The Role of Trust in High Reliability Organizing: The Moderating Affect of Organizational Trust in Temporary, Inter-Agency Group Dynamics

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Dedication

Always, my family provided invaluable encouragement in my learning journey. My mother and father, Angelina and Arturo, taught me to work hard. My husband, Francisco, open my eyes to the possibilities. My children, Alejandra and Frank, son-in-law, Justin, and grandson, Paulie, grounded me with love. My family enthusiastically and patiently supported my quest for knowledge; all along, gently reminding me that matters of the heart are equally important--my family makes me whole.

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Abstract of Dissertation

The Role of Trust in High Reliability Organizing:
The Moderating Affect of Organizational Trust in Temporary, Inter-Agency Group Dynamics

In the aftermath of disasters, thousands of lives are saved because of the reliable performance of temporary, inter-agency groups. Many studies have addressed the practices of reliable, temporary, inter-agency groups, e.g., high reliability organizing (HRO); however, few have addressed the role of behavior. The theoretical constructs of high reliability organizing (HRO) and trust are studied in this dissertation to gain insight into the role of behavior in the reliable performance of temporary, inter-agency groups. This dissertation proposes that organizational trust moderates HRO practices, thus, it moderates the reliable performance of temporary, inter-agency groups.

A mixed methodology (surveys and interviews) was used in this study. A sample of wildland firefighters was selected from an advanced incident management course, because attendees of this course had vast experiences in HRO and inter-agency groups. The subjects were highly skilled, all belonged to type1 and 2 incident management teams IMTs. The role of organizational-level trust was studied by capturing trustor-trustee organizational affiliation. Trust surveys provided trust data and demographic data. Interviews provided the reasons behind organizational trust attribution. By using, both, surveys and interviews, a deeper understanding of the attribution of organizational trust was obtained.

The results of four trust surveys indicated that: the trustee's organization was perceived as trustworthy; the level of organizational trust attribution was not related to

organizational affiliation; the levels of cognitive-based trust and affective-based trust equalized overtime; females had a high propensity to trust and attributed significantly higher levels of organizational trust; and, an individual's propensity to trust is highly related to their attribution of organizational trust. The interviewees attributed organizational trust based on the perception of competence. This perception of competence was enabled by the uniformity of training, certification, structure, language, etc. within the temporary, inter-agency group. Overall, the subjects perceived the 'other' inter-agency group members trustworthy, because their agencies had many uniform practices.

The wildland firefighting community is a tight network, e.g., they have structure, practices and mission in common. Further, the subjects recalled experiences as members of highly skilled and structured IMTs. Future research is needed on the role of organizational trust in 'loosely coupled' inter-agency groups--where the represented organizations, groups, or teams do not share common structure, practices, or mission.

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CHAPTER ONE: INTRODUCTION

The people when rightly and fully trusted will return the trust.

--Abraham Lincoln, 16th U.S. President

Purpose of the Study

On December 2004, over 200,000 people lost their lives when a tsunami obliterated hundreds of cities and villages in Southeast Asia. Although formal, governmental disaster preparedness plans were in place, the United Nations found it difficult to coordinate inter-organizational disaster responses (Hicks & Pappas, 2006). Fortunately, temporary groups, for example, non-governmental organizations (NGOs) reliably responded to the urgent need for help in the areas devastated by the tsunami and, thus, saved thousands of lives (Kilby, 2007).

On August 2005, over 1800 people lost their lives when Hurricane Katrina came ashore in New Orleans. Again, Federal, State, and local authorities' disaster preparedness plans proved insufficient to handle the urgent need to help (Boin & McConnell, 2007). Again, temporary groups prevented a greater loss of lives in the aftermath of Hurricane Katrina; for example, the temporary, inter-agency efforts of the U.S. Coast Guard, National Oceanic and Atmosphere Administration, U.S. Army Corps of Engineers, U.S. Maritime administration and citizen volunteers helped save an estimated 22,000 lives in the areas affected by the hurricane (Majchrzak, Jarvenpaa, & Hollingshead, 2007).

The Indian Ocean tsunami and Hurricane Katrina disaster are excellent examples of the crucial role that temporary, inter-agency groups play in the aftermath of disasters. A temporary, inter-agency group is a group of skilled people from different agencies who come together to work on a complex task over a limited period of time (Meyerson, Weick, & Kramer, 1996). Burkle (2006) observed that, "the 2004 Indian Ocean tsunami and Hurricane Katrina gave the world an opportunity to overcome the barriers of nation-state sovereignty and multi-culturalism through unprecedented collaboration and informal self-organizing networking of local populations with international agencies and organizations" (p. 244). Because temporary, inter-agency groups, such as, NGOs and incident management teams (IMT) have demonstrated their ability to perform reliably, these groups are increasingly used to save lives and resources in the aftermath of disasters (Bigley & Roberts, 2001; Kilby, 2007). Reliable performance is the continuous and effective management of working conditions, even those that fluctuate widely and are extremely hazardous and unpredictable (Bigley & Roberts, 2001; Weick, Sutcliffe, & Obstfeld, 1999). A disaster involves loss of life and long-term damage to infrastructure (Boin & McConnell, 2007). It is important to understand the factors that enable temporary, inter-agency groups to perform reliability in the aftermath of disasters--this understanding will aid in the development of effective disaster plans and training.

Many temporary, inter-agency groups are coupled systems that are able to perform reliably by quickly adapting to unexpected events (Orton & Weick, 1990). Temporary, inter-agency groups can adapt to unexpected events by practicing high reliability organizing (HRO) (Weick et al., 1999). HRO includes a preoccupation with

failures, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Weick & Sutcliffe, 2007). This dissertation focuses on the HRO practices of resilience and deference to expertise, because these practices, in particular, strive to contain the aftermath of disasters. Resilience allows groups to bounce back from setbacks by improvising (Weick & Putnam, 2006). Resilience is enhanced by just in time learning, trust, and use of relevant past experience (USDA RMRS-GTR-137, 2004). Deference to expertise allows the migration of decisions to those group members who are most technically knowledgeable (Bigley & Roberts, 2001). The HRO practices of resilience and deference to expertise enable adaptation to unexpected events and, thus, enable temporary, inter-agency groups to reliably contain disasters.

The HRO practices of resilience and deference to expertise rely on the behavior of trust (Connelly, 2007; Meyerson et al., 1996; Weick et al., 1999; Weick & Putnam, 2006). Upon analyzing the Indian Ocean tsunami experience, Kilby (2007) observed, "arguably, it was the informal system based on trust, confidence and credibility that enabled the East Coast Development Forum's to access the affected communities to determine what was required and how to proceed" (p. 4). Mayer, Davis, and Schoorman (1995) define trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 712); this definition applies to, both, individual-level trust and organizational-level trust (Schoorman, Mayer, & Davis, 2007). An individual is deemed trustworthy if the individual is perceived as having ability, integrity, and benevolence; likewise, an

organization is deemed trustworthy if the organization is perceived as having ability, integrity, and benevolence. The centrality of trust to an organization's practices is most evident during times of crisis and disasters (Webb, 1996).

The affect of individual-level trust on temporary, inter-agency group performance has been extensively researched, for example, research has been conducted on the role of swift trust in virtual teams (Meyerson et al., 1996; Miettinen, 2000); however, the affect of organizational-level trust on temporary, inter-agency group performance has not been well researched (Tan & Lim, 2009). Yet, when temporary teams first form, team members only know of each others' organizational-level affiliation; this organizational-level dynamic makes the understanding of organizational trust especially salient. Cummings and Bromiley (1996) state that "organizational trust refers to the degree of trust between units of an organization or between organizations" (p. 302). Little has been written regarding the role of organizational-level trust on temporary, inter-agency group performance; this a gap in organizational and disaster preparedness planning research.

Inter-organizational solutions are increasingly used to resolve complex problems (Connelly, 2007). Often, it is the reliable performance of temporary, inter-agency groups that 'save the day' in the aftermath of disasters (Burkle, 2006), therefore, it is critical to understand the factors that contribute to their reliability. Although much has been written regarding the practices that lead to reliable performance (Weick et al., 1999), more research is needed regarding the role of behavior in reliable performance, specifically, the role of organizational trust (Tan & Lim, 2009). Accordingly, this

dissertation researches the role of organizational trust on the HRO practices of resilience and deference to expertise, thus, the reliable performance of temporary, inter-agency groups.

Statements of Problem, Purpose, Significance and Gaps in Research

The aftermath of Indian Ocean tsunami in 2004, Hurricanes Katrina in 2005, and the Pakistani earthquake in 2005, demonstrate the failure of disaster preparedness plans to meet urgent needs for food, water, housing, health care, etc., consequently, thousands of people died needlessly (Hicks & Pappas, 2006). In their analysis of the Hurricane Katrina disaster response, Boin and McConnell (2007) observed that when formal top-down emergency response plans are insufficient, "effective response will depend on the adaptive behavior of citizens, front-line workers and middle managers" (p. 50). Formal disaster plans often drive the formation of temporary, inter-agency groups, because these groups can readily adapt to unexpected events (Bigley & Roberts, 2001; Majchrzak et al., 2007). Yet, even when the formation of these groups is mandated, the human factors that enable temporary, inter-agency groups to perform reliably are not addressed in the disaster preparedness plans, for example, the role of organizational trust (Connelly, 2007; Lim & Tan, 2009). Researching the affect of organizational trust is vital, because organizational trust plays an important role in organizing for reliable performance (Cox, Jones, & Collinson, 2006), in fact, as the magnitude of a crisis increases, so does the importance of organizational trust (Webb, 1996).

Not fully understanding how organizational trust affects temporary, inter-agency group reliability is a problem, because this lack of understanding can result in

understating the need for organizational trust development in disaster preparedness plans and disaster preparedness training; this will diminish the effectiveness of the plans and training. Accordingly, the purpose of this dissertation is to increase understanding of the affect of organizational trust on temporary, inter-agency group reliability. It is proposed that organizational trust moderates the relationship between the HRO practice of resilience and reliability as well as the relationship between the HRO practice of deference to expertise and reliability. In this dissertation's research, the moderating role of organizational trust will be evidenced when a temporary, inter-agency group member attributes trust along organizational lines. If organizational trust is attributed along organizational lines, then organizational trust plays a role in the dynamics of HRO, thus, group reliability.

The development of organizational trust affects the HRO practices of resilience and deference to expertise in temporary, inter-agency groups (Meyerson et al., 1996; Weick et al., 1999). However, Cox, et al. (2006) stated that, "trust still remains largely under researched within the context of high-reliability organizations" (p. 1124). This dissertation's research will fill gaps in trust, HRO, and organizational theories; filling these gaps is significant, because disaster preparedness personnel use trust, HRO, and organizational literature when developing disaster preparedness plans and training.

Research Questions

The research questions delineated below are designed to gain insight to the attribution of organizational trust in temporary, inter-agency groups. Cummings and Bromiley (1996) define organizational trust as "an individual's belief or a common belief

among a group of individuals that another individual or group (a) makes good-faith efforts to behave in accordance with any commitments both explicit or implicit, (b) is honest in whatever negotiations proceeded such commitments, and (c) does not take excessive advantage of another even when the opportunity is available" (p. 303); this definition of organizational trust is consistent with the Mayer et al. (1995) trust dimensions of ability, integrity and benevolence. The research questions focus on the attribution of trust at the organizational-level of analysis.

Importantly, trust is a multi-level phenomenon; trust can be attributed to individuals as well as organizations (Tan & Lim, 2009). Hosmer (1995) describes trust's multi-nature, "trust is the reliance by one person, group, or firm upon a voluntarily accepted duty on the part of another person, group, or firm to recognize and protect the rights and interest of all others engaged in a joint endeavor or economic exchange" (p. 393). This dissertation focuses on the affect of organizational trust, because in temporary, inter-agency groups, organizational-level issues, for example, organizational affiliation become involved in group decision making (Drnevich, Ramanujam, Mehta, & Chaturvedi, 2009; Webb, 1996).

Since group members belong to various organizations in a temporary, inter-agency group, organizational-level trust issues will surface (Cummings & Bromiley, 1996). Studies show that a trustor will perceive a trustee as more trustworthy when they share organizational affiliation; this trustworthiness is based on common communication and behavioral norms (Conchie and Burns, 2008; Drnevich, 2009; Elsbach & Elofson, 2000). Additionally, studies show a trustor's personal characteristics, for example,

propensity to trust may affect the attribution of organization trust in a temporary group (Mayer et al., 1995). The following questions address the possible affect of organizational trust in temporary, inter-agency group dynamics.

RQ 1: What is the relationship between organizational affiliation and the perception of the expert trustworthiness?

RQ 2: What is the relationship between organizational affiliation and the perception of team-member trustworthiness?

RQ 2a: Will the nature of organizational trust start out as cognition-based?

RQ 2b: Will the nature of organizational trust become affective-based over time?

RQ 3: Do trustor demographic variables moderate the relationship between organizational affiliation and the perception of expert trustworthiness, team-member trustworthiness, and the nature of organizational trust?

Theoretical Foundation—HRO and Trust

Often a group's reliability is attributed to technological factors, for example, the quality of equipment. This dissertation also attributes a group's reliability to human factors, specifically, the existence of organizational trust. Both, HRO and trust theories provide socio-psychological insight into temporary, inter-agency group dynamics; therefore, literature reviews of HRO and trust are provided in order to increase understanding of the affect of organizational trust on resilience and deference to expertise, thus, reliability.

HRO theory attributes reliable performance to the practices of preoccupation with failures, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and deference to expertise (Weick et al., 1999). The Weick and Sutcliffe HRO model (see Figure 1) indicates that mindfulness facilitates the five HRO practices and reliable outcomes, thus, recognizes the affect of human factors on reliability. Further, the behavioral practices of resilience and deference to expertise play an important role in the containment of disasters and crisis (Boin & McConnell, 2007; Cox et al., 2006; Majchrzak, 2007; Weick & Sutcliffe, 2007).

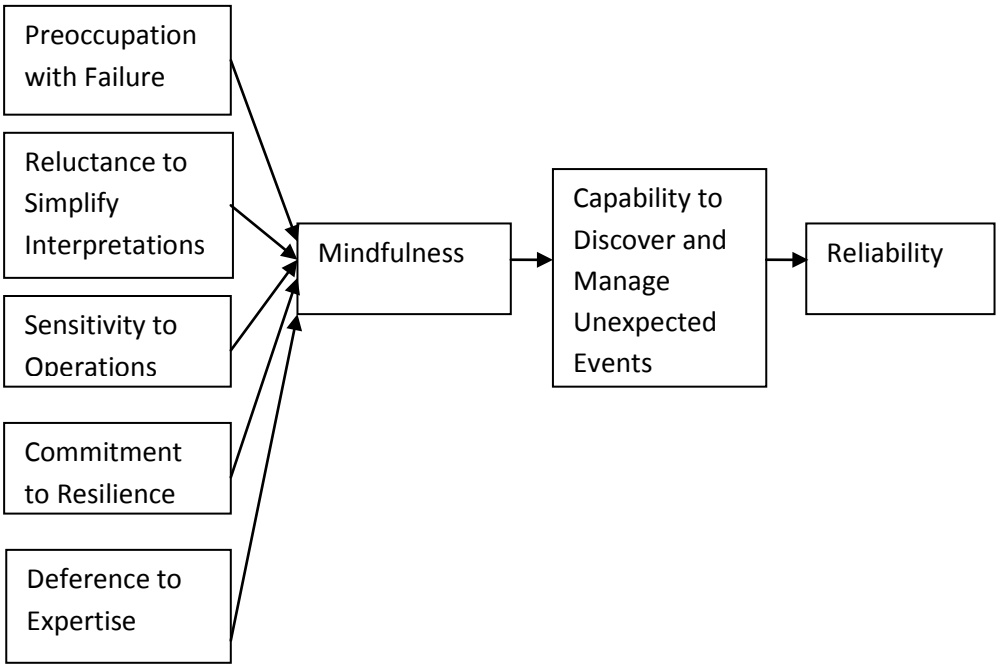


Figure 1: Weick-Sutcliffe High Reliability Organization (HRO) Model (2001)

Commitment to resilience and deference to expertise are driven by the need to adapt and improvise in high risk situations, and are enabled by interpersonal trust within groups and between groups (Weick et al., 1999). The practice of resilience includes the

ability to: (1) absorb strain and continue functioning despite the presence of adversity (internal or external); (2) 'bounce' back from errors and surprises; (3) learn and grow from previous experiences; and (4) trust (USDA RMRS-GTR-137, 2004; Weick & Sutcliffe, 2007). Deference to expertise is the migration of power and authority to the person who can best solve the 'on the spot' problem (Bigley & Robert, 2001). In temporary, inter-agency groups, both, individual-level trust (swift trust) and organizational-level trust enable resilience and deference to expertise.

Mayer's et al. (1995) theory of trust proposes that trust is based on ability, integrity and benevolence. Trustworthiness, that is, the perception of ability, integrity and benevolence is not only applicable to individuals, but is also applicable to groups and organizations (Cummings & Bromiley, 1996; Schoorman et al., 2007). The Mayer et al. (1995) trust model (see Figure 2) also includes the factor of risk in trust development; this recognition of risk is particularly relevant to the study of trust in temporary, inter-agency groups, because these group members are frequently strangers to each other. Because temporary, inter-agency group members may be strangers to each other, the perceived risk of failure at the personal or organizational levels becomes an increased possibility (Majchrzak et al., 2007).

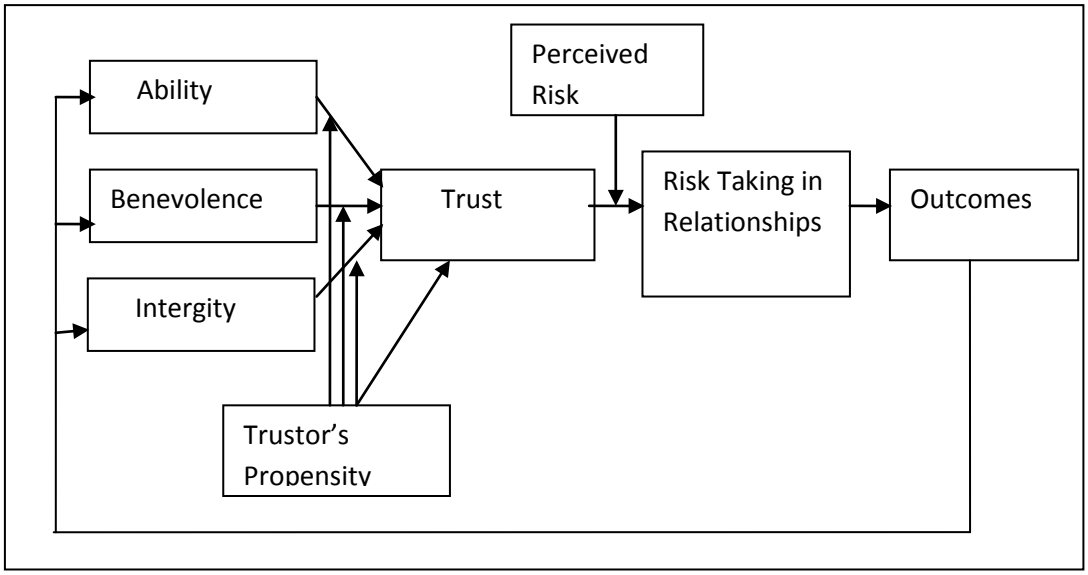


Figure 2: Mayer, Davis, Schoorman Model of Trust (1995)

Trust is a multi-level concept, for example, trust exists between individual and between organizations. Mayer's et al. (1995) trust model supports a "meso" concept of trust; meso concepts integrate microlevel psychological processes and group dynamics with macro level institutional arrangements (Rousseau, Sitkin, Burt, & Camerer, 1998). In temporary groups, swift trust is the type of trust that forms between individuals and it is based on the perception of an individual's ability. Meyerson et al. (1996) observed that in swift trust "there is less emphasis on feeling, commitment, and exchange and more on action, cognition, the nature of the network and labor pool, and avoidance of personal disclosure, contextual cues, modest dependency, and heavy absorption on the task…" (p. 191). In temporary groups, organizational trust is the type of trust that forms between individuals and it is based on organizational affiliation and perceived organizational ability (Schoorman et al., 2007). Trustworthiness is not only an individual-level phenomenon; it is also an organizational-level dynamic.

Miettinen (2000) observes "trust was used as an individually oriented concept, but in recent years, the focus has shifted onto relationships between institutions and the exchange process between them" (p. 81). Organizational trust refers to the degree of trust between units of an organization or between organizations (Cummings & Bromiley, 1996). With the explosion of new linkages between organizations (facilitated by virtual networks), international conglomerates, and governmental agencies, it is becoming critical to understand and encourage organizational-level trust (Kramer, Brewer & Hanna, 1996). Organizational trust, like swift trust, plays a role in temporary, inter-agency group reliability, yet, it has not been well researched.

Weick (1996) addressed the relationship between trust and group reliability in his analyses of the Mann Gulch and South Canyon fires; these two fires resulted in the death of 27 firefighters. Basically, lives were lost because legitimate orders were not followed; orders were not followed because the individuals giving the orders "were not trusted people" (p. 306). Webb (1996) concurred with the importance placed on the role of trust in disaster response groups; he stated, "dependency on others is greater during crises, and with that dependency go premiums on determining trustworthy people and trustworthy coping methods" (p. 289). Trust between temporary, inter-agency group members may not only be affected by the perception of another individual's ability, integrity and benevolence, but the perception of another organization's ability, integrity and benevolence (Schoorman et al., 2007).

Extensive research has been published on the HRO practices that contribute to organizational reliability (Weick et al., 1999; Weick & Putnam, 2006). Extensive

research has been published on the affect of swift trust on the HRO practices in non-virtual and virtual teams (Meyerson et al., 1996; Miettinen, 2000). However, research is needed on the affect of organizational trust on HRO practices in temporary, inter-agency groups (Tan & Lim, 2009). This dissertation fills a gap in organizational trust and HRO research by studying whether the perception of organizational trustworthiness moderates HRO practices (i.e., resilience and deference to expertise) and, thus, reliability in temporary, inter-agency groups. Organizational trust is studied by measuring the trust attributed by the trustor when the trustor and trustee share, or don't share, organizational affiliation (i.e., Federal, State, or Local affiliation). Also studied is whether the trustor's personal attributes affect the attribution of organizational trust (see Figure 3).

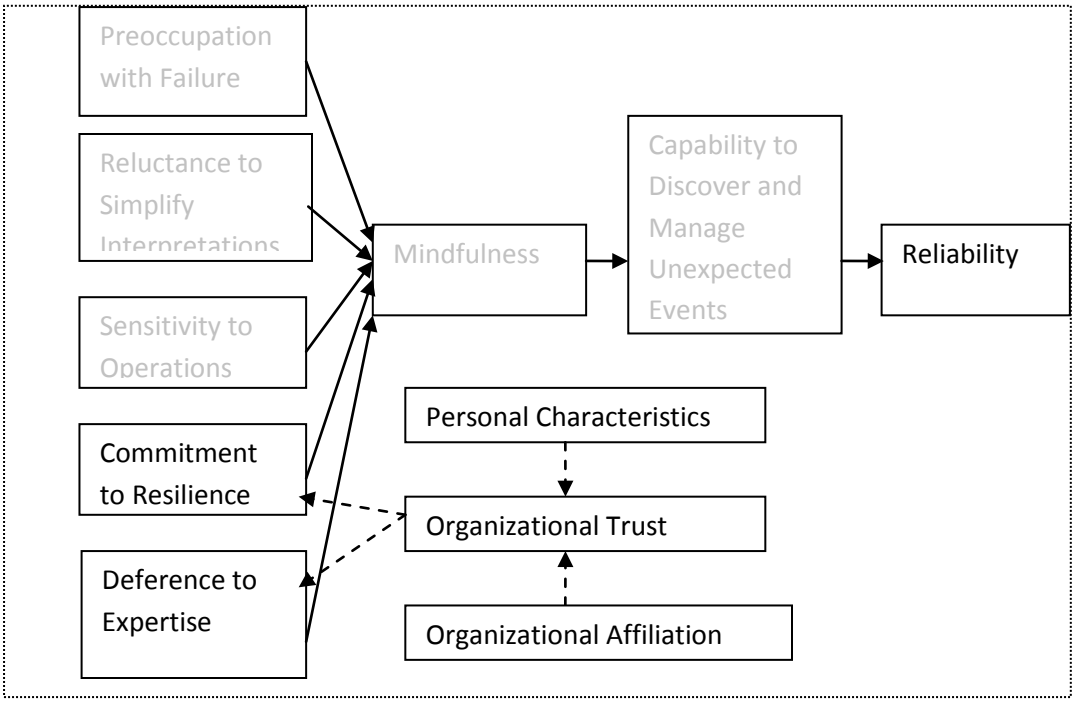


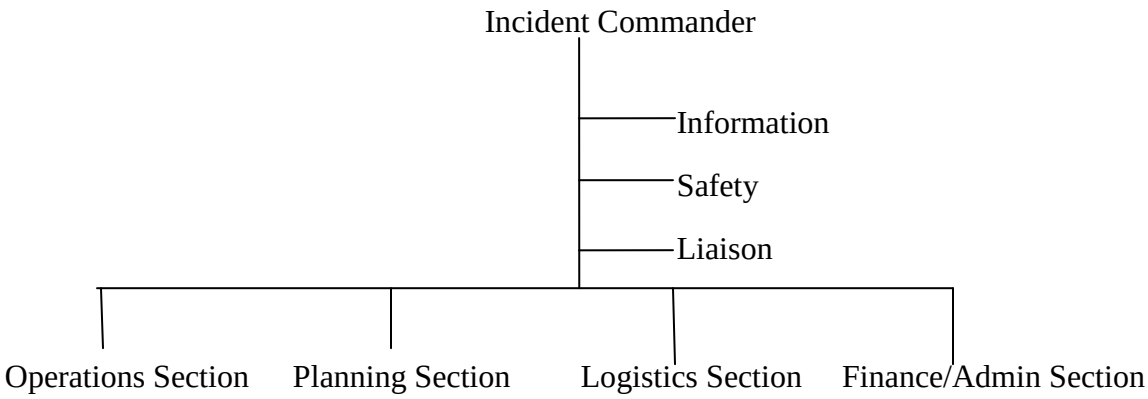
Figure 3: The Moderating Affect of Organizational Trust on HRO in Temporary, Inter-agency Groups

A type of temporary, inter-agency group that frequently responds to disasters is an Incident Management Team (IMT). For example, the wildland firefighting network frequently relies on IMTs to battle fires. The National Wildfire Coordinating Group (NWCG) Handbook 3 (2004) states that IMTs consisting of members that provide the command and control infrastructure needed to respond to disasters; they manage logistical, fiscal, planning, operational, safety and community issues related to the incident. Wildland firefighting organizations at the Federal, State and Local level use IMTs when responding to wildfires.

There are five types of IMTs and their use depends on the complexity and size of the wildfire: Type 5 IMTs are used to battle the least complex wildfires usually at the local level; Type 4 IMTs are used at city, county and fire district levels; Type 3 IMTs are used at the State level; Type 2 IMTs are used to battle large, complex fires at the Federal and State levels, and its team members are Federal and State certified; and, Type 1 IMTs are used to battle the most complex and large fires at the Federal and State levels, its team members are Federal and State certified, and they have the most training and experience. Ultimately, the National Interagency Fire Center (NIFC) is responsible for ensuring the adequate resourcing of large, complex fires to include assigning the appropriate type of IMT.

The more complex a fire, the more likely Type 1 and 2 IMTs will be sent to battle the fire. Type 1 and 2 IMTs members are highly respected and trusted in the wildland firefighting network, because they are the most experienced and trained in the wildland

firefighting network. The following depicts the organizational structure of most Type 1 and 2 IMTs:



Typically, wildland firefighting IMTs follow the Incident Command System (ICS) approach when structuring and performing. NWCG Handbook 3 describes components of the ICS approach as, "common terminology, modular organization, integrated communications, Unified Command structure, consolidated action plans, manageable span-of-control, predestinated incident facilities, and comprehensive resource management" (p.124). The NIFC helps manage the network of Type 1 and 2 IMTs, thus, ensuring that large, complex fires are adequately and timely resourced. The NIFC and its network of IMTs are responsible for the effective execution of the ICS approach—this results in reliable performance.

Methodology

A mixed-methods methodology was used to study organizational trust in temporary, inter-agency groups. A mixed methods research methodology was used because it best addresses the varied and multiple meanings of organizational trust in

temporary, inter-agency groups (Jink, 1979). The mixed methods methodology requires the use of both, qualitative and quantitative research methods. The quantitative portion of the study was conducted first and the qualitative portion was conducted second. Additionally, the quantitative research was more extensive than the qualitative portion, thus, making this mixed methods research methodology design a QUANT-qual.

Many wildland firefighters have extensive experience working in temporary, inter-agency groups; therefore, they are good subjects for the purpose of this dissertation. For the quantitative portion of the study, the study subjects were selected from the S-520 Advanced Incident Management Course given by the National Advanced Fire and Resource Institute (NAFRI). Students of the S-520 course have extensive experience working is complex, wildland firefighting situations, thus, qualifying them to for Incident Commander, Planning Section Chief, Operations Section Chief, Logistics Section Chief, Finance Section Chief, Safety Officer, or Information Officer on IMTs. Using classroom lecture and simulated incidents, the S-520 students are trained to understand the role and function of a Type 1 IMT, the applicability of management principles to the incident management job, and the special considerations of incident management within geographic areas of the nation. Over 200 wildland firefighters representing the Federal, State, and Local-levels have participated in the S-520 course.

Of the wildland firefighters who have participated in the S-520 course, only those firefighters that have battled wildland fires in a temporary, inter-agency group were selected for this study (i.e., the vast majority of the students in the S-520 course). As part of the quantitative study, four trust instruments were administered to over 200 wildland

firefighters, as follows: the Jarvenpaa, Knoll, and Leidner's (1998) Propensity to Trust Survey (Appendix A) was administered to determine the trustor's propensity to trust; the Organizational Trust Inventory (OTI-Short Form) (1996) (Appendix B) was administered to gain insight into the level of trust that is attributed to group members of the various agencies; the McAllister Affect-Based and Cognition-based Scale (1995) (Appendix C) was administered to gain insight into the type of trust (affective or cognitive) that is attributed to group members from other agencies; and, the Mayer & Gavin's (2005) Trust in Management Measure (Appendix D) was administered to gain insight into the level of trust that is attributed to experts from other agencies. The results of the surveys were grouped by Federal, State, and Local affiliation.

The responses were analyzed using an analysis of variance (ANOVA) statistical test which results in a F-statistic. The F statistic is the ratio of two variance estimates: the variance between groups divided by the variance within groups. The larger the F-statistic, the more likely it is that the difference between groups is due to the factor being tested, and not just the natural variation within a group (Hinkle, Wiersma, & Jurs, 2003). The factors tested in this dissertation were the attribution of organizational trust as compared to organizational affiliation--Federal, State, and Local; organizational trust was the dependent variable and organizational affiliation was the independent variable. Significance was measured at the 95% confidence level. Regression analysis was used determine whether a trustor's age, gender, years of experience and propensity to trust were significantly correlated to the perception of organizational trustworthiness; in this

analysis, organizational trust was the dependent variable and demographic data was the independent variable.

The qualitative portion of the study was conducted after the quantitative portion. Twenty of the surveyed respondents were interviewed (Appendix E); the twenty were selected randomly from those who had completed the trust surveys. The purpose of the interview question was to gain insight into the attribution of organizational trust--the why, when, and how of organizational trust attribution. These interviews helped interpret the survey data by providing the story behind the group's interaction (Creswell, 2007). The interviews provided context to the survey data, which enriched the understanding of organizational trust development and its affect on reliability in temporary, inter-agency groups.

CHAPTER TWO: LITERATURE REVIEW

Overview

Increasingly inter-agency groups are called to respond to disasters caused from natural, industrial and technological, or deliberate sources (Perrow, 2007). Although inter-agency solutions are frequently sought in response to disasters, the literature surrounding inter-agency groups is not well developed (Connelly, 2007). This dissertation intends to increase knowledge about inter-agency group outcomes by studying the role that organizational trust plays in the reliable performance of temporary, inter-agency groups.

Researchers and practitioners, alike, recognize that workplace trust enables HRO, thus, reliable performance (Cox et al., 2006). Accordingly, the HRO and trust theoretical constructs provide insight to the reliable performance of temporary, inter-agency groups. HRO theory addresses the best practices that contribute to temporary, inter-agency group reliability (Bigley & Roberts, 2001; Weick & Sutcliffe, 2007). Trust theory addresses relationships affecting inter-agency group reliability (Lewicki & Bunker, 1996). HRO and trust literature propose that organizational trust is critically important to the HRO practices of resilience and deference to expertise and, thus, to temporary, inter-agency group reliability (Lewicki & Bunker, 1996; Meyerson, et al., 1996; Mishra, 1996). This dissertation hypotheses that organizational trust affects the HRO practices of resilience and deference to expertise, that a trustor's and trustee's organizational affiliation moderates the attribution of organizational trust, and that a trustor's personal history also moderates the affect of organizational trust (see Figure 3).

High Reliability Organizing (HRO)

HRO practices enable reliable performance in high risk, complex environments, for example, the aftermaths of tsunamis, wildland fires, hurricanes, etc. (Weick & Putnam, 2006; Weick & Stucliffe, 2007). Klein, Bigley, & Roberts (1995) describe HRO practicing organizations as "organizations which are mandated to do everything possible to avoid altogether certain kinds of negative outcomes" (p. 771). Examples of organizations that practice HRO are nuclear power plants, petrochemical, aviation, naval activities, space flight, military, healthcare systems, fire fighting, national security, and police (Perrow, 2007). The wisdom of HRO practices can be seen through different ontological orientations.

There are two different HRO theories--Normal Accidents Theory (NAT) and High Reliability Theory (HRT) (Weick, et al., 1999). NAT and HRT differ from each other in the credit they give to organizational adaptation. NAT theorists see "normal accidents" are inevitable, so sometimes even adaptive processes cannot prevent normal accidents. Perrow (1984) stated, "we have produced designs so complicated that we cannot anticipate all the possible interactions of the inevitable failures; we add safety devices that are deceived or avoided or defeated by hidden paths in the systems" (p. 11). On the other hand, HRT theorists see accidents as avoidable (Weick, 1969); HRO prevents or minimizes accidents through adaptive processes. This study will rely on the HRT version of HRO, because it has a social constructivist orientation; i.e., an orientation that recognizes the importance of human behaviors, such as trust, in HRO and reliability.

HRO includes the practices of preoccupation with failures, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Weick & Putnam, 2006). The practices of preoccupation with failures, reluctance to simplify interpretations, and sensitivity to operations help anticipate problems; and, the practices of commitment to resilience and deference to expertise help contain problems via adaptation (Weick & Sutcliffe, 2001). The five HRO practices are founded in the organization and management theories of mindfulness, structure, culture, change, leadership, learning and sensemaking. The Weick-Sutcliffe-Obstfeld HRO model (1999) is revised (see Figure 4) to depict the relationship between these foundational organization and management theories and the five HRO practices.

