there a difference? If so, is this difference significant to emergency incidents? To in-extremis moments?
4. Since the Fire Service has a chain-of-command rank structure, aren't all firefighters of all ranks supposed to follow the orders given by superior ranks? Hasn't that officer already earned the right of command? Is earning respect that important while leading during in-extremis situations?
5. Another issue mentioned by many panel members in the first-round was that situational understanding and/or awareness is pivotal for most appropriately leading in-extremis situations. It would seem to make sense and be obvious that a best-case solution to any problem would be based upon more fully understanding the problem at hand. Is this important? If so, how important? How do exemplars acquire this skill set?
6. Change in the Fire Service was discussed through a few broad categories in the first-round and some of these brought about energetic answers...
 - a. The Fire Service was discussed as changing with modern technologies as they become relevant to our operations but not in a timely manner. Is this an accurate assessment of your observations?
 - b. The need for the Fire Service to include greater diversity and inclusion in its membership and command structures was discussed in the first round, sometimes passionately. To clarify, how should this affect the Fire Service?

Delphi Panel Interview Questions – Third Round

To be read to the Delphi Panel Participants:

As a final reminder, in this dissertation research study, I am using the term 'In-Extremis' (a Latin phrase for "at the point of death" or "in extreme circumstances") to describe situations that involve the very possible threat of harm to victims and/or the responders such as fireground operations, highway accidents, patients with highly contagious diseases, domestic violence calls, etc.

This third round of interviews is aimed at investigating any additional points that might arise from the issues already discussed and further clarifying these issues discussed in the first two rounds, both by yourself and the Delphi panel as a whole. It is the intent that this will be the final round of interviews and whether consensus was reached will be determined from the three rounds of interviews.

This round will include 'member-checking'; a form of ensuring that each interviewee is accurately understood and represented within the data collected.

1. In the first two rounds of the interviews, there have been comments about written procedures versus making independent decisions based upon the actual circumstances of the incident. How do these two come into play when making decisions at emergency incidents? Are they in conflict with each other or do they work together? When do you learn to trust your own intuition?
2. How 'tied' to established procedures are you? Does deviation from these cause confusion or inconsistency in organizational actions?
3. Experience has been talked about throughout the previous interviews. Is it a stand-alone factor which makes the Exemplar or is it just part of a continuum of necessary ingredients?
4. As the phrase 'Competence is the coin of the Realm' has been mentioned more than once during the first two rounds, how important is this when commanding during in-extremis moments? Do people who are being put into personally dangerous circumstances have to believe their leaders know what to do? What other personality traits are important at those moments?
5. Before we finish what might be the final round of interviews, are there any further issues you wish to discuss or clarify?

APPENDIX J: CONSENT LETTERS

Delphi Panel Consent Letter

BOWLING GREEN STATE UNIVERSITY

School of Educational Foundations, Leadership & Policy

INFORMED CONSENT FOR:

A Mixed-Methods Delphi Study of Exemplars' In-Extremis Decision-Making Characteristics

SUMMARY:

This study is investigating how identified exemplars (experts) in field command in the fire service make decisions during emergency incidents and to additionally look at their perceptions on how best for the United States fire service to adapt in the immediate and foreseeable future.

Study subjects will be asked to participate for 2-3 hours total of their time over a few online interview sessions. All information gathered will be confidential and not be shared with your department and only published as a final dissertation without identifying individual participants.

INTRODUCTION & PURPOSE:

I am a doctoral student working on my dissertation at Bowling Green State University (BGSU) in the Education Department. I am also a Senior Battalion Chief with the Toledo Fire & Rescue Department. My research topic revolves about how to better understand how field command exemplars make their decisions during moments where information is limited and its credibility is sometimes unknown, time is critical, needed resources may not yet be at hand, and the consequences of these decisions are significant. The study hopes to benefit the fire service by better understanding how fire officers who excel in commanding demanding emergency incidents make successful decisions and incorporating this knowledge in future officer professional development training.

