Measuring Effectiveness in the Domestic Intelligence Community:
Taking a Configurational Approach to Explain Organizational Outcomes in the National Network of Fusion Centers

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ABSTRACT

This dissertation examines organizational level outcomes within a whole network—the national network of fusion centers. Fusion centers are state and local organizations that fuse threat-related intelligence and information by working with federal, state, and local law enforcement as well as other security partners in the public and private sectors. This research will ask why outcomes at the fusion center level vary within the network by exploring unique configurations of conditions at multiple levels of analysis. The results of the research will present evidence that suggests whole network effectiveness cannot be fully comprehended without first examining sub-network level impacts, such as the training or experience of analysts, organizational capacities, and the roles of relationships between network actors. This line of inquiry has ramifications for inter-organizational network theory building because it will demonstrate the individual importance of these factors, and how they interact with other factors at multiple levels within a network to influence outcomes. For practitioners in the domestic intelligence community this research will provide important insights and present paths taken by organizations in a national network to achieve a desired or undesired outcome.
ACKNOWLEDGEMENTS

This dissertation would not have been realized without the tireless support of my committee. Co-chairs Dr. Patrick Roberts and Dr. Robin Lemaire have dedicated many hours to office visits and chapter reviews since I first presented my idea to them in 2013. I owe them both a great debt of gratitude. Dr. Brian Cook and Dr. Karen Hult have been a constant presence throughout my graduate experience at CPAP, and I consider it no small honor that they agreed participate in this chapter of my life.

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The National Fusion Center Association and its staff have played a significant role in facilitating this research from early design through data collection and reviewing the findings. I would also like to thank the subject matter experts and professionals working in Congress, federal agencies, policy think tanks, research institutes, member associations, and academia who were kind enough to listen, share, and offer counsel.

Some of the finest public servants I have had the privilege of meeting work in fusion centers all across the United States. Although they cannot be named individually, they exhibited great character and a ready willingness to speak openly about themselves and their organizations in the interest of advancing my research. It is my firm belief that these individuals play an increasingly critical role in protecting the United States from harm. To the fusion center directors, supervisors, analysts, and liaisons who participated in this research I extend a heartfelt thank you.

Finally, I would like to thank my family. Over nearly six years they have made many personal sacrifices so that I could follow this path. My parents raised me to believe I could achieve great things, and instilled a work ethic that served me well in the many weeks, months, and years of this research. My grandparents have lived a life of service to others, and were a source of constant support and encouragement. Most of all, I want to thank my wife Rebekah. This accomplishment is just as much hers as it is mine.
DEDICATION

This dissertation is dedicated to my dear friend and grandmother,

Marvareen Fulcher.
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<tr>
<td>AOR</td>
<td>Area of Responsibility</td>
</tr>
<tr>
<td>BRIC</td>
<td>Boston Regional Intelligence Center</td>
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<tr>
<td>csQCA</td>
<td>Crisp-Set Qualitative Comparative Analysis</td>
</tr>
<tr>
<td>DEA</td>
<td>Drug Enforcement Agency</td>
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<tr>
<td>DHS</td>
<td>Department of Homeland Security</td>
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<tr>
<td>DOJ</td>
<td>Department of Justice</td>
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<tr>
<td>FBI</td>
<td>Federal Bureau of Investigation</td>
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<tr>
<td>FIG</td>
<td>Field Intelligence Group</td>
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<tr>
<td>fsQCA</td>
<td>Fuzzy-Set Qualitative Comparative Analysis</td>
</tr>
<tr>
<td>HIDTA</td>
<td>High Intensity Drug Trafficking Area</td>
</tr>
<tr>
<td>HSDN</td>
<td>Homeland Secure Data Network</td>
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<tr>
<td>HSIN</td>
<td>Homeland Security Information Network</td>
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<tr>
<td>JTTF</td>
<td>Joint Terrorism Task Force</td>
</tr>
<tr>
<td>NCRIC</td>
<td>Northern California Regional Intelligence Center</td>
</tr>
<tr>
<td>QCA</td>
<td>Qualitative Comparative Analysis</td>
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<tr>
<td>RFI</td>
<td>Request for Information</td>
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<tr>
<td>TLO</td>
<td>Terrorism Liaison Officers</td>
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<td>WRTAC</td>
<td>Washington Regional Threat Analysis Center</td>
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CHAPTER 1: INTRODUCTION

1.1 Introduction to the Research

As runners crossed the finish line of the 2013 Boston Marathon two pressure cooker bombs exploded within seconds of each other, spewing nails and other shrapnel into a throng of athletes and onlookers. The blasts killed three people and injured 264 others.

In the weeks and months following the attack, Congress and the media asked why the intelligence and law enforcement communities had failed to stop the two bombers, the Tsarnaev brothers, who were known to the Federal Bureau of Investigation (FBI) prior to the attacks. It appeared to be yet another instance of intelligence agencies failing to share sensitive information with partners. Some of this attention centered on the Boston Regional Intelligence Center (BRIC), the city’s fusion center.

In the aftermath of the 9/11 terrorist attacks, policy makers and intelligence officials recognized the need for new intelligence and information sharing mechanisms that could penetrate silos in the intelligence community (IC) (Roberts 2009). To address this need the Department of Justice (DOJ), the then newly formed Department of Homeland Security (DHS), and prominent members of the law enforcement community began to promote the fusion center concept as a way to align the intelligence gathering activities of state and local entities with federal intelligence agencies, and to streamline information sharing across all levels of government (Carter and Carter 2009).

Early designers believed that these fusion centers could potentially circumvent common roadblocks like hierarchy, inter-agency turf-wars, and a general lack of trust in the intelligence community (Walsh 2011). The model that was eventually adopted follows from intelligence led policing concepts developed in the United Kingdom, and has similarities to other models found
at the federal level in the United States and abroad (Guidetti 2010). Today 78 federally recognized fusion centers are in operation around the country, including the BRIC. These organizations form what has become the national network of fusion centers.

After the Boston explosions media outlets hastily assigned some of the blame to the BRIC. In general this coverage was fraught with common misconceptions, including that fusion centers are owned and operated by DHS. Some news stories focused on past accusations by the American Civil Liberties Union (ACLU) that the BRIC had monitored peaceful antiwar events and had tried to suppress free speech, noting that the organization was focused on these events and not the Tsarnaev brothers (Newcombe 2013). Even local Boston news outlets pointed to the $1.4 billion investment DHS had made in fusion centers across the country, directly questioning the return on investment in Boston and elsewhere (Curran 2013). One report went so far as to label fusion centers a “flop” (Ward 2013).

Within the domestic intelligence community, however, the reaction was far different. Experts were quick to point out that fusion centers are not designed or equipped to serve the same purposes or perform the same functions as national security intelligence agencies—a point that practitioners have tried to communicate to members of Congress and the public for the better part of a decade. Others noted the role of the fusion center in supporting investigations after the attacks, which quickly led law enforcement to the bombers (Sena 2013a).

Furthermore, congressional hearings revealed that the BRIC had not received vital information from the FBI’s Joint Terrorism Task Force (JTTF) in the Boston area, which had knowledge of the Tsarnaevs and some of their activities prior to the attacks (Bender, Schworm, Kranish, and Viser 2013). In fact, it later became known the BRIC had co-written a threat

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1 For a more detailed explanation of what fusion centers are, and what they do, see page 16 of this chapter as well as the more in-depth discussion in Chapter 3.
assessment labeling the Marathon finish line a vulnerable area and had shared this information with law enforcement five days before the attack (Bennett and Serrano 2013). Although threat assessments are standard operating procedure and are not always informed by actual intelligence, the fact remains that while federal agencies were withholding information on possible suspects, the BRIC was doing its job.

Yet the Boston Marathon bombings highlighted important questions that remain unanswered. Are fusion centers effective? Why do some fusion centers seem to perform better than others, despite efforts by federal agencies to standardize capabilities and processes? And perhaps the most critical question for practitioners and policymakers alike: how should the value-added by fusion centers be measured?

Across the national network there is increasing evidence to suggest that fusion centers are adding value within their jurisdictions. For example, a recent report found that states are spending a higher proportion of their own money to maintain fusion centers as federal grant funding becomes increasingly scarce, indicating these organizations are a priority for state and local officials (Heaton 2014). Plenty of anecdotal evidence is also available, along with annual assessments by the DHS Fusion Center Performance Program that point to yearly capability gains. But anecdotal evidence and output based metrics alone don’t tell the whole story, and they leave the network open to criticism. For example, there is at least some competing evidence to suggest that while certain fusion centers are thriving and enjoy favorable reputations, others are struggling to serve their jurisdictions or to produce quality intelligence products (Isikoff 2012; O’Harrow 2012).

The complexities of intelligence and information sharing in the United States make even the most basic measurement of a value-based outcome like effectiveness a difficult task, but not
an impossible one. By carefully examining the network it may be possible to learn a great deal more about how and why some fusion centers are more effective than others. The resulting findings may also shed light on ways to evaluate effectiveness and other important outcomes.

1.2 Inter-organizational Networks and Effectiveness

For nearly two decades scholars have heeded O’Toole’s admonition to take networks seriously (O’Toole 1997). The growing literature on public sector inter-organizational networks spans several disciplines and has made progress in understanding complex network outcomes (Provan and Milward 2001). Although the scholarship has yielded theories related to network structure, management, and behavior in network settings (Borgatti and Halgin 2011), there remain several important gaps in the collective understanding of network outcomes like effectiveness (Raab and Kenis 2009).

In particular, the emerging literature on whole networks has been attentive to the challenges of measuring effectiveness (Provan and Milward 2001; Raab, Lemaire, and Provan 2013a). Whole networks are made up of three or more organizations seeking a common goal, and are typically created to solve wicked problems, like the threat of terrorism, or a major natural disaster (Provan, Fish, and Sydow 2007; see also Rittel and Webber 1973). The national network of fusion centers is a quintessential whole network.

The scholarship on whole networks has tended to focus on bilateral dyadic ties and multilateral relations that define networks and that are essential for achieving a collective outcome (Provan and Lemaire 2012). However, this work has been attentive to entire networks and has not yet fully unpacked the factors, or the ways in which these factors combine to impact
organizational outcomes in whole network settings (Kilduff and Brass 2010). In this dissertation I will try to address this gap in two ways.

First, I will explore the ways that sub-network features influence organizational outcomes within a single whole network: the national network of fusion centers. Sub-network features include the attributes of individual actors, organizational features, and dyadic or triadic relationships (Knoke and Yang 2008). These variables are generally classified in the network analysis literature as either structural (ties) or compositional (actor characteristics) (Knoke and Yang 2008). Although it is generally agreed that structural and compositional variables matter, there is much still to be learned about how these variables interact with each other and across the multiple levels of analysis within a network to influence or determine outcomes at the organizational level.

Second, I will apply the configurational approach to identify the configurations of conditions that contribute to observed organizational outcomes (Fiss, Marx, and Cambré 2013; Raab, Mannak, and Cambré 2013b), and ask why some configurations may lead to specific outcomes—such as effectiveness—while others do not. This will be accomplished using qualitative comparative analysis (QCA) to analyze the dataset. The configurational approach and QCA have garnered attention in the inter-organizational network literature, and been applied by network scholars to unpack the complexities of networks and outcomes (Raab et al. 2013a; Gulati, Lavie, and Madhavan 2011; Fischer 2011).

This research will contribute to the scholarly literature by providing insights into the ways sub-network level features interact with each other to influence organizational level outcomes in a whole network. Exploration of the combinations of conditions that lead to desirable or undesirable outcomes at the organizational level will hopefully yield valuable
insights that pertain to broader theoretical questions about the overall effectiveness outcomes of inter-organizational networks.

1.3 The National Network of Fusion Centers

Fusion centers are physical locations maintained by states and major urban areas that typically consist of one or more participating organizations. Federal, state, and local personnel often work together at these locations to fuse information related to terrorism, other criminal activity, and natural hazards. As of this writing, the national network of fusion centers consists of 78 federally recognized organizations. Throughout this dissertation the use of the term national network refers only to the formal network comprised of these 78 fusion centers.

Inter-organizational information sharing is a critical strategic activity for public sector organizations (Yang and Maxwell 2011; Hatala and Lutta 2009; Hall and Tolbert 2004; Dawes 1996). Although fusion centers are most commonly associated with intelligence and counterterrorism by the general public and even Congress, the fusion process of sharing and analyzing information applies broadly across multiple disciplines. Fusion center analysts perform essential functions that enhance the ability to connect the dots for law enforcement, enhance officer safety, and conduct trend analyses on crime patterns, among other functions. Some fusion centers also support all hazards preparedness and may be far more occupied with frequent drug trafficking or gang violence, natural disasters, or critical infrastructure security than with terrorism as a standalone threat. However, by developing capabilities to handle all crimes and all hazards, fusion centers build capabilities that pertain to the broader counterterrorism mission.

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2 For a more detailed definition of fusion centers and the fusion center network, please refer to Chapter 3.

3 A current list of these organizations can be found on various websites, including the Department of Homeland Security (dhs.gov) and the National Fusion Center Association (nfcausa.org).
1.4 The Puzzle

Although fusion centers are designed to share intelligence and information across a national network, and despite the fact that federal agencies have provided support and various forms of assistance, not all fusion share the same capabilities or outcomes. This is evident in the variation of pure outputs (quantities), as well as outcomes (value-based), across the national network that is visible in media coverage (Johnson and Dorn 2008; Serrao 2009), annual capability assessments (DHS 2011, 2012, 2013, 2014), as well as congressional reports (Levin and Coburn 2012; Tuutti 2012; GAO 2014).

While an organization’s mission, its resources, and its jurisdiction, among other factors, may explain variation in outputs, the reason for the variation in outcomes is less clear. Although there is no standard definition of effectiveness, fusion center stakeholders and subject matter experts are able to identify those fusion centers that are perceived to be effective—a desirable outcome—as well as those fusion centers that may be struggling to provide services and support security partners in their areas of responsibility. By gathering stakeholder perceptions on effectiveness for individual organizations in the network, it may be possible to work backwards and unpack the factors that explain observed variation.

The research setting provides cases to explore how factors at multiple levels of analysis influence organizational outcomes. These levels are defined as the network level, the organizational level, and individual actor or participant level factors (Popp, Milward, MacKean, Casebeer, and Lindstrom 2014). The network level consists of the relationships between individuals and organizations that makeup the network’s structure. The organizational level consists of the features and capacities of the organizations. The individual actor or participant level in this dissertation focuses mainly on the individuals who carry out the day-to-day tasks of
analysis and information sharing—the analysts. In this dissertation I will argue that the collective knowledge of network level outcomes—the area where much scholarship has been attuned—is enhanced by exploring outcomes at the organizational level in network settings as the result of configurations of variables at all three levels of analysis.