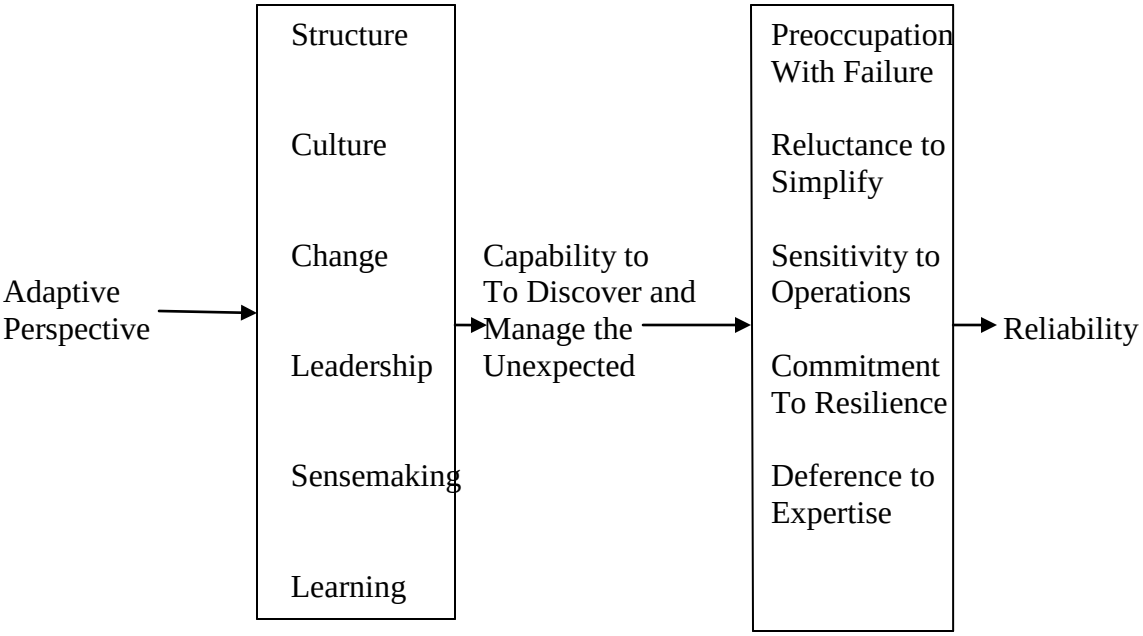


Figure 4: Revised Weick-Sutcliffe-Obstfeld HRO Model

The following overview of the theories of mindfulness, structure, culture, change, leadership, learning and sensemaking demonstrates that these theories are the foundation for the five HRO practices. The overview is places great importance on adaptation and, thus, is consistent with the HRT version of HRO.

HRO and Mindfulness

Fiol and O'Connor (2003) describe mindfulness as "an expanded data search that extends beyond data relevant to past events and past behaviors, or what others are doing, and that leads to new, pertinent distinctions and categories. It entails a search for current data that may disconfirm, as well as confirm, existing beliefs" (p. 59). Mindfulness, at the organizational and individual levels, produces an enhanced ability to discover (and correct) errors before they escalate into a crisis, and thus, is central to better performance (Weick & Putnam, 2006). The five HRO practices depend on mindfulness, because mindfulness enables an adaptive response to high risk situations (Weick et al., 1999).

HRO and Structure

Organizational structurization can be planned and rigid, or evolving and adaptive (Schwandt & Marquardt, 2000). Orlikowski (1992) describes organizational structurization, "patterns of interactions become established as standardized practices in organizations, e.g., ways of manufacturing a product, coordinating a meeting, or evaluating an employee. Over-time, habitual use of such practices eventually becomes institutionalized…" (p. 404). Organizational structures can be tightly coupled or loosely coupled (Orton & Weick, 1990). Tightly coupled structures follow a strict set rules and

regulations and discourage improvisation, e.g., teams who work in nuclear power plants, aviation, and space exploration (Perrow, 1984). Loosely coupled structures allow for improvising and adapting, e.g., teams who work in wildland firefighting and aircraft carriers (Rochlin, La Porte, & Roberts, 1998; Weick & Sutcliffe, 2007). HRO contains elements of, both, tightly and loosely coupled structuring; tight couplings allow for mental models of performance, and loose couplings allow for improvisation and the ability to bounce back from error (Bigley & Roberts, 2001).

HRO and Culture

Organizational culture provides insight into organizational behavior. Schein (1992) defined culture as "a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p. 12). There are three perspectives regarding organizational culture, each perspective is progressively adaptive: integrationist, differentiationist, and fragmentationist. Integrationists perceive one culture for an entire organization (reflected by the Schein, 1992, definition of culture); differentiationists perceive several subcultures within an organization; and, fragmentationists perceive many cultures within an organization--cultures which form, both, around issues and situations (Martin, 2002).

HRO enacts the following cultures: (1) Reporting culture--what gets reported when people make errors or experience near misses; (2) Just culture--how people apportion blame when something goes wrong; (3) Flexible culture--how people can adapt

to sudden and radical increments in pressure, pacing, and intensity; and (4) Learning culture--how adequately people can convert the lessons that they have learned into reconfigurations of assumptions, frameworks, and action (Weick & Sutcliffe, 2007). Organizations that do not enact the reporting, just, flexible, and learning subcultures are disabled and commit errors; for example, the National Aeronautic and Space Administration's Challenger disaster was attributed to a poor reporting culture (specifically, 'O' ring problems were not adequately reported) (Vaughan, 1990). HRO depends on organizational cultures which evolve and adapt around issues and situations.

HRO and Change

Organizational survival depends on continuous adaptation to external and internal pressures; it depends on change. When a system is pushed out of its limits and is not able to maintain its equilibrium, the system realigns--it changes (Gemmill & Smith, 1985). Parsons (1951) described the dilemmas created by the need for change, as follows,

> Social systems and especially large-scale societies are inescapably caught in a very fundamental dilemma. On the one hand they can only live by a system of institutionalized values, to which the members must be seriously committed and to which they must adhere in their actions. On the other hand, they must be able to accept compromises and accommodations, tolerating many actions which from the point of view of their own dominant values are wrong. (p. 179).

Organizations or groups that response to high risk situations must be able to quickly adapt (i.e., change) in order to save lives; for example, the wildland firefighters at Mann Gulch lost their lives because they did not adapt and change their practices (Weick, 1993).

Change is frequently described as episodic or continuous. Brown and Eisenhardt (1997) found that "continuously changing organizations are likely to be complex adaptive systems with semistructures that poise the organization on the edge of order and chaos and … force simultaneous attention and linkage among past, present, and future" (p. 32). HRO requires continuous change, for example, it requires bouncing back from errors and deference to expertise in order to contain disasters (Weick & Quinn, 1999).

HRO and Leadership

Leadership can be described as trait based, i.e., leader are transformational (motivating), transactional (exchange-based), or nontransactional (laissez faire) (Rubin, Munz, & Bommer, 2005). Also, leadership can be described as process based, for example, leaders are tags that influence other persons and processes (Schneider & Somers, 2006). Process based leadership emerges when interacting agents require adaptive outcomes (Lichtenstein, Uhl-Bien, Marion, Seers, Orton, & Schreiber, 2006). In describing HRO, Weick (2007) observes, "reliable systems let decisions 'migrate' to those with the appropriate expertise to make them. Adherence to rigid hierarchies is loosened--especially during high-tempo periods. In this way, a much better matching of experience with problems is achieved" (p. 17). HRO allows leadership to emerge; this is evidenced by the practice of deference to expertise.

HROs and Learning

Organizational learning is a process of renewal. Hedberg (1981) states, "organizational learning includes both the processes by which organizations adjust themselves defensively to reality and the processes by which knowledge is used

offensively to improve the fits between organizations and their environments" (p. 3). HRO requires continual, adaptive learning because the next failure to meet aspirations could also be fatal (Weick & Sucliffe, 2007). A study of firefighting Incident Command Systems (ICS) found that operators used preplanned response templates to battle fires, but when the unexpected happened, new response templates were encouraged (Bigley & Roberts, 2001). Likewise, a study of aircraft carriers found that there was continuous training and retaining. At any given moment, all but the most junior of the officers and crew were acting as teacher as well as trainee (Rochlin et al., 1998). HRO requires continual learning, because learning facilitates change and adaptation.

HROs and Sensemaking

Organizations are meaning systems which interpret newly learned information; the process of interpreting new information is sensemaking (Daft & Weick, 1984; Schwandt 2005). Sensemaking is a reflective process, which results in meaning-making. The breakdown of sensemaking can be disastrous; this disasterous affect is described by Weick (1993) in his case study of the U.S. Forest Service's Mann Gulch forest fire. He concluded that the collapse of structure and sensemaking resulted in the death of 13 smokejumpers. He explained that as the smokejumpers "found it harder to make sense of what was happening, until they finally were unable to make any sense whatsoever of the one thing that would have saved their lives, an escape fire. The disaster at Mann Gulch was produced by the interrelated collapse of sensemaking and structure" (p. 634). Mann Gulch demonstrated the importance of sensemaking in the HRO environment. HRO

enables reflective sensemaking by continually combining new knowledge and experiences.

HRO Theory Summary

The above literature review provides insight into HRO. The literature review explains how the organizational and managerial theories of mindfulness, structure, culture, change, leadership, learning and sensemaking provide the theoretical foundation for HRO--as seen through an adaptive, social constructivist orientation. It is adaptive responses, e.g., commitment to resilience and deference to expertise that save lives in the aftermath of disasters (Majchrzak et al., 2007). Trust facilitates adaptive responses; therefore, trust is central to successful HRO (Cox et al., 2006).

HRO is complex adaptive behavior that unfolds in social systems such as temporary, inter-agency groups. In social systems, behaviors such as trust play a critical role in reliable performance (Tan & Lim, 2009). The following discusses the role of trust in HRO, and hypotheses are proposed regarding the role of organizational trust in temporary, inter-agency group dynamics.

Trust

Trust plays a central role in the coordination of social actors' expectations and interactions (Cox et al., 2006). HRO is most effective when trusting and trustworthy people are willing and able to negotiate the differences among their diverse views in high risk situations (Weick et al., 1999). Studying the role that trust play in HRO will lead to an understanding of reliable performance (Tan & Lim, 2009). Trust theories are

discussed below and these theories provide insight into HRO and organizational reliability.

Theories of trust are associated with three particular perspectives: (1) personality theorists,' who view trust as an individual difference; (2) sociologists' and economists,' who view trust as an institutional phenomenon; and, (3) social psychologists,' who view trust as an expectation of another party in a transaction (Bigley & Pearce, 1998; Lewicki & Bunker, 1996). Taking a social constructivist perspective of HRO (Weick, 1969), a social psychologist perspective of trust is used to study the moderating affect of swift trust and organizational trust on HRO practices, thus, organizational reliability. Further, a social psychologist perspective is used to study moderators of organizational trust, i.e., organizational affiliation and the trustor's personal history.

Mayer et al. (1995) define trust as, "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 712). Further, trust is based on three distinct dimensions--the trustor's perception of the trustee's ability, integrity and benevolence. The Mayer, et al. (1995) trust model also depicts perceived risk as affecting trust development (see Figure 2). The inclusion of perceived risk in the Mayer et al. (1995) trust model makes this model especially applicable to studying trust in temporary, inter-agency groups, because many times these groups are formed to manage risk.

Trust can have, either, a causal affect on performance, or a moderating affect on performance. Some trust research proposes that interpersonal trust exerts a desirable

affect on interpersonal behavior and work group performance--this premise gives trust a causal affect on outcomes (Tan & Lim, 2009). Other trust research proposes that trust as has a moderating affect on outcome--trust moderates the relationship between motivators of behavior and group performance, for example, trust moderates the relationship between HRO and reliability (Dirks & Ferrin, 1998). Jarvenpaa, Shaw and Staples (2004) found that trust plays a direct role in situations and conditions with weak structure, however, "trust plays a moderating role in situations or conditions with moderately strong structure where there is some guidance and information to assess the behavior of others, but still some ambiguity about what the other party's behavior means" (p. 253). Basically, the level of situational ambiguity affects the role (direct or moderating) that trusts plays in HRO and reliability.

Temporary, interagency groups, for example, NGO, IMTs, and joint operations centers (JOCs) have a moderately strong structure. In disaster response plans using an ICS approach, each participating group (e.g., IMT) has fundamental rules, processes and behaviors which must be followed (Bigley & Roberts, 2001); the ICS approach is used by many wildland firefighting IMTs. Accordingly, this dissertation will treat trust as a moderator of HRO and reliability (see Figure 3).

The interdependence of individuals in groups results in, both, the individual and collective attribution of trust in groups. Swift trust is an individual-level phenomenon which develops between individuals in temporary groups (Meyerson et al., 1996). Organizational trust is a collective-level phenomenon which develops between units of an organization or between organizations (Cummings & Bromiley, 1996). Literature

reviews of, both, swift trust and organizational trust are presented in order to fully understand the social psychological dynamics of trust in temporary, inter-agency groups.

Swift Trust

The use of temporary, inter-agency groups in the management of disasters and crisis has increased with the growth of global political and economic alliances. An example of global, temporary, inter-agency collaboration is the 2009 wildfires in Australia--U. S. wildland firefighting IMTs assisted the country of Australia in battling wildfires that were so severe that over 200 fatalities resulted. Organizational interdependence has necessitated the need for temporary, inter-agency groups to quickly form and quickly interrelate (Cox et al., 2006).

Many temporary, inter-agency groups are composed of individuals that are strangers to each other; these groups are formed because each individual's expertise is needed to accomplish a critical, interdependent, time dependent task (Bigley & Roberts, 2001; Meyerson et al., 1996). The quick formation of a working relationship is facilitated by the development of trust, because trust works to break down the obstacles that interfere with group performance (Dirks & Ferrin, 1998). With the increase of temporary, inter-agency groups, there comes a need to understand the factors that facilitate their reliable performance; one such factor is trust.

Meyerson et al. (1996) named the individual-level trust that swiftly forms in temporary groups 'swift trust'; with swift trust, "there is less emphasis on feeling, commitment, and exchange and more on action, cognition, the nature of the network and

labor pool…. Swift trust is a pragmatic strategy for dealing with the uncertainties generated by a complex system concocted to perform a complex, interdependent task using the specialized skills of relative strangers" (p. 191-192). Swift trust theory proposes that from the very start of the group's mission, dedicated, experienced professionals will develop swift trust in order to perform reliably (Drnevich et al., 2009). Swift trust develops because of the social and environmental context that surrounds the group, for example, an urgent need to respond to a disaster (Ferrin, Dirks, & Shah, 2003). Basically, swift trust is based on the trustor's perception of the trustee's ability and is a reaction to an urgent situation.

Swift trust can form because of a critical situation (Meyerson et al., 1996), or because of shared experiences and history, e.g., organizational affiliation. Some research indicates that in the early stages of group performance, swift trust is moderated by organizational affiliation, i.e., the parent organization culture, routines, and practices (Drnevich et al., 2009). It is important to understand biases in decision making, for example, organizational affiliation, because these biases will affect the attribution of trust in HRO, thus, organizational reliability.

Deference to expertise is critical to group effectiveness. In times of crisis, formal leadership structures give way to deference to expertise; this is made possible because of the development of swift trust between trustor and trustee--a swift trust that is based on the perception of ability. Temporary, inter-agency groups self-organize for expert problem solving. Weick and Sutcliffe (2007) observe that temporary, inter-agency groups "allow for rapid pooling of expertise to handle events that are impossible to

anticipate" (p. 78). Temporary, inter-agency groups succeed because they swiftly trust expertise, i.e., they defer to expertise.

The following hypothesis addresses the attribution of swift trust to a particular individual in a temporary, inter-agency group--the group expert. If the attribution of swift trust to the temporary, inter-agency group expert is biased by the trustor's versus the trustee's organizational affiliation, it is possible that expertise will be disregarded and the group's reliability is adversely affected (Drnevich et al., 2009). Therefore, it is important to understand the attribution of swift trust to the group expert.

> Hypothesis 1 -- *In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.*

Drnevich et al. (2009) observe that group members, "participating in these organizations bring with them the unique histories, preferences, and routines of their parent organizations" (p. 218). In other words, organizational-level issues and behaviors effect a trustor's decision making when a temporary group first form. Since organizational affiliation may affect the trustor's swift trust in a trustee's expertise, it is logical to presume that organizational affiliation may also affect the trustor's trust in other organizations represented in an inter-agency group, i.e., a trustee's organization. In other words, organizational affiliation may affect organizational-level trust attributed to an 'other' organization represented in a temporary, inter-agency group.

Organizational Trust

Frequently, temporary, inter-agency group members are strangers to each other. When a group first forms, a group member may form perceptions about other group members based on preconceived perceptions of the others' organizational affiliation (Drnevich et al., 2009). Individuals form their perceptions about other organizations based upon information and experiences, which may include interaction with the other organization's employees and product/services (Caldwell & Clapham, 2003). Perceptions about other group members, thus, trust toward other group members, may be influenced by organizational-level issues (Cummings & Bromiley, 1996).

Organizational theorists believe that trust exist at the organizational-level. Katz and Kahn (1966) described the concept of organizational-level (macro) behavior in their argument that an organization is more than the sum of its parts. They state that there is fallacy in "equating the purposes or goals of organizations with the purposes and goals of individual members. The organization as a system has an output, a product or an outcome, but this is not necessarily identical with the individual purposes of group members" (p. 19). In order to fully understand the collective construct, important factors at the collective level, such as interaction, integration, coordination, and interdependence (which involves organizational trust) must be considered (Morgeson & Hofmann, 1999).

Organizational trust is a common belief among a group that another group will make a good-faith effort to behave in accordance with any commitments made, is honest in whatever negotiations preceded such commitments, and does not take excessive advantage of another even when the opportunity is available (Cummings & Bromiley

1996). The three dimensions of trust (ability, benevolence, and integrity) that apply to individuals also apply to organizations (Schoorman et al., 2007). Therefore, the Mayer-Davis-Schoorman (1995) Model (Figure 2) is used to describe, both, swift trust and organizational trust.

Organizational trust facilitates organizational relationships (Cox et al., 2006). Sitkin & Stickel (1996) point out that "trust has long been recognized as a fundamental feature of interpersonal and intergroup relations in a number of social science disciplines" (p. 196). Organizational trust develops via direct experience with the organization, third parties, or similarity of roles (Ferrin et al., 2003**).** However, as important as organizational trust is to adaptive processes and relationships, organizational-level trust represents a key construct that has been neglected in prior research on organizational responses, e.g., to disasters. Researching organizational trust may provide insight into how behaviors and relationships influence crisis response (Mishra, 1996). Organizational theorists agree that trust is important to organizational relationships, but additional research is needed to understand the affect of organizational trust on HRO in temporary, inter-agency groups.

Elsbach and Elofson (2000) found that language and labeling increased the perception of trustworthiness in teams. Further, they found that "perceptions of competency-based trustworthiness are suggested to be primary antecedents of…interparty trust…" (p. 80). Elbach's and Elofson's findings suggest that, not only is the perception of ability important to perceptions of trustworthiness, but language and labeling are important to the perception of trustworthiness. Their findings suggest that

team members from the same organization may perceive each other as more trustworthy even though they have not worked together previously, because they share similar language and labeling. Conversing, differences in organizational norms, such as language and labeling, may negatively affect the trustor's perception of the trustworthiness of group members from other organizations.

Research on organizational trust in temporary, inter-agency groups found that differing organizational norms and organizational affiliation influence the attribution of organizational trust (Drnevich et al., 2009; Elsbach & Elofson, 2000). This dissertation will study temporary, inter-agency groups in order to gain understanding on the effect of organizational affiliation on the attribution of organizational trust between group members who do not routinely work together.

> Hypothesis 2 -- *In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.*

The first stage of trust development is based on the perception of ability and is cognitive in nature; the second stage is based on the perception of integrity and is cognitive and affective in nature; and the third stage is based on the perception of benevolence and is increasingly affective in nature (Lewicki & Bunker, 1996; Mayer et al., 1995). Time affects the nature of trust--cognition-based trust forms fastest and affective-based trust forms slowest. Affective-based trust is more emotion laden and develops slower (Lewicki & Bunker, 1996). The following hypotheses test whether

organizational trust between temporary, inter-agency group members becomes more affective, i.e., emotional over time.

> Hypothesis 2a: *In temporary, interagency groups, cognition-based organizational trust is most evident at the start of the group formation.*
>
> Hypothesis 2b: *In temporary, inter-agency groups, affective-based organizational trust becomes increasingly evident the longer the group remains together.*

Drnevich et al. (2009) found that members of temporary, inter-agency groups "may often be affiliation driven, meaning they define the situation based on their training, using standard problem categories and prefer responses that are consistent with their organization's routines" (p. 218), in other words, organizational affiliation matters.

In addition to a group member's organizational history influencing their decision-making (to include the attribution of organizational trust), it is logical to think that a group member's personal history (e.g., age, experience, gender, and propensity to trust) will influence their decision making. Jarvepaa, Knoll, and Leinder's (1998) designed a 'Propensity to Trust Scale' (see Appendix A) to determine an individual's capacity to trust, because this capacity to trust would affect their attribution of trust to individual group members and to groups in general. Basically, propensity to trust is an antecedent of both swift trust and organizational trust. Because propensity to trust acts as an antecedent of trust attribution, Mayer et al. (1995) included the individual's propensity to

trust in their trust model (see Figure 2). It is proposed that a group member's personal characteristics will influence the attribution of organizational trust.

> Hypothesis 3: *A trustor's personal characteristics, that is, age, gender, years of experience, and propensity to trust moderate the attribution of organizational trust.*

The Weick-Sutcliffe-Obstfeld model of HROs (1999) (see Figure 3) has been revised to depict the moderating affect of organizational trust on HRO, and has also been revised to depict the moderators of organizational trust. Figure 3 depicts that organizational trust is a moderator of HRO and, thus, reliable performance (Mayer et al., 1995; Tan & Lim, 2009; Weick et al., 1999; Weick & Sutcliffe, 2007). In addition, figure 3 also depicts that the trustor's organizational affiliation and personal history moderate organizational trust.

Chapter Summary

Managing the aftermath of disasters and crisis with temporary, inter-agency groups is becoming increasingly common. Groups such as NGO, IMTs, and Joint Operation Centers (JOCs) are now part of formal disaster response planning, because these groups have proven their reliability in managing disasters. With the increased use of temporary, inter-agency groups, it is increasingly important to understand the human factors that facilitate their reliable performance--factors such as organizational trust.

Reliable temporary, inter-agency performance is vital in this age of world-wide disasters, economics, politics, internet, etc. In New Orleans, after the breakdown of

critical infrastructures, the adaptive and resilient behavior of citizen volunteers, NGOs', IMTs, and middle managers helped save lives (Boin & McConnell, 2007). In the pursuit of reliable performance, temporary, inter-agency groups, e.g., IMTs practice HRO (Weick & Putnam, 2006; Weick & Sutcliffe, 2007). In this chapter, HRO theory was discussed as well as its foundational organization and management theories of mindfulness, structure, culture, change, leadership, learning and sensemaking. Foundational theories were reviewed because they shed light on the reliable performance of temporary, inter-agency groups that frequently respond to crisis.

Organizational reliability is facilitated by positive organizational relationships. Positive relationships are enacted via the attribution of organizational trust (Cox et al., 2006). Weick's (1996) analysis of the South Canyon and Mann Gulch fires found that "people persist (routine behavior) when they don't trust the person who tells them to change" (p. 307). Trust facilitates adaptive outcomes. Trust theorists have made a connection between trust and reliable organizational outcomes (Tan & Lim, 2009; Mayer et al., 1995; Meyerson et al., 1996).

Lewicki and Bunker (1996) propose that "trust is viewed as a dynamic phenomenon that takes on a different character in the early, developing and "mature" stages of a relationship" (p. 118). In temporary inter-agency groups, trust is attributed to, both, individuals and organizations. This dissertation studies temporary, inter-agency, wildland firefighting teams in order to understand the moderating affect of swift and organizational trust on reliable performance, as well as, understanding the moderators of organizational trust. Several hypotheses were offered that suggested that organizational

trust effects HRO, and that organizational affiliation and personal histories moderate organizational trust.

CHAPTER THREE: STUDY DESIGN AND METHODOLOGY

Overview

Wildland firefighters experienced in temporary, inter-agency work were the subjects of this dissertation's research. Wildland firefights were selected for this study because they often manage disasters in temporary, inter-agency groups. For example, although the California Department of Forestry and Fire Protection (CAL FIRE) was the lead agency in the Esperanza wildfire of October 2006 (where 41,000 acres were burned and five U.S. Forest Service men were killed by a burn-over), many other agencies assisted in battling the Esperanza wildfire.

Experienced, skilled, wildland firefighters whom have been members of temporary, inter-agency groups often go to the U.S. Forest Service's National Advanced Fire and Resource Institute (NAFRI) for technical and leadership training. The subjects of this study were selected from NAFRI's S-520, Advanced Incident Management Course, because this course is attended by wildland firefighters from various Federal, State, and Local agencies, were members of temporary, inter-agency groups, and often were members of Type 1 and 2 IMTs. A mixed-methods research technique was used to study organizational trust in inter-agency, wildland firefighting groups.

Creswell (2007) observed that researchers make certain assumptions. These philosophical assumptions consist of a "stance toward the nature of reality (ontology), how the researcher knows what she or he knows (epistemology), the role of values in the research (axiology), the language of research (rhetoric), and the methods use in the

process (methodology)" (p. 16). He stresses that "research begins with… a worldview, the possible use of theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem" (p. 37). This is study focuses on the social-psychological behavior of trust and its affect on HRO and reliability. A mixed methods research methodology was used to gain a deep and varied understanding of the lived experience of wildland firefighting, specifically, the attribution of organizational trust in wildland firefighting, interagency groups.

Mixed method research methodology used both, qualitative and quantitative research methods (Jick,1979). Quantitative research methodologies was be used to measure the moderating effect of organizational trust on HRO and to measure how organizational affiliation and personal characteristics moderate organizational trust (see Figure 3). Qualitative research methodologies were used to more deeply understand, in a phenomenological sense, the attribution of organizational trust. The quantitative and qualitative research results were integrated.

Test Site

Research was conducted at the NAFRI. The NAFRI is a national level center serving the interagency wildland fire community through the development and implementation of fire, fuels, resource, and incident management skills and educational processes (www.nafri.gov). The NAFRI provides experienced wildland firefighters training on HRO, management, and leadership. The NAFRI was a good study location because the majority of the NAFRI students are experienced firefighters whom have often participated in temporary, interagency, wildland firefighting groups (most recently

on Type 1 and 2 IMTs). Only participants who worked in temporary, inter-agency, wildland, firefighting groups were part of the study.

For the quantitative portion of the study, the study subjects were selected from the S-520 Advanced Incident Management Course taught by NAFRI. Students of the S-520 course have extensive experience working in complex, wildland firefighting events. The S-520 course trains for Incident Commander, Planning Section Chief, Operations Section Chief, Logistics Section Chief, Finance Section Chief, Safety Officer, and Information Officer. Over 200 wildland firefighters have participated in the S-520 course; they represent Federal, State, and Local-level students. The past S-520 students were sent four trust surveys via an internet based Survey Monkey software; responses were obtained via the internet based Survey Monkey software. For the qualitative portion of the study, 20 subjects were interviewed telephonically.

Of the trust surveys sent to the population S-520 course participants, 132 completed responses were needed in order to achieve a confidence level of 95% and a confidence interval of +/- 5 (Hinkle, Wiersma, & Jurs, 2003); fortunately, 140 completed responses were received, thus a 95% confidence level was achieved. Because 140 completed surveys were returned for statistical analysis, sufficient power was obtained to allow the quantitative results to be generalizable. The results can be generalized to the greater population of highly trained, temporary, interagency group members; highly trained because an important uniqueness emerged in the subjects--they were all type 1 and 2 IMT certified. After receipt of the trust surveys, twenty survey respondents were

interviewed. This smaller sample of interview gave phenomenological depth to the quantitative results of the study.

Test Instruments

The participants in the S-520 course were a mix of federal-level, state-level, and local-level firefighters. The mix of federal-level, state-level, and local-level firefighters enabled analysis of the effect of organizational affiliation on organizational trust. The subject relied on recalled experiences (as trustor) in temporary, interagency teams when they rated or discussed their attribution of organizational trust. Although recalled experiences may change over time, it is believed that the 'recalled experience' methodology has merit for understanding the attribution of organizational trust, because the 'recalled experience' was an actual, lived experience.

The wildland firefighters who attended the S-520 were given four trust surveys via the internet using Survey Monkey software. The following four surveys were administered: the McAllister (1995) Affect- and Cognition-based Trust Scale (to test affective and cognitive trust attributed to inter-agency group members), the Mayer & Gavin's (2005) Trust in Management Measure (to test trust attributed to a group expert), the Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) (to test organizational trust attributed to inter-agency group members), and the Jarvenpaa, Knoll, and Leidner's (1998) Propensity to Trust Scale (to test the trustor's capacity to trust). These measurement tools were selected because they were determined to be statistically valid and reliable for measuring individual-level and organizational-level trust.

Trust is a multi-level phenomenon, i.e., it is attributed to individuals as well as organizations, at times, simultaneously (Schoorman et al., 2007). Trust, as a multi-level phenomenon, is the reliance a party upon another party to recognize and protect the rights and interest of all others engaged in a joint endeavor (Hosmer, 1995). This research used the Mayer & Gavin's (2005) Trust in Management Measure to test trust attributed to a group expert. Survey results regarding the perceived trustworthiness of the group expert were extrapolated to the perceived trustworthiness of the expert's organization; this extrapolation was made, because the expert's trustworthiness was assessed in the context of a 'remembered' organizational experience. Therefore, the results of Mayer & Gavis (2005) Trust in Management Measure were evaluated as multi-level trust responses, which reflected, simultaneously, individual and organizational-level assessments of trustworthiness. The multi-level nature of trust allows for a leader (as represented by the expert in HRO theory) to be seen as a proxy of their organization (Rochlin et al., 1998).

Mixed Methods Methodology

In order to deepen and extend the entire domain of organizational trust research, a multi-method approach was taken. The mix-methods methodological approach allows for both qualitative and quantitative research questions. Onwuegbuzie and Leech (2006) describe mixed methods as, "collecting, analyzing, and interpreting quantitative and qualitative data in a single study or in a series of studies that investigate the same underlying phenomenon" (p. 474). Jick (1979) advocates triangulating multiple research methods, because "qualitative and quantitative methods should be viewed as complementary rather than as rivals. In fact, most textbooks underscore the desirability

of mixed methods given the strengths and weaknesses found in single method designs" (p. 602). In this study, hypotheses one through three were researched with quantitative research methods, however, additional depth and understanding of the surveys' results were achieved via qualitative research methods, specifically, interviews with twenty of the surveyed subjects.

Hypotheses and Test

A quantitative research methodology was used to answer the four hypotheses proposed in Chapter Two, as follows:

Hypothesis 1: *In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.* (This hypothesis was tested with the Mayer & Gavin's (2005) Trust in Management Measure.)

Hypothesis 2: *In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.* (This hypothesis was tested with the Cummings and Bromiley (1996) Organizational Trust Inventory-Short Form.)

Hypothesis 2a: *In temporary, interagency group, cognition-based organizational trust is most evident at the start of the group formation.* (This hypothesis was tested with the McAllister (1995) Affect- and Cognition-based Trust Scale.)

Hypothesis 2b: *In temporary, inter-agency group, affective-based organizational trust becomes increasingly evident the longer the group remains together.* (This

hypothesis was tested with the McAllister (1995) Affect- and Cognition-based Trust Scale.)

Hypothesis 3: *A trustor's personal characteristics, that is, age, gender, years of experience and propensity to trust moderate the attribution of organizational trust.* (This hypothesis was tested by relating the results from the McAllister (1995) Affect- and Cognition-based Trust Scale, the Organizational Trust Inventory-Short Form, and the Trust in Management Measure to the trustor's age, gender, years of experience, and propensity to trust.)

Mixed Method Research Procedures

Students of NAFRI's S-520 course were administered four trust surveys in order to understand the affect of organizational trust on temporary, inter-agency group reliability, and to understand the possible moderators of organizational trust (such as organizational affiliation and the trustor's personal history). Each surveyed student completed four survey instruments: the McAllister (1995) Affect- and Cognition-based Trust Scale, the Mayer & Gavin's (2005) Trust in Management, the Cummings and Bromiley's (1996) Organizational Trust Inventory-Short Form (OTI-SF), and the Jarvenpaa, Knoll, and Leidner's (1998) Propensity to Trust Scale. Since most of the information regarding organizational trust was gathered using surveys, this research design is a QUAN-qual, i.e., the dominant methodology is quantitative.

Quantitative Research Section

Hinkle, Wiersma, and Jurs (2003) observe that quantitative "researchers monitor individuals' by representing that behavior in numerical form; they use statistics to evaluate, report, and explain the behavior" (p. 2). The major characteristics of traditional quantitative research are deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardized data collection, and statistical analysis (Johnson & Onwuegbuzie, 2004). The quantitative portion of the research required that the subjects complete a Jarvepaa, Knoll, and Leinder's Propensity to Trust Survey (1998) (see appendix A), Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) (see Appendix B), a McAllister's Affect- and Cognition-based Trust Scale (see Appendix C), and a Mayer & Gavin's (2005) Trust in Management Measure (see Appendix D). The surveyed subjects indicated levels of trust by circling a specific rating on the rating scales.

The purpose of the Jarvepaa, Knoll, and Leinder's (1998) Propensity to Trust Scale (Appendix A) is to test an individual's capacity to trust. Just as individuals have an organizational history that may accelerate (or inhibit) the development of organizational trust (Elsbach & Elofson, 2000), they may have a personal history that facilitates (or inhibits) the development of organizational trust. In this study of organizational trust, the trustor's propensity to trust, age, gender, and years of experience were considered independent variables, because they may influence the development of organizational trust; for example, an individual who has suffered significant gender or sexual harassment may attribute organizational trust more resultantly. The trustor's Propensity

to Trust Scale, age, gender, and experience are hypothesized to be predictors of organizational trust scores. The Jarvepaa, Knoll, and Leinder's (1998) Propensity to Trust Scale has a reliability estimate of 0.86; and, it uses a 1 to 7 scale, with 1 = strongly disagree and 7 = strongly agree. Because of its reliability, the Propensity to Trust Scale was administered to the subjects of this study for the purpose of understand the attribution of organizational trust.