PROCEDURE:

Your fire department has identified you as one of their exemplars (exceptional officers) in field command and has sent you my contact information so that you contact me back if you choose to voluntarily participate in this study.

This study will utilize the Delphi method to individually interview the exemplars online to ask semi-formal structured questions. The Delphi method interviews a panel of experts on a one-on-one basis, develops themes from those interviews and then individually re-interviews the experts to find if the group themes brings about modifications to the original answers. This process continues to determine if the panel of experts are able to reach consensus.

The researcher will compile the answers into groupings and follow-up interviews with each individual will happen to see if the group answer elicits a modification of the first answers. The idea is to see if the Delphi panel of experts can come to consensus to the questions. The first interview will be approximately in the 30-60 minutes range and the follow up interviews would most likely take 30 minutes or less.

In addition to the online one-on-one interviews, the study asks the participants to take an online survey, Rational-Experiential Inventory (REI-40), which should take 10 -15 minutes. This survey evaluates intuitive (more rapid and based upon personal experience) and analytical (consider multiple alternatives and their potential effectiveness) thinking. The survey results from the fire officers identified as exemplars in field command will be compared to a general sampling of fire service officers who will also take the REI-40 survey.

VOLUNTARY NATURE:

Your participation in this study is completely voluntary. You are free to withdraw at any time. You may decide to skip questions (or not do a particular task) or discontinue participation at any time without explanation or penalty. If you choose to withdraw from the study, the researcher would use all data collected up to that time.

Your decision whether to participate will not affect your relationship with Bowling Green State University or your fire department.

CONFIDENTIALITY PROTECTION:

All responses will be maintained confidentially and only the researcher will have access to the recorded one-on-one interviews. The recorded interviews will only be kept on an external drive which will have password protection that only the researcher will know. The interviews will be transcribed and the recordings will be deleted after the study is completed. The external drive will be kept in a locked safe when not in use for the study.

Some employers may use tracking software so you may want to complete the online interviews on a personal computer. You should not leave the survey open if using a public computer or a computer that others may have access to, and you should clear your browser cache and page history after completing the survey.

The study will present the answers as a group summation and any responses published individually as examples will always be non-identified. The study results will be made available to any participant who requests such.

RISKS OF PARTICIPATION:

The risk of participation is expected to be no greater than experienced in daily life.

CONTACT INFORMATION:

I can be contacted on my cell phone (419-350-4085),

Or my BGSU email (bryceb@bgsu.edu).

My Dissertation Chairman, Dr. Paul Johnson, can be contacted at (pjohnso@bgsu.edu).

For Questions Concerning Participant Rights:

BGSU Institutional Review Board; (419-372-7716) or (orc@bgsu.edu)

CLOSING STATEMENT & SIGNATURE:

I have been informed of the purposes, procedures, risks, and benefits of this study. I have the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary and that I may withdraw from the study at any time prior to the final data compilation. A completed and submitted response to the survey will be considered to be informed consent and for the response to be used in the research results. I agree to participate in this research.

Participant Signature

Date

Exemplar Fire Officer Online Survey Informed Consent Letter



BOWLING GREEN STATE UNIVERSITY

School of Educational Foundations, Leadership & Policy

INFORMED CONSENT FOR:

Rational-Experiential Inventory (REI-40) Online Survey Exemplar Participant

SUMMARY:

This dissertation research study is utilizing an online survey Rational-Experiential Inventory (REI-40) to investigate how fire service officers rely upon analytical and experiential tendencies to make decisions. This research hopes to gain a better understanding of how to better train and prepare fire service officers to perform under emergency incident circumstances.

The survey consists of 40 questions plus demographic questions and takes approximately 10 minutes to complete and submit.

Each participant is also asked to fill out a brief demographic section to categorize groupings of responses. The responses will be anonymous and participants cannot be identified from any of the demographic information.