There are several reasons why the national network of fusion centers provides appropriate case studies for this dissertation. First, it is a quintessential whole network. Second, it provides a rich setting for examining outcomes among organizations that share a common goal but serve unique jurisdictions and are at various stages of maturity. Finally, the inter-organizational network literature on whole networks has been pre-occupied with the public health sector and service delivery networks (Provan et al. 2007). Examining organizational outcomes in a national intelligence and information sharing whole network may yield valuable insights for practitioners and theory building both for the inter-organizational network and information sharing literatures (Yang and Maxwell 2011).

1.5 Research Approach

Complex causality is often avoided in quantitative and qualitative research because it is inherently messy; whenever it is explored, social scientists tend to treat the causal variables of an observed phenomenon as linear when they may in fact be configurational (Ragin 1987). Recent network scholarship has emphasized the importance of understanding causal complexity in order to better explain social phenomenon (Raab et al. 2013a).

The configurational approach is well suited to unpacking the complexity of individual organizational outcomes in whole network settings. Specifically, crisp set qualitative comparative analysis (csQCA) was applied to analyze an original dataset (Ragin 1987, 2000,
2008). First, I defined the outcome (effectiveness) using stakeholder perception data. This feedback was based on the stakeholders’ familiarity with the products and services of a representative sample of the national network. Organizational reputation was also used as a proxy to validate perceptions of effectiveness and distinguish between organizations (Provan, Huang, and Milward 2009). I argue that organizational reputation is important in information sharing networks because individuals often have the ability to determine their associations based on factors like trust, influence, and historical frames (Ebbers and Wijnberg 2010).

Once organizational effectiveness values were constructed for the organizations in the sample, the research worked backwards to unpack the complex causality of the outcome by identifying the critical factors, or configurations of conditions that exist within highly effective fusion centers, as well as in those fusion centers that may be less effective.

Data collection spanned a period of five months, with information on 18 fusion centers located in three geographic regions. Of these 18, four are urban area fusion centers and 14 are state-level organizations. Personnel from each of these fusion centers participated in a series of questionnaires that asked about the fusion center’s characteristics and features, its operations, its staff, and its analysts. Several of these same fusion center personnel, along with subject matter experts, participated in brief interviews that added context to the dataset.

In addition to questionnaires and interviews, case studies of two well-known and highly regarded fusion centers were conducted to supplement the dataset and build a conceptual framework to guide the research. This first-hand experience included interviews with directors and analysis in both fusion centers, and site visits to both locations. In total, I interviewed or corresponded with current or former directors and analysts from 27 different fusion centers for this research.
After collecting the data, I applied csQCA to the dataset to better understand how configurations of relationships (the structural factors), organizational factors like capacity, and analysts’ characteristics (the compositional factors) play a role in determining effectiveness outcomes for individual fusion centers making up the whole network (Ragin 2000, 2008; Knoke and Yang 2008). The findings reveal the paths taken by individual organizations to achieve the outcomes perceived by organizational and network stakeholders. The paths are distinguished by the various configurations of conditions at each level of analysis (network, organizational, and individual actor).

1.6. Anticipated Contribution

By applying this approach, the dissertation will contribute to the literature on inter-organizational networks by speaking to scholars interested in how multiple layers of whole networks interact with each other to influence organizational outcomes like effectiveness (Raab et al. 2013a). The results will also inform theory building efforts by presenting propositions to guide future hypothesis development and testing across a variety of whole networks, especially those designed to share information (Bacharach 1989). It will also inform scholarly inquiry into the effectiveness of information sharing between organizations (Yang and Maxwell 2011; Dawes 1996).

Practitioners in the domestic intelligence community may also benefit from a better understanding of the characteristics that are found in high performing fusion centers and the qualities common to fusion centers that may be less effective. The findings will also illustrate other important issues for practitioners, including the common traits and attributes of fusion
center analysts working in fusion centers with high effectiveness and reputation outcomes, as well as the barriers to improved effectiveness in intelligence and information sharing.

1.7 Chapter Organization

The remaining chapters are organized as follows. Chapter 2 provides a review of the scholarly literature, and places this dissertation into the ongoing conversation among inter-organizational network scholars on the importance of examining effectiveness, and outcomes more generally. It explains the importance of first understanding organizational level outcomes in whole network settings before building theory on whole network outcomes, and also makes a case for the significance of this research to scholars of organizational reputation. This chapter also introduces three research questions.

Chapter 3 describes the research setting, and introduces the fusion center network. This is followed by a discussion of the observations from the two case studies of fusion centers in the network, but outside the sample. The chapter concludes with a discussion of the findings that resulted from the in-person visits, and identifies key themes and observations that contribute to the proposal of a conceptual framework that explains fusion center effectiveness and reputation outcomes.

Chapter 4 describes the research methodology, and explains the selection process for the sample as well as the approach to data collection. Descriptions of the surveys, interview questions, and the case studies are provided, as well as an in-depth look at the sample. Additionally, this chapter reviews the descriptive statistics and general overview of the data that was collected during this research.
Chapter 5 introduces QCA and the steps used in this research. It then examines the findings resulting from QCA approach. The chapter continues with a discussion of the findings, and describes the solutions, or paths that emerged from the analysis. The solutions for highly effective fusion centers, and fusion centers that did not meet the criteria for highly effective fusion centers are then compared and contrasted. The chapter ends with a more in-depth look at the findings pertaining to organizational reputation, and the dimensions of organizational reputation that are apparent from the analysis.

Chapter 6 concludes the dissertation by discussing the findings within the context of the literature, and also provides some considerations for practitioners in the network. It presents several propositions that emerge from the application of QCA, and that may guide future research. The chapter closes with a discussion of the contribution and limitations of the research, and possible future lines of inquiry that build off of the findings presented. It also presents several considerations for practitioners in the domestic intelligence community.
CHAPTER 2: LITERATURE REVIEW

2.1 Inter-organizational Networks

Since O’Toole’s (1997) oft-cited admonition to treat networks seriously, scholars have explored many dimensions of networks and network outcomes. Inter-organizational network scholars have made strides in theory building, with much of this literature focused on network forms, management, and structural features with the primary unit of analysis being the individual node or actor (Isett, Mergel, LeRoux, Mischen, and Rethemeyer 2011; Provan, et al. 2007).

Recent attention has been paid to whole networks which consist of “three or more organizations connected in ways that facilitate achievement of a common goal” (Provan et al. 2007, 482), and are often created to solve wicked problems such as natural disasters or the threat of terrorism (see Rittel and Webber 1973). Additionally, whole network member organizations are independent of each other (Kilduff and Tsai 2003), and the relationships between member organizations may be formal or informal (Provan et al. 2007).

Much of the whole network literature is still in its early stages, comparative in nature, pre-occupied with the public health sector, and divided along cross-sectional and longitudinal lines (Isett et al. 2011; Turrini, Cristofoli, Frosini, and Nasi 2010; Provan et al. 2007). In a review of whole network research, Provan et al. (2007) found that scholars tend to focus on two specific areas: network properties and processes, such as structure, evolution, or governance, and network outcomes. Raab et al. (2013a) also describe whole network research at the individual node, dyad, and network levels. For example, research on individual nodes has focused primarily on how an organization’s ties to other organizations in the network determine outcomes. This research on dyads has been attentive to relational properties, but to a lesser degree on node characteristics.
One promising avenue within the whole network literature addresses the importance of organizational outcomes in whole network settings, and examines configurations of sub-network variables and their influence on network level outcomes (Raab et al. 2013a). This research also compares and contrasts micro and macro level features of whole networks, and asks how these features interact with each other to impact organizational and, ultimately, network level outcomes (Raab et al. 2013a; Gulati et al. 2011). When scholars apply the configurational approach, they are concerned with the causal factors that are necessary or sufficient conditions for an observed outcome, as opposed to more traditional approaches that analyze factors in isolation or as additive net effects (Raab et al. 2013; see also Ragin 1997).

The number of inter-organizational network scholars applying the configurational approach is growing, and recent research has made a case for exploring outcomes within networks as the results of configurations of conditions at multiple levels of analysis (Raab et al. 2013b; Raab et al. 2013a; see also Provan and Lemaire 2012). Although this dissertation is not a study of whole network effectiveness, it does examine a representative sample of a whole network—the national network of fusion centers—and explores the configurations of factors that are associated with organizational level outcomes like effectiveness.

### 2.2 Organizational Effectiveness and Reputation

In the public sector, efficiency and effectiveness are often measured as outputs. Outputs may consist of the number of constituents served, or the quantity of a particular good or service as measured against thresholds or pre-determined goals to evaluate the impact of public programs and services (Van Thiel and Leeuw 2002). In the counterterrorism and intelligence communities outputs are generally measured quantitatively based on the number of products or services
provided by an organization (Probst 2005). These could range from the number of briefings, the number of data points processed, or the number of reports issued, among others.

According to Modell, “the development of PM (performance measurement) for controlling public sector organizations in the 1980s and 90s was typically characterized by growing concerns with fiscal probity and accountability, often epitomized by the three Es: economy, efficiency and effectiveness” (2004, 42). In recent years, efforts to promote efficiency and effectiveness in government have grown in scope, sophistication and visibility, with the accounting and the balanced score card approaches becoming predominant mechanisms for assessing performance based on outputs or other quantifiable results (Heinrich 2012; Modell 2004).

Yet outputs alone are often inadequate for fully comprehending the value-added by inter-organizational networks, especially when the desired values are not tied directly to efficiency (Provan and Kenis 2007). In this dissertation, quantities are characterized as outputs because they can be measured without considering effectiveness, which is defined as a value-based outcome (Van Thiel and Leeuw 2002).

Outcomes like effectiveness have been challenging for scholars to conceptualize and measure at both the individual node and network levels due to the complexities of inter-organizational forms of governance (Provan and Kenis 2008). Although the difficulties of identifying and attributing measurable outcomes are well established, effectiveness has received much scholarly attention because it matters whether public-funded organizations and inter-organizational networks achieve desired outcomes (Popp et al. 2014).

Theories of organizational effectiveness identify the factors that influence or determine outcomes. One frequently cited theoretical framework highlights the importance of stakeholders,
agency autonomy, the importance of mission, organizational culture, and leadership, suggesting that these factors influence the degree of motivation within the organization, and ultimately the organization’s effectiveness (Rainey and Steinbauer 1999). Various models of organizational effectiveness emphasize the importance of goals, the perceptions of stakeholders, the meaning of values, and the contradictions or tradeoffs that organizations make when operating within the constraints of limited resources for measuring effectiveness (Cameron and Whetten 2013; Tolbert and Hall 2009).

Cameron has pointed out that the difficulties associated with measuring organizational effectiveness are “largely problems faced by researchers, not by managers and practitioners” (1980, 79). Managers tend to know what is or isn’t working, but their perceptions tend to be biased in some way and are not arrived at systematically (Cameron 1980). Therefore systematic determinants of effectiveness are most likely to rest on the things we can see, such as the organizations’ structures and capacities, its tasks, missions, and goals, as well as the perspectives of its stakeholders.

Stakeholder perception provides a contrast to other forms of measurement because it frames effectiveness by the perceptions of those to whom effectiveness matters most. Rainey and Steinbauer (1999) define organizational stakeholders as “persons, groups, and institutions that have an interest in the activities and outcomes of the organization sufficient to draw their participation and attention to the agency” (14). These stakeholders are critical in the fusion center context because they provide resources, through relational ties, predominately in the form of information. Their perceptions of member organizations in the network are defined by the quality of their interactions, the value of services and information received, and other interpersonal factors like familiarity, trust, or even friendship. In this dissertation, I take a
stakeholder approach to measuring organizational effectiveness because a larger population of network stakeholders can speak to their own perceptions of the organizations based on products or services, even without an intimate knowledge of each organization’s structures, personnel, or jurisdiction.

Stakeholder perceptions of effectiveness, however, have limitations, namely that stakeholders may have poor vantage points and are inevitably biased in their opinions. Another means for gathering and validating stakeholder perception is to capture another perception-based dimension of effectiveness. To this end, some network scholars have applied proxies for effectiveness, such as reputation, which is well established as an important organizational outcome (Provan, et al. 2009). According to Carpenter and Krause, organizational reputation in the public sector may be defined as “a set of beliefs about an organization’s capacities, intentions, history, and mission that are embedded in a network of multiple audiences” (2012, 26).

Scholars have identified three dominant dimensions of organizational reputation: familiarity with the organization, beliefs about what to expect from the organization in the future, and impressions about the organization’s favorability (Lange, Lee, and Dai 2011). Through these dimensions, “an organization can become well known, can accrue a generalized understanding in the minds of observers as to what it is known for, and can be judged favorably or unfavorably by its observers” (Lange et al. 2011, 154).

Reputation is also deeply rooted in an organization’s historical behavior and associations, but can change quickly if the organization’s failures are brought to light—as is often the case in the public sector due to higher levels of accountability—or if the organization behaves in a way that is perceived as negative, or “jarring to observers” (Lange et al. 2011, 155). A strong
reputation might buffer organizations from negative events, such as product recalls in the private sector or a publicized failure by a government agency (Chen, Ganesan, Liu 2009; see also Ahluwalia, Burnkrant, and Unnava 2000; Dawar and Pillutla 2000; Siomkos and Kurzbard 1994), and a negative reputation may be difficult for an organization to overcome (Fombrun and Shanley 1990; Dean 2004; Lange et al. 2011).

At the organizational level within a network, Provan et al. (2009) found that an organization’s embeddedness in the network as measured by centrality is positively correlated to reputation. They define reputation as the perception by others that an organization “is doing a good job, especially providing high-quality services to its clients” (Provan et al. 2009, 877). In their research on the relationships between task oriented indicators of an organization’s embeddedness and the related social outcomes—organizational trustworthiness, influence, and reputation—they discovered that positive relationships between embeddedness and these outcomes will strengthen over time (Provan et al. 2009). They also found that an organization’s positive reputation encourages others to interact with that organization, thereby enhancing reputation further, and that reputation appears to “play an important role in determining who to work with and who to avoid” (Provan et al. 2009, 877), which is critical in a network designed to facilitate information sharing.

Provan et al. (2009) also suggest that reputable agencies are more likely to have greater legitimacy. This legitimacy may come from valued information, political support, or visible resources. Legitimate organizations are therefore better equipped to enhance their capacity to attract more resources. Provan et al. (2009) found that reputable organizations are more likely to have central positions as they are sought out by others, and that “maintaining links to agencies with high reputation may even have a spillover effect, as connected organizations enhance their
reputation by maintaining strong ties to high reputation agencies” (Provan et al. 2009, 877; see also Collins 2005; Shrum and Wuthnow 1988). In this sense, reputable agencies enjoy an advantaged position and legitimacy due to their resources, trust, and influence, and can thereby strengthen their reputations in inter-organizational networks (Ebbers and Wijnberg 2010; Kossinets and Watts 2009).