The purpose of the McAllister Affect- and Cognition-based Trust Scale is to test the nature of the organizational trust that is attributed to group members. It is possible that the organizational trust attributed to inter-agency group members may be more cognitive, or may be more affective—this depends on the time spent with group members. Although Meyerson et al. (1996) found that swift trust is based on cognitive assessments of abilities; Lester (2006) found that swift trust also had an affective component. The McAllister Affect- and Cognition-based Trust Scale (Appendix E) provides insight into the cognitive versus affective nature of organizational trust attributed to inter-agency group members. The McAllister Affect- and Cognition-based Trust Scale (1995) reliability estimates were 0.89 for affect-based trust and 0.91 for cognition-based trust. The McAllister Affect- and Cognition-based Trust Scale is a 11-item questionnaire (5 items for affect-based trust, 6 items for cognition–based trust); it uses a 1 to 7 scale, with 1 = strongly disagree and 7 = strongly agree. Because of its reliability, the McAllister Affect- and Cognition-based Trust Scale was administered to the subjects of this study for the purpose of assessing the cognitive/affective nature of attributed trust.

The purpose of the Mayer & Gavin's (2005) Trust in Management Measure is to assess the attribution of trust to the inter-agency group expert(s). It is possible that the trust attributed to group experts is biased by organizational affiliation. Since same-agency group experts share the same language and labeling as the trustor, same-agency group experts may be preceived as more trustworthy (Elfbach & Elfson, 2000). Because of its reliability, the Mayer & Gavin Trust in Management Measure was administered to the subjects of this study for the purpose of assessing trust in the group expert.

The purpose of the Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) is to test the organizational trust attributed to the various group members. Organizational trust is composed of three dimensions: (1) the trustee is behaviorally reliable; (2) the trustee's statements and behavior prior to making commitments are consistent with the individual's real desires; and (3) the trustee does not take full, short-run advantage of unforeseen opportunities to gain at the expense of the other group members (Cummings & Bromiley, 1996). The Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) has a composite reliability rating of .93 for dimension one, .93 for dimension two, and .90 for dimension three; it uses a 1 – 7 scale, with 1 = strongly disagree and 7 = strongly agree. Because of its reliability, the OTI-SF was administered to the subjects of this study for the purpose understanding the attribution of organizational trust.

Qualitative Research Section

The work of temporary, inter-agency, wildland firefighting teams is rich in context, for example, they use standardized processes and procedure, but also improvise

in response to the unexpected, quickly changing environment. Creswell (2007) states, "we conduct qualitative research because we want to understand the contexts or settings in which participants in a study address a problem or issue. We cannot separate what people say from the context in which they say it…" (p. 40). Understanding context is critical to more fully understanding the development of organizational trust. Traditional qualitative research uses induction, discovery, exploration, theory, and hypothesis generation in order to develop an understanding of context (Johnson & Onwuegbuzie, 2004).

After the surveys were administered to the subjects, twenty of the respondents were randomly selected for interview. A total of six questions were asked during the interview. Mainly, the interviewed subjects were asked to recall their experiences while working in a temporary, interagency wildland firefighting group. Lincoln and Guba (1985) state that interviews include "… obtaining here-and-now construction of persons, events, activities, organizations, feelings, motivations, claims, concerns…" (p. 268). The interview questions were designed to provide insight into the development of organizational trust in temporary, interagency groups.

A structured interview was conducted telephonically. The researcher asked the interviewee to speak to the 'remember experience' used in the quantitative portion of the research. Appendix E depicts the interviewer's introductory statement and a list of six interview questions. The questions are designed to understand the background, i.e., the reasons that the trustor perceives some team members, and not others, as trustworthy. During the interview, the interviewer took hand written notes. Interviews took

approximately 30 minutes each. These telephonic interviews were not recorded, because recording the interviews would have reduced the subject's willingness to participate. Furthermore, recording the interview would have inhibited an open and frank discussion about group members and their trustworthiness. Basically, this study's subjects believed that confidentially was further ensured by not recording the interview. Extensive notes were taken with extra care to quote phrases.

After the interviews, the interview notes were reviewed for categories of themes. The development of categories continued until there was an exhaustion of sources, saturation of categories, emergence of regularities, and there was a sense of overextension (Lincoln & Gupa, 1985). Analysis of the themes provided insight regarding the development of organizational trust within temporary, inter-agency groups.

The purpose of mixed methods is to cross verify and relate qualitative data with quantitative data. Accordingly, the themes found in the interview data were cross verified with the quantitative data gathered from the four surveys. Cross verification of interview data and survey data was possible because the 20 interviewed subjects were selected for the list of subjects who had completed the four surveys. Both, quantitative and qualitative data was obtained, and cross verified, for each one of the 20 subjects interviewed. This mixed methods is a QUANT-qual, that is, the majority of the data collected was quantitative data derived from the four surveys and less data was collected from the interviews. The findings combined the quantitative, survey data with the qualitative, interview data in order to more fully understanding the subject's perspective and meanings.

Research Design

Step one. All participants of NAFRI's S-520 course who could be reached by the internet based, Survey Monkey software were asked to complete four survey instruments (see Appendices A-D). The following describes the survey techniques and statistical analysis that were used to test each hypothesis:

1. Hypothesis 1: *In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.* This hypothesis was tested with the Mayer & Gavin's (2005) Trust in Management Measure (see Appendix D). Each subject (in the role of trustor) was asked to fill out a Mayer & Gavin's (2005) Trust in Management Measure. The Mayer & Gavin's (2005) Trust in Management Measure ratings were grouped by Federal, State, and Local affiliation. An ANOVA factor analysis was calculated on the trust scores to determine if the trustor's and trustee's organizational affiliation were related to the resulting trust score.

Trustor / **Expert (Trustee)**	Federal-level	State-level	Local-level
Federal-level	trust score	trust score	trust score
State-level	trust score	trust score	trust score
Local-level	trust score	trust score	trust score

It was hypothesized that the trust scores would be significantly higher when the trustor and the trustee belong to the same organizational-level, i.e., same organizational affiliation.

2. Hypothesis 2: *In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.* This hypothesis was tested with the Cummings and Bromiley (1996) Organizational Trust Inventory-Short Form (see Appendix B). Each subject (in the role of trustor) was asked to fill out a Cummings and Bromiley (1996) Organizational Trust Inventory-Short Form. The Cummings and Bromiley (1996) Organizational Trust Inventory-Short Form ratings were grouped by Federal, State and Local affiliation. An ANOVA factor analysis was calculated on the trust scores to determine if correlations existed between the trustor's and trustee's organizational affiliation and the resulting trust score.

Trustor / **Trustee**	Federal-level	State-level	Local-level
Federal-level	trust score	trust score	trust score
State-level	trust score	trust score	trust score
Local-level	trust score	trust score	trust score

It was hypothesized that trust scores would be significantly higher when the trustor and the trustee were at the same organizational-level, i.e., same organizational affiliation.

3. Hypothesis 2a: *In temporary, interagency groups, cognition-based organizational trust is most evident at the start of the group formation.* This hypothesis was tested with the McAllister (1995) Affect- and Cognition-based Trust Scale (see Appendix C). Each subject (in the role of trustor) was asked to fill out a McAllister Affect- and Cognition-based Trust Scale. The results of the McAllister (1995) Affect-

and Cognition-based Trust Scale were grouped by the trustor's Federal, State and Local affiliation and by length of time the trustor spent in the 'remembered' group experience. An ANOVA factor analysis was calculated on the cognition-based trust scores to determine if a relationship existed between the trustor's length in a temporary, inter-agency group and the cognitive-based trust ratings.

Cognitive Trust Scores

Trustor / **Time in group**	Federal-level	State-level	Local-level
Less than 30 days	trust score	trust score	trust score
30-60 days	trust score	trust score	trust score
Over 60 days	trust score	trust score	trust score

It was hypothesized that the cognition-based trust scores would be significantly higher when the trustor had spent less time in a group.

4. Hypothesis 2b: *In temporary, inter-agency groups, affective-based organizational trust becomes increasingly evident the longer the group remains together*. This hypothesis was tested with the McAllister (1995) Affect- and Cognition-based Trust Scale (see Appendix C). Each subject (in the role of trustor) was asked to fill out a McAllister Affect- Cognition-based Trust Scale. The results of the McAllister (1995) Affect- and Cognition-based Trust Scale were grouped by Federal, State and Local affiliation and by length of time the trustor spent in the 'remembered' group experience.

An ANOVA factor analysis was calculated on the trust scores to determine if a relationship exists between the trustor's length in a temporary, inter-agency group and the affective-based ratings.

Affective Trust Score

Trustor / **Time in group**	Federal-level	State-level	Local-level
Less than 30 days	trust score	trust score	trust score
30-60 days	trust score	trust score	trust score
Over 60 days	trust score	trust score	trust score

It was hypothesized that the affect-based trust scores would be significantly higher when the trustor has spent more time in a group.

5. Hypothesis 3: *A trustor's personal characteristics, that is, age, gender, years of experience, and propensity to trust moderate the attribution of organizational trust.* This hypothesis was tested with the Jarvenpaa, et al. Propensity to Trust Scale and the demographic data collected on the Propensity to Trust Scale (see Appendix A). For each subject surveyed, the Propensity to Trust score, gender, age, and years of experience were considered independent variables, and the Organizational Trust Inventory-Short Form, McAllister Affect- and Cognition-based Trust Scale, and, Mayer & Gavin's (2005) Trust in Management Measure were considered dependent variables in a SPSS multiple regression analysis. The purpose of these correlation tests was to assess

whether the trustor's propensity to trust, gender, age, and years of experience (all static variables outside of the temporary, inter-agency event) have a significant influence on the Organizational Trust Inventory-Short Form, McAllister Affect- and Cognition-based Trust Scale, and the Mayer & Gavin's (2005) Trust in Management Measure scores.

The trustor's demographic data (independent variables) and the scores from the three surveys (dependent variable) were tested with a Statistical Package for the Social Science (SPSS) multiple regression analysis.

SPSS Analysis

(Independent variables are trustor demographics & Dependent variables are trust scores)

Indep variable / **Dep Variable**	Propensity to Trust Score	Trustor's Age	Trustor's Gender	Trustor's Years of Experience
OTI-Short score	r correlation	r correlation	r correlation	r correlation
McAllister score	r correlation	r correlation	r correlation	r correlation
Mayer/Gavin score	r correlation	r correlation	r correlation	r correlation

It was hypothesized that propensity to trust, gender, age, and years of experience had an influence (correlate) on the Organizational Trust Inventory-Short Form, McAllister Affect- and Cognition-based Trust Scale, and the Mayer & Gavin's (2005) Trust in Management Measure scores. A correlation between the trustor's demographics and the trustor's trust scores indicates that an individual's personal history influences the

development of organizational trust; an influence that team dynamics (no matter how positive) may not be able to overcome.

Step two. Over two hundred participants of NAFRI's S-520 course were asked via internet email to complete four trust surveys. Of the two hundred participants, twenty were randomly selected for interview. They were selected because they had worked on temporary, interagency, wildland firefighting teams.

Step three. The interview questions (see Appendix E) are designed to shed light on the results of Organizational Trust Inventory-Short Form, McAllister Affect- and Cognition-based Trust Scale, and the Mayer & Gavin's (2005) Trust in Management Measure scores. The interview questions were analyzed to further understand factors that influenced the attribution of organizational trust; factors such as (1) the trustor's/trustee's organizational affiliation, (2) the trustor's time in the 'remembered' group, and (3) the trustor's propensity to trust, age, gender, and years of experience in wildland firefighting. The interviews were annotated and the notes analyzed for themes and finding.

Human Participants and Ethics Precautions

Students of NAFRI's S-520 course who had active email addresses were asked (via email) to participate in this dissertation's study of organizational trust in temporary, inter-agency groups. The participants of the NAFRI S-520 course were a good resource for this study because they have extensive experience in battling forest fires in temporary, inter-agency groups. This study administered four surveys (Propensity to

Trust Scale, Organizational Trust Inventory-Short Form, McAllister Affect- and Cognition-based Trust Scale, and the Mayer & Gavin's (2005) Trust in Management Measure). The results of the surveys were analyzed using statistical methodologies.

After the administration of the surveys, twenty of the surveyed wildland firefighters were randomly selected for interview (see Appendix E). The interviews were non-attribution and their purpose was to gain the 'reasons why' trustors' answered the surveys as they did. The number of interviews (20) is not large, but effectively added phenomenological insight to the survey results.

Administering surveys and conducting interviews is a mixed-methods research methodology and was the selected methodology because it increases the depth of the study. The quantitative results of the surveys and the qualitative results of the interviews were compared for trends and complementarities. The surveys and the interviews were, both, administered in order to gain insight into the affect of organizational trust on temporary, inter-agency group reliability, and to gain insight into the moderators of organizational trust (see Figure 3).

The risk of physical harm to the participants of this study was zero. The risk of social harm to the participants was minimal, since organizational and individual identities were kept confidential. The administration of the surveys was conducted in a secured internet environment. Interviews were conducted by secure telephone. Both, survey and interview data was kept confidential.

Confidentiality of responses was ensured, because issues of trust and distrust between group members are sensitive information. All interviewed subjects were identified with a code, not a name. All notes taken during the interview process, as well as, all completed surveys were safeguarded under lock and key. All discussions regarding the participants' responses used the subjects' code, not name, and discussions were only held on a need to know basis.

Care was taken to not exhaust the participants with numerous interviews and surveys. The interviews lasted no more than 45 minutes each, and all four surveys could be completed in 45 minutes. Subjects, although judgmentally selected, were not pressured to participate; participation was voluntary.

Lastly, care was taken in Chapters Four and Five to respectfully address organizational issues. Specific agencies were not accused of careless or insensitive behavior. There was no finger pointing. All finding were framed to help--not to hurt organizations. Organizational or personal reputations were not diminished.

Chapter Summary

Increasingly, natural disasters and manmade crisis are being managed through the collaborative efforts of temporary, interagency groups. For example, the National Interagency Fire Center (NIFC) released this announcement on February 11, 2009;

> The NIFC received a request for assistance from Australia, in the wake of unprecedented fire activity in the southeastern part of Australia. Wildfires in Australia have claimed at least 200 lives in the past week. The United States will send 60 wildfire specialists to Australia to meet this request. …Since 2000, Australia has sent wildfire specialist several times to help

> the U.S. in some of our worst fire seasons. We are pleased that we can reciprocate. (www.nifc.gov)

With the increase in inter-agency collaboration, understanding the role of organizational trust in temporary, interagency groups is becoming increasingly important.

A mixed methods research methodology was used to assess the development of organizational trust in temporary, inter-agency, wildland, firefighting groups. The quantitative portion of the research involved the administration of four surveys to over 200 wildland firefighter: the Jarvenpaa, Knoll, and Leidner's (1998) Propensity to Trust Scale, the McAllister (1995) Affect- and Cognition-based Trust Scale, the Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) (1996), and the Mayer and Gavin's (2005) Trust in Management Measure. The qualitative portion of the research involved interviewing twenty of the surveyed subjects. This mixed method research methodology helped provide a more in-depth analysis of organizational trust in temporary, inter-agency groups.

CHAPTER FOUR: RESULTS

Overview

This dissertation studies the role of organizational trust in high reliability organizing (HRO), thus, reliable performance (see Figure 3). Temporary, inter-agency solutions are sought when tackling some of the most complex problems facing society, yet, there is little literature regarding the collective-level factors, such as organizational trust, that may affect temporary, inter-agency group dynamics (Connelly, 2007). This dissertation studies the affect of organizational trust on the dynamics of temporary, inter-agency groups that practice HRO by surveying and interviewing wildland firefighters. This study found that organizational trust affects temporary, interagency group dynamics, but in ways other than hypothesized.

Organizational trust and HRO are the theoretical constructs that shed light on the affect of organizational trust on the dynamics of temporary, inter-agency groups. Mayer et al. (1995) define organizational trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 712). HRO is characterized by a preoccupation with failures, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Weick & Putnam, 2006; Weick & Sutcliffe, 2007). Trust plays a role in the dynamics of groups that practice HRO, for example, trust development helps ensure safe practices (Cox et al., 2006). A wildland firefighter interviewed as part of this study

observed that “trust empowers the workforce to talk about close calls, and HRO is all about that.” This Chapter provides quantitative and qualitative data on the role of organizational trust in the group dynamics of temporary, inter-agency groups that must practice HRO.

In order to understand the affect of organizational trust on inter-agency group dynamics, this study investigates whether the trustor’s attribution of organizational trust is influenced by the trustee’s organizational affiliation (H1 and H2). Organizational affiliation is addressed because research has shown that the perception of trustworthiness is influenced by (an organization’s) common language, communication and norms (Conchie & Burns, 2008; Drnevich, 2009; Elsbach & Elofson, 2000). In addition, this study investigates whether the type of organizational trust is moderated by time (H2a and H2b), or the trustor’s personal attributes (H3). All five hypotheses were tested by surveying and interviewing wildland firefighters who attended an advanced incident management course (S-520), because HRO principals were reinforced in the course and the students frequently participated in temporary, inter-agency groups. Trust surveys were used to understand ‘what’ organizational trust existed and the interviews were used to understand ‘why’ organizational trust existed.

The results of the quantitative and qualitative analysis of organizational trust indicated that trustors attribute trust less because of organizational affiliation, and more because of network affiliations (and the competence required and sustained by the network). The surveyed wildland firefighters agreed that the ‘other’ organization’s expert was trustworthy, agreed that the ‘other’ organization’s members were trustworthy,

and agreed that members of the other organization were trustworthy on both affective and cognitive-levels. Additionally, it was found that the trustor's propensity to trust and gender are correlated to increased organizational trust levels. The interviewed wildland firefighters indicated that trust was attributed to temporary, inter-agency group members because the group members shared common goals, processes, and training—made possible by a network of IMTs using the ICS approach.

Importantly, the interviewed wildland firefighters remembered experiences as part of high skilled temporary, inter-agency groups (specifically, Type 1 and 2 IMTs) structured using an ICS approach. Bigley and Roberts (2001) describe the ICS as "a particular approach to assembly and control of the highly reliable temporary organizations employed by many public safety professionals to manage diverse resources at emergency scenes" (p.1281). IMTs have five type designations (1 thru 5), with type 1 being the highest skilled, most complex team (www.nifc.gov). The study's subjects were required to have Type 1 certifications in order to enroll in the S-520 course, thus, were unique.

The ICS approach requires IMTs to use common roles, processes, training, and certification; this, in turn, enables organizational trust in temporary, inter-agency groups, because IMT group members, having experienced common roles, processes, training, etc., are expected to be competent (Meyerson et al., 1996, Schoorman et al., 2007). Overall, the survey data indicated the existence of organizational trust in wildland firefighting, temporary, inter-agency groups and the interviewees attributed the organizational trust to their IMT's use of the ICS approach, an approach that enables the

development of competence. Overall, this study's results were heavily influences by the subjects' 'remembered experience', i.e., experiences while participating in type 1 and 2 IMTs; teams which use the ICS approach.

Hypotheses

The following five hypotheses make assertions regarding the affects of organizational trust on temporary, inter-agency group dynamics:

Hypothesis 1: *In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.*

Hypothesis 2: *In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.*

Hypothesis 2a: *In temporary, interagency groups, cognition-based organizational trust is most evident at the start of the group formation.*

Hypothesis 2b: *In temporary, inter-agency groups, affective-based organizational trust becomes increasingly evident the longer the group remains together.*

Hypothesis 3: *A trustor's personal characteristics, that is, age, gender, years of experience and propensity to trust moderate the attribution of organizational trust.*

Methodology and Study Design

A mixed methods research methodology was used to study the affect of organizational trust on the group dynamics of temporary, inter-agency groups. A mixed methods methodology entails both, quantitative and qualitative tests. A mix-methods research methodology enables the researcher to gain a more in-depth understanding of the data by shedding light on the subjects' judgments via the survey data and insight into the 'experience' via the interviews (Onwuegbuzie & Leech, 2006). A mixed methods methodology provides insight into the 'what' and 'why' of research data.

The subjects of this study came from a population that frequently works in inter-agency groups that practice HRO, i.e., highly qualified type 1 and 2 certified wildland firefighters. The study's subjects were wildland firefighters who had attended the U.S. Forest Service's National Advanced Fire and Resource Institute's (NAFRI), Advanced Incident Management Course (S-520). Those that attend the S-520 course are well experienced at working in temporary, inter-agency groups, thus, could address the affect of organizational trust on temporary, inter-agency group dynamics.

The S-520 course provided 261 subjects for the study. Using internet based Survey Monkey software, the subjects were asked to 'remember' an experience in a temporary, inter-agency group; then, with the 'remembered' experience in mind, answer the four trust surveys containing a total of 48 questions (see Appendices A through D). A total of 140 wildland firefighters completed the 48 questions and returned the surveys (out of 261 possible).

The quantitative data was gathered from the four trust surveys. The qualitative data was gathered from interviews conducted with 20 wildland firefighters (see Appendix E). The 20 interviewees were selected randomly from those that had completed the surveys. The interviews were conducted in order to reconstruct the here-and-now of events, persons, activities, organizations, feelings, motivations, claims, concerns, thus, the 'why' of the response (Lincoln & Guba, 1985).

In summary, 261 subjects were asked to complete 48 questions regarding a 'remembered' temporary, inter-agency experience. Of the 261 subjects, 140 responded, i.e., a 54% response rate. Of the 140 responses, only 125 surveys were fully completed. The high response rate of 54% allows for generalizations to be made from the survey responses received (Hinkle, Wiersma, & Jurs, 2003). Additionally, 20 subjects were telephonically interviewed using six questions (see Appendix E). The interviews provided additional and substantial insight into the attribution of organizational trust.

Quantitative Results

Trust is attributed based on the perception of competence, integrity, and benevolence at, both, the individual and collective levels (Schoorman et al., 2007). This study focuses on the collective, i.e., organizational-level. The attribution of organizational-level trust was captured using a survey designed to capture trust at the organizational-level, i.e., Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF). The other surveys used in this study captured the trustor's propensity to trust, the nature of organizational trust, and the trustworthiness of the group's expert; these surveys were answered by 'remembering' a collective experience,

therefore, were answered within a collective framework. In order to conduct a study of temporary, inter-agency group dynamics, an organizational level of analysis on all survey data was essential.

The quantitative portion of the research involved four different trust surveys: Jarvepaa, Knoll, and Leinder's Propensity to Trust Survey (1998) (Appendix A), Cummings and Bromiley's Organizational Trust Inventory-Short Form (OTI-SF) (Appendix B), McAllister's Affect- and Cognition-based Trust Scale (Appendix C), and Mayer & Gavin's (2005) Trust in Management Measure (Appendix D). The four trust surveys captured data with a high degree of reliability regarding the subject's judgments on: propensity to trust, trust in the 'other' organization's group members, level of affective trust for the 'other' organization's group members, level of cognitive trust for the 'other' organization's group members, and trust in the 'other' organization's expert (see Figure Five). Overall, the trust surveys' provided data regarding the attribution of organizational trust, i.e., trust attributed to a collective.

The four trust surveys were combined in Survey Monkey in order to facilitate administration. Consequently, Survey Monkey provided 40 trust questions and 8 demographic questions to the 140 study subjects. The 40 trust questions used six, or seven item Likert scales that rated responses as follows: 'strongly disagree', 'disagree', 'slightly disagree', 'neither agree nor disagree', 'somewhat agree', 'agree', and 'strongly agree' with the neutral or intermediate choice omitted in the case of the six point Likert scale. The Likert scale technique was used to capture organizational trust because it allowed for a quantitative analysis of responses.

A high internal consistency for the four trust surveys was demonstrated based on the Cronbach's alpha reliability test; the alpha reliability for all 40 questions combined was 0.979, for organizational trust it was 0.980 (all 12 questions), for expert trust it was 0.967 (all 10 questions), for affective trust it was .954 (all 5 questions), for cognitive trust it was 0.957 (all 6 questions), and for propensity to trust is was 0.843 (all 7 questions). These alpha reliability levels exceed the minimum recommended values of 0.7 to 0.8. (see Figure 5).

Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	# of Items
Org. Trust	.980	.981	12
Expert Trust	.967	.966	10
Aff. Trust	.954	.953	5
Cog. Trust	.957	.956	6
Propensity to Trust	.843	.851	7
All Items	.979	.977	40

Figure 5: Cronbach's Alpha Reliability Analysis of Trust Surveys

In addition to the 40 trust questions, Survey Monkey asked the participants eight demographic questions, i.e., the subjects's (also known as the trustor) organizational level, the 'other' organization in the 'remembered' inter-agency experience (also known as the trustee), the organizational level of the 'other' organization, subject's email address, subject's years of experience in wildland firefighting, subject's duration in the

'remembered' inter-agency experience, subject's gender, subject's age, and subject's gender. Additionally, the trustee's organizational affiliation was also captured.

The 140 surveys were returned via Survey Monkey within one month. The return of 140 surveys ensured a confidence level of 95% for the data with a confidence interval of +/- 5 (Hinkle, Wiersma, & Jurs, 2003). A 95% confidence level allows the findings of the study to be extrapolated to the greater population of temporary, inter-agency groups; however, since all the subjects were Type 1 or 2 qualified, extrapolation of the findings should be made to the population of highly skilled, temporary, inter-agency groups.

Quantitative Statistical Analysis and Results

In this study, trust is the dependent variable and the demographic data is the independent variable. When there is a relationship between the dependent variable and the independent variable, the dependent variable changes when the independent variable is changed. In other words, trust attribution changes when an independent variable is changed, e.g., the trustee's organizational affiliation. Independent variables in this study are: trustee's organizational affiliation, and the trustor's, organizational affiliation, duration in the group, age, gender, years of work experience, and propensity to trust (see Figure 6).

Survey Instrument--Kind of Trust	Variable Name	# Questions	Scale Size	Range of Responses	Variable Type
Organizational Trust	OrgTrust	12	7	12-84	Dependent
Other Expert Trust	Expert Trust	10	6	6-60	Dependent
Affective Trust	Affective Trust	5	7	7-35	Dependent
Cognitive Trust	Cognitive Trust	6	7	7-42	Dependent
Propensity to Trust	Propensity	**7**	7	7-49	Dependent
Observation					
Organization Affiliation	OrgOrg			9	Independent
Duration (Months)	Duration			1-3 (4)*	Independent
Demographics					
Age	Age			1-4	Independent
Gender	Gender			1-2	Independent
Experience (Years)	Experience			1-4	Independent
Propensity to Trust	Propensity	**7**	7	7-49 **	Dependent
*(4) Is "Don't Know" and as these are only a few records were excluded from analysis involving the Duration variable. ** Repeat of Propensity to Trust under "Kind of Trust."					

Figure 6: Structure of Each Survey Instrument

The attribution of organizational-level trust was captured by categorizing responses as follows: Federal trustor-Federal trustee, Federal trustor-State trustee, Federal trustor-Local trustee, State trustor-Federal trustee, State trustor-State trustee, State trustor-Local trustee, Local trustor-Federal trustee, Local trustor-State trustee, and Local

trustor-Local trustee. An alternative analysis was conducted for organizational trust by categorizing responses as 'peer' and 'diff,' with 'peer' being Federal trustor-Federal trustee, State trustor-State trustee, and Local trustor-Local trustee, and 'diff' being Federal trustor-State trustee, Federal trustor-Local trustee, State trustor-Federal trustee, State trustor-Local trustee, Local trustor-Federal trustee, and State trustor-Local trustee. The nine trustor-trustee pairing, and the 'peer' and 'diff' pairing were used to study the relationship between organizational affiliation and organizational trust attribution. Of the 125 surveys that were completed; the trustor-trustee organizational affiliations were as follows (see Figure 7):

Survey Responses Received					
	Trustor-org evaluates Trustee-org	**# of Responses**	**%**	**Valid Percent**	**Cumulative Percent**
Type of Response	Federal-Federal	44	35.2	35.2	35.2
	Federal-State	41	32.8	32.8	68.0
	Federal-Local	12	9.6	9.6	77.6
	State-Federal	5	4.0	4.0	81.6
	State-State	4	3.2	3.2	84.8
	State-Local	1	.8	.8	85.6
	Local-Federal	8	6.4	6.4	92.0
	Local-State	7	5.6	5.6	97.6
	Local-Local	3	2.4	2.4	100.0
	Total Responses	125	100.0	100.0	

Figure 7: Survey Responses Received

In addition to organizational affiliation, statistics regarding the trustors' demographics was obtained. The majority of the subjects' were 51++ years old (see Appendix F); had 21 to 30 years of experience (see Appendix G), 76 percent were males and 24 percent were females (see Appendix H), their propensity to trust averaged 5.2 (out of a maximum rating of 7, see Appendix I.1.), and the trustor participated in the 'remembered' group an average of 1.6 months (see Appendix I.2.).

The trust responses were statistically analyzed using analysis of means. The surveyed trustors on the averaged had a propensity to trust, which rated 5.2 out of a 7-level scale, see Appendix I.1.; agreed that the 'other' organization were trustworthy, which rated 5.2 out of a 7-level scale, see Appendix I.3.; agreed that the other organization's expert was trustworthy, which rated 4.2 out of a 6-level scale, see Appendix I.4.; and agreed that members of the other organization were trustworthy on both cognitive and affective-levels, which each rated 5.1 out of a 7-level scale, see Appendix I.5. and I.6. Overall, the averages obtained from the survey data demonstrated that the study's subjects (trustors) trusted the 'other' group members.

The purpose of this study was to determine whether organizational trust affects the dynamics, thus, reliable performance of inter-agency group members. The affect of organizational trust was captured by comparing trust levels among the nine different trustor-trustee organizational relationships, and the 'peer-diff' trust pairings. The organizational trust levels among the nine trustor-trustee organizational relationships were analyzed using various types of analysis of variance and correlation tests. However, before variance analysis could be performed, the data was analyzed for normality of distribution; this would help determine whether to use parametric or non-parametric

statistical test. Parametric test assume a normal distribution of results, whereas, nonparametric tests do not assume a normal distribution of results. The normality of distribution drives the decision regarding the use of parametric versus nonparametric variance and correlation tests.

Hinkle, Wiersma, and Jurs (2003) state that interval surveys, for example, Likert surveys allow for parametric test "variables measured on the interval or ratio scales are quantitative variables. It is assumed that quantitative variables have underlying continuity; that is, they can take on any value on the measurement scale" (p. 11). Statisticians argue that data gathered from interval scales can be assumed to have equal distances between each value, thus, the data will follow a normal distribution.

The Kolmogorv-Smirnov and the Shapiro-Wilk tests were applied to organizational trust and some of the demographic data in order to determine the normalcy of distribution (see Appendix J). The Kolmogorv-Smirnov and the Shapiro-Wilk tests indicated that the data gather from the 40 trust questions is distributed normally. Both, parametric and nonparametric analyses were found to be appropriate for evaluating this study's demographic data, as well as, trust data.

When the data from the four trust surveys is subdivided by male and females, the data indicates a normal distribution of trust values (see Appendix J. 1.). Only the Propensity to Trust Survey completed by females and the Cognitive Trust Survey completed by females were at the lower bound of true significance. Because the data is normally distributed, parametric test and nonparametric test can be used to analyze the role gender play in the attribution of trust.

When the data from the organizational trust survey and the expert trust survey was subdivided by nine organizational pairings (Federal trustor-Federal trustee, Federal trustor-State trustee, Federal trustor-Local trustee, State trustor-Federal trustee, State trustor-State trustee, State trustor-Local trustee, Local trustor-Federal trustee, Local trustor-State trustee, and Local trustor-Local trustee), the data indicated a normal distribution for the Federal-Federal and the Federal-State trustor-trustee relationships (see Appendix J.2 and J.3..) The data for the other trustor/trustee organizational relationships (Federal-Local, State-Federal, State-State, State-Local, Local-Federal, Local-Sate, and Local-Local) was not normally distributed. Consequently, parametric and non parametric tests for only the Federal-Federal and Federal-State data were used to analyze the role organizational affiliation plays in the attribution of organizational trust.

Because of the normal distribution of the demographic data, and the Federal-Federal and Federal-State pairings, an analysis of variance (ANOVA) parametric test was used to evaluate the responses to the 40 trust questions for these pairings. The ANOVA has three assumptions that must be met in order to evaluate results: observations are independent, the sample data have a normal distribution, and scores in different groups have homogeneous variances. Basically, the ANOVA detects a difference between treatments by comparing the mean responses to the various treatments (Orkin & Drogin, 1975).

An ANOVA was used to test whether organizational affiliation moderated the perception of expert trustworthiness (Hypothesis 1), and the perception of the group members' trustworthiness (Hypothesis 2). An ANOVA also was used to test whether

cognitive and affective trust levels changed over time (Hypothesis 2a and 2b), and whether the trustor's demographics (gender, age, years of experience, and propensity to trust) moderated the perception of trustworthiness (Hypothesis 3). The ANOVA and the nonparametric test results are depicted in Appendices K through O.

Hypotheses and Quantitative Results

Results for Hypothesis 1 (H1): Organizational Affiliation Moderates the Perception of Expert Trustworthiness

Hypothesis 1 (H1) asserts that organizational affiliation moderates the trustor's perception of the Expert's trustworthiness. In other words, a trustor will perceive an expert as more trustworthy when they share organizational affiliation; this trustworthiness would be based on shared experiences such as common communication and behavioral norms (Drnevich, 2009, Conchie and Burns, 2008, Elsbach and Elofson, 2000). Perception of a trustee's trustworthiness is critically important when the trustee is in a position of authority, e.g., the trustee is the group expert. In HRO, deference to expertise is a necessary, foundational practice (Bigley & Roberts, 2001; Weick & Putnum, 2006; Weick & Sutcliffe, 2007).

Trust attributed to an Expert was evaluated using a Levene's (ANOVA) parametric test for the Federal-Federal and the Federal-State pairings. The non-parametric Kruskal-Wallis and the Median tests are used to test the Federal-Federal, Federal-State, and Federal-Local pairings. The use of both parametric and nonparametric test ensured that the survey data results received a robust analysis of variance.

Federal trustor to Federal trustee trust results were compared to Federal trustor to State trustee trust results in order to isolate the impact of organizational affiliation of the attribution of trust. The results of the parametric and non-parametric tests for the level of trust attributed by a Federally employed trustor towards a Federally employed expert (of another Federal entity), versus the level of trust attributed by a Federally employed trustor towards a State employed expert are as follows: (a.) The parametric Levene's Test for Equality of Variances resulted in a F significance = .790 with a alpha significance of .377; (b.) the non-parametric Kruskal-Wallis Test resulted in a asympolic significance = .640; and (c.) that non-parametric Median Test resulted in a asympolic significance = .949 (see Appendix K). The parametric test showed no significant difference in the trust attributed to a Federal expert versus a State expert. The nonparametric test showed no significant difference in the trust attributed to a Federal expert versus a State expert, versus a Local expert. Overall, organizational affiliation does not play a role in the attribution of trust toward the expert; H1 is rejected.

Results for Hypothesis 2 (H2): Organizational Affiliation Moderates the Perception of the 'Other' Group Members' Trustworthiness

Hypothesis 2 (H2) asserts that organizational affiliation moderates the trustor's perception of the team-members' trustworthiness. It is the informal system (relationships between group members) based on trust, confidence and credibility that enabled performers to proceed with the required tasks (Kilby, 2007). The effectiveness of the temporary groups relies on the development of trust (Meyerson et al., 1996); therefore, the affect that organizational affiliation may have on the trustor's perception of the

group's trustworthiness in a temporary, inter-agency group is important to understand. Ultimately, as the importance of the group's tasks increases, so does the importance of organizational trust (Webb, 1996).