INTRODUCTION & PURPOSE:

I am a doctoral student working on my dissertation at Bowling Green State University (BGSU) in the Education Department. I am also a Senior Battalion Chief with the Toledo Fire & Rescue Department. My research topic revolves about how to better understand how field command exemplars make their decisions during moments where information is limited and its credibility is sometimes unknown, time is critical, needed resources may not yet be at hand, and the consequences of these decisions are significant.

PROCEDURE:

Your fire department has identified you as one of their exemplars (exceptional officers) in field command and has sent you my link to a secure online survey.

The study asks the participants to take an online survey, Rational-Experiential Inventory (REI-40), which should take 10 -15 minutes. This survey evaluates intuitive and analytical thinking. The survey results from the fire officers identified as exemplars in field command will be compared to a general sampling of fire service officers who will also take the REI-40 survey.

VOLUNTARY NATURE:

Your participation in this study is completely voluntary and anonymous. You are free to withdraw at any time. You may decide to skip questions or discontinue participation at any time without explanation or penalty.

Your decision whether to participate will not affect your relationship with Bowling Green State University or your fire department.

ANONYMITY PROTECTION:

550 Education
Bowling Green, OH 43403-0250

Phone: 419-372- 7377
Fax: 419-372-8448

www.bgsu.edu/colleges/edhd/LPS

All responses to the online survey (REI-40) will be anonymous and only the researcher will have access to submitted responses. The tabulated data from the survey results will only be kept on an external drive which will have password protection that only the researcher will know. The external drive will be kept in a locked safe when not in use for the study.

Some employers may use tracking software so you may want to complete the online survey on a personal computer. You should not leave the survey open if using a public computer or a computer that others may have access to, and you should clear your browser cache and page history after completing the survey.

RISKS OF PARTICIPATION:

The risk of participation is expected to be no greater than experienced in daily life.

CLOSING STATEMENT:

As a study participant, I have been informed of the purposes, procedures, risks, and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary.

A completed and submitted response to the survey will be considered to be informed consent and for the response to be used in the research results.

CONTACT INFORMATION:

I can be contacted at my BGSU email (bryceb@bgsu.edu).

My Dissertation Chairman, Dr. Paul Johnson, can be contacted at (pjohnso@bgsu.edu).

For Questions Concerning Participant Rights:

BGSU Institutional Review Board; (419-372-7716) or (orc@bgsu.edu)

General Fire Officer Online Survey Informed Consent Letter



BOWLING GREEN STATE UNIVERSITY

School of Educational Foundations, Leadership & Policy

INFORMED CONSENT FOR:

Rational-Experiential Inventory (REI-40) Online Survey Participant

SUMMARY:

This dissertation research study is utilizing an online survey Rational-Experiential Inventory (REI-40) to investigate how fire service officers rely upon analytical and experiential tendencies to make decisions. This research hopes to gain a better understanding of how to better train and prepare fire service officers to perform under emergency incident circumstances.

The survey consists of 40 questions plus demographic questions and takes approximately 10 minutes to complete and submit.

Each participant is also asked to fill out a brief demographic section to categorize groupings of responses. The responses will be anonymous and participants cannot be identified from any of the demographic information.

INTRODUCTION & PURPOSE:

I am a doctoral student working on my dissertation at Bowling Green State University (BGSU) in the Education Department. I am also a Senior Battalion Chief with the Toledo Fire & Rescue Department. My research topic revolves about how to better understand how field command exemplars make their decisions during moments where information is limited and its credibility is sometimes unknown, time is critical, needed resources may not yet be at hand, and the consequences of these decisions are significant.

PROCEDURE:

Your fire department has sent you my link to a secure online survey. This study asks the participants to take this online survey, Rational-Experiential Inventory (REI-40), which should take approximately 10 minutes. This survey evaluates intuitive and analytical thinking. The survey results from the fire officers will be compared and analyzed to determine if there are consistencies or differences in decision-making tendencies.