At the individual actor level, network scholars have defined reputation as information about an actor’s ability to deliver products or services to other network participants (Podolny 1994). In network settings, reputation can have many facets at the individual actor level. For example, Kilduff and Krackhardt (1994) have presented evidence that node-node interactions depend upon perceptions of individual characteristics, including reputation. According to Ebbers and Wijnberg (2010), the value of deriving the reputations of individual actors from the reputation of the entire organization or network increases when observers are allowed to compare the performance of different organizations. Because each actor’s reputation provides information about its ability to gather, process, and share information, other actors are more likely to connect with participants that have positive reputations (Shane and Cable 2002).

Within networks, individuals can also play a critical role in building and reinforcing reputations by leveraging positions of trust and influence between or across organizations. Network facilitators, for example, are defined by Antoldi et al. (2011) as “usually individuals or organizations that leverage their reputation and abilities by facilitating interfirm relationships within a local cluster or group of firms. Their role is to promote and strengthen relationships among firms, give a clear strategy to the alliance, mediate negotiations among partners and help network members create opportunities for trust, shifting them out of their collaborative inertia” (pg. 35; Mesquita 2007).
Trust is also a critical factor for how well network facilitators are able to form and function. McEvily and Zaheer (2004) describe facilitators as the primary purveyors of trust between firms—a critical role in whole networks set up to solve wicked problems, or to seek a common goal—thereby positioning these facilitators to reinforce or delegitimize perceptions of reputation among and across individuals operating within the network.

Relational ties are other conduits for establishing and reinforcing perceptions of reputation (Podolny 2001). An important concept that goes beyond a mechanical description of ties is found in the sociological network research on cognition (Kilduff and Brass 2010). In Krackhardt’s (1990) work, accurate perceptions of who is connected to whom empowers individual actors. “In addition, people evaluate others based on their perceptions of connections in the network,” and “an individual’s reputation as a high performer in an organization is significantly affected by whether others in the organization perceive the individual to have a high-status friend, irrespective of whether the individual actually has such a friend” (Kilduff and Brass 2010, p. 338; see also Kilduff and Krackhardt 1994). The cognitive social network research has informed and been informed by Podolny’s (2001) characterization of “networks as ‘prisms’ through which others’ reputations and potentials are viewed, as well as ‘pipes’ through which resources flow” (Kilduff and Brass 2010, p. 338).

Although scholars have used reputation as a proxy for effectiveness, reputation is itself a complex construct and difficult to measure. It remains unclear whether reputation is an antecedent or result of effectiveness at the organizational level within network settings, and the validity of reputation as a proxy for organizational effectiveness is still in question. Might reputable organizations fail to be effective, and could ineffective organizations be reputable in whole network settings? The challenge for researchers is to further explore the relationships
between the two organizational level constructs of effectiveness and reputation. In this
dissertation I will use the reputations of organizations in a whole network as a way of validating
stakeholder perceptions of effectiveness, and explore the relationship between reputation and
effectiveness for organizations in a whole network.

2.3 The Multiple Levels of Analysis
The configurational approach explores combinations of factors, and network scholars have
advocated an approach that simultaneously looks at multiple levels of analysis within a network
to establish the causes of network or organizational outcomes like effectiveness and reputation.
Provan and Milward (2001) have identified three distinct levels of analysis for evaluating
network effectiveness: the community, the network, and the organization and/or participant.
Popp et al. (2014) have recently expanded the Provan and Milward (2001) framework by
breaking the organization/participant level into two distinct levels (organization and individual-
participant), resulting in a total of four levels of analysis for evaluating networks. Turrini et al.
(2010), Kilduff and Brass (2010), Isett et al. (2011), and Popp et al. (2014) provide
comprehensive reviews of research at each of these levels.

In this dissertation I focus on the conditions or factors at the network-, organizational-, and individual actor-levels to explain organizational outcomes (Popp et al. 2014). In what
follows, I briefly summarize the inter-organizational network literature on three different levels
of analysis, but focus primarily on identifying the ways in which these three levels interact to
determine, or at least influence, organizational level outcomes, and how these levels will be
constructed in this dissertation.
2.3.1 The Network Level

The network level can be analyzed in one of two ways: as the entire network and all of its component parts, or as the relational ties that make up the network. The first approach requires large amounts of data that is often difficult to gather and analyze (Provan and Kenis 2008). As a result, very little research has examined whether, and under what circumstances, networks are effective (Kenis and Provan 2009), with scholars instead focusing on network formation, network governance, and the role of power and influence in network settings (Turrini et al. 2010).

In this dissertation, however, the network level is constructed as the relational ties between individuals. Scholars have measured the presence, intensity, or strength of these ties in inter-organizational network research related to outcomes. One way to measure relationship strength is through tie multiplexity. Multiplexity is generally defined as multiple ties between nodes of a network, such that if one tie were broken, others would still link those nodes together. For example, a single tie might be a role-oriented relationship that places two individuals on a team working towards a solution. Multiple ties might mean additional linkages so that if one individual is moved to another team both individuals would still remain connected in some other way.

In the network literature, “multiplex ties are thought to be an indicator of the strength and durability of an organization’s links because they enable the connection between an organization and its linkage partner to be sustained even if one type of link dissolves” (Provan et al. 2007, p. 484). As a result, the presence of these multiplex relationships is generally associated with stronger (and therefore more effective) networks because simplex, or single ties, are more easily broken due to bad feelings, a breakdown of technology, or a restructuring of the network.
The concept of multiplexity is central to this dissertation because key relationships in the fusion center network are maintained with stakeholders (Rainey and Steinbauer 1999). I argue that without multiplex ties, relationships may be less likely to withstand inevitable disruptions or stresses, such as the relocation or re-assignment of personnel through promotion, reductions in funding, increasing workload, among other possible scenarios common in the fusion center network. Because multiplex ties are more durable, the presence or absence of multiplex ties at the level of individuals will provide insights about the strength and maturity of individual organizations, as well as the ties that make up the network.

Recent scholarship has, in fact, suggested that the presence of multiplex ties may be directly related to network outcomes (Provan and Milward 2001; Isett and Provan 2005; Provan et al. 2007; Provan et al. 2009; Kapucu and Demiroz 2011). In several studies, multiplexity has been captured as a network-level variable to measure the strength or maturity of the network, but the precise ways in which multiplexity relates to organizational outcomes like effectiveness has not been fully explored. This dissertation will construct the network level as the multiplex relationships maintained by individuals in an organization with specific communities of practice represented both within and outside their own organizations.

2.3.2 The Organizational Level

The organizational theory and public administration literature has established the role of various organizational factors in shaping outcomes (Cameron and Whetten 2013; Rainey and Steinbauer 1999; Cameron 1980). This work has broadly ranged from the resource-based view of public organizations (Barney 1991; Conner 1991; Ulrich and Lake 1991; Bryson, Ackerman, and Eden 2007) to ways of measuring, building, and sustaining capacity (Frederickson and London 2000;
Grindle and Hilderbrand 1995), and to the importance of building a capacity for strategic management (Poister and Streib 1999), among other aspects.

At the organizational level defined by Provan and Milward (2001), factors such as resources, longevity and maturity, capacity, and stakeholders are generally accepted as the key variables. That individual organizational outcomes matter is intuitive to network scholars, but there remains a lack of research that extrapolates how organizational outcomes are determined or shaped by variables at all three levels of analysis such as the role of actor attributes, characteristics, and ties, and how organizational level outcomes influence network outcomes (Kilduff and Brass 2010).

Recent whole network scholarship has taken a configurational approach to better understand the relationships between the organizational and network levels, as discussed above. Additional research has simultaneously examined the network and organizational levels to monitor processes and outcomes like effectiveness, multiplexity, the role of network facilitators, capacity, service delivery, embeddedness, and organization centrality (see Popp et al. 2014; Mandell and Keast 2007). Still other research at the organizational level has focused on the benefits the network provides to the organization (Popp et al. 2014).

In this dissertation I will construct the organizational level as the characteristics of individual organizations, namely capacity. I will pay particular attention to the presence or absence of organizational capacity as a contributing factor to organizational level outcomes.

2.3.3 The Individual Actor Level

Individual actors make up organizations. At a most basic level, individual participant attributes are generally defined by the aims or goals of the researcher (Waserman and Faust 1994). For
example, some researchers are only interested in the role that demographic variables, such as sex or race play on interpersonal relationships. Other scholars might focus on task-specific, or role-related characteristics.

Some network scholars have used self-monitoring theory to understand the importance of actor attributes in network settings. Self-monitoring theory suggests that “people with different self-monitoring orientations tend to occupy different structural positions” in networks, and emphasizes the individual’s control and monitoring of expressive behavior (Kilduff and Brass 2010; see also Kilduff and Krackhardt 2008; Kilduff 1992). When individuals display a self-monitoring orientation, they might “inhabit partitioned social worlds….whereas other people inhabit closed social worlds” (Kilduff and Brass 2010, p. 333).

There is additional evidence to suggest that individual actors and their characteristics and attributes, as well as their relationships, are important for better understanding the effectiveness of the organizations and networks in which they exist. Specifically, research has examined how the behavior of individuals—such as preferences for partnering with other individuals and for repeated engagement—shape macro network characteristics such as small worldedness (Kilduff and Brass 2010).

Kilduff and Brass (2010), however, lament the lack of research on the importance of actor attributes, or characteristics noting that sociological network research has followed a mostly Durkheimian model “focused on emergent social structures irreducible to any individual attribute” (p. 332). To the extent individual actors are examined at all, it is generally as “residues of social structure” (Kilduff and Brass, p. 332).

In this dissertation, the individual actor level will be defined as the attributes and characteristics of the analysts who do the work of information sharing in the national network of
fusion centers. I will pay close attention to the roles, responsibilities, skills, abilities, and relationships, and try to understand how these traits influence the relationships that are critical to the success or failure of inter-organizational intelligence and information sharing.

2.4 Research Questions
Currently, very little is known about the determinants of whole network functioning and outcomes, and even less is known about how factors at the three levels of analysis (as discussed above) interact to influence outcomes at the organizational level within a whole network. In this dissertation, I will try to make contributions to the understanding of organizational outcomes in whole networks that result from configurations of conditions across all three levels of analysis, simultaneously explore the relationship between reputation and effectiveness, and examine the significance of multiplexity.

This research will frame the network’s member organizations as the unit of analysis. These organizations make up the organizational level of a network, along with the elements that are distinct to the organizations under examination (capacity, size, geographic location, among other factors). Although scholars have called for research on whole network outcomes (Isett et al. 2011), this research will demonstrate the importance of first understanding how variables at multiple levels of analysis impact or shape the outcomes at the level of the organization, and hopefully support future theory building on the ways organizational outcomes determine or influence whole network outcomes. Reputation is also constructed at the organizational level.

This research will draw from several themes in the literature. First, that stakeholder or client perceptions are critical to understanding organizational effectiveness in a whole network (Provan and Milward 2001). Second, that multiple levels of analysis are equally important, and
that effectiveness must be understood in terms of how it relates to or results from these levels (Popp et al. 2014; Provan and Milward 2001). Third, that configurations or combinations of variables are essential to understanding how organizations arrive at measured or observed outcomes within whole networks (Kenis and Provan 2009; Gulati et al. 2011; Raab et al. 2013; Provan et al. 2013). Fourth, that reputation may be a viable proxy for effectiveness when concise definitions prove elusive (Provan and Huang 2009). Finally, that a better understanding of sub-network level variables theory building can inform future theory building on whole network effectiveness and information sharing between public sector organizations (Provan et al. 2013; Yang and Maxwell 2011).

In pursuing this line of inquiry, I will ask three research questions. First, the variation of organizational outcomes in whole networks should be explored as the result of interactions between configurations of variables at all three levels of analysis. While researchers have explored outcomes at these levels individually or at the organizational and network levels simultaneously, it is less clear how all three levels interact to shape organizational level outcomes. It is of interest to this research how that these outcomes might result from various configurations of causal conditions—or variables—across multiple levels of analysis. Therefore, this dissertation will ask:

**RQ 1:** Why do organizational outcomes vary in whole networks?

Second, although scholars have applied reputation as a proxy for effectiveness, it has not been empirically tested as a viable substitute when constructed as stakeholder perception of reputation and effectiveness at the organizational level. Empirical research can illuminate the
significance of organizational reputation for outcomes, and what relationships exist between reputation and effectiveness as two distinct outcomes. In order to address this gap, this dissertation will ask:

**RQ 2: Is reputation a viable proxy for effectiveness when evaluating organizational level outcomes in whole networks?**

Finally, much like reputation, the inter-organizational network literature has not fully established the relationship between tie multiplexity and organizational effectiveness. Although multiplexity is often associated with effectiveness, this has not been thoroughly tested in empirical network research (Popp et al. 2014). This dissertation will explore the significance of multiplexity in relation to effectiveness and reputation outcomes by asking the following question:

**RQ 3: Is the presence of tie multiplexity necessary for positive organizational effectiveness outcomes in whole networks?**

This dissertation will address these questions and the gaps introduced in the literature by understanding how factors at the individual participant level, organizational level, and network level help to explain organizational effectiveness in whole network settings. In doing so, the dissertation will hopefully make meaningful contributions to theory building and practice.
CHAPTER 3: THE RESEARCH SETTING AND CONCEPTUAL FRAMEWORK

3.1 The National Network of Fusion Centers

According to *Implementing Recommendations of the 9/11 Commission Act of 2007 (Pub. L. 110-53)* fusion centers are a “collaborative effort of 2 or more Federal, State, local, or tribal government agencies that combine resources, expertise, and information with the goal of maximizing the ability of such agencies to detect, prevent, investigate, apprehend, and respond to criminal and terrorist activity.” The DHS describes the role of fusion centers as contributing to the Information Sharing Environment (ISE) by receiving, analyzing, and disseminating threat information, as well as gathering tips, leads, and suspicious activity reporting (SAR) (DHS 2014). The national network is made up of individual fusion centers spread across the entire United States, connected by a common identity and mechanisms for sharing information vertically and horizontally.

Although some fusion centers existed prior to 9/11, the formal national network was established as part of intelligence reforms that addressed recommendations in *The 9/11 Commission report: final report of the National Commission on Terrorist Attacks upon the United States* (2004). The report highlighted the intelligence community’s (IC) failure to share intelligence and information leading up to the 9/11 attacks. Although the Central Intelligence Agency (CIA), FBI, and Department of Defense (DoD), among others, were gathering and analyzing intelligence, members of the IC were unable to penetrate the silos between agencies (Roberts 2009). Sharing between the federal, state, and local levels was practically non-existent except for a few prominent urban area police departments (Straw 2007). The fusion center concept—drawn in part from the DoD and intelligence led policing—was conceived as a
solution to the lack of information sharing between federal and non-federal partners (Guidetti 2010; Carter and Carter 2009).