Trust attributed to group members of the same organizational-level as the trustor's (i.e., Federal-Federal) was compared to the trust attributed to group members from organizational-levels other than the trustor's (i.e., Federal-State) using a Levene's (ANOVA) parametric test. The non-parametric Kruskal-Wallis and the Median tests are used to test the Federal-Federal, Federal-State, and Federal-Local trustor-trustee relationships. The use of both parametric and nonparametric test ensures that the trust data received a robust analysis of variance.

The results of the parametric and non-parametric tests of trust attributed to group members of the same organizational-level as the trustor's (i.e., Federal-Federal) compared to the trust attributed to group members from organizational-levels other than the trustor's (i.e., Federal-State) follow: (a.) The parametric Levene's Test for Equality of Variances resulted in a F significance = 2.006 which is at a alpha significance of .160; (b.) the non-parametric Kruskal-Wallis Test resulted in a asympolic significance = .601; and (c.) that non-parametric Median Test resulted in a asympolic significance = .974 (see Appendix L). The parametric test showed no significant differences in the trustor's attribution of trust toward the Federal trustee as compared to the trustor's attribution of trust toward the State trustee. The nonparametric test showed no significant differences in the attribution of trust to a Federal trustee, or a State trustee, or a local trustee. Given the results of the parametric and nonparametric test, H2 is rejected.

An alternative methodology was used to test H2. The first test of H2 revealed that organizational trust was not significantly different between the Federal-Federal and Federal-State trustor-trustee relationships. In order to take a deeper look at trust data, the data for Federal trustor-Federal trustee, State trustor-State trustee, Local trustor-Local trustee pairings were grouped into a 'peer' group, and the data for Federal trustor-State trustee, Federal trustor-Local trustee, State trustor-Federal trustee, State trustor-Local trustee, Local trustor-Federal trustee, and Local trustor-State trustee pairings were grouped into a 'diff' group. Then, the 'peer' and 'diff' groups were compared to determine differences in trust attribution (see Appendix M1-10).

The alternative methodology for H2 tests whether trust attributed in 'peer' groups is significantly different than trust attributed in 'diff' groups. The results of the parametric and non-parametric tests on the trust levels of 'peer' versus 'diff' groups follow: (a.) the parametric ANOVA for propensity to trust, F significance = .544; organizational trust, F significance = .291; affective trust, F significance = .679; cognitive trust, F significance = .991; and expert trust, F significance = .457. For all types of trust (propensity to trust, organizational trust, affective trust, cognitive trust, and expert trust) 'peer' versus 'diff' trust levels were not significantly different; in other words, the trustor attributed the same level of trust, whether the team members were 'peer' or the team members were 'diff' (see Appendix M.10); given these results, H2 is rejected.

Lastly, the attribution of organizational trust was analyzed along gender lines, that is, the trust data was analyzed by comparing male trustor versus female trustor responses. The male and female trustors were compared using a parametric ANOVA test, with the

following results: (a.) propensity to trust, F significance = .097; organizational trust, F significance = .080; affective trust, F significance = .109; cognitive trust, F significance = .202; and, expert trust, F significance = .750. The male versus the female trust levels for propensity to trust, organizational trust, affective trust, cognitive trust, and expert trust were not significantly different at the alpha .05 level; however, female trustors had a higher propensity to trust and attributed higher organizational trust at the alpha .10 level (see Appendix M.11). The affect of gender (as a trustor demographic) on the attribution of trust is addressed in greater depth in Hypothesis 3.

In conclusion, the trustor's perception of the trustworthiness of interagency group members is not related to the trustor's versus trustee's organizational affiliation. However, the trustor's gender does affect the attribution on trust. Female trustors had a higher propensity to trust, and females attributed organizational trust at significantly high levels then male trustors (at the alpha .10). Trust is a multi-level phenomenon (micro to macro) and its attribution is a multi-variate phenomenon, therefore, its attribution must be analyzed in many different ways. It is important to note that the subjects were a special group of wildland firefighters, who remembered experiences when participating in highly specialized type 1 and type 2 IMTs; these unique experiences and roles can affect the attribution of organizational trust (discusses in the qualitative analysis section).

Results of Hypothesis 2a and 2b (H2a and H2b): a. Cognitive trust is more evident at the beginning of a temporary, inter-agency group formation, and b. Affective trust is more evident the longer a temporary, inter-agency group stays together .

Trust is based on three distinct dimensions--the trustor's perception of the trustee's ability, integrity and benevolence. Also, trust has a temporal element--trust is first based on the perception of ability, afterwards on the perception of integrity, and lastly, based on the perception of benevolence (Mayer et al., 1995, see Figure 2). Trust is a dynamic phenomenon that has a different character in the early, developing and "mature" stages of the trustor-trustee relationship (Lewicki & Bunker, 1996). Both, H2b and H2b assert that the type of trust attributed (cognitive or affective) is influenced by the trustor's duration in the group. H2a asserts that the level of *cognitive* trust is higher at the start of group formation, whereas, H2b asserts that the level of *affective* trust is higher the longer the group remains together. Time will change the nature of trust in an inter-agency group.

Trust can form between inter-agency group members shortly after the group forms, this is called swift trust, and it is based on the perception of ability (Meyerson et al.; 1996, Miettinen, 2000). For swift trust, there is less emphasis on feeling, commitment, and exchange, and more emphasis on action, cognition, and heavy absorption on the task. Shortly after group formation, trust is more cognitive in nature, but later on the trust becomes more affective in nature.

Time, as related to a group's lifespan, is the variable (called Duration) that may affect the type of trust attributed. For the 125 subjects that completed the survey,

duration was distributed as follows: “less than one month (83 responses),” “one to two months (15 responses),” “three or more months (23 responses),” and “don’t know (4 responses).” Only 121 responses were used to test H2a and H2b, since four responses indicated ‘don’t know’, which does not represent time. Understanding the development of cognitive and affective trust develop will shed light on the types of relationships developing in inter-agency groups over time.

An ANOVA parametric test was used to determine whether cognitive trust is more evident (or at higher levels) at the beginning of a group formation, i.e., at less than one month, versus, two months or three months. The results of the ANOVA was F = .674, with an alpha significance of .512. The result of the nonparametric Kruskal-Wallis test was an asymp significance of .610, and the result of the nonparametric Median Test was an asymp significance of .600. The use of both parametric and nonparametric test ensured that the survey data received a robust analysis of variance. Based on the parametric and non-parametric analyses, cognitive trust is not more evident at the start of the group formation; in other words, H2a is rejected regarding the development of cognitive trust (see Appendix N.1.).

An ANOVA parametric test was used to determine whether affective trust is more evident (or at higher levels) at the end of a group formation, i.e., at high levels at three months, versus, two months or one month. The results of the ANOVA was F = .467, with an alpha significance of .628. The result of the nonparametric Kruskal-Wallis was an asymp significance of .478. The result of the nonparametric Median Test was an asymp significance of .226. The use of both parametric and nonparametric test ensured

that the survey data results received a robust analysis of variance. Based on the above parametric and non-parametric analyses, affective trust is not more evident at the end of the group formation; in other words, the H2b is rejected regarding the development of affective trust (see Appendix N.2.).

Although the parametric and nonparametric tests indicate that the level of cognitive trust does not significantly vary over time, there appears to be a trend for the levels of cognitive and affective trust to become more equal over time. If the level of cognitive trust is to be contrasted, matched, compared or paired to the level of affective trust between groups of different durations, then a single, alternative hypothesis can be formed, i.e., "for temporary, inter-agency groups, the difference between levels of cognitive and affective trust will not vary." This approach can be called a mixed hypothesis and is depicted in Appendix N.3. This alternate/mixed approach contrasts the levels of attributed cognitive trust and attributed affective trust in temporary, interagency groups.

A test of the mixed hypothesis indicates that the levels of cognitive trust and the levels of affective trust equalize over time. It may be that the trust that is developed in temporary, inter-agency groups has both cognitive and affective elements (Lester, 2006). Both, parametric and non-parametric tests were performed on the behavior of cognitive and affective trust over time, and the analyses indicate that the gap between cognitive and affective trust significantly narrows over time. The results of the ANOVA was $F = 4.297$, with an alpha significance of .016. The result of the non-parametric Kruskal-Wallis was an asymp significance of .022. The result of the Median Test was an asymp significance

of .055. Based on parametric and non-parametric analyses, cognitive trust and affective trust equalize over time in temporary, interagency groups (see Appendix N.3.).

Results--Hypothesis 3(H3): The trustor's demographics, such as, age, gender, years of experience and duration in a temporary, inter-agency group influences the attribution of organizational trust.

A trustor's characteristics influence the attribution of trust, for example, the propensity to trust moderates the trustor's ability to trust, see Figure 2 (Mayer, et al, 1995). Other personal characteristics may affect the trustor's attribution of trust, such as the trustor's age, gender, years of experience, and duration in a group. In order to test this possibility, age, gender, duration in a group, and years of experience were captured in the trust surveys. H3 proposes that a trustor's characteristics of propensity to trust, age, duration in a group, and years of experience moderate the attribution of organizational trust.

Analysis regarding the relationship between the attribution of organizational trust and the subject's demographics is at Appendix O. The subject's demographics are independent variables, while organizational trust is a dependent variable. The relationships between the independent variable and the dependent variable were tested using independent samples t-test, ANOVA, and a variety of non-parametric tests.

1. Age and Organizational Trust Attribution.

For each Organizational Trust Survey (OTI-SF) completed, the trust response was compared to the respondent's age. Age was captured as 21-40 years old, 41-50 years old,

and 51+ years old. There were 120 completed responses, with 8 respondents indicating 31-40 years old, 38 respondents indicating 41-50 years old, and 74 respondents indicating 51+ years old. The 31-40 year old group had the highest attributed organizational trust scores (see Appendix O.1.).

A parametric ANOVA test was used to compare the subjects' age with the organizational trust levels to determine whether age was significantly related to the attribution of organizational trust. The results of the ANOVA was $F = 1.171$, with an alpha significance of .314. The non-parametric Welch and Brown-Forsythe tests were used to further validate the relationship between age and organizational trust level. The Welch test resulted in a significance of .123. The Brown-Forsythe test resulted in a significance of .165. Based on the parametric and non-parametric test, age does not correlate with the attribution of organizational trust (see Appendix O.1.).

2. Gender and Organizational Trust Attribution.

For each OTI-SF completed, the organizational trust response was compared to the respondent's gender (male or female). There were 120 completed responses, with 91 male responses and 29 female responses. The male's average organizational trust value was 5.1 out of 7 and the females average organizational trust score was 5.6 out of 7 (see Appendix O.2). The parametric Levene's test was used to determine if there was a significant difference in means between the male and female organizational trust levels. The results of the Levene's test for equality of variances was $F = 8.547$, with an alpha significance of .004. Based on the parametric analyses, gender is significantly related to a higher attribution of organizational trust (see Appendix O.2.).

3. Experience and Organizational Trust Attribution.

For each OTI-SF completed, the organizational trust response was compared to the respondent's years of work experience; there were 120 completed responses. Experience was captured as 1-10 years of experience, 11-20 years, and 21-30 years, 30++ years. Of the responses, 6 respondents indicating 1-10 years of experience, 12 respondents indicating 11-20 years, 62 respondents indicating 21-30 years, and 40 respondents indicating 30++ years . The 1-10 year group had the highest organizational trust scores (see O.3.).

Both parametric and nonparametric tests were used to determine whether years of work experience was significantly related to the attribution of organizational trust (see Appendix O.3.). The parametric ANOVA test resulted in a significance of .169. The non-parametric Welsh test resulted in a significance of .001, and the non-parametric Brown-Forsythe test resulted in a significance of .072. Based on the ANOVA parametric test and the Brown-Forsythe nonparametric tests, years of experience are not significantly correlated to the attribution of organizational trust. However, according to the Welch non-parametric test, years of work experience significantly correlated with the attribution of organizational trust. Accordingly, the test on whether years of work experience correlated with the attribution of organizational trust merits further research.

4. Propensity to Trust and Organizational Trust.

The completed OTI-SF organizational trust scores were compared to the respondent's Propensity to Trust scores. There were 120 completed responses. A

Pearson's correlation was used to analyze the relationship between the attribution of organizational trust and the trustor's propensity to trust. The results of the Pearson Correlation was .000 (i.e., significant at the .01 level for a two tailed test). The non-parametric Wilcoxon Signed Ranks Test also resulted in a significant correlation at the .01 level for a two tailed test. Based on the Pearson's test and the Wilcoxon Signed Ranks Test, the attribution of organizational trust is highly correlated with the trustor's propensity to trust (see Appendix O.4.).

5. Analysis of Organizational Trust and Five Trustor Demographics.

For each respondent, the organizational trust scored captured by the OTI-SF (and treated as a dependent variable) were regressed against the respondent's age, gender, years of experience, duration in the group, and propensity to trust (treated as independent variables). Regression analysis helped identify the most significant explanatory variable for the attribution of organizational trust. There were 125 respondents who completed all the dependent and independent variable information. A Pearson Correlation test indicated that Age had a .015 explanatory value, Gender had a .155 explanatory value, Experience has a -.114 explanatory value, Duration in team had a -.019 explanatory value, and Propensity to Trust had a .439 explanatory value (see Appendix O.5.). Propensity to Trust had the strongest correlation to organizational trust with Gender having the second strongest correlation. In other words, Propensity to Trust was the strongest predictor of organizational trust.

An ANOVA test was used to further test whether a subjects' attribution of organizational trust is related to the subject's propensity to trust. The results of the

ANOVA was F = 29.281, with an alpha significance of .000; t tests also resulted in significance of .000 (see Appendix O.5.). Both, ANOVA and t-tests indicate that attributed organizational trust is strongly related to the trustor's Propensity to Trust.

In summary, some of the subject's demographics explain the attribution of organizational trust. Females attribute higher level of organizational trust in temporary, inter-agency groups, and they had a high propensity to trust. Additionally, propensity to trust is highly correlated to the attribution of organizational trust.

Quantitative Analysis Summary

Statistical analysis was performed on the survey results; 140 surveys were received from wildland firefighter who had served on temporary, inter-agency teams. The quantitative analysis indicated that (1) the trust attributed to the group expert is not significantly different between in the Federal-Federal versus the Federal-State trustor-trustee relationships; (2) the levels of cognitive versus affective trust are not significantly different over time, but they do equalize over time; (3) the organizational trust levels are not significantly different between the Federal-Federal versus the Federal-State trustor-trustee relationships, and there aren't significant differences in the organizational trust levels between the 'Peer' versus the 'Diff' relationships (that is, Federal-Federal/State-State/Local-Local versus Federal-State/Federal- Local/State-Federal/ State-Local/Local-Federal/Local-State); however, the trustor's characteristics of gender and propensity to trust significantly correlated with the attribution of organizational trust.

Overall, organizational affiliation did not affect the trustor's attribution of organizational trust. Although trust plays a role in the dynamics of temporary, inter-agency groups (Meyerson et al., 1996), in this study trust is not attributed because of organizational affiliation. The qualitative portion of this mixed-methods research methodology will help explain how organizational trust is formed, thus, will help explain organizational trust's role in temporary, inter-agency group dynamics.

Qualitative Results

In order to more fully understand the affect that organizational trust has on the dynamics of temporary, interagency groups who practice HRO, the results of the quantitative data were augmented with qualitative data. When quantitative and qualitative data is used in a research study, it is called mixed methods research. A mixed methods research methodology is used because it best addresses the varied and multiple meanings of a respondent's feedback (Jink, 1979). The quantitative data gathered from the four trust surveys indicated a positive level of trust between the nine different organizational pairings. The 'why' of the high levels of organizational trust between trustor and trustee from differing organizations can be explained by the qualitative data gathered via telephonic interviews.

Of the 140 subjects who responded to the trust survey, 20 subjects were randomly selected for an interview (using a random numbers table). The random selection of the 20 subjects resulted in a diversity of demographic and organizational backgrounds. Nonetheless, the 20 subjects were all experienced, wildland firefighters who had participated on inter-agency teams. The interviews were conducted after the surveys were completed and over an eight month period. With each of the 20 subjects, a questionnaire was used to structure the telephonic

interview (see Appendix E). The 20 interviewees freely shared their views and experiences regarding the role of organizational trust in temporary, inter-agency groups that practice HRO.

Common themes regarding the development of organizational trust emerged during the interviews. The interviewees frequently mentioned that the important roles of structure, leadership, learning, and mission in the development of organizational trust in a temporary, inter-agency team that practices HRO (see Figure 4). Generally, the interviewees relayed their experiences as part of type 1 or 2 IMTs. The interviewees were very consistent in their observations; most stating that the IMT's structure, leadership, training and mission required by the ICS approach enabled the existence of organizational trust in temporary, interagency groups. The interviewees often iterated that IMTs that respond to wildfires follow the ICS approach (see Appendix P). The ICS is an organizing approach followed by a network of IMTs for the purpose of wildland firefighting and disaster response (Bigley & Roberts, 2001). One interviewee observed that "inconsistent processes, i.e., each day is a different sheet of music, impedes the development of trust. The more consistent the processes, the easier it is to attribute trust." The ICS is the approach used by the wildland firefighting community to enable predictable structures and processes, and the interviewee credits the ICS approach for facilitating organizational trust in temporary interagency groups.

Qualitative Analysis and Results

In an ICS approach, each participating group (e.g., IMT) has fundamental rules, processes and behaviors (i.e. response templates) which must be followed (Bigley & Roberts, 2001). The ICS's rules, processes and behaviors are taught and reinforced at joint training centers, e.g., the U.S. Forest Service's National Advanced Fire and Resource Institute (NAFRI). Most of the 20 interviewees remembered high levels of organizational trust among wildland

firefighters in temporary, inter-agency groups--they credited the ICS approach. Importantly, most of the interviewees' remembered experiences were in type one IMT, which have the common rules, processes, roles, and training required by the ICS. Wildland firefighters in an IMT gather from various agencies, but they practice common rules, processes, roles, and training, thus, they perceived each other as predictable and competent, thus, trustworthy (Meyerson et al., 1996). An interviewee expressed "trust in ICS (the system of processes). ICS creates professionalism. ICS helps people make the right decision. ICS is trusted worldwide."

Many the interviewees indicated that they participated in an interagency group as part of an Incident Management Team (IMT), which use the ICS approach. There are five types of IMT, with the type one being the most skilled and complex. IMT is a preestablished group generally composed of an Incident Commander, Deputy Incident Commander, Planning Section Chief, Logistics Section Chief/Facilities Unity Leader, Safety Officer, and Operations Section Chief (Bigley & Roberts, 2001). Firefighters assigned to these roles in an IMT are well trained, certified in their roles, have many years of experience, and belong to varying Agencies. Most interviewees addressed organizational trust within their 'remembered' IMT experience, which is a very structured, professional experience.

Trust in the ICS approach led to trust of others in the ICS network, i.e., participating IMTs. Statements such as, "if there is someone assigned to an IMT, then they must know what they are doing regardless of the Agency they belong to;" and "IMT members have a standard qualification system… have trust in those qualified by the system." The interviews indicated that since the ICS approach was trusted, group members using the approach, e.g. IMTs, were also trusted.

The ICS addresses roles and responsibilities, for example, leadership functions and processes. Incident Commanders and Deputy Incident Commanders fulfill certain roles that are critical to incident management (Bigley & Roberts, 2001). An interviewee observed that the "ICS is a role based process which brings order to chaos." Although leadership roles are well defined in an ICS, HRO still acknowledges the need for underspecification of structure. A way to enact underspecification of structure is via deference to expertise (Weick & Putnam, 2006). When preplanned disaster responses do not work, improvisation is allowed, and rank is subordinated to expertise and experience, i.e., the person that is most knowledgeable of the critical task at hand.

Deference to expertise works if mindfully enacted by smart, trusting, trustworthy people willing and able to negotiate the differences among their diverse views under pressure (Weick et al., 1999). The ICS approach specifies roles, but allows for adaptive (improvised) responses to unexpected events, thus, allows for deference to expertise (Weick & Sutcliff, 2001). The practice of deference to expertise reinforces the need to trust members of IMTs, regardless of organizational affiliation, because important decisions must be made at the right level by the right member (Weick & Stucliff, 2007).

The ICS encourages learning; this learning is documented via certifications which, in turn, attest to competencies. The ICS approach requires wildland firefighters to take specific types of training in order to get certain certification, thus, hold certain roles in an IMT. Wildland firefighters with similar roles have undergone the same type of training and have had similar experiences—no matter their agency affiliation. Group members holding the same or similar roles conclude that they will perform better if they trust and help one another rather than trying to undermine each other interest (Ferris et al,

2003). Roles in an IMT create a structural equivalency between group members even though they do not belong to the same Agency. This structural equivalency, which is made possible by common training and experiences, enables the development of organizational trust across Agency lines.

The ICS encourages learning through open communication--even if to share mistakes made (Weick et al., 1999). Many interviewees remarked how the ICS approach reinforces the need to communicate openly--this enables learning, adapting, and trusting. Conchie & Burns (2008) found "when the organization openly discussed occupational risk and possible preventive strategies, it was perceived by workers as being more trustworthy than an organization that failed to communicate with workers." (p. 147). One interviewee said that in an IMT, "open communication is very important. You go into a team open minded, i.e., team-members are trustworthy, until they show otherwise." Another interviewee said, "the HRO model requires trust, because HRO requires the discussion of mistakes and close calls. Trust helps team-members to discuss close calls." Dirks and Ferrin (1998) observe that "studies do provide some evidence that trust is related to the effectiveness of the problem-solving process, particularly when measured as the number of ideas generated" (p. 3). The ICS approach encourages learning by sharing information—this sharing is possible because trust is facilitated and reinforced in an IMT.

The Incident Commander of an IMT ensures that the group members share a common mission, goals, and purpose (Bigley & Roberts, 2001). An interviewee stated that IMT group members share a common value for service, and when values are shared, trustworthiness is perceived. Cox et al. (2006) found "if managers endeavor to provide

rapid and useful feedback when accidents, incidents, and near misses are reported, employees trust in management will improve…" (p. 1130). The ISC approach, as enacted in IMTs, ensure that Incident Commanders articulate the group's mission, goal and purpose, thereby, enabling group trust. Courses like the NAFRI's Advanced Incident Management Course (S520) reinforce the ICS approach, IMT roles, and the Incidents Commander's responsibility to articulate mission, goals, and purpose.

Qualitative Data Analysis Summary

Ferris et al. (2003) suggest "that individuals may use social information to develop their beliefs about the trustworthiness of other individuals within the organization. According to this perspective, third parties may function as informants that a coworker relies upon in developing a conclusion about an employee's trustworthiness" (p. 2). The interviews suggest that the third party in the wildland firefighting community is the ICS approach. Interviewees uniformly gave credit to use of the ICS approach by the network of IMTs that follow the approach for enabling the existence of organizational trust in temporary, interagency groups that practice HRO. The ICS approach, by providing common structure, leadership, learning, and mission informed coworkers about expected behavior and standards, thus, enabled IMT members to readily trust each other (Bigley & Roberts, 2001).

The ICS acts as a third party that informs participants about the trustworthiness of others that follow the ICS approach, e.g., members of IMTs. One interviewee said "members with titles, e.g., Incident Commander, or, ICS qualified, are trusted because of the perception of expertise and common experience." In IMTs, the presumption of

trustworthiness is made before the inter-agency group performs; therefore, the 'going in' position is with a perception of group competence, as attested by ICS group members' certifications.

Basically, IMT and ICS affiliation is considered heavily than assessing group members, and interviewees give greatest credit to IMT and ICS affiliation (versus organizational affilation) when developing their perception of trustworthiness. One interview observed that "in an IMT, individuals shed their organizational identity and take on the identity of the IMT. The IMT invests in the common mission, thus, the team-members can extend trust relatively easily." Interviewees acknowledged that the attribution of organizational trust affected reliable performance in temporary, interagency teams; however, the organizational trust was attributed based on IMT and ICS affiliation, thus, not necessarily organizational affiliation (see Figure 8).

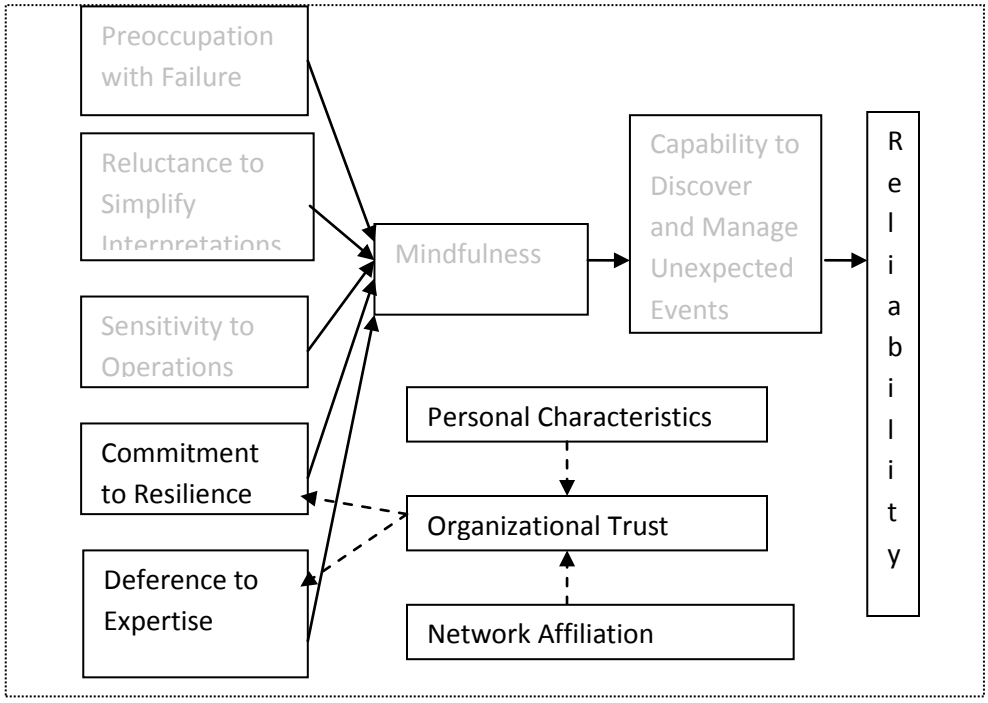


Figure 8: High Reliability Organizing--The Affect of Organizational Trust and the Moderator of Organizational Trust

Membership in the network of IMTs that follow the ICS approach (i.e., common processes, procedures, norms, language, etc,) positively affected the trustor's ability to trust (Drnevich et al. 2009; Elsbach & Elofson, 2000).

Chapter Summary

Trust is recognized as a fundamental feature of interpersonal and intergroup relations in numerous social science disciplines (Sitkin & Stickel,1996). Organizational trust facilitates organizational relationships, which facilitates productivity (Cox et al., 2006). However, there isn't much research in the role of organizational trust in temporary, inter-agency group dynamics. Yet, understanding the role of trust in

temporary, inter-agency groups is important, because the use of temporary, inter-agency groups is ever expanding.

The increasing and crucial role that temporary, inter-agency groups play when responding to disasters was demonstrated after Hurricane Katrina, the Indian Ocean tsunami, and the earthquake in Haiti; in each disaster thousands lost their lives, but many more thousands were saved because of the reliable work of temporary, interagency teams. Connelly (2007) stresses "the need for trust among all parties so as to maintain commitment from all participants" (p. 1248). Understanding the role that organizational trust plays in the dynamics of temporary, inter-agency groups will help disaster preparedness planners develop disaster preparedness policies and practices that enable the development of organizational trust, such as, plan for the establishment of IMT-type teams that use an ICS-type approach.

Organizational trust plays a central in groups (Drnevich, Ramanujam, Mehta, & Chaturvedi, 2009; Webb, 1996). Research on organizational trust in temporary, inter-agency groups found that differing organizational norms and organizational affiliation influence the attribution of organizational trust (Drnevich et al., 2009; Elsbach & Elofson, 2000). This dissertation focuses on potential moderators of organizational trust, such as organizational affiliation. Five hypotheses were tested in order to understand the attribution of organizational trust; four hypotheses (H1, H2, H2a, and H2b) tested organizational-level trust, and the last hypothesis (H3) tested the role of the trustor's characteristics in the attribution of organizational trust. Trust was measured using four trust surveys.

A total of 140 participants responded to the trust surveys, of those, 120 fully answered all 40 trust questions. Data obtained from the 40 trust questions indicated a positive level of trust between the wildland firefighter. The hypotheses addressed the potential moderators of organizational trust, i.e., trustor's and trustee's organizational affiliation and demographics. The following are the findings:

Hypothesis 1: Organizational affiliation did not significantly impact the attribution of trust to the group expert.

Hypothesis 2: Organizational affiliation did not significantly impact the attribution of organizational trust to group members.

Hypothesis 2a: Cognitive-based organizational trust did not significantly decrease over time. However, the gap between cognitive and affective trust-levels significantly narrowed over time

Hypothesis 2b: Affective-based organizational trust did not significantly increase over time. However, the gap between cognitive and affective trust-levels significantly narrowed over time

Hypothesis 3: A trustor's personal characteristics of gender and propensity to trust significantly related to the attribution of organizational trust. However, the trustor's characteristics of age, duration in the group, and years of experience did not significantly relate to the attribution of organizational trust.

The finding that gender and propensity to trust are significantly related the attribution of organizational trust reinforces the notion that in collective dynamics, the

individual-level perspective is not lost (Mayers et al., 1995). However, this study focused on the collective-level of analysis, therefore, the gender and propensity to trust findings must be left to another research project. The attribution of organizational-level trust is the focus of this research project.

This study's subjects were wildland firefighters. It is important to note that the wildland firefight community is a tight network, i.e., a network of agencies that follow an ICS approach for structuring, learning, certifications, practices, etc. Organizations such as the National Interagency Fire Center (NIFC) and the National Advanced Fire and Resource Institute (NAFRI) are established to build close working relationships among wildland fire fighting agencies, thus, ensuring successful interagency coordination via the ICS approach and IMT network. The wildland firefighting community frequently works and train together in an inter-agency setting, i.e., it is a tight network.

Phelps (2010) states, "dense networks facilitate the production of trust and reciprocity among networked firms, which decrease exchange hazards in alliances, increase cooperation among partners, and mitigate absorptive capacity problems" (p. 895). Test of the hypotheses found that there was a high level of trust among the subject wildland firefighters; however, the trust was not related to organizational affiliation. The tight network of the wildland firefighting explained the high levels of trust among wildland firefighters from different Agencies.

The ICS approach used by the wildland firefighting IMTs facilitated the creation of a tight network of temporary, inter-agency IMTs; a network with many commonalities. However, IMTs must improvise and adapt as the crisis requires, therefore, IMTs have

elements that are loosely coupled. The ICS approach allows IMTs to have characteristics of, both, tight and loose couplings. The Interviewees most credited the tight couplings of IMTs for enabling the perception of group trustworthiness.

The quantitative analysis found high levels of trust across the nine different trustor-trustee organizational relationships. Further insight into the attribution of organizational trust was gained from the 20 telephonic interviews with the research subjects. The 20 participants noted that the ICS approach used by wildland firefighting IMTs facilitated the generation of trust in temporary, inter-agency groups. The attribution of organizational trust was not related to organizational affiliation, but was related to ICS and IMT affiliation.

The IMT team-members went into the group with a high level of trust toward the other team members (although they may not have previously worked together), because the team members were part of a highly skilled network of IMTs. Overall, the ICS approach, acting as a third party in the IMT network, facilitated the development of organizational trust (Ferris et al., 2003). Organizational-level trust evolved into network-level trust.

This study found that in short-term, interagency groups the attribution of organizational trust is affected by the trustor's characteristics (i.e., gender and propensity to trust), and the perception of common mission, processes, roles and training--as facilitated by the IMT structure and ICS approach. Ferris et al. (2003) state, "the trust between any two individuals is likely to be influenced by the social context that surrounds their dyadic relationship. …trust in one another may be influenced by the

similarity of roles they fulfill within the organization." (p. 1). This study found that the ISC approach, practiced by IMTs, facilitated positive organizational trust levels.

The ICS approach enabled trustworthiness, because of it requirements for training and certification. The interviewees commented that the trust was based on the expectation of competence, which is the initial type of trust attributed (Mayer et al., 1995; Meyerson et al., 1996; Schoorman et al., 1995). Elsbach and Elofson (2000) observe, "perceptions of competency-based trustworthiness are suggested to be primary antecedents of … interparty trust" (p. 80). Finding that wildland firefighters (who are part of IMTs) attributed trust based on the perception of competence is logical, since the study focused on temporary, inter-agency groups--groups that do not have a chance to establish a more affective type of trust.

In conclusion, this dissertation supports the following guiding principles for temporary, inter-agency systems and plans: (1) the need to establish a common culture, while not compromising the unique culture of each participating organization; (2) the creation of a common vision/strategy; (3) the need for open communications; (4) the need for trust among all parties so as to maintain commitment; (5) flexibility in terms of processes; and (6) a belief that alliances/networks build alliances/networks (Connelly, 2007). The network of wildland firefighters has implemented these five guiding principles, in addition to the five HRO practices; these which is inherent in the ICS approach. Consequently, temporary, inter-agency groups with Type 1 IMT group members perceive the other group members as trustworthy.

This study found that a temporary, inter-agency group has a high level of organizational trust within the group when they are part of a tight network and they

follow the ICS-type approach to organizing (Weick & Sutcliff, 2001; Weick & Sutcliff, 2007). High organizational trust is important because it facilitates reliable performance (Webb, 1996). An ICS approach requires common training, roles, responsibilities, etc. for disaster responders. HRO is moderated by organizational trust--as the trust is facilitated by the tight network of IMTs following the ICS approach and HRO.

CHAPTER FIVE: DISCUSSION OF RESULTS AND IMPLICATIONS

Review of the Purpose of the Study

Intra-Agency groups are increasingly used to solve complex problems, such as, recovery work after devastating natural disasters (Connelly, 2007). Members of inter-agency groups come together quickly and must develop working relationships quickly in order to perform reliably. Trust is recognized as a fundamental feature of interpersonal and intergroup relations (Sitkin & Stickel, 1996). However, it may be a challenge for temporary, inter-agency group members to establish intergroup trust quickly, because members of temporary, intra-agency groups are most likely strangers to each other; they have not had a chance to access each other's competence, integrity, or benevolence (Mayer et al., 1995). But, it has been demonstrated that when responding to a disaster, group members can swiftly attribute trust to each other, thus, function reliably (Meyerson, et al., 1996). The attribution of trust is critical in temporary, inter-agency group dynamics, because, without trust, there can be devastating effects on reliable performance (Weick, 1993, 1996).