VOLUNTARY NATURE:

Your participation in this study is completely voluntary and anonymous. You are free to withdraw at any time. You may decide to skip questions or discontinue participation at any time without explanation or penalty.

Your decision whether to participate will not affect your relationship with Bowling Green State University or your fire department.

ANONYMITY PROTECTION:

All responses to the online survey (REI-40) will be anonymous and only the researcher will have access to submitted responses. The tabulated data from the survey results will only be kept on

an external drive which will have password protection that only the researcher will know. The external drive will be kept in a locked safe when not in use for the study.

Some employers may use tracking software so you may want to complete the online survey on a personal computer. You should not leave the survey open if using a public computer or a computer that others may have access to, and you should clear your browser cache and page history after completing the survey.

RISKS OF PARTICIPATION:

The risk of participation is expected to be no greater than experienced in daily life.

CLOSING STATEMENT:

As a study participant, I have been informed of the purposes, procedures, risks, and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary.

A completed and submitted response to the survey will be considered to be informed consent and for the response to be used in the research results.

CONTACT INFORMATION:

I can be contacted at my BGSU email (bryceb@bgsu.edu).

My Dissertation Chairman, Dr. Paul Johnson, can be contacted at (pjohnso@bgsu.edu).

For Questions Concerning Participant Rights:

BGSU Institutional Review Board; (419-372-7716) or (orc@bgsu.edu)

APPENDIX K: LUCAS COUNTY (OHIO) VENTRICULAR FIBRILLATION / PULSELESS
VENTRICULAR TACHYCARDIA EMS PROTOCOL



P
Ventricular Fibrillation
Pulseless Ventricular
Tachycardia



Special Considerations:

1. Pulseless VT is included in the algorithm because it is treated as VF. VF and pulseless VT require CPR until a defibrillator is available. Both are treated with high-energy unsynchronized shocks.
2. **Effective CPR and prompt defibrillation are the keys to successful resuscitation.** Shortening the interval between the last compression and the shock by even a few seconds can improve shock success (defibrillation to ROSC). Thus, it is reasonable for healthcare providers to practice efficient coordination between CPR and defibrillation to minimize the hands-off interval between stopping compressions and administering the shock.
3. Interruption in CPR to conduct a rhythm analysis should not exceed 10 seconds.
4. Reassess and document advanced airway placement and EtCO₂ frequently, after every move, and upon delivery to ED.
5. The importance of diagnosing and treating the underlying cause of VF/pulseless VT is fundamental to the management of all cardiac arrest rhythms. As always, the provider should recall the H's and T's to identify a factor that may have caused the arrest or may be complicating the resuscitative effort. The most common causes of VF/pulseless VT are presented as H's and T's in the table below:

H's	T's
Hypovolemia	Tension Pneumothorax
Hypoxia	Tamponade (cardiac)
Hydrogen ion (acidosis)	Toxins
Hyper- / hypokalemia	Thrombosis (pulmonary)
Hypothermia	Thrombosis (coronary)

Tab 800
V-Fib / Pulseless V-Tach P-2
10/2021

Cited from (Lucas County EMS, 2021).

APPENDIX L: U.S. FIREFIGHTER ANNUAL LINE OF DUTY DEATHS (1997-2020)

LINE OF DUTY DEATHS (LODDs) – U.S. Fire Service Personnel


1997	100
1998	93
1999	114
2000	105
2001	452
2002	101
2003	112
2004	108

2005	99
2006	92
2007	106
2008	108
2009	78
2010	72
2011	91
2012	86

2013	110
2014	97
2015	90
2016	92
2017	93
2018	85
2019	140
2020	141

- Cited from (Fahy & Petrillo, 2021; U.S., 2012; U.S., 2020)