Individual fusion centers are established by state and local governments to meet the needs of stakeholders within their jurisdiction, or area of responsibility (AOR), and share intelligence and information vertically and horizontally with security partners at all levels of government. The AORs for most fusion centers are typically delimited by geographical boundaries, such as state lines, regions, or city limits. Stakeholders normally include state agencies, local law enforcement, tribal and territorial authorities, and the private sector. Fusion centers also provide value to federal agencies as a consistent link to non-federal actors at the state and local levels.

As of this writing, the national network consists of 78 federally recognized fusion centers including 49 at the state level (Wyoming is the only state without a fusion center), and another 29 in major urban areas and U.S. territories. Host or parent agencies in these jurisdictions include state police agencies, major urban area police departments, or state-level homeland security and emergency management agencies. The internal makeup of a fusion center generally consists of a director, an operations manager or analyst supervisor, intelligence analysts, and liaisons from federal, state, local, or private sector partners. Staffing ranges from as little as four analysts to over 200 analysts, depending on the resources of the parent agency and needs of the AOR. Analysts come from a variety of backgrounds, including law enforcement, the IC, military, or private sector.

Fusion centers simultaneously serve their parent agencies, multiple sectors, state and local officials, and are accountable to the public all while pursuing leads, supporting investigations, and operating in a fiscally challenging environment. Fusion centers serve their clients, or stakeholders, by providing specific resources or services that may include a dedicated
product line of intelligence or information products issued on a regular basis. The contents of these products may consist of notifications to police, threat assessments for pre-planned events, or reports that synthesize sensitive data. Analysts also provide operational and tactical support, such as conducting background checks, analyzing criminal data for trends and patterns, or SAR. In addition to these activities, fusion center personnel are routinely asked to respond to requests for information (RFIs) from a range of entities.

Although fusion centers are not federal assets, they do receive technical assistance and funding from federal agencies. The DHS Office of Intelligence and Analysis (I&A) is the federal agency providing critical support to fusion centers. Although the agency’s ability to actually determine fusion center outcomes is limited, it does provide various kinds of support including personnel, access to shared information databases, and connections to other federal agencies. In addition, DHS I&A conducts an annual performance assessment that tracks performance and capability development across the network. This activity falls under the Fusion Center Performance Program (FCPP), which is tasked with the annual assessment, conducting exercises to test capabilities, and mitigating these gaps to improve or sustain fusion center operations.

The FBI also plays an important role by providing liaisons and access to FBI data streams. FBI personnel and information resources are critical for fusion centers. Without some level of access to the FBI’s systems and databases containing information on known or suspected criminals, as well as important data on investigations, fusion centers are more likely to face difficulties connecting the dots between pieces of information related to threats, tips, or investigative leads.

Other federal agencies work with fusion centers on a case by case basis. These include the United States Secret Service (USSS), Drug Enforcement Agency (DEA), National Guard,
Department of the Treasury, Customs and Border Protection (CBP), Immigration and Customs Enforcement (ICE), and the Transportation Security Administration (TSA), among others. The strength and nature of these relationships varies from fusion center to fusion center and depends largely on the jurisdiction.

Finally, within a fusion center’s jurisdiction there may also be relationships with non-governmental entities, such as the private sector. Obviously, the operating environment shapes the nature of these relationships. For example, a fusion center in Seattle may have very different relationships with the private sector or volunteer organizations than a fusion center in Chicago. Likewise, some states may be home to key ports or transportation nodes whereas other states may be sparsely populated with an entirely different threat picture. Regardless of the precise nature of these relationships, there has been concerted effort on the part of the entire network to engage in and develop relationships with private sector entities in areas like critical infrastructure and cybersecurity (Sena 2013).

3.2 The Fusion Center Literature

The fusion center literature has been attentive to the challenges of coordinating law enforcement agencies and intelligence operations with the federal intelligence community (Carter and Chermak 2012; Jones 2011; Carter and Carter 2009; Johnston 2005). For example, in the law enforcement community, police officers are trained to solve cases, not to conduct intelligence analysis like a CIA or FBI analyst might (Carter and Chermak 2012; Johnston 2005). Likewise, police officers may have little incentive to share data or information because it could be perceived as detrimental to their own professional advancement, which largely rests on solving
cases. In other instances, sharing might compromise evidence compiled by an individual investigator, or result in accidentally exposing sensitive information or key witnesses.

Other research has looked beyond the operational aspects of fusion centers to explore the accountability and civil liberty issues (Carter and Carter 2009). For example, Waxman (2009) explores the accountability challenges generated by state and local police involvement in the intelligence process after 9/11, arguing that the secrecy issues surrounding the counterterrorism mission disrupt the accountability structures for state and local law enforcement. Citron and Pasquale (2011) have examined the controversy stemming from the role of fusion centers in placing citizens on watch lists, privacy invasions, and controversial intelligence analysis on religious or ethnic groups. Their research argues that although fusion centers are assumed to represent a trade-off between security and civil liberties, the network’s structure was designed in part to circumvent “strictures on information sharing” rather than conducting objective analysis on known terrorists or likely threats (Citron and Pasquale 2011). Jones (2011) has also suggested that fusion centers—and state and local intelligence operations more broadly—commonly lack formal governance mechanisms that ensure civil rights are protected.

Research on fusion center performance, however, has been limited. The work by Carter and Chermak (2012) on fusion center operations draws from criminal justice masters theses and dissertations, government reports and analyses, studies conducted by the RAND corporation, as well as survey data to provide information on fusion center outputs. These outputs consisted of things like the percentage of fusion center products shared among homeland and national security organizations, the quality of those products, and general perceptions among fusion center partners of the intelligence and information sharing capabilities of fusion centers in general (Carter and Chermak 2012).
Masters theses from the Naval Postgraduate School have also examined fusion center effectiveness. For example, a case study of two fusion centers in Border States found evidence to suggest that these organizations were effective in enhancing information flow and leveraging resources (Saari 2010). Other theses have explored the use of technologies to improve effectiveness (Brueggemann 2008), the role of federal guidelines in creating model fusion centers (Smith 2011), how fusion centers can demonstrate the value they add to counterterrorism efforts (Nenneman 2008), and fusion center effectiveness compared with other fusion cell concepts in the federal government (Fussell, Hough, and Pedersen 2009).

The RAND Corporation also has recently published research on domestic intelligence and information sharing, including a report that presents ways of measuring the value-added of information sharing by domestic intelligence agencies since 9/11, especially the fusion center network (RAND 2014). The report emphasizes the importance of evaluating different types of information sharing and establishes the need for evaluations that can appreciate the diversity of needs that organizations may have in information sharing. The report also distinguishes between measuring outputs and outcomes, and argues in favor of extending performance measurement regimes to include outcome-based metrics.

Practitioners are slowly embracing an outcome-based approach, but the main thrust of assessment efforts still track outputs. Several recent reports and publications are worth noting. In 2010, DHS and other federal stakeholders developed an annual assessment process that tracks fusion center outputs and capabilities. This annual assessment gathers self-assessments from all of the fusion centers in the network and presents a year after year baseline from which to measure capability development. The 2014 iteration of the report revealed that in 2013 fusion centers assessed their overall capabilities across relevant capability categories at 91.7 percent out
of a possible 100 percent (DHS 2014). In 2015, the reported 2014 data reported that fusion centers had achieved 96.3 out of 100 as an overall measure of capabilities (DHS 2015). This means that fusion centers are adding to their organizational capacities and capabilities, such as ensuring the organization has a privacy policy in place, sufficient security clearances, and mechanisms for information sharing that reflect best or desired practices within the intelligence community. This annual assessment, however, relies largely on measuring quantities of products or technical abilities and self assessments by the fusion centers.

Congress has weighed in on the network and its development. In 2013, the House Homeland Security Committee released a Majority Staff Report on the National Network of Fusion Centers that detailed some of the advances made by the network, as well as remaining gaps and weaknesses. The report was extensive and called for action in key areas, namely the development of a national strategy to guide fusion center network development in the years ahead. The first national strategy was publicly released in July 2014, and is the result of a collaborative effort by network stakeholders to address goals related to building trust with partners and strengthening the network. The GAO has also examined the network, focusing mostly on the investments of federal dollars, and recently finding that fusion centers are making some important capability gains (GAO 2014).

At least one congressional committee has been critical of the network. The Senate Permanent Subcommittee on Investigations released a 2012 report entitled Federal Support for and Involvement in State and Local Fusion Centers (Levin and Coburn 2012), which contained a scathing critique of the network and the role of federal agencies. Specifically the committee focused its attention on the role of DHS I&A and chastised the agency for not bringing all fusion centers up to a collective standard, and for failing to demonstrate how that continued investment
in the fusion center network would result in the apprehension of a single terrorist (Levin and Coburn 2012). The report, however, was criticized by the agency and even some lawmakers for too heavily relying on outdated information (O’Harrow 2012; Kopan 2012).

Some former government officials and subject matter experts have also weighed in with criticism of the network by pointing to the lack of rigorous performance assessment, and civil liberties issues, to name a few, as well as structural issues. For example, an issue brief published by the Heritage Foundation argues that the network is too large to be effective, and that the Nation would be better served by a leaner network that focuses more on high risk cities and major urban areas instead of the current model, which is largely organized by state (Downing and Mayer 2012).

One notable gap in this nascent literature is that neither scholars nor practitioners have treated the network as a network, instead focusing on areas like civil liberties or individual organizational capabilities and output based metrics. As a result, very little is known about the traits and characteristics of fusion center personnel, the relationships between organizational level capacity and capacity at other levels of the network, the strength of relationships between individuals and organizations, and performance outcomes like effectiveness.

3.3 Fusion Center Case Studies

In order to better understand the fusion center network, I visited two fusion centers during the summer of 2014 to conduct case studies. My goal was to identify fusion centers considered highly effective and reputable by their peers, and to learn more about these organizations and their operations. Early in the process of developing this dissertation I spoke informally with
current and former fusion center directors to identify organizations that were considered highly effective and reputable. Two organizations were consistently referenced as exemplary models.

The first was the Washington Regional Threat Analysis Center (WRTAC), which serves the District of Columbia. The second was the Northern California Regional Information Center (NCRIC) in San Francisco, California. After conducting additional research on both organizations, it appeared they presented contrasts in organizational size and operational context. For example, the WRTAC operates within a complex threat environment and must work in close proximity with federal intelligence and security agencies. The NCRIC is one of the oldest fusion centers in the network, and its director oversees the fusion center as well as the Bay Area’s High Intensity Drug Trafficking Agency (HIDTA). Despite these differences, however, both organizations are highly regarded for the quality of their information sharing products and services.

The National Fusion Center Association (NFCA) was instrumental in providing contact information for both directors. Introductions were made by NFCA staff at the 2013 annual training event held in Alexandria, Virginia. After describing the purpose and scope of the research to each director, they agreed to allow access for the purposes of conducting academic case studies.

I began with the WRTAC and made two physical site visits in May 2014. In July, I made one visit to the NCRIC. Both fusion centers provided access to their operations facilities (under supervision), as well as opportunities to interact with fusion center supervisors and staff. All interactions complied with Virginia Tech Institutional Review Board (IRB) protocols. Both organizations are described below, followed by a discussion of my observations.
3.3.1 Washington Regional Threat Analysis Center (WRTAC)

The WRTAC is located in the District’s Homeland Security and Emergency Management Agency (HSEMA) headquarters in Washington, D.C. Formerly part of the Metropolitan Police Department (MPD), the WRTAC was re-organized in 2011 as an all hazards fusion center and relocated to HSEMA headquarters. It now serves stakeholders ranging from federal agencies to local law enforcement in the District and the larger National Capital Region, which includes portions of Northern Virginia and Maryland.

The WRTAC is in operation twelve hours each day, five days per week, with duty analysts available at any time. The director and operations manager share adjacent offices, while the analysts, interns, and partner-agency liaisons occupy a large, well-lit area with cubicles and television monitors that are visible from any point in the workspace. The physical operations area also includes several meeting rooms and a vault for accessing classified information. In addition to fusion center personnel, the operational space also houses liaisons from DHS and the FBI that maintain a part-time presence in the fusion center, as well as liaisons from District partner agencies.

The WRTAC primarily gathers, analyzes, and disseminates intelligence and information that is relevant to the District and the WRTAC’s stakeholders. As an all-hazards center, the WRTAC serves the emergency management, public health, and law enforcement communities. The fusion center has also built relationships with other fusion centers in the region, and is co-located with the D.C. watch center and the D.C. emergency operations center (EOC).

The WRTAC produces a suite of approximately 60-90 intelligence and informational products that are distributed to various stakeholders each month. These products consist of trend analyses, specific threat information, or notices, and are carefully designed and refined through a
feedback loop consisting of a brief survey distributed to product recipients. Many of these products are posted to the DHS Homeland Security Information Network (HSIN), which is the unclassified web-based portal where fusion centers can post their own products, and view information posted by other fusion centers. More sensitive information is posted to or viewed on the Homeland Security Data Network (HSDN), the classified version of HSIN.

Stakeholder engagement at the WRTAC consists of building key relationships within the AOR. At present, the WRTAC’s core stakeholders consist of seven District agencies. There are 27 formal partner agencies with points of contact established in 17 others. The WRTAC also has an additional 51 vetted points of contact in the private sector that represent five critical infrastructure sectors within the District. These stakeholders include federal intelligence agencies, federal, state, and local law enforcement agencies, high-priority buildings and facilities within the District, private sector infrastructure, and the transportation sector, among others.

Analysts estimated the average combined total number of outreach briefings they conducted between them per month at 20-25. The director conducts another 15-20 outreach briefings or meetings each month. The majority of these meetings and briefings involve planning for special events—the District hosts over 6,000 events per year ranging from the State of the Union address to major international conferences and sporting events—or ensuring that organizations are aligning efforts to reduce duplication of effort and share information.

WRTAC personnel also conduct outreach to introduce potential partner agencies to the organization and its capabilities. Some of the WRTAC’s partner agencies have dedicated Liaison Officers (LNOs) that represent their host agencies in joint efforts, meetings, conference calls, and other activities with the fusion center. According to the analysts, relationships with LNOs are invaluable for sustaining the intelligence and information sharing process within the fusion center.
center. Without this vital link, analysts would lack visibility within their jurisdiction, negatively impacting their ability to conduct analysis.