Organizational trust facilitates inter-agency relationships, which facilitates productivity (Mishra, 1996). Organizational trust is based on the perception of competence, integrity, and benevolence (Mayer et al., 1995; Schoorman et al., 2007). Perceptions of an organization's competence, as reflected in an organization's reputation, can affect the attribution of organizational trust between temporary, inter-group members (Bitektine, 2011). This study addresses whether organizational affiliation and the trustor's personal attributes affect the attribution of organizational trust in temporary,

inter-agency groups that practice HRO. Understanding the moderators of organizational trust in temporary, inter-agency groups is important, because of (1) the ever expanding use of temporary, inter-agency groups, not only in response to disasters, but in response to virtual, complex, multi-disciplinary, and/or multi-national problems, and (2) the criticality of trusting relationships to reliable performance (Hicks & Pappas, 2006; Miettinen, 2000).

Effective disaster preparedness plans must take into account the social-psychological dynamics in temporary, inter-agency groups that respond to disasters, such as, the attribution of organizational trust (Caldwell & Clapham, 2003). This study hypothesized that the trustor's organizational affiliation would affect the attribution of organizational trust, which would, in turn, would affect the dynamics and performance of temporary, inter-agency groups. By understanding the moderating affect of organizational trust in temporary, inter-agency group dynamics, such dynamics can be addressed in disaster preparedness plans, thus, the plans will be more effective at the time of disaster response.

A mixed-methods research methodology was used to study the role of organizational trust in temporary, inter-agency group dynamics. The mixed methods research methodology uses quantitative and qualitative research techniques to capture data from the research subjects. Specifically, Likert surveys and telephonic interviews were used to capture data regarding the attribution of organizational trust. A mixed methods research methodology was used because it best addresses the varied and multiple meanings of organizational trust in temporary, inter-agency groups (Jink, 1979).

The use of quantitative and qualitative research techniques increased our understanding of organizational trust; the surveys informed of the positive levels of organizational trust among wildland firefighters, and the interviews informed of the reasons for the positive level of organizational trust. By using a mixed-methods research methodology, this study achieved a more in-depth understanding of the attribution of organizational trust.

Discussion of the Study's Major Findings

Organizational trust plays a central role in groups (Drnevich et al., 2009; Webb, 1996). Connelly (2007) stresses "the need for trust among all parties so as to maintain commitment from all participants" (p. 1248). Research of organizational trust in temporary, inter-agency groups finds that differing organizational norms and organizational affiliation influence the attribution of organizational trust (Drnevich et al., 2009; Elsbach & Elofson, 2000). This dissertation studied whether the trustor's organizational affiliation and the trustor's personal attributes moderate the development of organizational trust in temporary, interagency groups that practice HRO.

Five hypotheses were tested in order to understand the attribution of organizational-level trust. Hypotheses H1, H2, H2a, and H2b tested the attribution of organizational trust, and hypothesis H3 tested the role of the trustor's characteristics in the attribution of trust. Overall, organizational affiliation was not found to have a significant affect on the attribution of organizational trust; the subjects in this study attributed trust to 'other' group members--regardless of their organizational affiliation. Importantly, it was found that the subjects in this study were part of a tight network, i.e.,

they were part of a network of IMTs that shared many common structures, practices, and mission.

The IMTs use an ICS approach that requires common training, certifications, language, roles and responsibilities; and, these common practices facilitated the attribution of organizational trust (Lewicki & Bunker, 1996). Both, the quantitative and qualitative analysis indicated an agreement that the 'other' organizations in the temporary, interagency group were trustworthy, because they were perceived as competent. The perception of competence was based on the common training and certifications required of the network of firefighting IMT. The common training and certifications were required of the network of IMTs by the ICS approach used by the wildland firefighting community.

Methodology

The subjects of this study came from a population that frequently work in inter-agency groups that practice HRO, that is, wildland firefighters. The study's population was 261 wildland firefighters who had attended the U.S. Forest Service's National Advanced Fire and Resource Institute (NAFRI), Advanced Incident Management Course (S-520), however, of the 261, only 140 wildland firefighters completed the study, so, ultimately, this study has 140 subjects. The 140 subjects are well experienced at working in temporary, inter-agency groups, thus, could well address the affect of organizational trust on temporary, inter-agency group dynamics.

As part of the quantitative analysis for this study, the subjects answered 48 questions. Of the 48 questions, 40 questions were taken from four trust surveys and 8 questions captured demographic data, such as, age, years of experience, gender, etc. The

40 trust questions were taken from the following four trust surveys: the McAllister (1995) Affect- and Cognition-based Trust Scale, the Mayer & Gavin's (2005) Trust in Management, the Cummings and Bromiley's (1996) Organizational Trust Inventory-Short Form (OTI-SF), and the Jarvenpaa, Knoll, and Leidner's (1998) Propensity to Trust Scale. Using the internet based Survey Monkey software the 48 questions were sent to, and received from, the 140 subjects.

The introduction to the 48 questions asked the subjects to 'remember' a work experience when they participated in a temporary, inter-agency group; then, with the 'remembered' experience in mind, answer the 48 questions (see Appendixes A through D). Interviews with 20 subjects were conducted after the surveys were completed. The subsequent interviews with 20 of the subjects made it apparent that the 'remembered' experience was, as requested, an experience the trustor had while in a temporary, inter-agency group. Importantly, the 'remembered' experience also was while a member of a highly skilled, type 1 or 2 IMT. In summary, quantitative data was captured via 48 survey questions and the responses to the 48 questions were clarified via interviews with 20 randomly selected subjects.

Findings

Of the 140 wildland firefighters that addressed the surveys, 125 completed all 48 questions; the subjects indicated the following about themselves:

a. Were mostly 51++ years old (see Appendix F);

b. Had mostly 21 to 30 years of experience (see Appendix G);

c. Were 76 percent males, 25 percent female (see Appendix H);

d. Their propensity to trust averaged 5.2 (out of a maximum rating of 7, see Appendix I.1.); and,

e. Had participated in the 'remembered' group an average of 1.6 months (see Appendix I.2.).

f. Rated the 'other' organization's trustworthiness as 5.2 out of a 7-level scale (see Appendix I.3.);

g. Rated the 'other' organization's expert's trustworthiness as 4.2 out of a 6-level scale (see Appendix I.4.); and,

h. Rated the 'other' organization trustworthiness as 5.1 out of a 7-level scale on, both, cognitive and affective type questions (see Appendix I.5. and I.6.).

The trust data was analyzed to determine the trustor's perception of the trustee's trustworthiness (the trustee was the 'other' organization in the 'remembered', temporary, inter-agency group). Trustor-trustee data was paired organizationally in order to analyze whether organizational affiliation affected the attribution of organizational trust in the 'remembered' experience. The following organizational pairings were analyzed: Federal trustor-Federal trustee, Federal trustor-State trustee, Federal trustor-Local trustee, State trustor-Federal trustee, State trustor-Local trustee, Local trustor-Federal trustee, Local trustor-State trustee, and Local trustor-Local trustee. It was found that of the nine groupings, only the Federal-Federal and the Federal-State pairings contained enough data to withstand quantitative analysis. However, in order to use all paired data, the trustor-trustee data were grouped as 'Peer' versus 'Diff' (i.e., Federal-Federal, State-State, and Local-Local pairings were consolidated and compared to the Federal-State, Federal-Local, State-Federal, State-Local, Local-Federal, Local-State pairings). By comparing

the attribution of trust between the organizational pairing, the affect of organizational affiliation on organizational trust could be determined.

The quantitative analysis of the trustor-trustee pairings demonstrated that organizational affiliation did not affect the attribution of organizational trust; in other words, organizational trust was attributed, and the trustees were perceived as trustworthy, irrespective of organizational affiliation. Additionally, quantitative analysis indicated that females attributed significantly higher levels of organizational trust as well has had a higher propensity to trust. It was also found that propensity to trust highly correlated to the attribution of organization trust. Although the organizational-level affiliation did not affect the attribution of organizational trust, the individual-level attributes of gender and propensity to trust did affect the attribution of organizational trust.

As part of the qualitative analysis for this study, 20 telephonic interviews were conducted. These 20 interview subjects were randomly selected from the 140 subjects who answered the trust surveys. The telephonic participants indicated that they joined the temporary, inter-agency group ready to trust the 'other' group members. The telephonic participants were ready to trust the 'other' group members because, as members of skilled IMTs, they all had common training, certification processes, roles and responsibilities, thus, this commonness facilitated the attribution of organizational trust, even when the temporary, inter-agency group first formed. Since the trustor knew what to expect of the other group members (trustee), the trustor went into the group experience trusting the other group members. Although, the differing organization affiliation of the trustee did not affect the attribution of organizational trust, the common training, norms, language, etc. did facilitate the attribution of organizational trust.

The 20 interviews shed light on the reason for the common training, certification processes, roles and responsibilities among the wildland firefighting group, that is, their IMT's allegiance to the ICS approach. The ICS approach is used by the wildland fire fighting community as a means to organize and manage responses to disasters, and ICS approach requires the establishment of common practices and roles across the wildland firefighting community (USDA RMRS-GTR-137, 2004). The ICS is an organizing system which facilitates the networking of IMTs for the purpose of firefighting and disaster response.

An IMT is a preestablished group generally composed of an Incident Commander, Deputy Incident Commander, Planning Section Chief, Logistics Section Chief/Facilities Unity Leader, Safety Officer, and Operations Section Chief (Bigley & Roberts, 2001). The interviewees indicated that because of the ICS approach, and the network of IMT that use the ICS approach, the attribution of organizational trust was facilitated in wildland firefighting, temporary, inter-agency groups (see Appendix P). In summary, although organizational trust was not attributed because of organizational affiliation, organizational trust was attributed because of ICS and IMT affiliation, i.e., a network affiliation (Bitektine, 2011).

Although the interviewed subjects had only worked a short time in a temporary, inter-agency group, they went into the group with a high level of trust toward the other team members, because the team members used an ICS approach in their temporary, inter-agency IMTs. The ICS, acting as a third party, facilitated the development of organizational trust (Ferris et al., 2003). The ICS approach is followed by a network of IMTs. Networks facilitate the production of trust and reciprocity among networked agencies, which decrease exchange hazards in alliances, increase cooperation among

partners, and mitigate absorptive capacity problems (Phelps, 2010). The IMTs tight network (implemented by the wildland firefighting community) explains the positive organizational trust among the subject wildland firefighters (even when trustor and trustee are affiliated to different agencies), and explains why organizational affiliation was not the primary reason for the attribution of organizational trust in temporary, inter-agency groups that practice HRO.

Hypothesis Testing

This study attempted to understand whether there are moderators that affected the attribution of organizational trust, such as, differences between trustor and trustee organizational affiliation or trustor characteristics. A total of 140 participants responded to the trust surveys, of those, 125 fully completed all 40 trust questions contained in the four trust surveys. Data obtained from the 40 trust questions indicated that 'other' organizations in their 'remembered' temporary, inter-agency group were perceived as trustworthy. In this study organizational affiliation did not moderate the attribution of trust. However, the trustors gender and propensity to trust did affect the trustors attribution of trust. The level of organizational trust was not affected by the organizational-level attribute of organizational affiliation, but was affected by the individual-level attributes of gender and propensity to trust.

In order to more fully understand the quantitative data, qualitative data also was gathered from interviews conducted with 20 wildland firefighters (see Appendix E). The 20 interviewees were selected randomly from those that had completed the surveys. The interviews were conducted in order to construct the here-and-now of events, persons,

activities, organizations, feelings, motivations, claims, concerns, thus, the 'why' of the responses (Lincoln & Guba, 1985).

The hypothesis addressed possible moderators of organizational trust as follows:

Hypothesis 1: *In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.*

The quantitative analysis indicated that organizational affiliation did not significantly impact the attribution of trust to the group expert. The level of organizational trust attributed to the expert was statistically equal whether the trustor and expert (trustee) belonged to the same organizational level or different organizational levels (organizational levels were Federal, State, and Local). The qualitative analysis also indicated that when the group expert belonged to an 'other' organization they were still deemed trustworthy. The perception of the expert's trustworthiness stemmed from the expert's membership, training, certifications, and role in a Type 1 or 2 IMT—an organizing system respected and followed throughout the wildland firefighting community (Bigley & Roberts, 2001).

Hypothesis 2: *In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.*

The quantitative data indicated that organizational affiliation did not significantly impact the attribution of organizational trust to group members from 'other' organizations. The level of attributed organizational trust to the group members from other organizations was statistically equal whether the trustor and 'other' group members

(trustee) belonged to the same organizational level or different organizational levels (organizational levels were Federal, State, and Local). The qualitative analysis also indicated that when the group members belonged to an 'other' organization they were still deemed trustworthy. The perception of the group member trustworthiness stemmed from 'others' membership, training, certifications, and role in a Type 1 or 2 IMT that followed the ICS approach.

The quantitative data also indicated that female subjects had significantly high levels of organizational trust than male subjects. The reason for these gender differences requires additional research. Gender research is outside the scope of this dissertation.

Hypothesis 2a: *In temporary, interagency groups, cognition-based organizational trust is most evident at the start of the group formation.*

The quantitative data indicated that cognitive-based organizational trust did not significantly change over time. It was hypothesized that cognitive based trust would form first in temporary, interagency teams then be replaced with affective based trust (Mayers et al., 1995). Trust forms quickly in temporary, inter-agency teams, because these teams must quickly become effective even though group members may not have previously worked together.

The type of trust that forms first in temporary, interagency teams is swift trust, and it is cognitive based. Cognitive based trust is based on the perception of competence (Meyerson et al., 1996). In this study, the groups that worked together for shorter periods

of time did not significantly demonstrate significantly higher levels of cognitive based trust versus affective based trust.

Hypothesis 2b: *In temporary, inter-agency groups, affective-based organizational trust becomes increasingly evident the longer the group remains together*.

The quantitative data indicated that affective-based organizational trust did not significantly increase over time. It was hypothesized that affective based trust would replace cognitive based trust the longer the temporary, interagency groups worked together (Schoorman et al., 2007). In this study, the temporary, interagency groups that worked together for longer periods of time did not significantly demonstrate significantly higher levels of affective based trust.

Interestingly, the difference between cognitive levels and affective levels of trust significantly narrowed over time, with affective trust levels increasing over time to be more in line with cognitive trust level. The equality of cognitive and affective trust levels may be because the trustors' felt like they 'knew' the trustees when they joined the group; knew them, because the trustor was familiar with the trustees' roles, practices, certifications, and values. The more the trustor knows the trustee, the more affective the trust (Mayer et al., 1995).

H 3: *A trustor's personal characteristics, that is, age, gender, years of experience and propensity to trust moderate the attribution of organizational trust.*

A trustor's personal characteristics of gender and propensity to trust significantly correlated to the attribution of organizational trust. However, the trustor's characteristics

of age, duration in the group, and years of experience did not significantly relate to the levels of organizational trust. The findings that gender and propensity to trust are significantly related the attribution of organizational trust reinforces the notion that in collective dynamics, the individual-level attribute is not lost (Mayer et al., 1995; Schoorman et al., 2007). Since this study focused on the collective-level of analysis, the relationships between gender and organizational trust, and the relationship between propensity to trust and organizational trust must be left to another research project, i.e., a research project that focuses on the individual-level analyses of gender and propensity to trust.

Test of hypotheses H1, H2, H2a, H2b, and H3 found that there was organizational trust among the wildland firefighters in temporary, interagency groups, but, for the subject's of this study the trust was not related to organizational affiliation. Interviews with 20 wildland firefighter indicated that the close network within the wildland firefighting community helped facilitate organizational trust. In the wildland firefighting community, the network is strengthened by the IMT structure and the ICS approach; this facilitates trust among temporary, inter-agency group members.

It is important to note that the wildland firefight community is a tight network, i.e., a network that works hard at identifying and working with partner agencies to accomplish a common purpose by establishing common roles, having common practices, and having common norms (Bigley & Roberts, 2001; Lechner, 2010). Wildland firefighting agencies frequently work and train in an inter-agency setting and frequently work together when managing disasters. For example, organizations such as the National

Interagency Fire Center (NIFC) and the National Advanced Fire and Resource Institute (NAFRI) were established to build close working relationships, i.e., networks among wildland fire fighters. The NIFC, specifically, is tasked to ensure successful interagency coordination among the wildland firefighting agencies. Phelps (2010) states, "dense networks facilitate the production of trust and reciprocity among networked firms, which decrease exchange hazards in alliances, increase cooperation among partners, and mitigate absorptive capacity problems" (p. 895). The wildland firefighting community, and more specifically, the type 1 and 2 IMTs from which the subjects came, is a tight network--they work together closely and frequently.

The ICS approach is perceived as a legitimizing entity. The ICS approach legitimized its membership and facilitated trusting relationships by requiring common structures, training, certification, roles and practices (Bitektine, 2011); these common ways are enacted by a network of IMTs. The 20 interviews conducted in this study indicated that organizations that participate in the ICS are perceived as legitimate, competent, thus, trustworthy. Bitektine (2011) observes, "in the case of cognitive legitimacy, the evaluation stops when the organization is classified as a member of some already known and already legitimate class of organizations" (p. 157). In this study, organizational trust was based on the expectation of competence--expectations formed by the trustrees' membership in an IMT network that uses the ICS approach.

Limitations of the Study

Sample

The purpose of this study was to further understand the affect of organizational trust in temporary, inter-agency groups who practice HRO. Therefore it was important to select study subjects who had worked in temporary, inter-agency groups, and who practiced HRO while responding to a disaster. Wildland firefighters frequently work in temporary, inter-agency groups when battling large, wildland fires (both, nationally and internationally); accordingly, wildland firefighters were determined to be good subjects for this study.

The subjects of this study were those wildland firefighters who had attended the National Advanced Fire and Resource Institute (NAFRI), Advanced Incident Management Course (S-520). The subjects were seasoned firefighters with many years of inter-agency work. However, the fact that all the subjects of this study were drawn from the wildland firefighting community is a limitation of the study, because there are many different types of entities that participate in temporary, inter-agency groups. Additionally, the subjects where all part of type 1 and 2 IMTs, a very select, highly professional group of wildland firefighter; these subjects are not, as a whole, completely representative of wildland firefighters or disaster preparedness responders.

There are many different entities that perform in temporary, interagency teams, for example, virtual networks, international companies, and non-profit organizations, and the unique attributes of these groups may not be captured by studying only wildland firefighters. The organizational trust formed by wildland firefighters may not represent

the type of relationships and trusts that form in other types of networks, for example, more loosely coupled networks (Orton & Weick, 1990). Additionally, studying wildland firefighters is appropriate for studying the affect of organizational trust on temporary, interagency groups who practice HRO, but they may not represent the dynamics of different types of temporary, interagency groups, for example, those that do not practice HRO.

The interviews made it evident that this study performed its research on subjects who are in a tight network; that is, a network of IMTs that have many structures, roles, training, certifications, and practices in common (Lechner, 2010). These common processes, required by the ICS approach and IMTs, facilitated the development of organizational trust among subject wildland, firefighters. Further, organizational trust found among the trustor and trustee in this study is reflective of the wildland firefighter's tight network. Organizational trust may affect organizational dynamics differently among participants of loosely coupled network; therefore, it is a limitation of this study to only have studied a tightly coupled network of wildland firefighters.

The number of subjects in this study was 140. Having 140 subjects respond to emailed trust surveys, from a possible 261 subjects, is a good response rate for emailed surveys. The response of 140 provided significant power for the quantitative analysis. However, these experienced 140 subjects may not be representative of all wildland firefighters (for example, those that are less experienced, less skilled, or those who do not respond to emailed surveys). In addition, these 140 subjects, and the way they attribute organizational trust, may not be representative of all the different types of agencies and

groups that respond to disasters, for example, NGOs (Burkle, 2006; Drnevich et al., 2009,).

The 20 interviewees also may not be representative of the community of disaster responders, because the interviewees were all wildland firefighters who belonged to Type 1 and 2 IMTs, thus, a tight network of highly skilled professionals. The 140 subjects of this study is a very small sample of the population of wildland firefighters, or disaster responders, therefore, the organizational trust dynamics of these 140 subjects may not be representative of the organizational trust dynamics in the greater population of disaster responders.

External validity of tasks and performance outcomes

This study was conducted via emailed surveys and telephonic interviews. The emailed surveys were sent and received via Survey Monkey software and were constructed from four trust surveys that had been tested for validity and reliability. The Survey Monkey survey contained 40 trust questions and 8 demographic questions. The trust questions were answered by the subjects based on a 'remembered' experience while on a temporary, interagency group. The 'remembered' experience, itself, was not captured in the survey, only the trust responses to the 'remembered' experience were captured. It is not evident that the 'remembered' experience reflected the 'actual' experience, since retrospective thinking can be flavored by subsequent experiences and thoughts. Relying on a 'remember' experience can be considered a methodological weakness of this study.

Further, the 'remembered' experience may have been remembered in a more favorable light because of the passage of time since the experience; as the saying goes "time heals all wounds." Additionally, recording responses on a Likert scale may produce more favorable results regarding group trustworthiness, since respondees tend to avoid the extremely negative, or positive, parts of the Likert scale. Reliance on a 'remembered' experience, versus, gathering data from an actual performing temporary, inter-agency group may have produced overly (or, less) favorable results regarding the attribution of organizational trust in a temporary, inter-agency group.

Lastly, 20 subjects were interviewed telephonically. The use of a telephonic interview vice in person interviews, may have resulted in the interviewer missing subtle emotional reactions to the trust questions. In-person interviews may have been a better methodology for capturing responses regarding trust, especially, affective reactions and responses.

Implications for Theory, Practice, and Future Research

This study found organizational trust among temporary, inter-agency groups, but organizational affiliation did not explain the organizational trust levels--network affiliation explained the positive organizational trust levels. In their 'remembered experience', the subjects were certified, and worked with 'others' who were certified, to participate in type 1 and 2 IMTs. They belonged to IMTs that followed the ICS approach. Furthermore, the IMTs were a network that followed the ICS approach. The ICS approach requires common training, certifications, and high reliability organizing and processes (Bigley & Roberts, 2001); thus, the ICS approach creates a tight network—

a network with many similarities and a lot of interaction. Many of the subjects 'remembered experiences' while on a temporary, inter-agency Type 1 and 2 IMTs where the inter-agency group members were type 1 and 2 qualified. The type 1 and 2 IMTs were part of a wildland firefighting network that follow an ICS approach; these teams are considered the best, most capable within the wildland firefighting network.

Overall, the subjects perceived the 'other' organizations represented in the temporary, inter-agency experience as trustworthy. Importantly, the perceived trustworthiness of 'other' organizations in the temporary, inter-agency group (or IMT) was affected by the cognitive legitimization of the ICS approach used by the type 1 and 2 IMTs (Bitektine, 2011). The attribution of organizational trust may be different among groups that belong to more loosely coupled networks, i.e., networks that do not have common practices, roles, norms, and certifications. The moderating affect of organizational trust on temporary, inter-agency group dynamics should be studied for groups that belong to more loosely coupled networks.

Implication forTheory

This study found that the wildland firefighting network helped create a trusting environment by requiring that wildland firefighter be trained, certified, and experienced before participating in wildland firefighting. Further, the wildland firefighting network helped create a trusting environment by ensuring that wildland firefighters understood their roles, responsibilities, and command structure before participating in wildland firefighting; that is, the network required the ICS approach when battling complex

wildland fires. This studie's subjects worked in a network of IMTs where group members were perceived as trustworthy and reliable performers, regardless of organizational affiliation, because of network-wide common policies and practices. A network-wide approach to temporary, inter-agency group policies and practices facilitated the attribution of organizational trust.

This study found that network affiliation moderated the perception of trustworthiness--more so than organizational affiliation. Yet, network or trust theories have not fully addressed the role of network--level trust in network dynamics and performance. Meyerson et al. (1996) observed, "people who are scare freelance specialist and tied into minimally overlapping networks should perceive their position in temporary systems to be more vulnerable. Their reputation is entrusted to others who can do considerable damage in multiple networks." (p. 172). In temporary groups there is a high need to trust--trust decreases the perception of risk, thus, increases the ability to quickly perform (Mayer et al. (1995). Network theory must address the importance of building network-wide trusting relationships, even before a problem or crisis arises, because trusting relationships enable networks to quickly resolve complex problems as they arise.

Implication for Practice

The subjects of this study believed that the network of IMTs, which were bonded by the ICS approach, helped create the perception of trustworthiness among group members. IMTs (most notably the type 1 and 2) shared common mission, goals, training,

certifications, role, responsibilities, and infrastructure. This finding supports the need for building identifiable and tightly coupled networks, where the network's members have a common set of practices. Tightly coupled networks share common plans that involve logistics, fiscal, operational, safety and community issues, as well as, common controls. Yet, tightly coupled networks must also improvise (as needed) and exploit the process of training and retraining as a means for socialization and acculturation (Rochlin et al., 1998). Tightly coupled networks, with an openness to improvisation and learning, will facilitate the development of network-level trust, thus, reliable performance.

The building of tight networks will decrease the perception of professional risk among those that are temporarily performing in the network and, thus, will increase the temporary member's reliable performance. Disaster preparedness plans rely heavily on networks to reliably respond to disaster, such as the wildland firefighting network, the homeland security network, the Federal emergency response network. Since networks (especially those that are responsible for saving lives) must be prepared to respond quickly, disaster preparedness planners must build and manage tight networks well before their services are needed. The wildland firefighting network, with its IMT and ICS infrastructure, is an excellent model for reliable, tight networks. Formalizing the creation and management of networks will ensure their reliable performance, thereby, ensuring the reliable resolution of complex problems.

Implication for Research

This study did not include subjects that belonged to loosely coupled networks. A study needs to be conducted on the affect of organizational trust on temporary, inter-agency group dynamics when the groups belong to loosely coupled networks, i.e., networks where the groups/organizations don't share mission, goals, and practices (Orton & Weick, 1990). In loosely coupled networks, the attribution of organizational trust may be affected by organizational affiliation, since the group members do not share network-level practices, norms, and language (Elsbach & Elofson, 2000).

Further, research is need on network-level trust. With the increased use of networks to tackle large, complex problems, understanding the behavioral dynamic of network-trust is critically important. Addressing the issues of network-trust before a network need to responds to complex problems, such as, wildfires, earthquakes, floods, etc. will ensure their reliable performance when it is most needed.

The wildland firefighting community is an exploitation group, i.e., a group that focuses on tasks, requirements, and compliance. Lechner, Frankenberger, and Floyd (2010) state "in exploitation groups, performance is greater at higher levels of tie strength, centrality, and shared vision than in exploration groups" (p. 884). It may be that the need for organizational trust in a temporary, inter-agency group is greatest when the tasks are exploitative in nature, i.e., task oriented. When the tasks are creative, or exploration in nature, the role of organizational trust in the temporary, inter-agency group is not as important. Future research should take into account the nature of the temporary, inter-agency group (exploitative or explorative).

This study also found that gender and propensity to trust are correlated to higher levels of organizational trust. Women have higher levels of organizational trust and have a higher propensity to trust. Also propensity to trust is related to organizational trust levels. The affect of personal demographics, such as gender and propensity to trust on group dynamics merits closer attention than this study offered. This study focuses on trust attribution at the collective level (organizational) in temporary, inter-agency groups; therefore, trust attribution at individual level in temporary, inter-agency groups merits further research.

Chapter Summary

This study found organizational trust in temporary, interagency groups, however, the attribution of organizational trust was not related to the trustee's organizational affiliation, but was related to the trustee's network affiliation. In temporary, interagency groups, the perception of organizational trustworthiness is affected by network affiliation, in the case of this study's subjects, membership in a wildland firefighting network of IMTs that follow an ICS approach (see Figure 8). The wildfire firefighting network is a tight network, because they have many member agencies that share common language, training, and structures.

The ICS approach ensures that there are common practices among the IMTs. The common practices required by the ICS approach results in a common language, training, and structure among the networks/s members. The common professional backgrounds (training, roles, responsibilities, etc.) among wildland firefighters resulted in positive

levels of organizational trust among this study's temporary, inter-agency wildland firefighters.

With increased globalization, there is an increased reliance on networks. Consequently, networks must understand the moderators of reliable performance, such as, organizational or network-level trust, and the role of common practices such as language, norms, goals, and structure. The ICS approach is an excellent model for network structuring and practices.

The subjects of this study were type 1 or 2 qualified, and were members of highly skilled and experienced Type 1 or 2 IMTs--these are not your average wildland firefighters. Wildland firefighters are, generally, less skilled and experienced. Consequently, this dissertation's findings are most generalizable to highly skill, temporary, inter-agency groups--groups that are part of tight networks. However, the lessons of this study should be applied to temporary, inter-agency groups that are not as highly skilled, experienced, and networked.

Organizations in inter-agency groups that are not members of tight networks may not attribute organizational trust as readily. In today's disasters, many of the responding inter-agency groups are formed with organizations that are not part of tight networks. Accordingly, loosely coupled responders that have not worked together before (the varied organizations that responded to e.g. Housing and Urban Development, Coast Guard, Army, National Guard, FEMA, etc.) may attribute organizational trust differently that those belonging to an IMT. Accordingly, it is critical that future research be conducted

on the role of organizational trust in temporary, inter-agency group dynamics for groups that are not part of tight networks. Loosely coupled groups and networks will continue to respond to disasters and their reliable performance will make the difference between life or death, therefore, studying the moderators of trust in loosely coupled networks is critically important (Majchrzak et al., 2007, Kilby, 2007).

This study found that the context of the ICS and the IMT, and their requirement for common practices affected the attribution of organizational trust in a positive way. Therefore, this dissertation supports the following guiding principles and practices for networked systems: the need to establish a common culture, while not compromising the unique culture of each participating organization; the creation of a common vision/strategy; the need for open communications; the need for trust among all parties so as to maintain commitment; flexibility in terms of processes; and a belief that alliances/networks build alliances/networks (Connelly, 2007). The wildland firefighting community implemented these principles via the IMT structure and its use of the ICS approach, thus, IMTs, and its members, are seen as very reliable responders in times of disaster. Inter-agency groups, as a whole, should implement the five guiding principles proposed above; these five principles complement the five HRO practices. Accordingly, just as HRO is moderated by organizational-level trust, or network-level trust, the five guiding principles could be moderated by trust.

In conclusion, researches should research tight networks for an understanding of the role that trust (facilitated by common culture, language, practices, and goals) plays in reliable performance. By understanding the role that trust plays in tightly (or loosely

coupled networks), disaster preparedness professionals can plan accordingly. This study indicates that in tightly coupled networks (with common culture, training, structures, missions, etc.), disaster responders will presume group member trustworthiness, thus, will more readily perform cohesively and reliably.

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Appendix A

Jarvepaa, Knoll, and Leinder's (1998) Propensity to Trust Scale

(seven item scale: 1-strongly disagree, 2-disagree, 3-slightly disagree, 4-neither agree nor disagree, 5-slightly agree, 6-agree, and 7-strongly agree)

1.	One should be very cautious when working with leaders. 1 2 3 4 5 6 7
2.	Most leaders tell the truth about the limits of their knowledge. 1 2 3 4 5 6 7
3.	Most leaders can be counted on to do what they say they will do. 1 2 3 4 5 6 7
4.	If possible, it is best to avoid working with leaders on projects. 1 2 3 4 5 6 7
5.	Most leaders are honest in describing their experiences and abilities. 1 2 3 4 5 6 7
6.	Most leaders answer personal questions honestly. 1 2 3 4 5 6 7
7.	Most leaders are very competent in terms of their work. 1 2 3 4 5 6 7

Please indicate your age: _____

Please indicate your gender: _____

Please indicate your years of experience in wildland firefighting: _____

Appendix B

Organizational Trust Inventory-Short Form (OTI-SF)

Remember a time that you worked on a temporary, multi-agency team—a team that was newly formed. Remember your interaction with the team members from the other agency.

1. *Your organization is _____.*
2. *The 'other' team-members' organization is _____.*
3. *Amount of time you and the 'other' team-members worked together on the remembered effort _____.*

Please circle the number to the right of each statement that most closely describes your opinion toward members of the other organization. Interpret the blank spaces as referring to the other organization about which you are commenting.

(1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, 7 = strongly agree)

1. We think the people in _____ tell the truth in negotiations.	1 2 3 4 5 6 7
2. We think that _____ meets its negotiated obligations to our department.	1 2 3 4 5 6 7
3. In our opinion, _____ is reliable.	1 2 3 4 5 6 7
4. We think that the people in _____ succeed by stepping on other people.	1 2 3 4 5 6 7
5. We feel that _____ tries to get the upper hand.	1 2 3 4 5 6 7
6. We think that _____ takes advantage of our problems.	1 2 3 4 5 6 7
7. We feel that _____ negotiates with us honestly.	1 2 3 4 5 6 7
8. We feel that _____ will keep its word.	1 2 3 4 5 6 7
9. We think _____ does not mislead us.	1 2 3 4 5 6 7
10. We feel that _____ tries to get out of its commitments.	1 2 3 4 5 6 7
11. We feel that _____ negotiates joint expectations fairly.	1 2 3 4 5 6 7
12. We feel that _____ takes advantage of people who are vulnerable.	1 2 3 4 5 6 7

Appendix C

McAllister (1995) Affect- and Cognition-based Trust Scale

Remember a time that you worked on a temporary, multi-agency team—a team that was newly formed. Remember your interaction with the team members from the other agency.

1. *Your organization is _____.*
2. *The 'other' team-members' organization is _____.*
3. *Amount of time you and the 'other' team-members worked together on the remembered effort _____.*

Please circle the number to the right of each statement that most closely describes your opinion about members of the other organization.

(1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, 7 = strongly agree)

Affect-based trust:

1. We have a sharing relationship. We can both freely share our ideas, feelings, and hopes. 1 2 3 4 5 6 7

2. I can talk freely to these individuals about difficulties I am having at work and know that (s)he will want to listen. 1 2 3 4 5 6 7

3. We would both feel a sense of loss if one of us was transferred and we could no longer work together. 1 2 3 4 5 6 7

4. If I shared my problems with these persons, I know they would respond constructively and caringly. 1 2 3 4 5 6 7

5. I would have to say that we have both made considerable emotional investments in our working relationship. 1 2 3 4 5 6 7

Cognition-based trust:

1. These individuals approach their job with professionalism and dedication. 1 2 3 4 5 6 7

2. Given these persons' track record, I see no reason to doubt their competence and preparation for the job. 1 2 3 4 5 6 7

3. I can rely on these persons not to make my job more difficult by careless work. 1 2 3 4 5 6 7

4. Most people, even those who aren't close friends of these individuals, trust and respect them as coworkers. 1 2 3 4 5 6 7

5. Other work associates of mine who must interact with these individuals consider them to be trustworthy. 1 2 3 4 5 6 7

6. If people know more about these individuals and their background, they would be more concerned and monitor his/her performance more closely. (reversed coded). 1 2 3 4 5 6 7

Appendix D

Mayer & Gavin's (2005) Trust in Management Measure

Remember a time that you worked on a temporary, multi-agency team—a team that was newly formed. Remember your interaction with the team members from the other agency.

1. *Your organization is _____.*
2. *The 'other' team-members' organization is _____.*
3. *Amount of time you and the 'other' team-members worked together on the remembered effort _____.*

Please circle the number to the right of each statement that most closely describes your opinion about the expert from the other organization.