APPENDIX M: BGSU TOPIC APPROVAL LETTER



BOWLING GREEN STATE UNIVERSITY

Graduate College

TOPIC APPROVAL FORM - DISSERTATION

First name: Bryce Last name: Blair

BGSU ID: 0009795286 Current GPA: 4.0

Field of Study: Ed.D. - Leadership Planned Graduation Date: Spring 2021

Title: A MIXED-METHODS DELPHI STUDY OF IN-EXTREMIS DECISION-MAKING CHARACTERISTICS BY FIREGROUND COMMANDERS

Committee Signatures:

<p>Committee Chair</p> <p><u>Paul Johnson</u> <small>Paul Johnson (Dec 15, 2020 14:38 EST)</small></p> <p>12/15/2020</p>	<p>Paul Johnson</p> <p>0009606701</p>	<p>Committee Member</p> <p><u>Kristina LaVenia</u> <small>Kristina LaVenia (Jan 21, 2021 18:23 EST)</small></p> <p>01/21/2021</p>	<p>Kristina LaVenia</p> <p>0080000351</p>
<p>Committee Member</p> <p><u>Judith May</u> <small>Judith May (Dec 18, 2020 11:50 EST)</small></p> <p>12/18/2020</p>	<p>Judith May</p> <p>0001620991</p>	<p>Committee Member</p> <p><u>Shirley Green</u> <small>Shirley Green (Feb 23, 2021 13:13 EST)</small></p> <p>02/23/2021</p>	<p>Shirley Green</p> <p>0009621082</p>
<p>Committee Member</p>		<p>Graduate Faculty Representative</p> <p><u>Sara Worley</u> <small>Sara Worley (Jan 26, 2021 12:43 EST)</small></p> <p>01/26/2021</p>	<p>Sara Worley</p> <p>0000778052</p>

IRB / IACUC Approvals:

Are human subjects involved? Yes No
(If yes, approval by the BGSU IRB is required prior to gaining final topic approval and beginning research)

IRB Project ID#: 1647756-2 Date of IRB Approval: 01/01/2099

Are non-human vertebrate animals involved? Yes No
(If yes, approval by the BGSU IACUC is required prior to gaining final topic approval and beginning research)

IACUC Project ID#: _____ Date of IACUC Approval: _____

Graduate Coordinator Approval: Paul Willis
Paul Willis (Mar 6, 2021 11:47 EST) Paul Willis 0020226820 03/08/2021

The signature of the graduate program coordinator indicates that appropriate policies and procedures have been followed.

Graduate College Approval: Jonathan Chambers
Jonathan Chambers (Mar 10, 2021 13:34 EST) Jonathan Chambers 0006912451 03/10/2021

The approval of the Graduate College indicates that the topic has been approved as listed above. Any future changes to the title or committee must be approved by the Graduate College.

Green ID ...1083, 001723 ALC 3.9.21

000343

APPENDIX N: IRB APPROVAL LETTER



BOWLING GREEN STATE UNIVERSITY

Office of Research Compliance

Institutional Review Board

DATE: July 18, 2022

TO: Bryce Blair, BA, MLS

FROM: Bowling Green State University Institutional Review Board

PROJECT TITLE: [1647756-5] Investigating Exemplar Officers in the Fire Service.

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED

APPROVAL DATE: August 20, 2022

EXPIRATION DATE: August 19, 2023

REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of Continuing Review/Progress Report materials for this project. The Bowling Green State University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Please note that you are responsible to conduct the study as approved by the IRB. If you seek to make any changes in your project activities or procedures, those modifications must be approved by this committee prior to initiation. Please use the modification request form for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. All NON-COMPLIANCE issues or COMPLAINTS regarding this project must also be reported promptly to this office.

This approval expires on August 19, 2023. You will receive a continuing review notice before your project expires. If you wish to continue your work after the expiration date, your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date.

If you have any questions, please contact the Institutional Review Board at 419-372-7716 or irb@bgsu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Bowling Green State University Institutional Review Board's records.