The WRTAC’s lead analysts are responsible for four functional areas: Counterterrorism, Law Enforcement, Public Health/Emergency Management, and Critical Infrastructure/Cybersecurity. Assistant analysts and a support staff usually comprised of interns or entry-level personnel are also assigned to these functional areas. The lead analysts bring subject matter expertise and field experience in their respective areas, and two of the four analysts are former DHS and FBI intelligence analysts. Each analyst is well trained in intelligence analysis and emergency management; in fact, WRTAC analysts have completed the full suite of Incident Command System (ICS) training provided by the Federal Emergency Management Agency (FEMA). In addition, all relevant aspects of cyber analyses are considered within each analytical unit, and all analysts are required to have or obtain training in aspects of cyber security related to their areas of responsibility. Individual WRTAC analysts also have unique skill sets such as fluency in a foreign language, or the ability to conduct statistical analysis.

The lead analysts share several other responsibilities. The first is to produce daily, weekly, or monthly written intelligence or information sharing products for their respective functional areas. The analysts also develop and distribute reports for specific audiences on a case by case basis. While not all of their products are deeply analytical, the analysts are tasked with finding any meaningful connection between events and potential threats to the District.

The second responsibility is stakeholder engagement, which consists of regular meetings and briefings with stakeholders in the District, including federal agencies as discussed above. In one of the bi-weekly briefings I attended, WRTAC analysts shared their insights on events and
trends with these stakeholders, and received updates and information directly from stakeholders in the room. Important interactions may also take place outside the WRTAC. For example, one WRTAC analytic team teaches an eight hour course at the MPD police academy so that officers know how to leverage the fusion center in their daily work. Other analysts meet with community groups, volunteer organizations, planning committees, and other stakeholders on a range of public health and emergency management issues.

While the amount of stakeholder engagement depends on the position an analyst holds in the fusion center, there is an expectation that analysts will be able to identify key stakeholders within their area of responsibility and build and maintain relationships. The WRTAC’s leadership believes strongly in ensuring partner agencies and stakeholders have a personal connection to the organization. This requires at least some physical interaction and “face time” between analysts and stakeholders in the AOR.

Finally, analysts have responsibilities for pre-planned events, such as staffing incident command posts or forward operations centers, as well as additional support for major national events like the State of the Union or the inauguration. Analysts also know their responsibilities should an incident occur, as in the case of the Washington Navy Yard shooting in 2013. Throughout the event, the WRTAC provided situational awareness for local stakeholders and released vetted information to the rest of the fusion center network. The fusion center also provided “lookout” information until it was clear there was only one shooter and that he was deceased.
3.3.2 The Northern California Regional Intelligence Center (NCRIC)

The NCRIC traces its origins to 1997 and a five-person HIDTA center. Early in the HIDTA’s development, efforts were made to create a shared information environment with federal agencies operating in the state, as well as state and local law enforcement. In 2004, the NCRIC was officially created as a joint entity with the HIDTA, which enabled the organization to leverage pre-established relationships with intelligence and security partners at all levels of government. From 2006-2012 a major re-organization created new lines of authority, reduced overlap, and increased efficiency.

The NCRIC’s parent organization is the Northern California HIDTA Executive Board. The fusion center’s fiscal agent, however, is the San Mateo County Sherriff’s Office. Due to its central position within the Bay Area network of law enforcement and counterterrorism agencies, the NCRIC serves as an arbiter of intelligence and information. The NCRIC also maintains a feedback loop where stakeholders in the field (such as law enforcement officers) can inform analysts on what products are most useful, and what intelligence or information is most needed. This is managed informally by the director and lead analysts through informal communication with these stakeholders.

In addition, the NCRIC has a document tracking system to ensure products can only be accessed by the appropriate personnel, thereby providing an added layer of protection for privacy and civil liberties. The NCRIC is also equipped with access to advanced information sharing and data management technologies, and has IT professionals at its disposal to sync these technologies in support of fusion center operations. Federal agencies still work closely with the NCRIC, and even provide the operations space it occupies.
The NCRIC has a team of 35 analysts that make up the core of the organization’s staff. Like the WRTAC, the fusion center also maintains a cadre of interns throughout the year. Although the NCRIC is not a 24-hour operations center, it does have analysts available to support stakeholders at any time. The analysts are divided into two separate sections: strategic and tactical.

Strategic analysts work on domestic threats, transnational threats, gang related cases, cyber threats, and narcotics. NCRIC personnel refer to this as “the HIDTA side.” These intelligence analysts most closely resemble analysts in the IC who work for federal agencies. They track a variety of information sources to identify the nexus between domestic and international events, patterns, trends, or emerging issues and the Bay Area. From this analysis, they write bulletins, reports, and threat assessments for Bay Area stakeholders. According to an analyst supervisor at the NCRIC, their analysts are continually building expertise:

“If (a stakeholder) wants some sort of presentation on gangs or human trafficking, the (strategic) analysts become SMEs and go out and talk to other people across the network or in agencies that deal with these areas. They attend conferences and training sessions. They also provide monthly monitors on their individual accounts, which provide a snapshot of what’s going on in domestic threat issues …. then they use this information to try to identify what’s relevant within the AOR. The analysts have to really understand the AOR, and speak to what’s important to the AOR, not just whatever is the story of the day.”
Tactical analysts in the NCRIC are more focused on vetting and analyzing SAR data, and conducting threat assessments in support of key stakeholders. This might include responding to RFIs, general inquiries from law enforcement agencies, conducting background checks, searching databases to connect the dots between seemingly disparate pieces of information, and providing support to investigators. In fact, these analysts specialize in condensing information and providing reports or briefings to partner agencies. The tactical division also has specialized expertise in creating detailed maps for stakeholders, including information on critical infrastructure and key resources in the region.

Recently the NCRIC has expanded its tactical case support capabilities. “Not all the agencies in the Bay Area have their own analysts who can do the things they need done, so we provide that and try to fill whatever need they might have,” said one analyst. This takes many forms, from conducting a threat assessment for major sports venues to providing detailed local information to law enforcement on scheduled events. In order to balance the demand for threat assessments, the NCRIC has an internal deliberative system for assigning priority (the exact details of this process were not provided), and has “developed a sense over time” of what types of activities are deserving of the tactical analysts’ attention.

The work of the tactical division is directly tied to the fusion center’s stakeholder engagement strategy. According to the director, “It’s hard to get the public safety community engaged in terrorism issues when they don’t see it very often. If (we) can’t help with their main issues on a regular basis, they won’t help out when something related to terrorism does come up.” This means simultaneously balancing the fusion center’s operational focus between public safety, emergency management, and law enforcement concerns.
There are approximately 200 law enforcement agencies and 12,000 police officers in the Bay Area that lack sufficient intelligence capacity to counter criminal and terrorist threats on their own, and therefore have a need for the NCRIC’s information analysis and intelligence services. The NCRIC’s tactical capabilities are highly valued within the Bay Area by stakeholders, as evidenced by the steady stream of requests for information received by the fusion center on a daily basis.

The tactical team is able to support these stakeholders with analytical capabilities, and provide training and support through an extensive Terrorism Liaison Officer (TLO) network of over 2,200 individuals. A TLO may be a police officer, a fireman, or a representative from a local private sector company that provides information to, and receives information from the fusion center. The NCRIC’s TLO network serves the same function as the WRTAC’s LNO cadre, which is to provide vital linkages between the fusion center and stakeholders within the AOR. Some of the NCRIC’s personnel are tasked solely with outreach to TLOs and provide training and instruction on a regular basis so that these individuals can report and share information with the fusion center. In fact, the NCRIC maintains one of the largest TLO cadres in the entire national network.

3.4 Case Study Observations

Visits and conversations with WRTAC and NCRIC personnel provided insights into the structures, capacities, analyst traits and attributes, relationships, and priorities of two prominent and reputable fusion centers in the national network. These insights serve to highlight the importance of multiple factors that contribute to organizational level outcomes.
3.4.1 Organizational Effectiveness

In discussions with the WRTAC and NCRIC directors, being perceived as an effective organization was closely associated with several factors. First, both organizations share their analytical products on the HSIN portal. This portal is easily accessible and does not require a high-level security clearance to access. Due to the ease of access and the ability for individual fusion centers to build and maintain profiles on the portal, HSIN is the place where directors and analysts may form their own perceptions of other organizations’ products and capabilities—the two primary frames used to assign reputation to an organization. This view is supported by Podolny’s (2001) characterization of networks as prisms through which individuals can observe the reputation and potential of other network actors (see also Kilduff and Brass 2010).

Second, reputation is closely associated with the high visibility of the organization’s leaders and staff (Ebbers and Wijnberg 2010; Provan et al. 2009). The NCRIC’s director is often asked to testify before Congress, and he served as the President of the NFCA Executive Board during the research period. The WRTAC director was also the Vice President of the NFCA Executive Board. Personnel from the WRTAC and NCRIC travel to other fusion centers, participate in regional meetings and training events, or work with other fusion centers to develop joint products. It is intuitive, then, to assume that agencies with high visibility may be perceived as reputable (at least most of the time), and that reputable agencies may also be perceived as more effective than less reputable agencies.

A third factor is organizational capacity, which Carpenter and Krause (2012) and Lange et al. (2011) indicate is a key factor in establishing and maintaining reputation. Both organizations enjoy stable funding streams, maintain robust LNO/TLO networks, employ skilled and well-trained analysts, and enjoy positive working relationships with federal agencies (by
their own accounts). Both fusion centers are situated in major metropolitan areas that ensure a demand for their intelligence and information sharing capabilities, and both organizations are well equipped to continue to enhance their perception based reputations.

Based on observation of the WRTAC and NCRIC, one indicator of organizational capacity may be the presence of interns. Interns are able to relieve workload on the analysts, and also serve as a talent pipeline for the organizations. Both the WRTAC and NCRIC have robust intern programs in place and are leveraging these interns to support operations. The ability to defer certain administrative or basic analytical and research tasks to interns frees analysts to do more high-level analysis that can in turn strengthen the product line and enhance other services to stakeholders. Although the impact of the interns was not measured, simply having the ability to recruit and manage interns indicates a level of organizational capacity that other fusion centers may lack.

Other indicators of capacity may be the number of personnel the fusion center is able to hire and retain, the level of analysts’ security clearances, especially Top Secret or higher level security clearances that typically demand higher salaries, the size and usability of the facilities and operational areas, the presence of a secure room for handling classified information, access to federal agency information databases, and tools for processing information. In addition the level and amount of training analysts receive, the fusion center’s operating hours, the number of RFIs processed per month, and the number of TLOs may also be other indicators of organizational capacity that are linked to desired outcomes.

Without being prodded to do so, the WRTAC and NCRIC directors referred to the importance and necessity of sustaining their positive reputations. It appeared from conversations with both directors that a fusion center’s positive reputation is a conduit for acquiring additional
resources, which in turn enhances capacity and then reputation even further. Provan et al. (2009) have presented ways that an organization’s positive reputation can encourage others to interact and engage that organization, making effective organizations, or at least those with the capacity to leverage their positive reputations, better equipped to build and attract additional resources. For example, the NCRIC is often chosen to test or implement new tools or capabilities, which ultimately bring additional resources into the fusion center. The WRTAC director has also attributed growth in stakeholders and partner agencies to the organization’s positive reputation.

3.4.2 Analysts’ Attributes and Characteristics

Conversations with WRTAC and NCRIC fusion center analysts revealed several consistent factors about their attributes and roles. First, analysts in both fusion centers have and maintain subject matter expertise in specialized areas (such as counterterrorism, critical infrastructure, or drug trafficking), and are often asked to rapidly acquire and apply knowledge to meet stakeholder needs. Second, analysts at both fusion centers are highly skilled in specific areas, such as the ability to speak foreign languages, leverage statistical packages to analyze data, conduct rigorous analysis, or build relationships with stakeholders and partner agencies. Third, the analysts were well trained and equipped to perform their duties. The analysts I observed also demonstrated certain analytical tendencies and traits.

To better understand the intangibles that distinguish the highest performers, I asked several analysts from the WRTAC and NCRIC to define what it takes for someone to excel in the fusion center environment. According to one WRTAC analyst:
“It takes a special individual to work in a fusion center, and they have to believe in the mission. It is hard to get that because people are dealing with different agencies that don’t always have the same mission…. You can also train and teach good analysts, but they have to want to move forward.”

At the NCRIC, managers are attentive to hiring and retaining individuals who are able to think analytically. According to one NCRIC analyst supervisor:

“In a fusion center, analysts have to be able to learn and understand the intelligence community at both the federal level and the local level. They need to have flexibility, but with the ability to specialize. There’s some creativity involved here. Analysts approach data a certain way. Analysts ask questions when they see data. They want to know where it comes from, what it is saying, and what it tells them. They don’t just take it as gospel because it’s got an intelligence agency logo on the top. They have to be able to be aggressive, and have to be proactive, and can’t wait for the data to fall in their lap.”

Although these traits are difficult to quantify, the WRTAC and NCRIC directors and analyst supervisors are attentive to the abilities of applicants to fit into the environment. Of note, although experience is highly valued, “experience isn’t everything,” according to an analyst supervisor at the NCRIC. “(Experience) can help, but it can also prevent analysts from being effective if they are too entrenched in a way of thinking. The analytic nature, and wanting to understand things and be inquisitive is something you can’t train.” Even though these traits are
difficult to define and quantify, it is possible to identify the presence of certain traits consistent among analysts in effective organizations.

Another important finding relates to training. Both WRTAC and NCRIC analysts are well-trained, meaning they have received instruction on producing intelligence products, intelligence and information sharing procedures, as well as other specific training and skills development related to their roles and responsibilities. Simply having this training, however, is not as important as being able to apply it. According to a NCRIC analyst supervisor, “training matters, but it’s good to have it spread out over time.” The time dimension ensures analysts are able to leverage their experience and properly apply new skills acquired through training.

Although the WRTAC and NCRIC are structured very differently, both organizations have analysts that share similar roles and responsibilities. For example, in both organizations, analysts’ duties were centered primarily on meeting the needs of stakeholders in their AORs. This includes support for the parent agency and primary stakeholders, assisting ongoing criminal investigations and conducting routine criminal background checks, or physically staffing an EOC during an incident.

Finally, fusion center analysts are trained to develop intelligence and information products that can be understood by state and local stakeholders. This is an important distinction between fusion centers and the formal IC, which is generally developing intelligence for a different audience. While fusion center analysts need to be able to produce clear, concise, analytical products, the level of expectations for what these products contain and how they are presented must be evaluated within the fusion center’s operational contexts and stakeholder needs.
3.4.3 Stakeholders and Relationships

As presented in Chapter 2, ties are the relationships that connect people and organizations, and without ties linking these actors, the network could not exist (Borgatti and Foster 2003). At the WRTAC and the NCRIC, directors, supervisors and analysts maintain relationships with personnel from partner agencies, other fusion centers, and the federal government. These relationships are critical to fusion center operations—without them fusion centers would be unable to gather, analyze, and disseminate intelligence and information in an efficient manner. Within both organizations, personnel maintained ties or relationships that fell into eight generalized categories (see Table 3.1).