(1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree)

1. If I had my way, I wouldn't let this expert/leader have any influence over issues that are important to me. (reverse coded) 1 2 3 4 5 6
2. I would be willing to let this expert/leader have complete control over my future in this company. 1 2 3 4 5 6
3. I really wish I had a good way to keep an eye on this expert/leader. (reverse coded) 1 2 3 4 5 6
4. I would be comfortable giving this expert/leader a task or problem which was critical to me, even if I could not monitor his/her (its) actions. 1 2 3 4 5 6
5. I would tell this expert/leader about mistakes I've made on the job, even if they could damage my reputation. 1 2 3 4 5 6
6. I would share my opinion about sensitive issues with this expert/leader even if my opinion were unpopular. 1 2 3 4 5 6
7. I am afraid of what this expert/leader might do to me at work. (reverse coded) 1 2 3 4 5 6
8. If this expert/leader asked why a problem happened, I would speak freely even if I were partly to blame. 1 2 3 4 5 6
9. If someone questioned this expert/leader 's motives, I would give him/her the benefit of the doubt. 1 2 3 4 5 6
10. If this expert/leader asked me for something, I would respond without thinking about whether it might be held against me. 1 2 3 4 5 6

Appendix E

Introduction and Interview Questions

My name is Mary Sally Matiella. I am a doctoral student at the George Washington University, and I am studying the role of organizational trust in temporary, inter-agency groups. The following questions are structured in order to understand how organizational trust was exhibited in your temporary, inter-agency, wildland firefighting group.

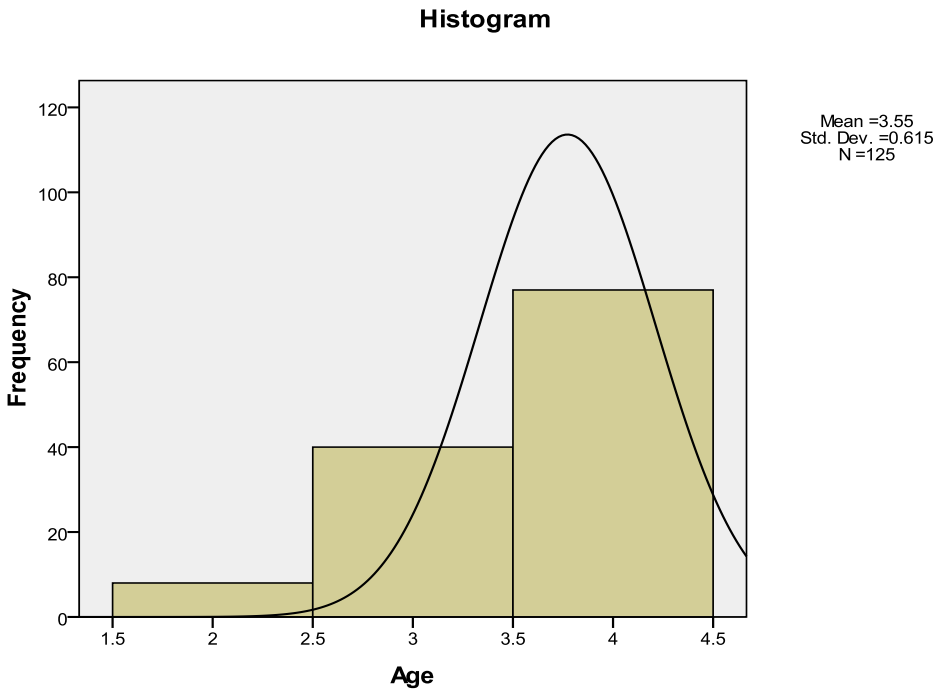
1. Describe the group's agency makeup, i.e., what organizations were represented in the group. What other characteristics come to mind?
2. Did you develop trust towards your team members? Explain.
3. Describe the trust you felt toward your team members--was it based on the perception of ability, integrity, or benevolence.
4. Describe how you felt about the team member from your organization.
5. Describe how you felt about the team members from the other organization.
6. Did the development of trust between the team members enable better outcomes? Explain.

After the final question, the interview will thank the respondent and will offer to share the results of the study after the study is completed.

APPENDIX F

SUBJECTS' AGE:

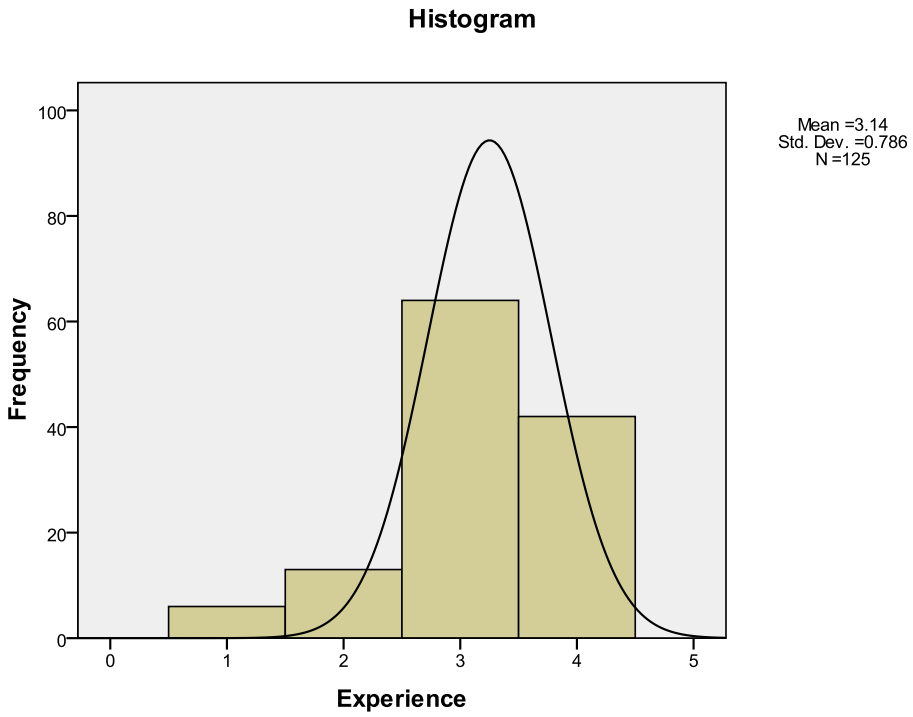
Age					
Years		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Group	31-40	8	6.4	6.4	6.4
	41-50	40	32.0	32.0	38.4
	51++	77	61.6	61.6	100.0
	Total	125	100.0	100.0	



APPENDIX G

SUBJECTS' EXPERIENCE:

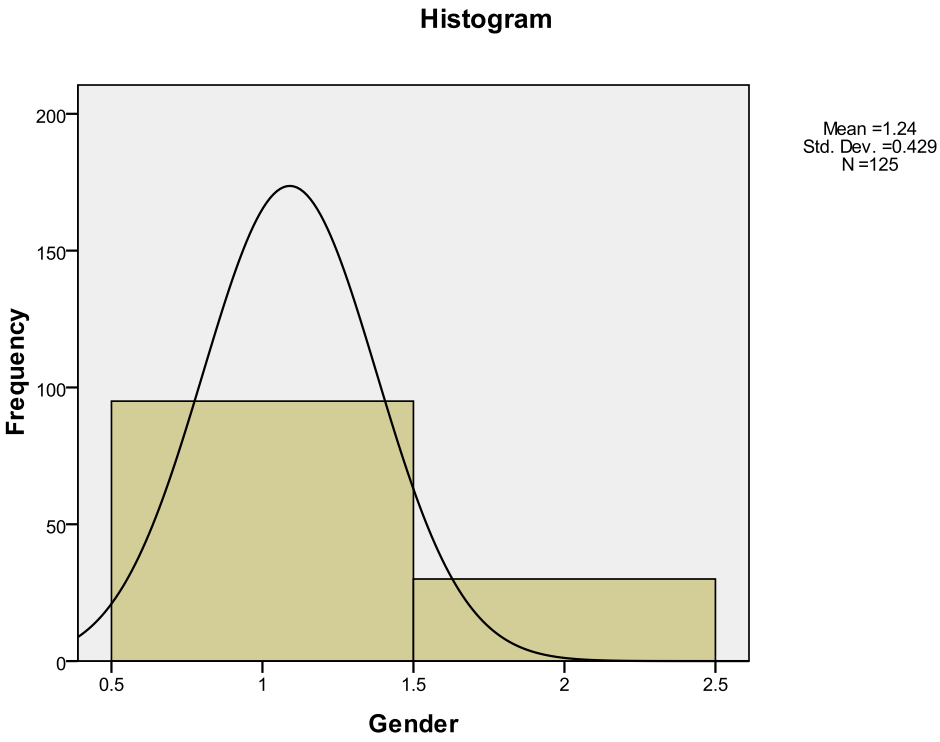
Experience					
Years		Frequency	Percent	Valid Percent	Cumulative Percent
Group	1-10	6	4.8	4.8	4.8
	11-20	13	10.4	10.4	15.2
	21-30	64	51.2	51.2	66.4
	31++	42	33.6	33.6	100.0
	Total	125	100.0	100.0	



APPENDIX H

SUBJECTS' GENDER:

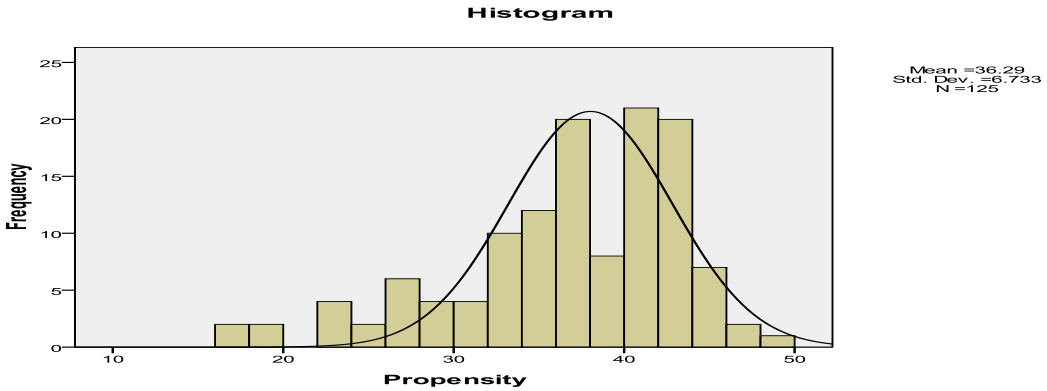
Gender					
Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Group	Male	95	76.0	76.0	76.0
	Female	30	24.0	24.0	100.0
	Total	125	100.0	100.0	



APPENDIX I

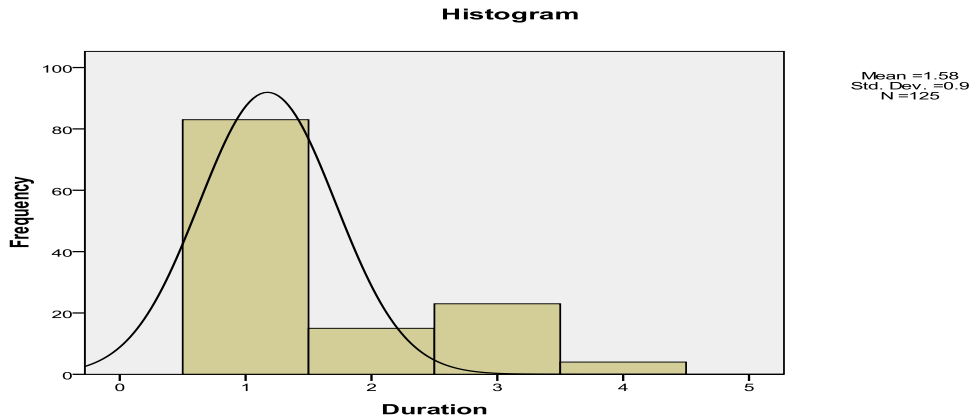
1. SUBJECTS' PROPENSITY TO TRUST:

Propensity to Trust Statistics		
N	Valid	125
	Missing	0
Mean		36.29
Std. Error of Mean		.602
Median		37.00
Mode		40
Std. Deviation		6.733
Variance		45.336
Skewness		-.943
Std. Error of Skewness		.217
Kurtosis		.544
Std. Error of Kurtosis		.430
Range		32
Minimum		17
Maximum		49
Sum		4536
Percentiles	25	33.00
	50	37.00
	75	41.00



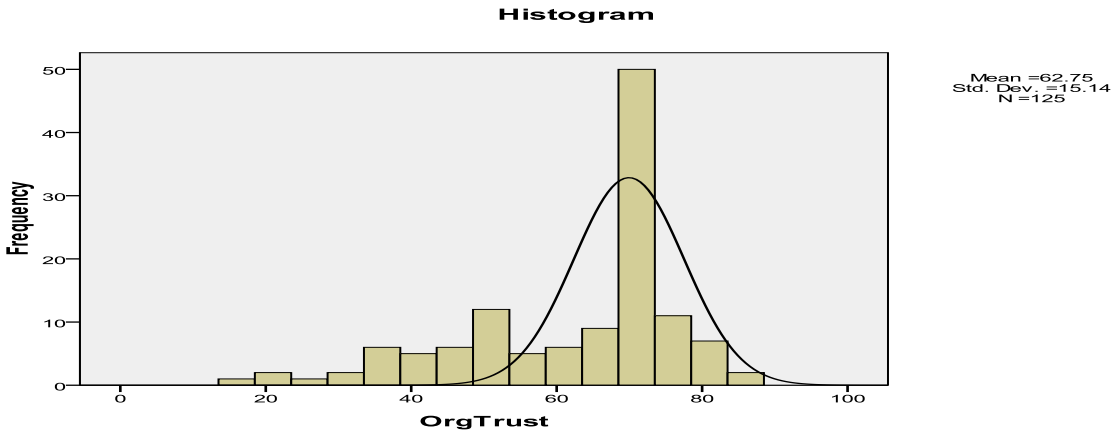
2. SUBJECTS' DURATION IN INTER-AGENCY TEAM :

Duration		
N	Valid	125
	Missing	0
Mean		1.58
Std. Error of Mean		.080
Median		1.00
Mode		1
Std. Deviation		.900
Variance		.809
Skewness		1.196
Std. Error of Skewness		.217
Kurtosis		.012
Std. Error of Kurtosis		.430
Range		3
Minimum		1
Maximum		4
Sum		198
Percentiles	25	1.00
	50	1.00
	75	2.00



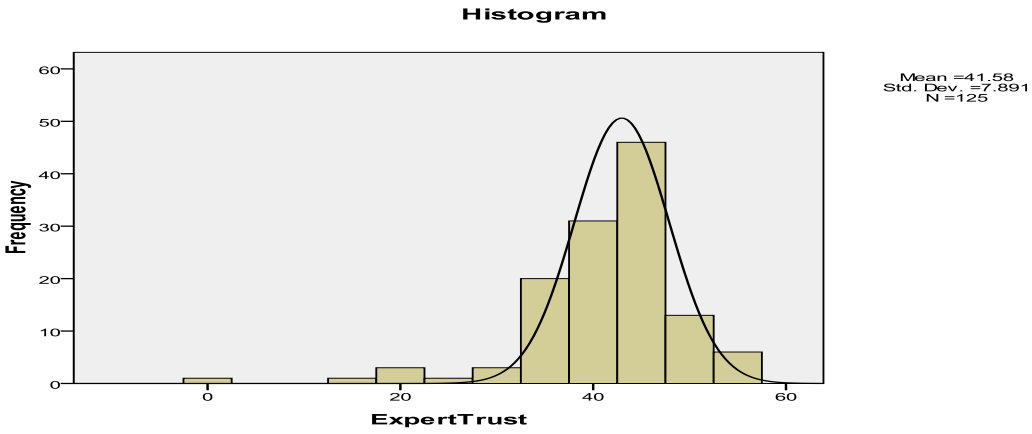
3. SUBJECTS' ORGANIZATIONAL TRUST LEVELS:

OrgTrust		
N	Valid	125
	Missing	0
Mean		62.75
Std. Error of Mean		1.354
Median		70.00
Mode		72
Std. Deviation		15.140
Variance		229.220
Skewness		-1.078
Std. Error of Skewness		.217
Kurtosis		.462
Std. Error of Kurtosis		.430
Range		68
Minimum		16
Maximum		84
Sum		7844
Percentiles	25	52.00
	50	70.00
	75	72.00



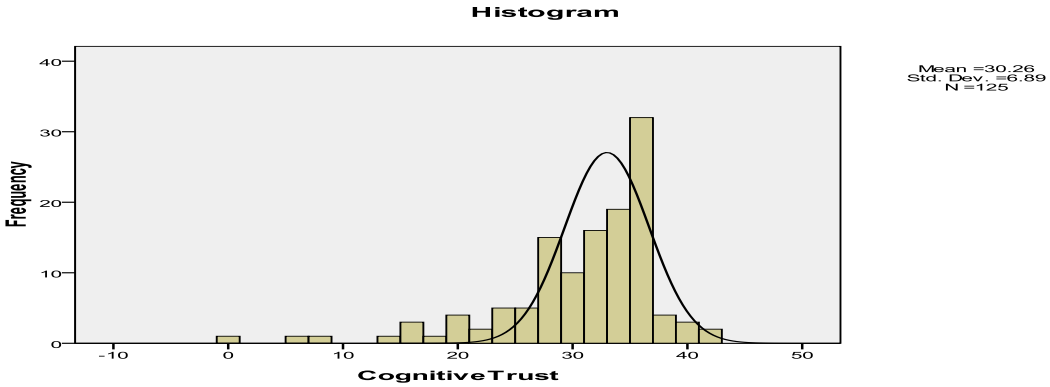
4. SUBJECTS' EXPERT TRUST LEVELS:

ExpertTrust		
N	Valid	125
	Missing	0
Mean		41.58
Std. Error of Mean		.706
Median		43.00
Mode		47
Std. Deviation		7.891
Variance		62.262
Skewness		-1.805
Std. Error of Skewness		.217
Kurtosis		6.508
Std. Error of Kurtosis		.430
Range		55
Minimum		0
Maximum		55
Sum		5197
Percentiles	25	38.00
	50	43.00
	75	46.50



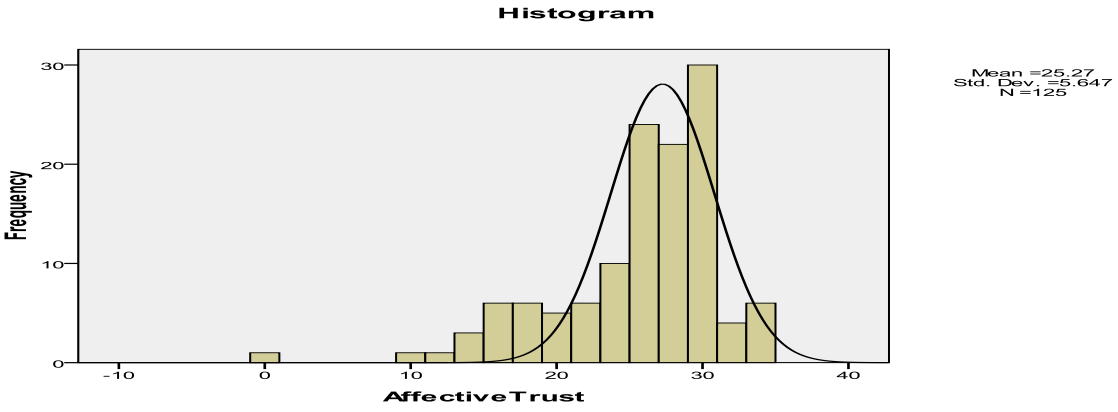
5. SUBJECTS' COGNITIVE TRUST LEVELS:

Statistics		
CognitiveTrust		
N	Valid	125
	Missing	0
Mean		30.26
Std. Error of Mean		.616
Median		32.00
Mode		35
Std. Deviation		6.890
Variance		47.470
Skewness		-1.723
Std. Error of Skewness		.217
Kurtosis		3.963
Std. Error of Kurtosis		.430
Range		41
Minimum		0
Maximum		41
Sum		3783
Percentiles	25	27.00
	50	32.00
	75	35.00



6. SUBJECTS' AFFECTIVE TRUST LEVELS:

AffectiveTrust		
N	Valid	125
	Missing	0
Mean		25.27
Std. Error of Mean		.505
Median		26.00
Mode		30
Std. Deviation		5.647
Variance		31.893
Skewness		-1.365
Std. Error of Skewness		.217
Kurtosis		2.652
Std. Error of Kurtosis		.430
Range		34
Minimum		0
Maximum		34
Sum		3159
Percentiles	25	23.00
	50	26.00
	75	29.00



APPENDIX J

Evaluating the Normal Distribution of Survey Data

1. EVALUATING THE NORMAL DISTRIBUTION OF THE DATA FOR EACH TRUST SURVEY (Propensity to Trust, Organizational Trust, Expert Trust, Cognitive Trust and Affective Trust):

Tests of Normality

Trust Survey	Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Propensity	Male	.120	91	.002	.923	91	.000
	Female	.111	29	.200*	.974	29	.681
OrgTrust	Male	.211	91	.000	.884	91	.000
	Female	.205	29	.003	.909	29	.016
ExpertTrust	Male	.113	91	.006	.931	91	.000
	Female	.163	29	.046	.940	29	.099
CognitiveTrust	Male	.179	91	.000	.861	91	.000
	Female	.122	29	.200*	.970	29	.551
AffectiveTrust	Male	.165	91	.000	.925	91	.000
	Female	.180	29	.017	.906	29	.014

*. This is a lower bound of the true significance.

2. EVALUATING THE NORMAL DISTRIBUTION OF THE DATA FOR *Organizational Trust by Org-Org Relationships*:

The Kolmogorov-Smirnov and Shapiro-Wilk test confirm the normality of the Federal_Federal and Federal_State organizational relationships. All other organizational relationships failed these tests.

Tests of Normality[b]

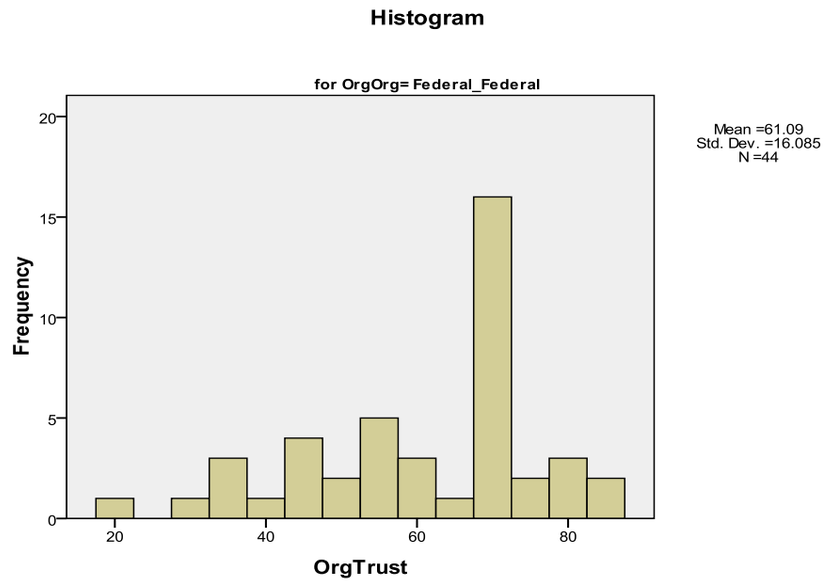
		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Org	Statistic	df	Sig.	Statistic	df	Sig.
OrgTrust	Federal_Federal	.211	44	.000	.913	44	.003
	Federal_State	.231	41	.000	.882	41	.001
	Federal_Local	.203	12	.187	.883	12	.096
	State_Federal	.265	5	.200*	.836	5	.154
	State_State	.287	4	.	.864	4	.276
	Local_Federal	.211	8	.200*	.885	8	.212
	Local_State	.330	7	.020	.700	7	.004
	Local_Local	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

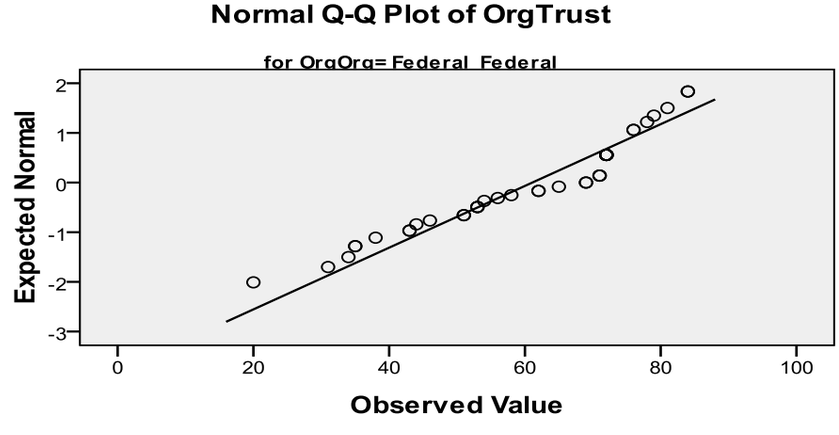
b. OrgTrust is constant when Org = State_Local. It has been omitted.

Federal-Federal Relationship

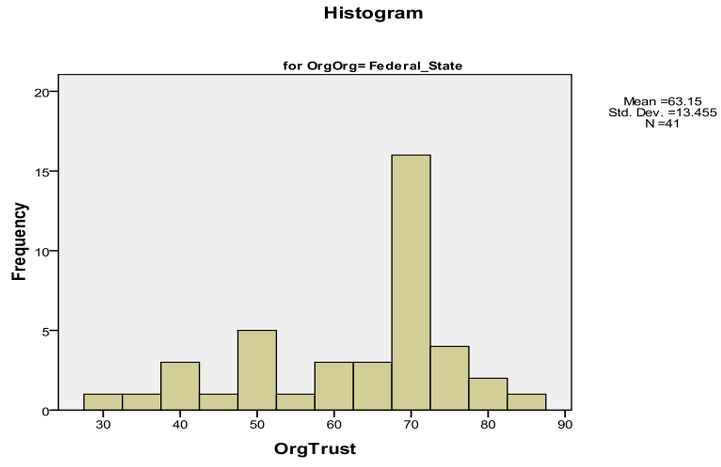


OrgTrust Stem-and-Leaf Plot for OrgOrg= **Federal_Federal**

Frequency	Stem &	Leaf
1.00	2 .	0
5.00	3 .	14558
4.00	4 .	3346
8.00	5 .	11333468
5.00	6 .	22599
18.00	7 .	111222222222226689
3.00	8 .	144

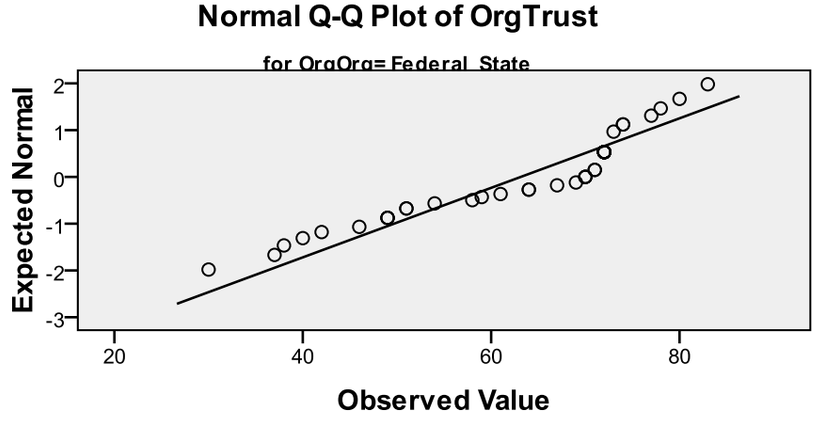


Federal-State Relationship



OrgTrust Stem-and-Leaf Plot for OrgOrg= **Federal_State**

Frequency	Stem &	Leaf
1.00	3 .	0
2.00	3 .	78
2.00	4 .	02
4.00	4 .	6999
3.00	5 .	114
2.00	5 .	89
3.00	6 .	144
2.00	6 .	79
18.00	7 .	000112222222222344
2.00	7 .	78
2.00	8 .	03



3. EVALUATING THE NORMAL DISTRIBUTION OF THE DATA FOR *Expert Trust by Org-Org Relationships*:

The Kolmogorov-Smirnov and Shapiro-Wilk test confirm the normality of the Federal_Federal and Federal_State organizational relationships. All other organizational relationships failed these tests.

Tests of Normality[b]

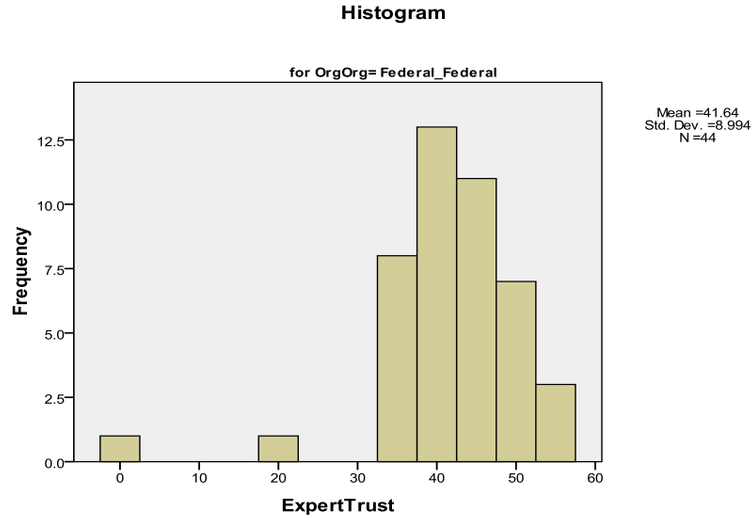
		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Org	Statistic	df	Sig.	Statistic	df	Sig.
ExpertTrust	Federal_Federal	.162	44	.005	.803	44	.000
	Federal_State	.139	41	.044	.935	41	.021
	Federal_Local	.183	12	.200*	.916	12	.257
	State_Federal	.281	5	.200*	.927	5	.579
	State_State	.305	4	.	.799	4	.100
	Local_Federal	.158	8	.200*	.960	8	.811
	Local_State	.438	7	.000	.623	7	.000
	Local_Local	.343	3	.	.842	3	.220

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

b. ExpertTrust is constant when Org = State_Local. It has been omitted.

Federal-Federal Relationship



ExpertTrust Stem-and-Leaf Plot for OrgOrg= **Federal_Federal**

```
Frequency    Stem &  Leaf

   2.00 Extremes    (=<22)
   1.00        3 .  4
  11.00        3 .  55667778889
  13.00        4 .  0000122223334
  12.00        4 .  555667788899
   4.00        5 .  1234
   1.00        5 .  5
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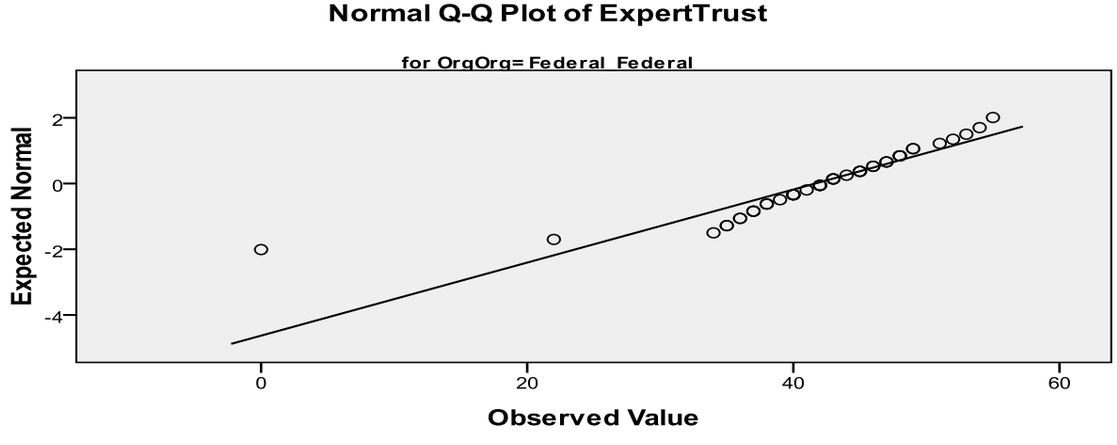
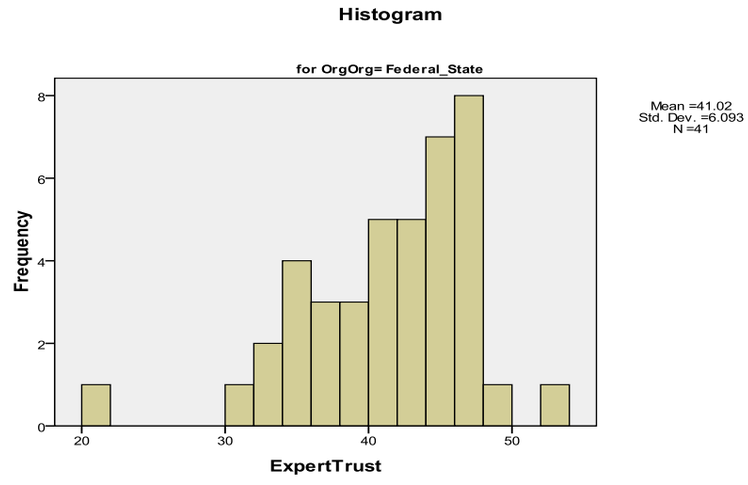


Federal-State Relationship



ExpertTrust Stem-and-Leaf Plot for OrgOrg= **Federal_State**

```
Frequency    Stem &  Leaf

      1.00 Extremes    (=<21)
      6.00        3 .  023444
      7.00        3 .  5677889
     13.00        4 .  0111123333444
     13.00        4 .  5555666777778
      1.00        5 .  3
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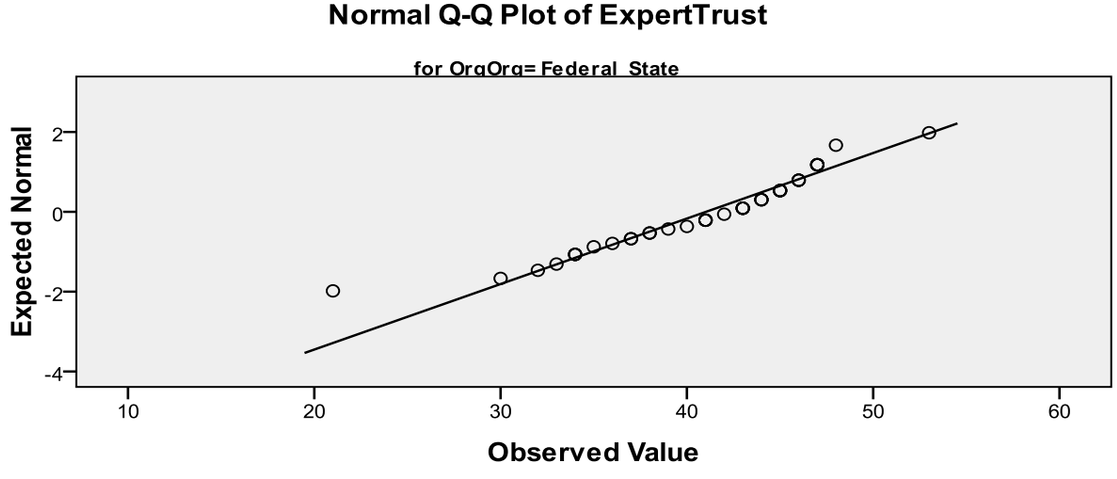


APPENDIX K

<u>Hypothesis 1</u>: In a temporary, inter-agency group, organizational affiliation moderates the trustor's perception of the group expert's trustworthiness.

Expert Trust (H1) was evaluated using a Levene's (ANOVA) parametric test for the Federal-Federal and the Federal-State relationships. The non-parametric Kruskal-Wallis and the Median tests tested the Federal-Federal, Federal-State, and Federal-Local relationships. The results of these parametric and non-parametric tests showed no significant difference in the levels of Expert Trust across the various organizational affiliations.

Parametric Test

Group Statistics

	Org	N	Mean	Std. Deviation	Std. Error Mean
ExpertTrust	Federal_Federal	44	41.64	8.994	1.356
	Federal_State	41	41.02	6.093	.952

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Expert Trust	Equal variances assumed	.790	.377	.365	83	.716	.612	1.679	-2.727	3.951
	Equal variances not assumed			.369	7.598	.713	.612	1.656	-2.687	3.911

Non-parametric test--Kruskal-Wallis Test

Ranks			
	Org	N	Mean Rank
Expert Trust	Federal_Federal	44	50.51
	Federal_State	41	46.05
	Federal_Local	12	53.54
	Total	97	

Test Statistics[a,b]	
	ExpertTrust
Chi-Square	.893
df	2
Asymp. Sig.	.640
a. Kruskal Wallis Test	
b. Grouping Variable: Org	

Non-parametric test--The Median Test

Frequencies				
		Org		
		Federal_Federal	Federal_State	Federal_Local
Expert Trust	> Median	21	21	6
	<= Median	23	20	6

Test Statistics[b]	
	ExpertTrust
N	97
Median	42.00
Chi-Square	.105[a]
df	2
Asymp. Sig.	.949
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.9.	
b. Grouping Variable: Org	

APPENDIX L

<u>Hypothesis 2</u>: In a temporary, inter-agency group, organizational affiliation moderates the perception of trustworthiness between group members.

Organizational Trust is evaluated using an Levene's (ANOVA) parametric test for the Federal-Federal and the Federal-State relationships; the non-parametric Kruskal-Wallis and the Median tests tested the Federal-Federal, Federal-State, and Federal-Local. The results of the parametric and non-parametric tests showed no significant difference in Organizational Trust-levels across the various organizational affiliations.

Group Statistics

	Org	N	Mean	Std. Deviation	Std. Error Mean
OrgTrust	Federal_Federal	44	61.09	16.085	2.425
	Federal_State	41	63.15	13.455	2.101

<u>Parametric Test</u>

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
OrgTrust	Equal variances assumed	2.006	.160	-.637	83	.526	-2.055	3.229	-8.478	4.367
	Equal variances not assumed			-.641	82.074	.524	-2.055	3.209	-8.438	4.328

Non-parametric Kruskal-Wallis Test

Ranks			
	Org	N	Mean Rank
OrgTrust	Federal_Federal	44	46.94
	Federal_State	41	49.12
	Federal_Local	12	56.13
	Total	97	

Test Statistics[a,b]	
	OrgTrust
Chi-Square	1.019
df	2
Asymp. Sig.	.601
a. Kruskal Wallis Test	
b. Grouping Variable: Org	

Non-Parametric Median Test

Frequencies				
		Org		
		Federal-Federal	Federal-State	Federal-Local
Org Trust	> Median	21	19	6
	<= Median	23	22	6

Test Statistics[b]	
	OrgTrust
N	97
Median	70.00
Chi-Square	.053[a]
df	2
Asymp. Sig.	.974
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.7.	
b. Grouping Variable: Org	

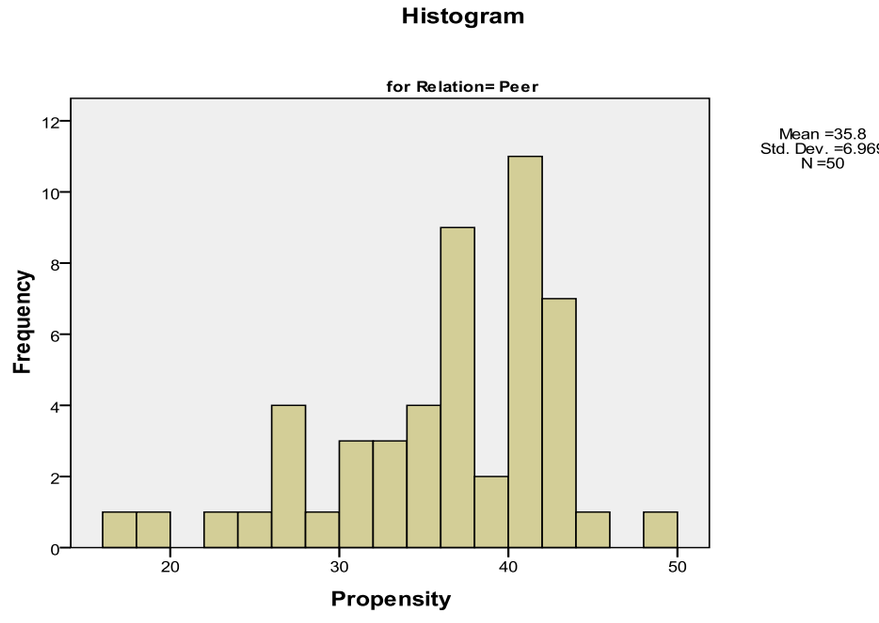
APPENDIX M

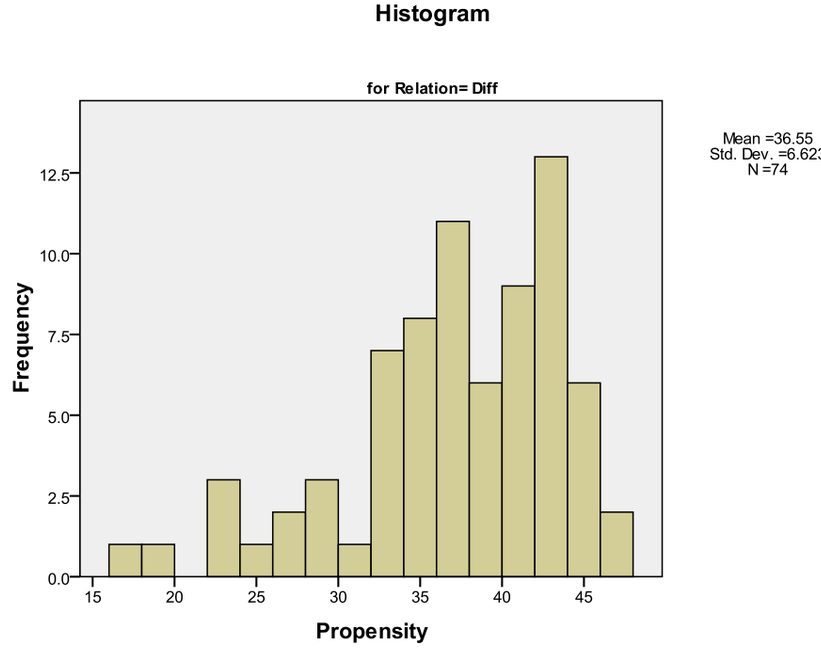
<u>Alternative H2</u>: Organizational trust is higher among group members of the same organizational-level (labeled 'Peer') than among group members from other differing organizational-level (labeled 'Diff').

Case Processing Summary

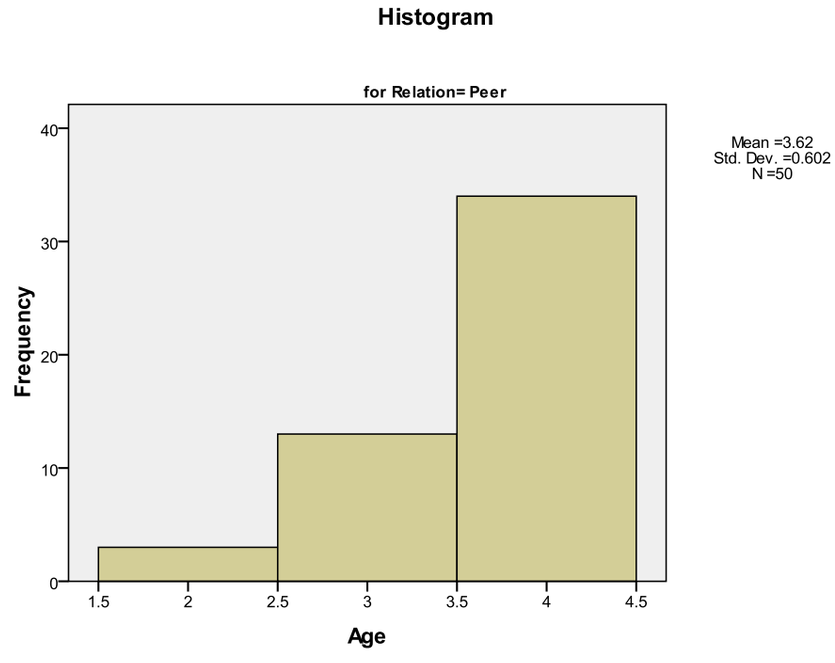
		Cases					
		Valid		Missing		Total	
	Distance	N	Percent	N	Percent	N	Percent
Propensity	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
Age	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
Gender	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
Experience	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
Duration	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
OrgTrust	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
AffectiveTrust	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
CognitiveTrust	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
ExpertTrust	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%
DeltaCogAffect	Peer	50	98.0%	1	2.0%	51	100.0%
	Diff	74	100.0%	0	.0%	74	100.0%

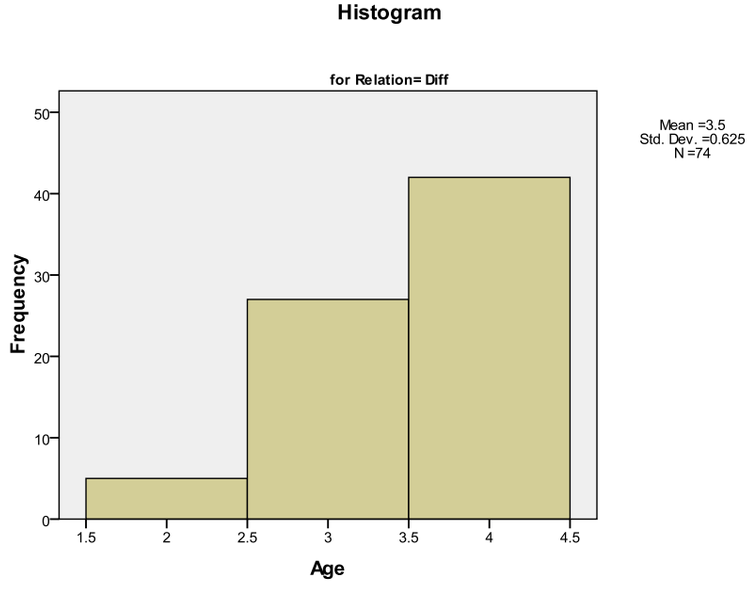
1. Propensity to Trust Demograpthic-- ‘Peer’ vs ‘Diff’:



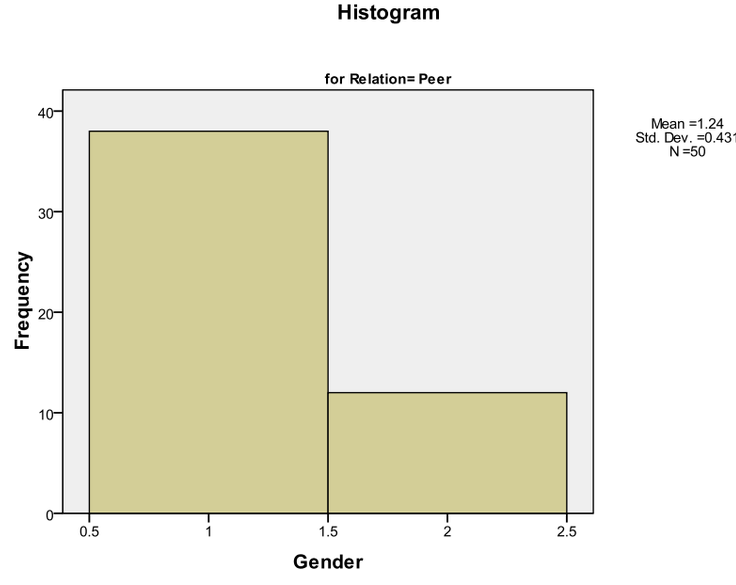


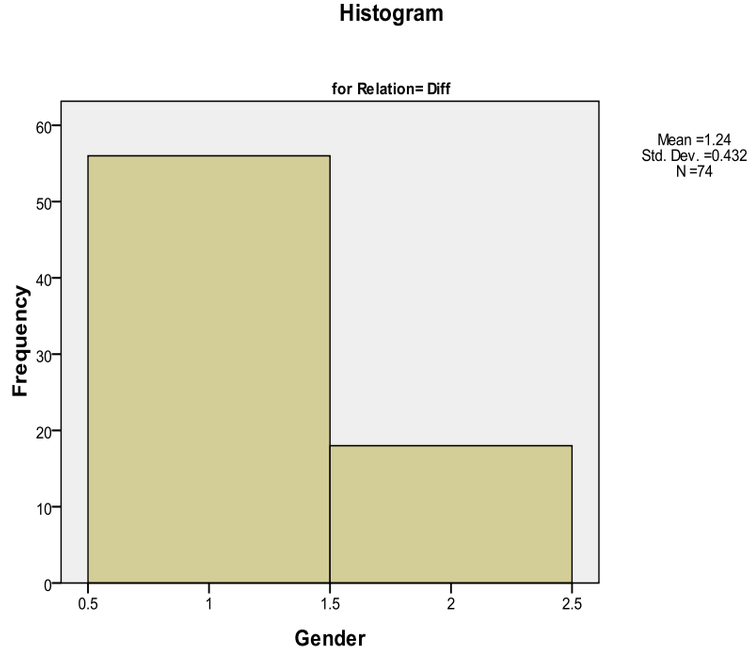
2. Age Demographic -- ‘Peer’ vs ‘Diff’:



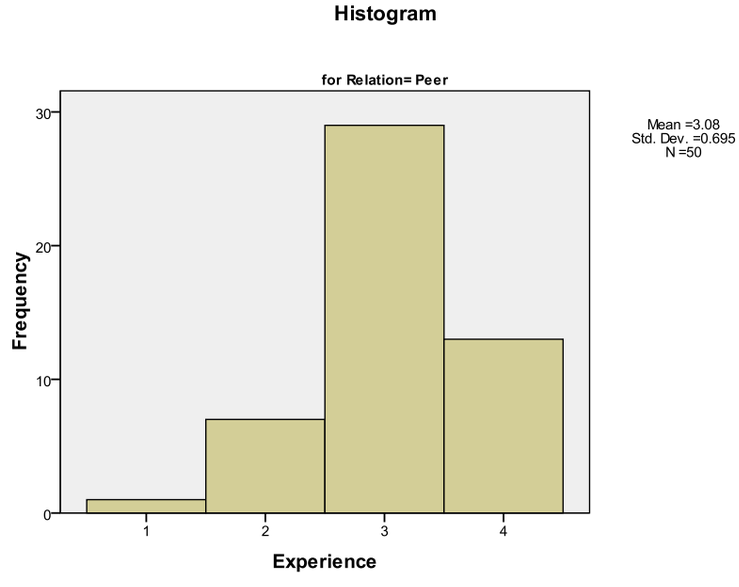


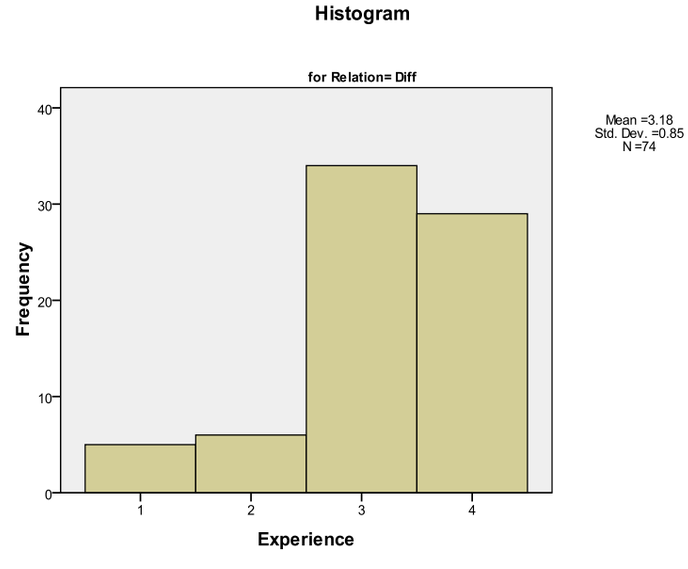
3. Gender Demographic-- ‘Peer’ vs ‘Diff’:



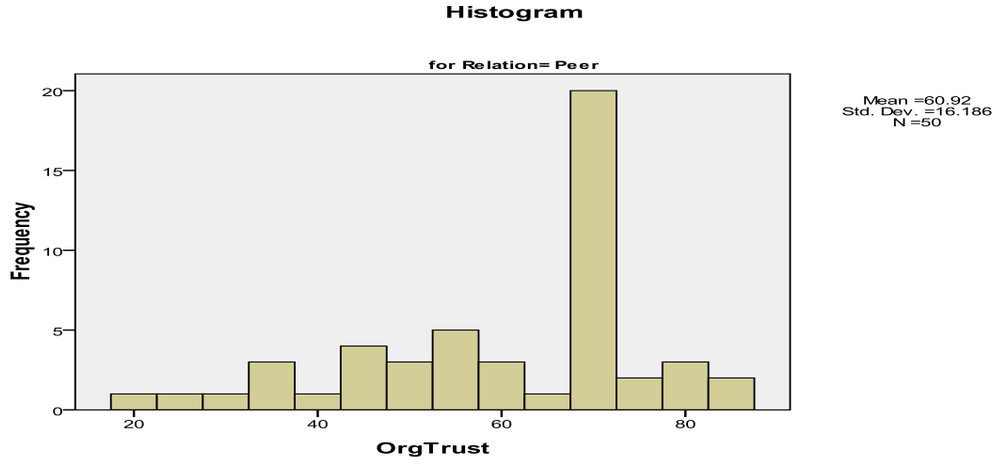


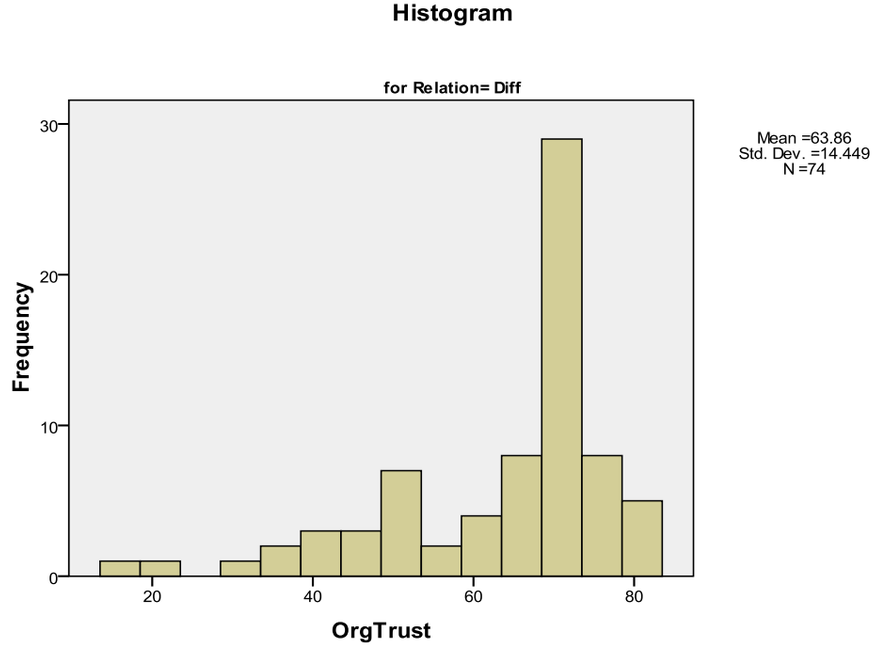
4. Experience Demographic -- ‘Peer’ vs ‘Diff’:



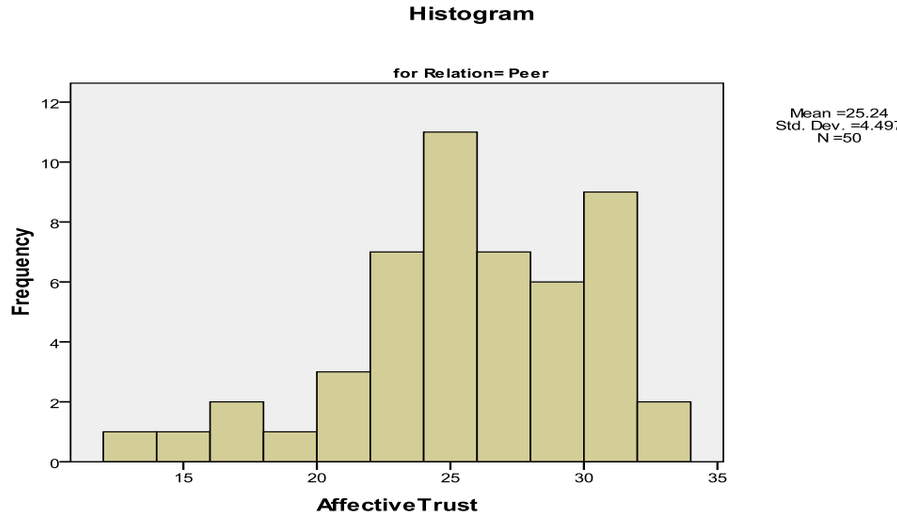


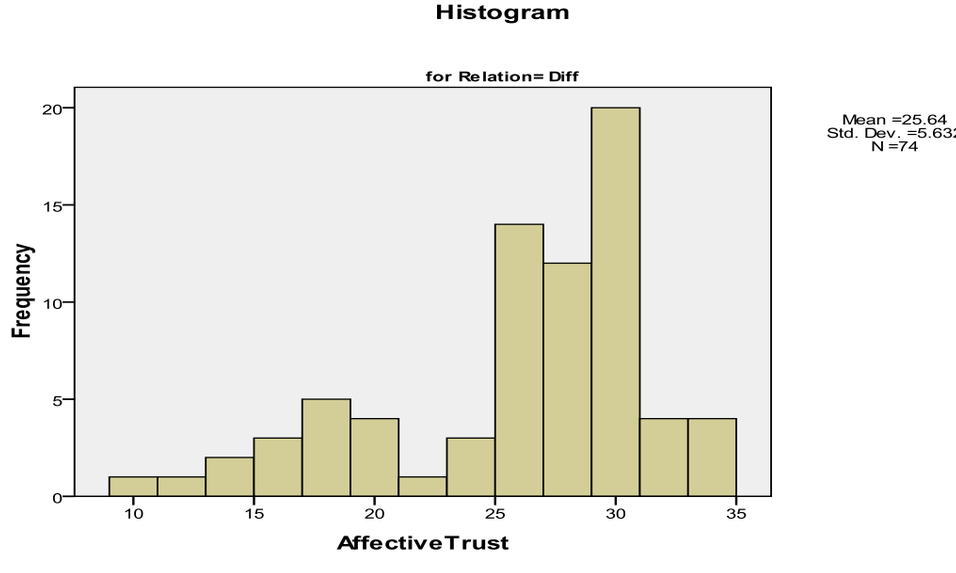
5. Organizational Trust Demographic -- ‘Peer’ vs ‘Diff’:



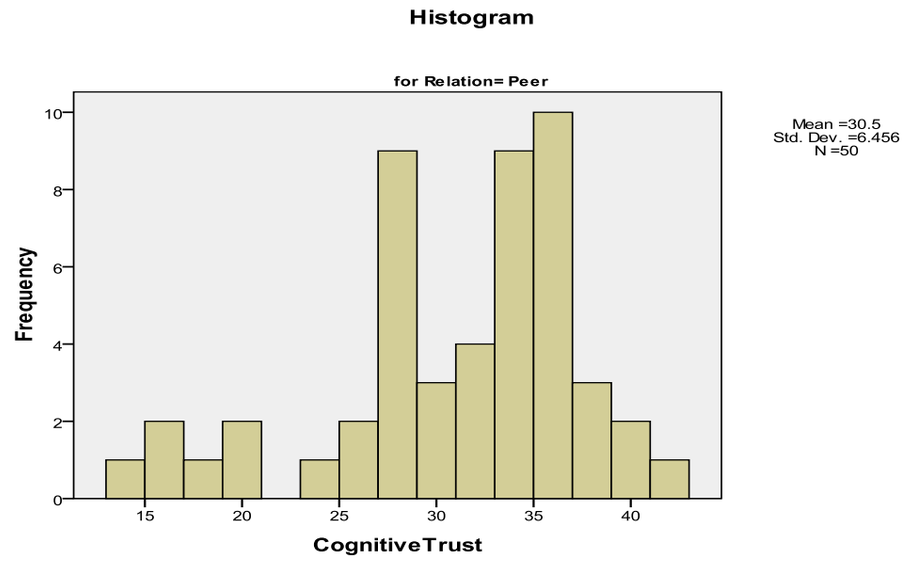


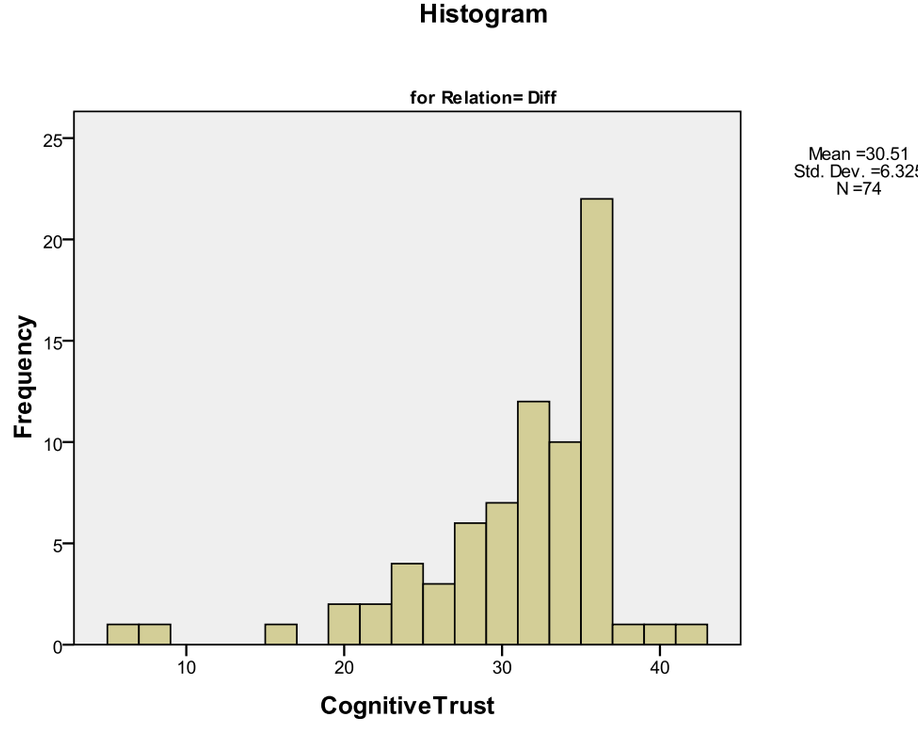
6. Affective Trust Demographic -- 'Peer' vs 'Diff':



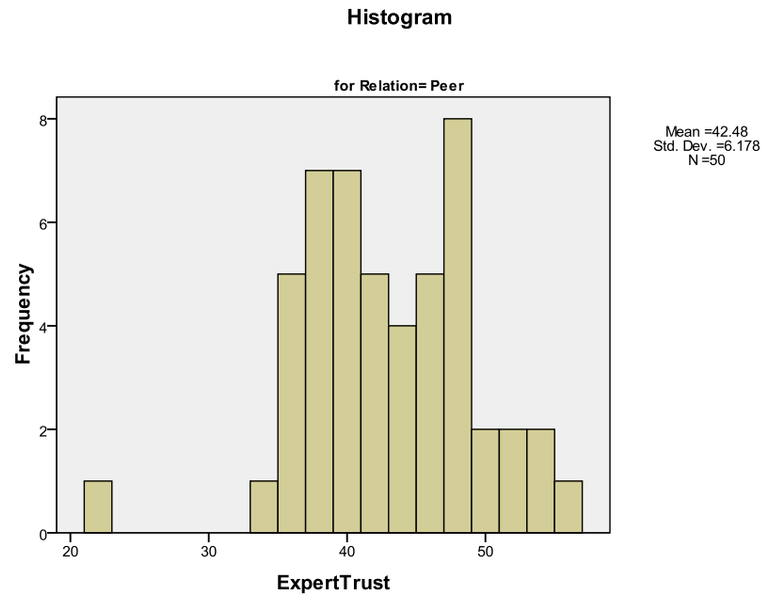


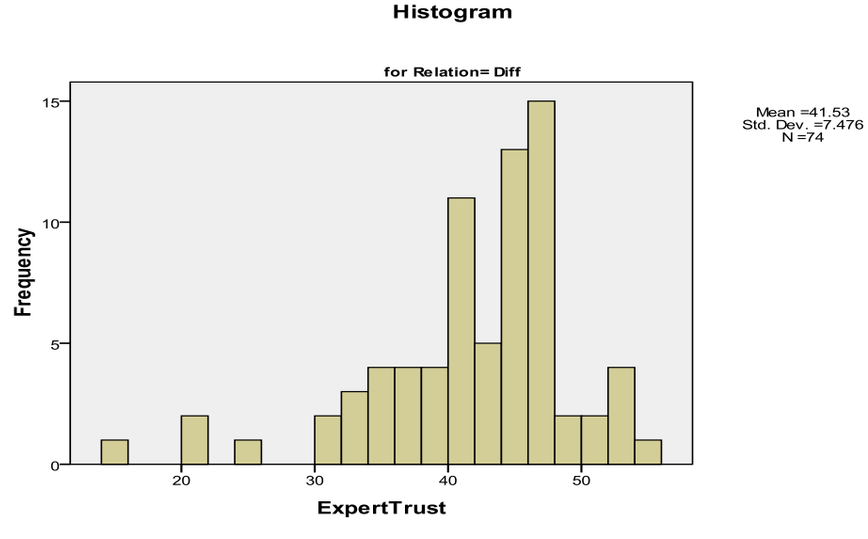
7. Cognitive Trust Demographic -- ‘Peer’ vs ‘Diff’:



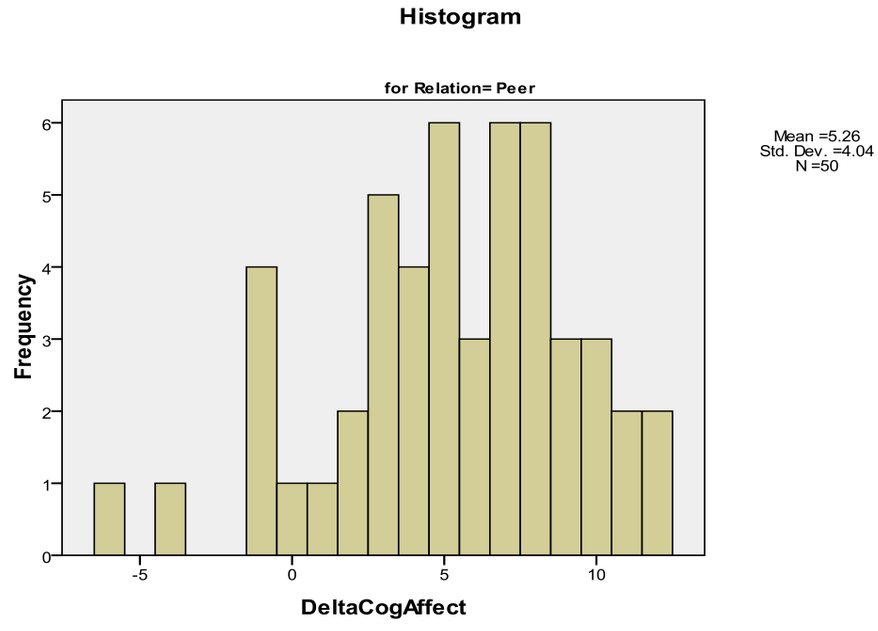


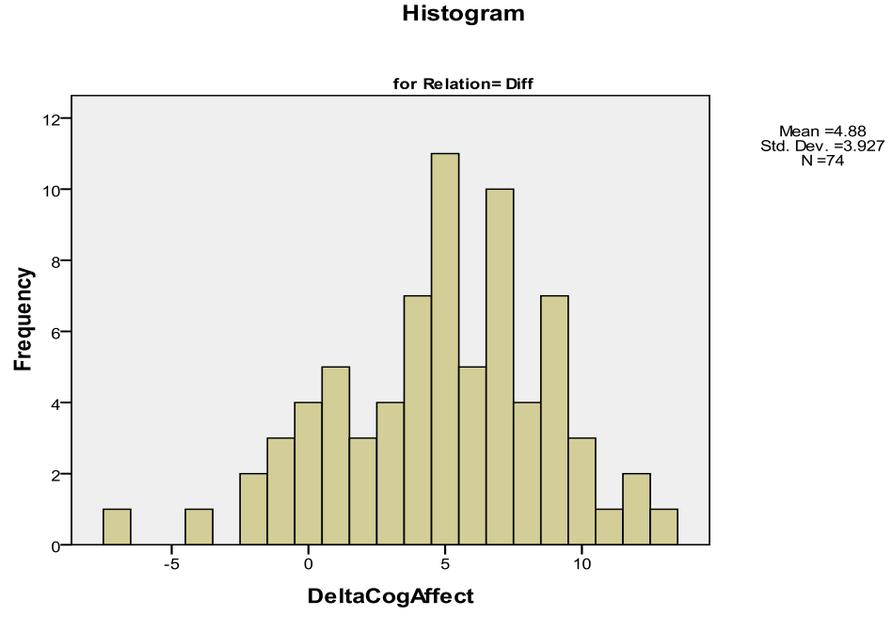
8. Expert Trust Demographic -- ‘Peer’ vs ‘Diff’:





9. DeltaCogAffect Demographic -- ‘Peer’ vs ‘Diff’:





10. Parametric Test of Propensity to Trust, Organizational Trust, Affective Trust, Cognitive Trust, Expert Trust, and Delta/CogAffecct Trust levels between 'Peer' and 'Diff':

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Propensity	Peer	50	35.80	6.969	.986	33.82	37.78	17	49
	Diff	74	36.55	6.623	.770	35.02	38.09	17	47
	Total	124	36.25	6.747	.606	35.05	37.45	17	49
OrgTrust	Peer	50	60.92	16.186	2.289	56.32	65.52	20	84
	Diff	74	63.86	14.449	1.680	60.52	67.21	16	83
	Total	124	62.68	15.178	1.363	59.98	65.38	16	84
AffectiveTrust	Peer	50	25.24	4.497	.636	23.96	26.52	13	33
	Diff	74	25.64	5.632	.655	24.33	26.94	10	34
	Total	124	25.48	5.188	.466	24.55	26.40	10	34
CognitiveTrust	Peer	50	30.50	6.456	.913	28.67	32.33	14	41
	Diff	74	30.51	6.325	.735	29.05	31.98	6	41
	Total	124	30.51	6.352	.570	29.38	31.64	6	41
ExpertTrust	Peer	50	42.48	6.178	.874	40.72	44.24	22	55
	Diff	74	41.53	7.476	.869	39.79	43.26	15	55
	Total	124	41.91	6.972	.626	40.67	43.15	15	55
DeltaCogAffect	Peer	50	5.26	4.040	.571	4.11	6.41	-6	12
	Diff	74	4.88	3.927	.457	3.97	5.79	-7	13
	Total	124	5.03	3.961	.356	4.33	5.74	-7	13

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Propensity	Between Groups	16.966	1	16.966	.371	.544
	Within Groups	5582.284	122	45.756		
	Total	5599.250	123			
OrgTrust	Between Groups	258.768	1	258.768	1.124	.291
	Within Groups	28078.329	122	230.150		
	Total	28337.097	123			
AffectiveTrust	Between Groups	4.659	1	4.659	.172	.679
	Within Groups	3306.269	122	27.101		
	Total	3310.927	123			
CognitiveTrust	Between Groups	.005	1	.005	.000	.991
	Within Groups	4962.986	122	40.680		
	Total	4962.992	123			
ExpertTrust	Between Groups	27.098	1	27.098	.556	.457
	Within Groups	5950.926	122	48.778		
	Total	5978.024	123			
DeltaCogAffect	Between Groups	4.346	1	4.346	.275	.601
	Within Groups	1925.525	122	15.783		
	Total	1929.871	123			

Summary: Between the ‘Peer’ and ‘Diff’ groups, the propensity to trust levels, organizational trust level, affective trust levels, cognitive trust levels, expert trust levels, and deltacogaffect trust levels were not significantly different.