Table 3.1 Categories of Relationships Maintained by Analysts at the WRTAC and NCRIC

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the Fusion Center</td>
<td>Ties confined to the fusion center in which the analyst is employed</td>
</tr>
<tr>
<td>Other Fusion Center(s)</td>
<td>Other fusion centers in neighboring jurisdictions, the region, or across the network</td>
</tr>
<tr>
<td>DHS</td>
<td>DHS liaisons</td>
</tr>
<tr>
<td>FBI</td>
<td>FBI field agents/officers</td>
</tr>
<tr>
<td>Other Intelligence Community</td>
<td>Federal personnel assigned to the fusion center not employed by DHS or FBI that represent Federal agencies</td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>Members of state and local law enforcement agencies (non-Federal)</td>
</tr>
<tr>
<td>Non-Law Enforcement</td>
<td>Emergency management, first responders, etc.</td>
</tr>
<tr>
<td>Private Sector</td>
<td>Vetted private sector entities, including utilities, venues, and major industries</td>
</tr>
</tbody>
</table>

Establishing and maintaining relationships is the work of stakeholder engagement that fusion center directors and analysts are continually engaged in. This includes the relationships within the fusion center, which may include law enforcement and non-law enforcement public
sector partners, or the private sector. Although the directors are often very visible and engaged with stakeholders, analysts are key to building and maintaining stakeholder relationships because they conduct the majority of regular interaction with stakeholders at the ground level.

The WRTAC and NCRIC analysts approached this in slightly different ways, even though they shared similar stakeholders (ranging from law enforcement agencies to the private sector). At the WRTAC, analysts maintain a direct level of interaction with their liaisons and stakeholders. Although some analysts spend more time in the field than others (no clear pattern emerged), analysts are actively engaged with stakeholders at a variety of levels, from giving briefings on threats or trends to training police officers. During my limited time at the WRTAC, it was not uncommon to see analysts and LNOs engaged directly in person to person conversation in the operations area.

At the NCRIC, the level of stakeholder engagement maintained by analysts is determined by their position and placement in the tactical or strategic branches to which they are assigned. For example, the NCRIC has dedicated personnel who specialize in stakeholder engagement and TLO training. It would not be accurate to portray the other intelligence analysts as somehow cut off from stakeholders—this is certainly not the case—but the NCRIC’s organizational structure and larger team enables some analysts to focus on specific analytical duties whereas others can more narrowly focus on building and maintaining relationships between the organization and stakeholders.

This is perhaps one way that organizational capacity may interact with network ties to influence how organizations reach an observed outcome. In this case, both organizations are perceived as effective and reputable, but take two separate paths to achieve that outcome—a concept known as equifinality by researchers interested in combinations of conditions that lead
to observed outcomes (for a more in-depth discussion of equifinality, see Chapter 5). The important takeaway from the case studies is that both fusion centers prioritize stakeholder engagement, but approach and manage it differently. The similarities lie in the recognition of the importance of stakeholder engagement, while the variation appears to be tied to organizational capacity in some way.

Although the case studies did not lead to mapping relationships, or measuring their strength, the findings do establish that interpersonal ties within the jurisdiction and across the fusion center network are highly valued at both the organizational and analyst levels. The fusion centers I visited were also keenly aware of the need for feedback loops with stakeholders, and indicated a commitment to continuous improvement that reflected stakeholder needs. At the WRTAC and NCRIC, feedback loops were maintained either through surveys or informal requests to stakeholders.

The significance of interpersonal relationships extends beyond stakeholder engagement within a jurisdiction or AOR, however, and can include linkages with other fusion centers. At the WRTAC, for example, relationships are maintained with four other fusion centers in the immediate region that depend on each other for situational awareness, and to navigate the complexities of jurisdictional proximity. At the NCRIC, analysts maintained relationships and connections with other fusion centers in the State of California, and on an as-needed basis with fusion centers throughout the network.

The three categories of federal connections in Table 3.1 are distinct from the way other relationships are maintained, and in the way they provide tangible benefits to the fusion centers. DHS personnel assigned to fusion centers are known as Intelligence Officers (IOs). These IOs, as well as representatives from other federal agencies, are critically important to the network and
serve as network facilitators (Antoldi et al. 2011). DHS IOs in particular may be assigned on a shared or full-time basis, but maintain an important physical presence. While the IOs do not provide actual analytic support to the fusion centers, the primary purpose of the IO is to connect fusion centers with DHS resources, as well as other members of the IC in some cases.

The relationships with DHS IOs, as well as regional IOs, are highly valued by fusion centers. For the WRTAC in particular, the DHS IO assigned to the fusion center has repeatedly facilitated the development of interpersonal and inter-organizational linkages between WRTAC analysts and DHS to share information or coordinate activities. There was also at least some evidence at the WRTAC and NCRIC to indicate regional linkages have also been facilitated by the IOs.

Another network facilitator for the WRTAC and the NCRIC is the FBI. The NCRIC has established a legacy of positive partnership with the FBI, and its analysts share physical space with FBI personnel. According to NCRIC personnel, this physical proximity and working relationship facilitates information sharing. Although the WRTAC does not share the same level of interaction and physical proximity, two WRTAC employees are former FBI employees, and an FBI liaison maintains a part-time presence at the fusion center.

Both the WRTAC and NCRIC also maintain important relationships with other parts of the intelligence community, but the nature and type of relationship hinges largely on the dynamics of the jurisdiction. In the District, the WRTAC shares close proximity with members of the formal intelligence community and has invested in building relationships with these agencies. The NCRIC also benefits from relationships established through the HIDTA, and is an important partner for federal agencies due to its geographic location and presence in a major port city.
Despite the importance of relationships with federal agencies, it is the relationship between fusion centers and their primary stakeholders that are the most critical to outcomes. When asked, both the WRTAC and NCRIC fusion center directors indicated that their primary responsibility was to their parent agency or agencies, followed by the stakeholders within their areas of responsibility, and then to federal agency partners. Without strong relationships to key stakeholders within their jurisdictions, it is likely to be challenging for even the most reputable fusion centers to maintain that position in the eyes of intelligence and information sharing partners.

3.5 Building the Conceptual Framework

Observations of the WRTAC and NCRIC provide the building blocks for a conceptual framework to guide research on a larger sample of the national network of fusion centers. The following section connects the case study observations with the scholarly literature presented in Chapter 2, and proposes a conceptual framework that suggests fusion center effectiveness and reputation outcomes are the result of configurations of conditions from the organizational, individual-participant, and network levels of analysis.

3.5.1 The Dependent Variable: Effectiveness

Although network effectiveness is difficult to conceptualize and measure (Provan and Milward 2001), it is important for public sector organizations to demonstrate performance and maintain accountability (Popp et al. 2014). Output-based metrics are commonly used to indicate success or failure, but output based metrics often conflict with the measurement of outcomes like effectiveness (Provan and Kenis 2008; Propper and Wilson 2003; Van Theil and Leeuw 2002).
An alternative is to evaluate organizational effectiveness as defined by stakeholder perception (Provan and Kenis 2008). This defines effectiveness to whom, not to what. The conceptual framework proposed in this dissertation constructs effectiveness as stakeholder perceptions of intelligence and information sharing activities and products.

The WRTAC and NCRIC are perceived to be effective by network stakeholders (both fusion center personnel and subject matter experts) because they have demonstrated the ability, over time, to produce and share high quality products with their stakeholders. Based on my observations of both fusion centers, the effectiveness of intelligence and information sharing and products can be captured through stakeholder evaluation of three dimensions: accuracy, consistency, and relevance.

Even in the most basic sense, intelligence products or information about potentially serious threats must be accurate; if they are not, it could result in wasted resources, a damaged reputation, or even a serious criminal or terrorist incident. When information is not relevant, it wastes critical resources and reflects poorly on the organization. Finally, consistency is an important indicator because it signifies the ability to sustain high quality product development, which reflects positively on the organization. By gathering data on how stakeholders perceive these three dimensions of an organization’s activities and products, it is possible to construct a dependent variable for organizational effectiveness in a sample of the network.

Some scholars have also used organizational reputation as a proxy for effectiveness (Provan et al. 2009). A fusion center’s reputation is defined in this dissertation as the perception, either positive or negative, of what the organization is capable of doing or producing among a defined group of stakeholders. For example, stakeholders can assign a positive reputation to an organization by suggesting that researchers look to that organization for best practices, or by
identifying the organization as one they admire. Conversely, fusion centers with negative reputations are those whom stakeholders are least likely to recommend or name as exemplary organizations, or those in which they place the least confidence.

The WRTAC and NCRIC were recommended by subject matter experts and individuals from other fusion centers because they have excellent reputations. In this dissertation, reputation will be used as a validating mechanism for effectiveness. By gathering stakeholder perceptions of effectiveness, and then validating those findings by also measuring reputation, it is possible to learn more about both concepts within the context of the national network.

3.5.2 Organizational Level
To produce accurate, relevant, and consistent intelligence and information sharing products, fusion centers need organizational capacity. These same organizational variables are commonly considered in both the organizational and network literatures (see for example Rainey 1997; Provan and Milward 2001; Popp et al. 2014), including financial and personnel resources, interns, geographic features, known threats and hazards, and the size of the fusion center’s jurisdiction, among others. It is intuitive to assume that a fusion center with ample resources, physical proximity to stakeholders and key partners, a large and well-trained staff, and an established presence in the network will likely produce better products than a fusion center lacking these same attributes, based solely on observation of the WRTAC and NCRIC.

Whether or not an organization is perceived as effective may indirectly result from a combination of these various organizational capacity factors (Carpenter and Krause 2012; Provan and Huang 2009). The case study observations do indicate that organizational variables play an important role in influencing how organizational outcomes are achieved and perceived,
and that greater capacity may enable analysts to perform better analysis or maintain a greater number of relationships.

Of course, without empirical analysis it is impossible to know for certain whether these variables do indeed influence organizational level outcomes. In the conceptual framework, organizational variables are considered in combination with (and not simply in addition to) individual analyst and network relationship variables.

3.5.3 Analyst Level
Although directors, supervisors, analysts, and liaisons all serve as critical human links in and among fusion centers, the primary concern of this dissertation is the analyst. Analysts perform the basic functions of the organization that are most closely associated with reputation and effectiveness outcomes. In order to better understand the impact analysts have on organizational level outcomes, it is necessary to first capture and examine their characteristics and incorporate the analyst level into the conceptual framework.

In the network literature, single actor characteristics are only broadly defined, and categorization of these characteristics varies based upon the interests of the researcher (Wasserman and Faust 1994). To deal with the complexity and variety of human and organizational attributes, researchers generally construct categories of characteristics and behavior in network settings that fit into three categories: demographic, task-related, and organizational characteristics. Demographics capture the age, sex, race, or other unique characteristics of the individual(s) under study. Organizational variables typically have more to do with an individual actor’s centrality, or how he or she might interact with network structures,
technologies, or other actors. In this dissertation I will focus mainly on task-related characteristics.

In a fusion center, analysts have a variety of skills, training, experience, and backgrounds that were perceived to contribute to the individual analysts’ ability to perform their duties at the WRTAC and NCRIC. These task level characteristics are derived from the literature on single-mode networks (Wasserman and Faust 1994), and are informed by observations of important analyst characteristics that emerged from the case studies. The characteristics can be separated into five distinct categories (see Table 3.2).

**Table 3.2 Description of the Relevant Task-Related Actor Characteristics**

<table>
<thead>
<tr>
<th>Actor Characteristics</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>Type or purpose of training</td>
</tr>
<tr>
<td>Role</td>
<td>Full-time, Part-time, Civilian, Contractor, Sworn</td>
</tr>
<tr>
<td>Stability</td>
<td>Time-in-position, Movement between organizations</td>
</tr>
<tr>
<td>Skills</td>
<td>Analysis, Technology, Communication, etc.</td>
</tr>
<tr>
<td>Background</td>
<td>Military, Law Enforcement, Emergency Management, Intelligence Community, etc.</td>
</tr>
</tbody>
</table>

First, fusion center analysts are able to take advantage of training opportunities that develop expertise and specialization in information sharing and data analysis. For example, as of 2011, 100 percent of fusion center analysts had been trained to access criminal intelligence databases, and nearly 85 percent of fusion centers had participated in training exercises (National Fusion Center Assessment, 2012). As the network continues to mature, intelligence officials have identified the continued need for additional training as a priority for overall capability development across the network (DHS National Fusion Center Assessment, 2012). It should be noted that the WRTAC and NCRIC analysts encountered during the case study research appeared to be well-trained.
The second characteristic is the analysts’ role within the fusion center. Roles are
determined by official titles, job descriptions, and the responsibilities analysts have for day-to-
day operations. For example, fusion center guidelines outline key processes that fusion centers
must be able to execute, including: planning and requirements development, information
gathering/collection and recognition, processing and collation of information, intelligence
analysis and production, intelligence/information dissemination, and re-evaluation. The tasks
associated with these processes fall to the analysts. Within a fusion center, analysts are evaluated
on their ability to execute these tasks.

A third characteristic is analysts’ stability, meaning the amount of time that an analyst
spends at a single fusion center, and in a single position. It is likely that some analysts relocate
from one fusion center to another, to other law enforcement agencies, or that they may move in
or out of various roles within the same organization. Likewise, analysts that remain in place may
forge stronger relationships and build trust with stakeholders over time. Alternately, analysts
may bring best practices with them from one fusion center to the next, or bring ineffective
practices or approaches that hinder productivity.

The fourth characteristic includes the skills and abilities of individual analysts. Analyst
skills include things like analytical capabilities, familiarity with databases used by law
enforcement and the intelligence community, or the ability to communicate using a variety of
technologies. At both the WRTAC and NCRIC, analysts were known by their respective skillsets
and abilities. For example, at the WRTAC, one analyst was introduced as an expert in
cybersecurity, another by foreign language proficiency, and still another by advanced skills in
statistical and trend analysis. Skills are not only applied to develop intelligence and information
products, but may also be used by an organization’s leadership and personnel as evidence of capabilities, therefore building or enhancing the organization’s reputation within the network.

The fifth and final category consists of the background and experiences analysts draw from to execute their tasks. Background characteristics include prior experience, such as military service, time in law enforcement, emergency management, or work in the intelligence community. An analyst’s background is likely to shape his or her worldview, and therefore his or her approach to analyzing intelligence and information, as well as the presentation of threats, risks, or intelligence and information sharing products to stakeholders.

These categories capture the individual and task-related characteristics of fusion center analysts over a brief period at the WRTAC and NCRIC. The inter-organizational network literature has established the individual-participant as an important level of analysis in network research (see Popp et al. 2014), but attention to actor-level characteristics in the conceptual framework proposed by this dissertation will treat individual actor characteristics as more than simply the “residues of social structure” (Kilduff and Brass 2010, p. 332). By examining these characteristics alongside other levels of analysis, this dissertation will try to illuminate the significance of individual actor characteristics as influencing organizational level outcomes in whole network settings.

3.5.4 Network Level

In this dissertation, the network level is constructed as the relationships that link people and organizations (Borgatti and Foster 2003). At the WRTAC and NCRIC, analysts rely on relationships with individuals in their fusion center, analysts in other fusion centers, liaisons from partner organizations, and stakeholders within their AORs to execute their tasks and fulfill
their roles and responsibilities. The analysts at the WRTAC and NCRIC emphasized that all relationships are critical to the functions of product development and information sharing.

The network analysis literature has found that individual actors (analysts in the fusion center context) participate in social systems that connect them with other actors (Knoke and Yang 2008). This structural-relational emphasis rests on three assumptions (Knoke and Yang 2008). First, structural relations are important for understanding human behaviors. Second, social networks affect perceptions, beliefs, and actions through a variety of structural mechanisms that are socially constructed. Third, structural relations should be observed as dynamic processes because networks are continually changing through interactions among their constituent groups. In this dissertation, the relational aspects of human behavior, namely the importance of strong relationships between analysts and other actors, are viewed as key to outcomes.

According to Knoke and Yang (2008) “relations reflect emergent dimensions of complex social systems that cannot be captured by simply summing or averaging its members’ attributes. Structural relations can influence both individual behaviors and systematic performances in ways not reducible to actor characteristics” (p. 7-8). Therefore, network analysis offers great value when it is able to deconstruct the dimensions of various attributes of actors to determine the makeup and importance of observed relationships, and also understand how these dimensions interact with each other.

Network relationships can be constructed or measured by researchers in several ways. However, it is important that the construction is relevant within the context of the case or cases one is observing. The social network literature provides an appropriate distinction between two categories of interpersonal relational ties: state- and event-type ties (Borgatti and Halgin 2011). State-type ties are formed through friendship, affection, role based relationships, or cognitive
relations and can be dimensionalized by strength, intensity, or duration (Borgatti and Halgin 2011) (see Table 3.3). Event-type ties, on the other hand, have a “discrete and transitory nature” and consist of “e-mail exchanges, phone conversations, and transactions….” that are dimensionalized in terms of frequency of occurrence (Borgatti and Halgin 2011, p. 1170-1171). Both types of relationships were observed at the WRTAC and NCRIC, but an examination of state type ties offers deeper insights into outcomes due to the relationship aspect of these ties.

Table 3.3 State and Event Type Ties and Related Dimensions

<table>
<thead>
<tr>
<th>Relational Characteristics</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Type Ties</td>
<td>Strength, Intensity, Duration</td>
</tr>
<tr>
<td>Event Type Ties</td>
<td>Frequency</td>
</tr>
</tbody>
</table>

In Table 3.1, the categories of relationships maintained by analysts in the WRTAC and NCRIC were divided by the descriptions or organizations with which a fusion center analyst might interact. These included relationships within the fusion center, with other fusion centers, with federal government agencies, and with non-federal partners that are more likely to occupy the AOR. Therefore, the conceptual framework will define the network level variable as the strength of the bi-lateral dyadic ties between analysts and each of the communities identified in Table 3.1.

The strength of these relationships will be measured by determining the presence or absence of multiplexity (Isett and Provan 2005; Popp et al. 2014). Multiplexity is generally defined as multiple ties between nodes of a network, such that if one tie were broken, others would still link those nodes together (Kilduff and Brass 2010). This concept is central to the conceptual framework’s treatment of relationships because it is not known whether fusion center analysts with multiplex ties are more commonly occurring in fusion centers that demonstrate effectiveness as opposed to analysts in ineffective fusion centers.
3.5.5 The Framework

Kilduff and Brass (2010) argue “the organizational network research program progresses as attributes are combined with relationships to understand organizations,” (p. 321). The conceptual framework proposed in this dissertation (see Figure 3.1) tries to connect the various levels identified and observed through the case studies to explain how fusion centers arrive at effective outcomes.

The proposed framework suggests that a fusion center’s stakeholders’ perceptions of the organization and its effectiveness are based on what stakeholders can see, which is the ability to share intelligence and information. The ability to produce high quality products and disseminate them hinges on the configurations of conditions across individual (actor characteristics), organizational (organizational capacity), and network (actor relationships) levels of analysis.

Figure 3.1 Conceptual Framework for Organizational Level Effectiveness

Within this conceptual framework, the unit of analysis is the organization. The relationships between analysts and organizations are what constitute the actual sharing of information in the fusion center network and are critical to understanding why outcomes vary across organizations within a whole network (Knoke and Yang 2008; see also Kilduff and Brass
2010; Borgatti, Mehra, Brass, and Labianca 2009). Instead of conceptualizing the impact of network effectiveness on outcomes at other levels (see Popp et al. 2014), this framework examines how the multiple levels of the national network of fusion centers interact to shape the organization’s ability to conduct information sharing—the activity by which stakeholder perceptions are formed and crystallized.

Notably, reputation is concealed within dotted lines because the precise relationship between reputation, effectiveness, and the other variables is unknown. This conceptualization also borrows from other network research that has applied reputation as a proxy for effectiveness (Provan et al. 2009). It is intuitive that a fusion center’s reputation will determine, at least in part, whether it is able to forge relationships that might make it more effective (Ebbers and Wijnberg 2010). Reputation may also be critical for public organizations that depend on legislation for funding and other resources (Carpenter and Krause 2012).

Both the WRTAC and the NCRIC are considered reputable by stakeholders and subject matter experts. What is less clear, however, is whether a positive organizational reputation is an antecedent to effectiveness. Can an organization in a whole network be reputable without being effective, or effective without being reputable? In addition, how might perceptions of effectiveness relate to perceptions of reputation, or vice versa? For example, according to the WRTAC’s director the organization was largely viewed as ineffective prior to 2013. A change in leadership and organizational structure led to the forging of new relationships with partner agencies. By taking action and demonstrating the ability to perform essential tasks within the jurisdiction, the WRTAC was able to forge a positive reputation in a short amount of time.

Is the WRTAC’s experience unique? The answer is unclear. Although the conceptual framework includes reputation, these questions can only be answered by empirical analysis of
stakeholder perceptions and organizational outcomes across a sample of the larger national network.
CHAPTER 4: RESEARCH METHODOLOGY

4.1 Data Collection

Data collection spanned from March to July 2014 and involved visits to two fusion centers, the
distribution and collection of six online questionnaires, and interviews with fusion center
personnel and subject matter experts. The data collection process was aided by the National
Fusion Center Association (NFCA), which made introductions and provided contact information
for members of the fusion center community.

The collection of fusion center data was preceded by open source research, as well as
informal conversations with subject matter experts in law enforcement and domestic intelligence.
I also spoke with congressional staffers, federal government officials, academics, subject matter
experts from research institutions and public policy think tanks, lobbyists, government
contractors and consultants, and representatives of member associations, and visited the WRTAC
and NCRIC during the May-July 2014 timeframe (see Chapter 3).

In addition, I invited subject matter experts as well as current and former fusion center
analysts and directors to provide insights on the appropriateness of the overall research design, as
well as the questionnaires. Together these individuals formed an informal test group that
provided key insights through the research design and execution.

I also attended the November 2013 National Fusion Center Conference held in
Alexandria, Virginia, and talked with analysts and directors to gain additional insight and frame
the network context. Over a period of three days I attended seminars on various topics ranging
from critical infrastructure protection to suspicious activity reporting. Equipped with this
information, I began to design the research approach.
4.1.1 Constructing the Sample

Early in the research process I elected to build a representative sample of the national network. There were several reasons for this. First, the network consists of 78 independent organizations with no central coordinating body, and I did not have the resources to conduct research on all 78 fusion centers. Second, because these organizations are independent, it was anticipated that some of the organizations would not be willing to participate. Finally, the time and availability of the individuals who would participate in the research was limited, and a smaller sample provided a greater degree of flexibility. By creating a smaller sample, I could mitigate these factors and focus more intently on a smaller number of cases.

The research sample was constructed after careful consideration of three factors. First, the sample needed to include fusion centers that spanned the range of possible effectiveness and reputation outcomes. Because public sector organizations are unlikely to self-identify as ineffective, a cursory analysis of the network and open-source materials was used to determine—in a very general sense, and based largely on reputation as conveyed through media reports, conversations with subject matter experts, and fusion center personnel—likely variation among network member organizations across the entire national network.

Second, the sample needed to include fusion centers from states and regions that represent variation in population size, annual budget expenditures for critical categories such as public safety, and geographic features or contexts such as border areas, coastal areas with major ports, or less developed and rural areas. For example, a state fusion center is likely to have a different set of priorities and capabilities than an urban area fusion center. This variety was important to capture because the network is made up of diverse organizations.
Finally, it was important for the sample to represent a range in the maturity of fusion centers as defined by time in operation. I wanted to ensure that the sample included well-established fusion centers along with fusion centers that have been in operation for shorter periods of time, or that have undergone major re-organizations since their creation.

Based on these three criteria, I was able to winnow the national network of 78 federally recognized fusion centers down to a representative sample of 18 fusion centers spread across three geographic regions. These regions span coast to coast and encompass 14 states. Two of these states have multiple fusion centers. Five of these 18 are urban area fusion centers, and the remaining 13 are maintained by state-level homeland security or law enforcement agencies.

The sample also contained one of the oldest and one of the newest fusion centers, a wide range in variation across variable categories (state level funding, time in operation, population, personnel, etc.) and anticipated outcomes. Some of these fusion centers are parented by large state level law enforcement agencies whereas major urban area police departments parent others. Some are all-crimes and all-hazards centers, meaning they are likely to address a variety of threats posed by criminal activity including terrorism, as well as natural disasters or other types of incidents and even pre-planned events. Other fusion centers are more focused solely on all-crimes, depending on the needs of the jurisdiction or AOR.

Although the sample only represents about a quarter of the national network, it does provide enough variation in key areas and similarity in others to represent the larger network. For example, in terms of time in operation, staff size, state level public safety and law enforcement expenditures, threat picture, and state population, the sample is similar to the rest of the nation. This was confirmed by conversations with members of the test group.

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4 These parent organizations are simply the host agencies, and usually provide operations space and funding, among other resources. They are called parent organizations in this dissertation because these agencies, in nearly every case in the sample, established and continue to maintain the fusion centers in the sample.
4.1.2 Recruitment and Participation

After selecting the sample, I created a contact spreadsheet to track interactions with directors or supervisors from each of the fusion centers. Approval for conducting the research and contacting participants was received from the Virginia Tech IRB in December 2013. In April 2014, I began to contact fusion center directors with an initial email introducing myself, the research, the support from the NFCA, along with a request for their participation. These contact materials were approved by the IRB prior to dissemination.

The majority of directors and supervisors responded to the first contact. For those that did not, I made three follow-ups via email. If no email reply was received, I conducted a web search for phone numbers or contacted the fusion center operations desk to make initial contact. I was able to make some level of contact with all 18 centers. In total, 14 of the 18 fusion centers agreed to participate in all of the questionnaires and interviews; however, only 11 fusion centers completed the questionnaires and interviews by the self-imposed July 14, 2014 deadline.\textsuperscript{5} This deadline was set to give respondents some sense of when the research would conclude, and to allow for scheduling a window of time to analyze the data.

The final sample, however, still offered sufficient variation and represented a wide range of organizational and jurisdictional characteristics. The final sample of participating fusion centers were located geographically from the east coast to the west coast of the United States, and included states with multiple fusion centers, states with only one fusion center, Border States, coastal states, as well as variation in state and local resources.

In addition to the 18 fusion centers, I also recruited external and internal stakeholders to respond to brief questionnaires that gathered effectiveness and reputation data for each fusion center.

\footnote{Non-response bias for the fusion centers in the sample was avoided due to the similarities in outcomes (based on the effectiveness and reputation data) for participating and non-participating fusion centers.}
center in the sample (see Table 4.1). External stakeholders are defined as individuals who are employed by some organization other than a fusion center, but who have more than a notional concept of fusion centers and their operations from previous experience or subject matter expertise. Internal stakeholders are those individuals employed by one of the 18 fusion centers in the sample, and for this research included directors or supervisors and analysts.

<table>
<thead>
<tr>
<th>Category</th>
<th>Recruitment</th>
<th>Final N Participants</th>
<th>Approximate Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Stakeholders</td>
<td>75+</td>
<td>19</td>
<td>25%</td>
</tr>
<tr>
<td>Internal Stakeholders</td>
<td>60-70</td>
<td>24</td>
<td>37%</td>
</tr>
</tbody>
</table>

In order to be included in the external stakeholder group, individuals also had to demonstrate (in terms of their backgrounds) an ability to distinguish between fusion centers in the sample. These stakeholders included current and former congressional staff, current or retired federal, state, and local intelligence, law enforcement, and emergency management officials, academic researchers and instructors, as well as representatives of member associations. In addition, current fusion center directors and employees who worked for fusion centers external to the sample completed the same questionnaire. I recruited over 75 individuals to the external stakeholder category, and a total of 19 participated. Because the recruitment method involved sharing invitations with subject matter experts, many of whom recommended or invited other subject matter experts to participate, it is difficult to arrive at an exact estimate of the number of individuals who were recruited.

Internal stakeholders were defined as individuals employed by the parent agency of one of the 18 fusion centers, and serving as full- or part-time staff at the time of their participation. In total, I recruited over 60 individuals who met these criteria. The recruitment of analysts in each participating fusion center was aided by a director or supervisor. For some fusion centers, the
director is the overseer of operations but has very little control or supervisory authority over the personnel in the organization. For example, a fusion center might be home to over 50 analysts, but the fusion center director may only have authority over 10 or 15 of those analysts. The other analysts may be liaisons from other agencies, or be shared by multiple agencies, and not willing to participate in the research without approval from an entirely different chain of command.

Rather than sorting through this on a case-by-case basis, I emphasized that all participation must be voluntary, and that a director or supervisor could determine the appropriate distribution of information and materials about the research within the fusion center. Directors were asked to invite only analysts or analyst supervisors employed by the fusion center’s parent agency to participate in the questionnaire and interview process. This excluded federal employees and liaisons. However, no exclusions were made for contractors who were full-time and working on behalf of the fusion center.