11. Parametric Test of Propensity to Trust, Organizational Trust , Affective Trust, Cognitive Trust, Expert Trust, Delta/CogAffect Trust levels between 'Male' and 'Female':

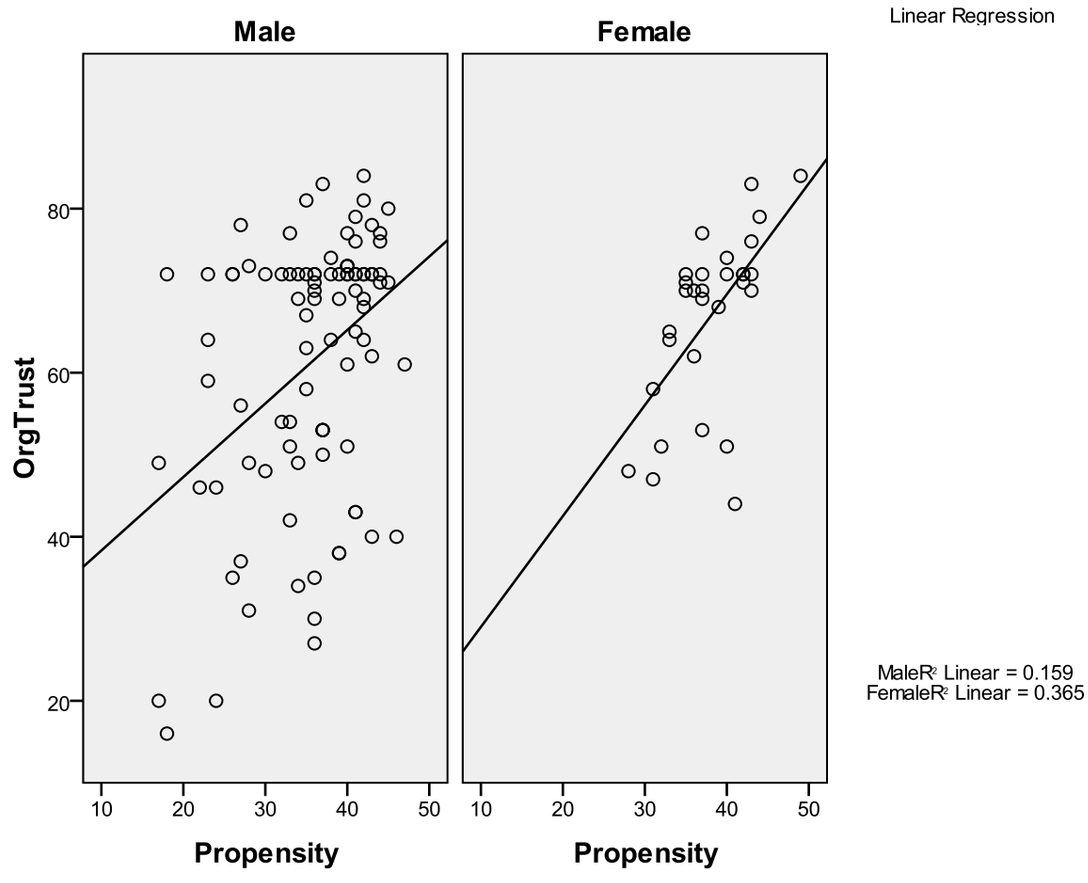
Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Propensity	Male	94	35.68	7.201	.743	34.21	37.16	17	47
	Female	30	38.03	4.738	.865	36.26	39.80	28	49
	Total	124	36.25	6.747	.606	35.05	37.45	17	49
OrgTrust	Male	94	61.33	16.189	1.670	58.01	64.65	16	84
	Female	30	66.90	10.600	1.935	62.94	70.86	44	84
	Total	124	62.68	15.178	1.363	59.98	65.38	16	84
Affective Trust	Male	94	25.05	5.349	.552	23.96	26.15	10	33
	Female	30	26.80	4.475	.817	25.13	28.47	14	34
	Total	124	25.48	5.188	.466	24.55	26.40	10	34
Cognitive Trust	Male	94	30.10	6.871	.709	28.69	31.50	6	41
	Female	30	31.80	4.180	.763	30.24	33.36	24	41
	Total	124	30.51	6.352	.570	29.38	31.64	6	41
Expert Trust	Male	94	41.80	7.040	.726	40.36	43.24	15	55
	Female	30	42.27	6.858	1.252	39.71	44.83	21	54
	Total	124	41.91	6.972	.626	40.67	43.15	15	55
DeltaCog Affect	Male	94	5.04	4.074	.420	4.21	5.88	-7	12
	Female	30	5.00	3.648	.666	3.64	6.36	-1	13
	Total	124	5.03	3.961	.356	4.33	5.74	-7	13

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Propensity	Between Groups	125.858	1	125.858	2.805	.097
	Within Groups	5473.392	122	44.864		
	Total	5599.250	123			
OrgTrust	Between Groups	705.620	1	705.620	3.115	.080
	Within Groups	27631.477	122	226.488		
	Total	28337.097	123			
AffectiveTrust	Between Groups	69.393	1	69.393	2.612	.109
	Within Groups	3241.534	122	26.570		
	Total	3310.927	123			
CognitiveTrust	Between Groups	66.054	1	66.054	1.646	.202
	Within Groups	4896.938	122	40.139		
	Total	4962.992	123			
ExpertTrust	Between Groups	4.998	1	4.998	.102	.750
	Within Groups	5973.026	122	48.959		
	Total	5978.024	123			
DeltaCogAffec	Between Groups	.041	1	.041	.003	.959
	Within Groups	1929.830	122	15.818		
	Total	1929.871	123			

Summary: Between the ‘Male’ and ‘Female’ groups, the propensity to trust levels, organizational trust level, affective trust levels, cognitive trust levels, expert trust levels, and deltacogaffect trust levels were not significantly different at the alpha equal .05 levels. However, between the ‘Male’ and ‘Female’ groups, the propensity to trust and organizational trust levels were significant at the alpha equal .10 levels.



Summary: A review of the following data shows that 'Peer' and 'Diff' organizations had quite similar values for all levels of trust (and other factors as well.)

APPENDIX N

1. <u>Hypothesis 2A (Cog Trust)</u>: In temporary, inter-agency groups, higher levels of cognitive trust exist for shorter duration groups than for those of a longer duration. (Note: restated)

<u>Oneway Parametric Test</u>:

Descriptives

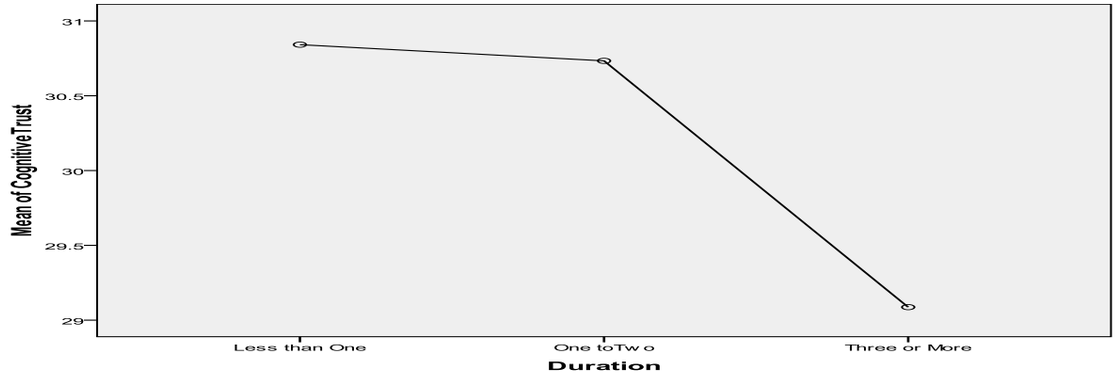
CognitiveTrust

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than One	82	30.84	6.267	.692	29.46	32.22	6	41
One toTwo	15	30.73	5.378	1.389	27.76	33.71	15	39
Three or More	23	29.09	7.692	1.604	25.76	32.41	7	39
Total	120	30.49	6.446	.588	29.33	31.66	6	41

ANOVA

CognitiveTrust

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	56.293	2	28.147	.674	.512
Within Groups	4887.698	117	41.775		
Total	4943.992	119			



Non Parametric Tests:

Kruskal-Wallis Test:

Ranks			
	Duration	N	Mean Rank
Cognitive Trust	Less than One	82	62.63
	One toTwo	15	56.60
	Three or More	23	55.46
	Total	120	

Test Statistics[a,b]	
	CognitiveTrust
Chi-Square	.989
df	2
Asymp. Sig.	.610
a. Kruskal Wallis Test	
b. Grouping Variable: Duration	

Median Test:

Frequencies				
		Duration		
		Less than One	One toTwo	Three or More
Cognitive Trust	> Median	41	8	9
	<= Median	41	7	14

Test Statistics[b]	
	CognitiveTrust
N	120
Median	32.00
Chi-Square	1.021[a]
df	2
Asymp. Sig.	.600
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 7.3.	
b. Grouping Variable: Duration	

2. **<u>Hypothesis 2B (Affective Trust)</u>: In temporary, inter-agency groups, lower levels of affective trust exist for shorter duration groups than for those of a longer duration. (Note: restated)**

<u>Oneway Parametric Test:</u>

Descriptives

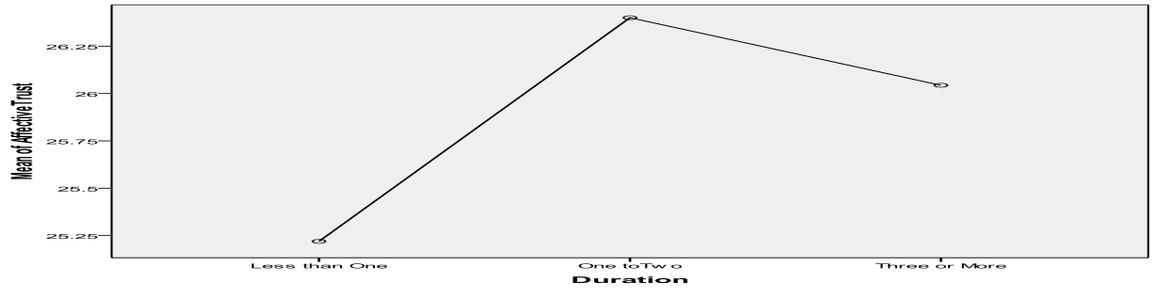
AffectiveTrust

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than One	82	25.22	5.249	.580	24.07	26.37	10	34
One toTwo	15	26.40	4.273	1.103	24.03	28.77	16	33
Three or More	23	26.04	5.572	1.162	23.63	28.45	11	33
Total	120	25.53	5.182	.473	24.59	26.46	10	34

ANOVA

AffectiveTrust

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.320	2	12.660	.467	.628
Within Groups	3170.605	117	27.099		
Total	3195.925	119			



Non-Parametric Tests (H2B)

Kruskal-Wallis Test:

Ranks			
	Duration	N	Mean Rank
Affective Trust	Less than One	82	57.93
	One toTwo	15	64.40
	Three or More	23	67.11
	Total	120	

Test Statistics[a,b]	
	AffectiveTrust
Chi-Square	1.478
df	2
Asymp. Sig.	.478
a. Kruskal Wallis Test	
b. Grouping Variable: Duration	

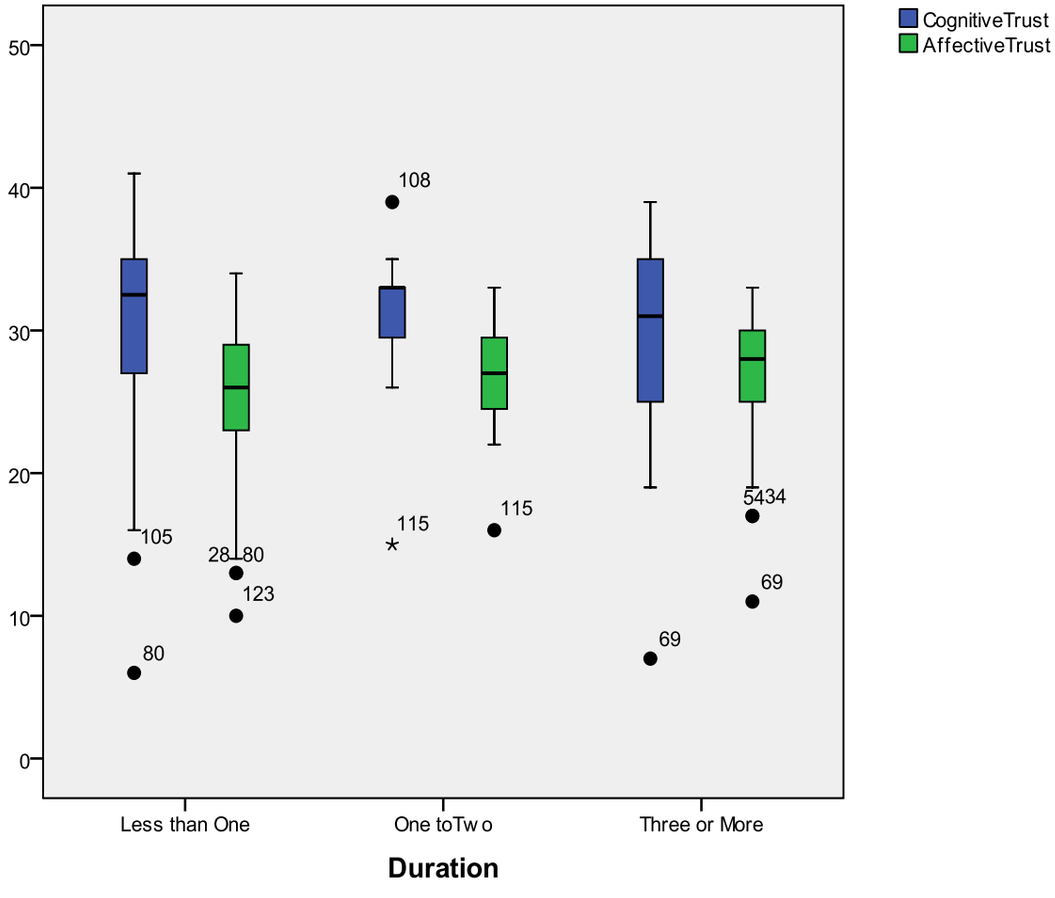
Median Test:

Frequencies				
		Duration		
		Less than One	One toTwo	Three or More
AffectiveTrust	> Median	37	8	15
	<= Median	45	7	8

Test Statistics[b]	
	Affective Trust
N	120
Median	26.50
Chi-Square	2.978[a]
df	2
Asymp. Sig.	.226
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 7.5.	
b. Grouping Variable: Duration	

3. **Alternative Analysis of Cognitive and Affective Trust (Hypotheses 2a and 2b)—Mixed Hypothesis:**

The graph below shows the boxplots for both Cognitive and Affective Trust. A visual observation of the above chart suggests that the 'gap' between cognitive and affective trust might be narrowing as the duration of a group's existence increases. It is based on that possibility, that a derived measure, calculated as the difference between cognitive trust and affective trust in any time period will be examined. The name given to this derivative data value is 'DeltaCogAffect' : the value of Cognitive Trust – Affective Trust.



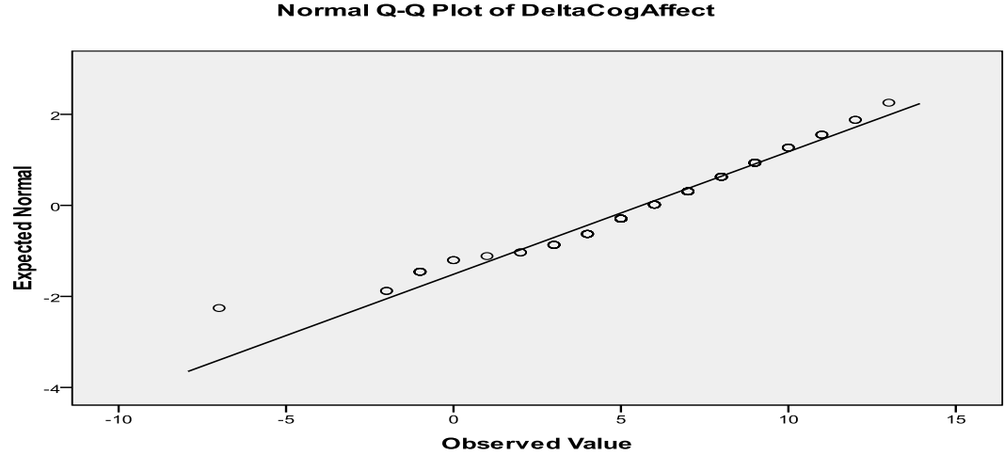
Case Processing Summary							
		Cases					
		Valid		Missing		Total	
	Duration	N	Percent	N	Percent	N	Percent
DeltaCog Affect	Less than One	82	100.0%	0	.0%	82	100.0%
	One toTwo	15	100.0%	0	.0%	15	100.0%
	Three or More	23	100.0%	0	.0%	23	100.0%

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Duration	Statistic	df	Sig.	Statistic	df	Sig.
DeltaCogAffect	Less than One	.129	82	.002	.959	82	.011
	One toTwo	.123	15	.200*	.958	15	.654
	Three or More	.105	23	.200*	.962	23	.514

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.



Descriptives

DeltaCogAffect

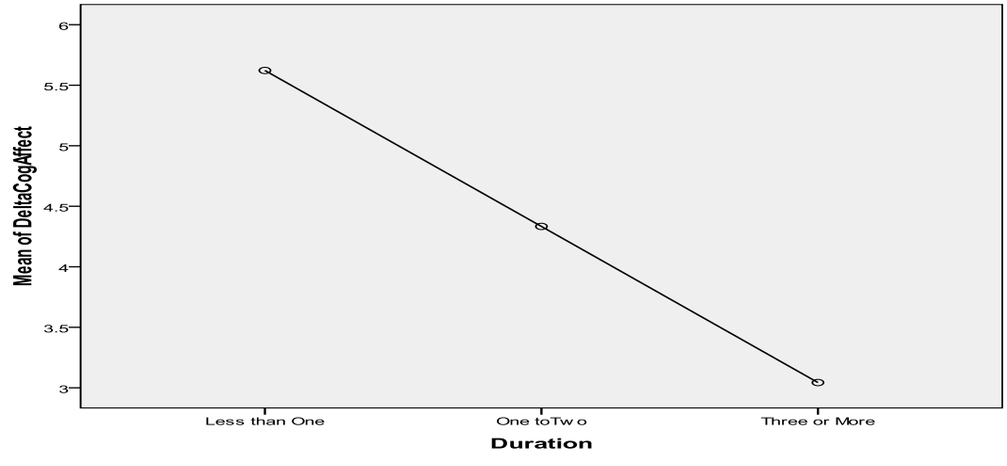
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Less than One	82	5.62	3.714	.410	4.81	6.44	-7	13
One toTwo	15	4.33	3.940	1.017	2.15	6.52	-1	12
Three or More	23	3.04	4.183	.872	1.23	4.85	-6	10
Total	120	4.97	3.938	.360	4.25	5.68	-7	13

Parametric Test:

ANOVA

DeltaCogAffect

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	126.296	2	63.148	4.297	.016
Within Groups	1719.570	117	14.697		
Total	1845.867	119			



Non-Parametric Test:

Kruskal-Wallis Test

Ranks			
	Duration	N	Mean Rank
DeltaCog Affect	Less than One	82	66.24
	One toTwo	15	53.30
	Three or More	23	44.72
	Total	120	

Test Statistics[a,b]

	DeltaCogAffect
Chi-Square	7.676
df	2
Asymp. Sig.	.022

a. Kruskal Wallis Test

b. Grouping Variable: Duration

Median Test:

Frequencies

		Duration		
		Less than One	One to Two	Three or More
DeltaCog Affect	> Median	44	6	6
	<= Median	38	9	17

Test Statistics[b]	
	DeltaCogAffect
N	120
Median	5.00
Chi-Square	5.792[a]
df	2
Asymp. Sig.	.055
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 7.0.	
b. Grouping Variable: Duration	

APPENDIX O

<u>Hypothesis 3:</u> A trustor's personal characteristics, that is, age, gender, years of experience, and propensity to trust moderate the attribution of organizational trust.

1. OrgTrust vs. Age: Degree of organizational trust is not significantly related to age.

Descriptives

OrgTrust

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
31-40	8	67.63	8.017	2.834	60.92	74.33	53	77
41-50	38	59.79	14.048	2.279	55.17	64.41	20	78
51++	74	63.41	16.433	1.910	59.60	67.21	16	84
Total	120	62.54	15.344	1.401	59.77	65.32	16	84

Test of Homogeneity of Variances

OrgTrust

Levene Statistic	df1	df2	Sig.
2.894	2	117	.059

ANOVA

OrgTrust

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	549.763	2	274.882	1.171	.314
Within Groups	27466.029	117	234.752		
Total	28015.792	119			

Robust Tests of Equality of Means

OrgTrust

	Statistic[a]	df1	df2	Sig.
Welch	2.282	2	25.337	.123
Brown-Forsythe	1.843	2	77.252	.165

2. **OrgTrust vs. Gender:** Degree of organizational trust is significantly related to gender.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
OrgTrust	Male	91	61.20	16.362	1.715
	Female	29	66.76	10.759	1.998

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Org Trust	Equal variances assumed	8.547	.004	-1.713	118	.089	-5.561	3.246	-11.988	.866
	Equal variances not assumed			-2.112	7.227	.038	-5.561	2.633	-10.810	-.312

3. OrgTrust vs. Experience: Degree of organizational trust is not significantly related to experience.

Descriptives

OrgTrust

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1-10	6	71.67	3.724	1.520	67.76	75.57	69	79
11-20	12	68.00	14.013	4.045	59.10	76.90	35	83
21-30	62	60.27	15.029	1.909	56.46	64.09	20	84
31++	40	63.05	16.658	2.634	57.72	68.38	16	84
Total	120	62.54	15.344	1.401	59.77	65.32	16	84

Test of Homogeneity of Variances

OrgTrust

Levene Statistic	df1	df2	Sig.
2.989	3	116	.034

ANOVA

OrgTrust

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1186.220	3	395.407	1.710	.169
Within Groups	26829.572	116	231.289		
Total	28015.792	119			

Robust Tests of Equality of Means

OrgTrust

	Statistic[a]	df1	df2	Sig.
Welch	7.680	3	31.129	.001
Brown-Forsythe	2.451	3	59.368	.072

4. OrgTrust vs. Propensity to Trust: Degree of organizational trust is related to propensity to trust.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
Propensity	120	36.15	6.802	17	49	33.00	37.00	41.00
OrgTrust	120	62.54	15.344	16	84	51.00	70.00	72.00

Pearson Correlations

		Propensity	OrgTrust
Propensity	Pearson Correlation	1	.435**
	Sig. (2-tailed)		.000
	N	120	120
OrgTrust	Pearson Correlation	.435**	1
	Sig. (2-tailed)	.000	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
OrgTrust - Propensity	Negative Ranks	9[a]	7.83	70.50
	Positive Ranks	110[b]	64.27	7069.50
	Ties	1[c]		
	Total	120		

Test Statistics[b]

	OrgTrust - Propensity
Z	-9.282[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

5. OrgTrust vs. Propensity to Trust, Age, Experience, and Gender:

Descriptive Statistics

	Mean	Std. Deviation	N
OrgTrust	62.75	15.140	125
Propensity	36.29	6.733	125
Age	3.55	.615	125
Gender	1.24	.429	125
Experience	3.14	.786	125
Duration	1.58	.900	125

Correlations

		Org Trust	Propensity	Age	Gender	Experience	Duration
Pearson Correlation	OrgTrust	1.000	.439	.015	.155	-.114	-.019
	Propensity	.439	1.000	-.050	.146	-.169	-.061
	Age	.015	-.050	1.000	-.201	.394	-.106
	Gender	.155	.146	-.201	1.000	-.289	.031
	Experience	-.114	-.169	.394	-.289	1.000	.035
	Duration	-.019	-.061	-.106	.031	.035	1.000
Sig. (1-tailed)	OrgTrust	.	.000	.435	.043	.103	.415
	Propensity	.000	.	.288	.052	.030	.249
	Age	.435	.288	.	.012	.000	.119
	Gender	.043	.052	.012	.	.001	.366
	Experience	.103	.030	.000	.001	.	.349
	Duration	.415	.249	.119	.366	.349	.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Propensity	See Below. .	Stepwise (Criteria: F-to-enter >= 3.840, F-to-remove <= 2.710).

- Dependent variable is Org Trust.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.439[a]	.192	.186	13.662	.192	29.281	1	123	.000	1.950

a. Predictors: (Constant), Propensity b. Dependent Variable: OrgTrust

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5465.326	1	5465.326	29.281	.000[a]
	Residual	22957.986	123	186.650		
	Total	28423.312	124			

a. Predictors: (Constant), Propensity b. Dependent Variable: Org Trust

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	26.972	6.724		4.011	.000	13.662	40.282		
	Propensity	.986	.182	.439	5.411	.000	.625	1.347	1.000	1.000

a. Predictors in the Model: (Constant), Propensity b. Dependent Variable: OrgTrust

Excluded Variables[b]

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
1 Age	.037[a]	.455	.650	.041	.997	1.003	.997
Gender	.092[a]	1.130	.261	.102	.979	1.022	.979
Experience	-.041[a]	-.494	.622	-.045	.971	1.029	.971
Duration	.007[a]	.091	.928	.008	.996	1.004	.996

a. Predictors in the Model: (Constant), Propensity b. Dependent Variable: OrgTrust

SUMMARY: Levels of OrgTrust are strongly affected by Propensity to Trust. The inclusion of additional independent variables (Age, Gender, Experience, and Duration) don't increase the explanatory power of the above single factor model.

APPENDIX P

List of Subjects Interviewed and Summary of their Comments

Subject's #	Summary of Comments
3	An Agency's reputation may bias perspective, i.e., it may shape the first interaction, but trust can be rebuilt and shaped with continued communication. The trust for the agency (collective-level) becomes less important over time because then build individual-level trust. In an Incident Management Team (IMT), the certification process provides a foundation for trust.
7	In an IMT, members know each other even though they may be from different agency; because they know each other, it is easy to trust each other. IMT member have common intention, goals, and purpose, this enables trust. When participants are new to an IMT, their initial communication will help determine their trustworthiness; communication helps build trust.
17	When part of an IMT, the presumption is team is trained, so the teammates are trustworthy. Trust the process that creates type 1 and type 2 IMTs. Since the process is trustworthy, then the certified teammates (the collective) are trustworthy. Communication facilitates the attribution of trust. Importantly, talking about the little things (weak signals) is critical.
23	In an IMT, everyone should know their roles and responsibilities, and are qualified in their roles. The Incident Command System (ICS) dictates roles and certifications; therefore, team members have to have certain skills in order to be part of an IMT. ICS, a role based process, brings order to chaos. Certifications reflect levels of experience and require continuous education. Also, a common background facilitates trust development.

32	**ICS teaches one to trust the process (rules) and those associated with the process. You learn how to quickly evaluate the situations and the team. ICS has a training system that creates competent firefighters, therefore, trustworthy team-members.** **Learn to look for trustworthy/untrustworthy behaviors. Communication tells a lot about trustworthiness—are they asking the right questions?** **IMT share values. When share values, trustworthiness is perceived. A common value among wildland firefighters is being service oriented.**
34	**Overtime, learned that team-members are competent and trustworthy.** **Skills are built from experience and formal training. In an IMT, each team-member had to go through the same type of training. There is a defined class regiment in ICS, which ensures that team-members know that they are doing. Team-members must have qualification 'cards' to participate in IMT.**
37	**Trust is built on process management (ICS). Trust is built on the fact that the same things are done 'on the ground' among the different wildland firefighting agencies. Trust, based on common process, is built pretty fast.** **Different Agency cultures can be a stumbling block to building trust; but, the ICS requires the same processes, so trust is enabled by ICS. Trust overrides differing agency 'cultures'; policy alignment helps build trust.**
40	**Overtime have learned to trust, but verify. Diversity in experiences helps build trust, because has learned that all organizations have good and bad.** **Trust is built on open communication, eye contact, and mannerisms. Keep an open mind that other Agencies have skills, therefore, are trustworthy.**
48	**Trust is based on the fact that all team-members have qualifications to be on the IMT. The trust is established based on qualifications. Trust in ICS (the system of processes) creates professionalism. ICS helps people make the right decision. ICS is trusted worldwide.**

59	**In wildland firefighting a lot of reputations are widely known. There are not a lot of surprises when IMTs form, generally, everyone knows the processes.** **Time helps you mellow out become for trustworthy. Now there is a lot more Agency standardization, i.e., standard procedures and training; you can quickly see the differences. Today, a lot more professionalism on an IMT, which goes back to standard processes and training. If do not have organizational trust, it is a mission deterrent.**
68	**National IMTs are easy to work with. Ad hoc teams are harder to work with—much more stressful. When on IMT, know what to expect, and what to pack. When on a roster of an IMT, know the team-members, so attribute trust more readily.** **Knowledge of the ICS, i.e., knowledge of roles, is a huge benefit in getting to the work (and being trustworthy). It does not matter where team-member came from, competence is what matters. Swift trust is built on the perception of competence; which is facilitated because all have gone to the same training.**
74	**If know organization, have more experience with the organization, will have more trust toward the organization. Definitely, the level of trust will help the team perform better.** **Time will help develop trust. Trust is also built on a similar value system. Member with titles, e.g., Incident Commander, or, ICS qualified, are trusted because of the perception of expertise and common experience.**
91	**Have a mutual respect for IMT members because each team member has a skill or knowledge important to the team; if did not, would not be on the team. Go into IMT with an open mind regarding competence.** **Trust the process (ICS) that trains wildland firefighters. IMT is an inter-agency concept, thus, facilitates interagency teams work, thus, trust. Although members come from different Agencies, they have the same goals of putting fire out; common goals, helps build trust.**

111	**In the old days, there was less trust among Agencies. Cultural differences between organizations impede trust. Over time, as Agencies work and train together, inter-agency trust has improved. Trust helps overcome perceptions of differences.** **In wildland firefighting, a couple of minutes means saving lives; if trust, then actions occur without discussion and act quicker. But if don't trust each other, need to work on differences, which takes valuable time, which can cost lives.**
113	**Some Agencies are more are aware of standardization than others, thus, some agencies are further along than others in competency. However, go to IMT with the perception that team-members are trustworthy. IMT model facilitates trust.** **Development of trust is important to performance. Team-members are much more willing to give best, if best is appreciated. The HRO model requires trust, because HRO requires the discussion of mistakes and close calls. Trust helps team-members to discuss close calls.** **Deference to expertise is facilitated by trust. Without trust, none of the pillars of the HRO model will stand up.**
120	**Open communication is very important. You go into team open minded; team-members are trustworthy, until they show otherwise.** **Inconsistent processes, "each day is a different sheet of music", impedes the development of trust. The more consistent the processes, the easier to attribute trust.**
134	**Trust transcends Agency boundaries. Go into an IMT trusting, until shown otherwise. Train and practice together, because must perform together. Trust is built on the perceptions of successful performance.** **In wildland firefighting, you need each other and have the same goals, so building a trusting relationship is an imperative. Wildland firefighting is a family like structure. I have learned to trust; at start of career, not as trusting. Now believe, that organizational trust, trust toward team-members, is a foundation to doing the job.**

136	**Have a standard qualification systems, have trust in the system, so have trust in those qualified by the system.** **Trust other Agencies, because wildland firefighting Agencies are very much the same. There is a common training system that binds wildland firefighters. What would deteriorate team trust is low integrity at the individual level.**
137	**Previous associates with an organization will enable organizational trust. Prior experience with an organization will flavor how you perceive/trust that organization's members. If an organization is perceived as inflexible, then that organization's member will be initially perceived as inflexible.** **Joint training helps build organizational trust. In an IMT, individual shed they organizational identity and take on the identity of the IMT. Trust the IMT's common processes. The IMT invests in the common mission, thus, the team-members can extend trust relatively easily.**
141	**ICS and IMTs has standard certifications and processes, therefore, if there is someone assigned (and certified to perform) to an IMT, then they must know what they are doing "regardless of the Agency" they belong to. In an IMT, everyone speaks the same language/jargon.** **Federal and State agencies have the same levels of experience and processes, however, city fire departments are less experienced at wildland firefighting, so must be watched more closely.** **Trust team-member with whom have worked with before more. IMT keep stability in team membership, so it facilitates the attribution of trust.**