4.1.3 Interviews
I conducted semi-structured interviews with practitioners, experts, and congressional staffers to establish context and provide important background information. I alone handled, stored, and transcribed the interviews. No attempt was made to code or otherwise analyze the interview transcripts. All interviews were conducted with a single participant except when conducted in person inside the WRTAC and NCRIC. All interviews complied with IRB protocols and used pre-approved interview questions to begin each interview.

Prior to each interview, potential participants were contacted via email or with a phone call to determine their willingness to participate. The initial contact was followed by an email containing the IRB consent form and instructions to review the consent form. This was followed
by setting the date and time for the interview. The majority of interviews were conducted over the phone, and verbal confirmation was provided at the beginning of each conversation that the participant had read and agreed to the IRB consent form. At the beginning of in-person interviews, participants were presented with hard copies of the IRB consent form and given the opportunity to review them before consenting to the interview.

The interviews started with a standard question template that had been approved by the IRB. However, interview conversations generally branched out from the common questions to related topics and subject matter that was deemed important by either the interviewer or interviewee. In some cases, analysts provided valuable organizational data that supplemented the dataset, which was recorded and then later added to the dataset.

Interviews generally lasted between 15 and 25 minutes, depending on the availability of the interview subject. In general, phone interviews with directors and analysts from within the sample were more time limited than interviews with subject matter experts outside the sample. This was due to the time constraints of conducting interviews within business hours for fusion center personnel. In-person interviews typically lasted much longer, however, as analysts had been asked to set aside at least an hour in their schedules.

Approximately 40 potential interviewees were invited to participate. Of this total, 32 participated in formal interviews between February and July 2014. The interviews with analysts were helpful in understanding the complexities of the network from the analysts’ perspective. The interviews also provided data on important aspects of the participating fusion centers and personnel that were not captured in the questionnaires.
4.1.4 The Questionnaires

The questionnaires were developed in an online format for ease of distribution across the sample. After conducting research on available survey tools, I selected the Qualtrics software and web-based platform. Virginia Tech has a student license for use by registered students that enabled me to access all of the features for questionnaire development and distribution.

I created original questions and response formats for each questionnaire. The questions were informed by inputs and reviews from the test group, and by the dissertation committee. All of the questions were submitted to the IRB for review and approval prior to dissemination of the questionnaires to the sample of participants. Additionally, directors were asked to distribute the questionnaires to their analysts and were instructed that all participation must be voluntary. Consent forms were distributed with the surveys, and respondents had to verify they had reviewed the consent form as the first response in each questionnaire.

The first two questionnaires were designed to gather effectiveness and reputation data for all 18 fusion centers in the sample, and were distributed to the external and internal stakeholder groups. The external stakeholder questionnaire asked nine questions related to products and services. The internal stakeholders were asked to respond to an additional five questions. The additional questions posed to internal stakeholders provided insights into how fusion center personnel compared and contrasted their own organization with other fusion centers in the sample. However, both questionnaires shared the same questions regarding fusion center intelligence and information sharing products and services. For the questions and layout of each questionnaire, see Appendix A.

The remaining four questionnaires captured data on the fusion centers as organizations, as well as various aspects of the individual analysts, such as their backgrounds, their skills and
abilities, their relationships, and their roles and responsibilities in the fusion center. The first of these questionnaires was completed by a fusion center director, operations manager, or analyst supervisor from each of the 11 participating fusion centers. The questionnaire consisted of 18 questions (excluding those asking for personally identifying information) related to the organization and its capacity. All respondents were asked to complete and return the questionnaire within 10 business days, but were given flexibility due to time constraints and other obligations.

The three remaining questionnaires gathered data on analysts’ characteristics and their relationships. The first questionnaire (Analyst I) asked respondents to provide information that captured the data on individual characteristics of interest to this research. These included information about analysts’ professional backgrounds, such as their past employment, training, backgrounds, security clearances, and how long they had held their respective positions. The questionnaire also provided analysts with short answer questions intended to capture additional context and supporting information, for a total of 17 questions.

The second questionnaire (Analyst II) transitioned into areas related to the respondent’s ties within their own fusion centers, other fusion centers, and those external to the network. This was captured in a response matrix in the Qualtrics tool, and repeated for nine types of ties—the same nine types presented in Table 3.1 in Chapter 3. The purpose of this questionnaire was to gather network level data for the purpose of establishing the presence of, and measure the strength of, tie multiplexity for analysts working in these fusion centers. Analysts were also asked to identify whether the ties were formal, informal, or professional in nature for an added dimension of the data.

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6 Sample questionnaires used to collect this type of data were provided by Dr. Robin Lemaire, and reflect common design approaches in network analyses (see Marsden 1990; and Henry, Lubell, and McCoy 2012).
The third and final questionnaire (Analyst III) focused on elements of the analysts’ daily routines as well as roles and responsibilities. This was complemented by general questions on how they felt their performance should be assessed. This questionnaire also included questions related to their positions, including their level of access to classified information, sharing portals and web-based databases, and the level of interaction they maintain with federal agencies for a total of 20 questions.

The justification for having three separate questionnaires instead of a single questionnaire was based on the expected time of completion, which was 5-7 minutes per questionnaire. The many time demands and constraints on respondents were also factored into the decision to create three separate questionnaires instead of the total 87 questions contained in a single questionnaire. Finally, I didn’t want to overwhelm respondents with a long questionnaire. These considerations led to three surveys that could be taken separately and at the most convenient times for participants.

4.1.5 Questionnaire Submissions and Data Management

After the questionnaires were submitted by the individual respondents, the data were exported into Microsoft Excel spreadsheets (one spreadsheet containing all the responses for each questionnaire). Once the data had been transferred to the spreadsheets, all personal identifying information that had been gathered from each respondent was deleted. All spreadsheets and any data from the questionnaires and interviews were stored in a password protected file. In total, 49 directors and analysts participated in the questionnaire process (see Table 4.2).

After removing personally identifying information, the questionnaire data were then aggregated to the organizational level. To do this, I grouped the characteristics of analysts from a
single fusion center together. The same process was followed for each of the external and internal stakeholder questionnaires to derive an overall effectiveness level or score for each fusion center. These spreadsheets were then saved as master files and stored in a password protected file.

<table>
<thead>
<tr>
<th>Table 4.2 Participation in Questionnaires and Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Directors</td>
</tr>
<tr>
<td>Analyst I</td>
</tr>
<tr>
<td>Analyst II</td>
</tr>
<tr>
<td>Analyst III</td>
</tr>
<tr>
<td>Interviews</td>
</tr>
</tbody>
</table>

4.1.6 Case Inclusion and Exclusion Criteria, and Limitations of the Data Collection Process

Although the sample was relatively small, I applied a general criterion for inclusion and exclusion to each case to ensure methodological rigor. In order to be included in the final sample, a fusion center had to submit the director’s questionnaire, and at least one analyst had to respond to all three analyst questionnaires. In addition, the number of respondents had to make up at least 20 percent of the fusion center’s full time staff. This would ensure that the responses were representative of the organization and its personnel. To be excluded, a fusion center needed only to fail to meet the above criteria for inclusion. By applying this criterion, one of the participating fusion centers was excluded from the final sample, leaving 10 fusion centers in the final sample.

Several limitations in the data gathered through the interviews and questionnaires emerged early in the process. First, as small-N research, there are limits resulting from few
observations and the final dataset. Every effort was made to collect more data, yet despite these efforts fewer than 70 completed questionnaires were submitted.\(^7\)

Second, there are limits to the knowledge that stakeholders and fusion center analysts and directors have about other fusion centers. The questionnaire instruments rely fully on the ability of respondents to recall the pertinent information requested. Every effort was made to ensure respondents demonstrated more than a notional knowledge of the network and its components before distributing the questionnaire instruments. There are, however, limitations to this approach in that the qualifications and abilities of respondents to provide accurate information cannot be easily validated.

Finally, two analysts from separate fusion centers reported difficulty understanding some of the questions in the questionnaires, especially the Analyst II questionnaire on network ties. Although every effort was made to ask clear, concise questions, and provide instructions in taking the questionnaires, it is impossible to ensure everyone understands the meaning or purpose of a question. In cases where a question may have been misunderstood, or where the researcher may have intended something that was not obvious to the respondents, every effort was made to clarify the discrepancy and to interpret the data accordingly. I also followed up with the two analysts who reported specific difficulties to clarify their responses.

### 4.2 Analyzing the Data

After the data were collected, an initial review was conducted to sort the information and construct the outcome and independent variables. I first examined the datasets to ensure none of

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\(^7\) Due to the limits of the recruitment process I was unable to fully control for response bias among the analysts who participated in the questionnaires. I was also unable to accurately determine the number of analysts who were invited to participate by fusion center directors or supervisors. However, follow-up interviews with each fusion center did reveal that participating analysts were representative of the core analytical team within each organization.
the fields were empty, and that at least one respondent provided information in response to all 87 questions. After this review, I found that in nearly every case, respondents provided answers to all of the questions in each completed survey.

Some of the data was excluded from the final dataset because the results were inconclusive, or too much variation existed between the short answer questions. Using the same example from above, two additional questions asked analysts about the sufficiency of their current security clearances, and their director’s clearance. These questions were only intended to provide context, and were not included in the dataset.

Several other questions were also asked for context only, and were not used to create independent variables. For example, the directors’ questionnaire asked each director or supervisor who responded to discuss the approaches he or she would take to improve federal performance assessment, along with other supporting questions about how fusion centers are currently evaluated. The answers provided no consistent values that could be converted into meaningful variables, and were instead used to provide context when analyzing the other data.

Analysts were also asked to provide information on their training. Although the purpose of this short answer question was originally intended to provide useful data on the types of consistent training or unique types of training, the information was too varied and inconsistent to be useful. No clear patterns emerged after a careful review of each response. While training is still believed to be an important element, the questionnaires and the data collected through them was insufficient to create training related variables.

Due to the consistency of responses, as well as the fact that all of the fusion centers in the final sample were well represented in the responses, the effectiveness scores were not weighted. Likewise, the tally of reputation scores indicated how well known these organizations are within
the community of practice, and were not weighted. Finally, none of the cases were in any way advantaged or disadvantaged by the number of participating analysts, and therefore the independent variables were not weighted.

4.2.1 The Dependent Variable

The questionnaires provided data that measured effectiveness and reputation at the organizational level for all 18 fusion centers in the original sample, based on stakeholder perception of intelligence and information sharing products and services. Stakeholders were asked to assess fusion centers on a sliding scale from 0-100 based on the accuracy, consistency, and relevance of each fusion center’s products. Two additional questions required respondents to rate how well they expected fusion centers to meet stakeholder expectations, and how well they performed in “real-world” scenarios or exercises. Respondents were asked to only provide responses for those fusion centers with which they were familiar (the actual level of familiarity was determined by each respondent).

In order to ensure the data were not skewed, I excluded any answer of zero and any answer of 100, and only those responses from 1-99 were included in the final dataset. The justifications for excluding these data points are based largely on the functionality of the software tool and general assumptions on anticipated outcomes. Qualtrics automatically registers a score of 0 when a respondent clicks on the sliding scale. Also, it is nearly impossible for any operational fusion center to have zero effectiveness. Likewise, it is virtually impossible for any fusion center to have achieved 100 percent effectiveness as compared with other fusion centers in the sample. These assumptions led me to exclude observations that could potentially skew the sample in either direction.
Additionally, three of the external stakeholders submitted blank questionnaires, which were excluded. As a result, only responses from the remaining 16 external stakeholders were included in the dataset. The mean, median, and standard deviations for stakeholder perceptions of effectiveness can be found in Table 4.3.

<table>
<thead>
<tr>
<th>Table 4.3 Descriptive Statistics for Effectiveness and Reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>Effectiveness (External Stakeholder)</td>
</tr>
<tr>
<td>Effectiveness (Internal Stakeholders)</td>
</tr>
<tr>
<td>Positive Reputation</td>
</tr>
<tr>
<td>Negative Reputation</td>
</tr>
</tbody>
</table>

N=10

For the questions in these same questionnaires that were intended to capture reputation, respondents were given a roster or a short answer prompt to identify those fusion centers they perceived as the most reputable of the sample. The questions asked respondents to identify the fusion centers they would most likely recommend to researchers studying best practices, or least likely recommend, as well as the fusion centers they most admire, or those that have struggled (for any reason) to meet the needs of their jurisdictions.

<table>
<thead>
<tr>
<th>Table 4.4 Effectiveness and Reputation by Case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>External Stakeholders</strong></td>
</tr>
<tr>
<td>FC1</td>
</tr>
<tr>
<td>FC2</td>
</tr>
<tr>
<td>FC3</td>
</tr>
<tr>
<td>FC4</td>
</tr>
<tr>
<td>FC5</td>
</tr>
<tr>
<td>FC6</td>
</tr>
<tr>
<td>FC7</td>
</tr>
<tr>
<td>FC8</td>
</tr>
<tr>
<td>FC9</td>
</tr>
<tr>
<td>FC10</td>
</tr>
</tbody>
</table>
The questionnaire asked respondents to select at least three, but no more than five fusion centers when answering these questions. However, the questionnaire allowed respondents to provide reputation scores for all 18 fusion centers, or none at all. The reason for the request of a range of three to five responses was to try to ensure that respondents only provided reputation information for those fusion centers with which they are most familiar with. Some respondents provided information on fewer than three, or more than five fusion centers, and all answers were included in the data. The total number of reputation mentions for questions that asked for positive reputation data, and those that asked for negative reputation data were aggregated and represented the fusion center’s reputation.

The reputation scores in Table 4.4 were calculated by taking the difference of positive reputation and negative reputation mentions when the questionnaire results were aggregated for each fusion center. As evidenced by the descriptive statistics in Table 4.4, external stakeholders tended to assess fusion centers lower overall than internal stakeholders. There was, however, nearly complete agreement among all respondents in terms of where fusion centers fell on the reputation scale based on the overwhelming number of positive responses for the five fusion centers with the highest reputations.

4.2.2 The Independent Variables

The four questionnaires distributed to fusion center directors and analysts gathered data that fit into three categories, or groupings, of independent variables that align with the three levels of analysis in the network literature: organizational, analysts, and the network (relationships). The descriptive statistics were calculated for the data that were reported as continuous or categorical variables, as well as variables that were derived from the interview transcripts.
4.2.2.1 Organizational Level

The directors’ questionnaires provided the core organizational capacity variables, which consisted of information about the fusion center’s size in terms of personnel, operational capabilities, co-location with other agencies, among other aspects of organizational capacity. In addition to these questions, follow-up interviews with directors and analysts provided additional information on organizational capacity that was incorporated into the dataset derived from the questionnaires. For example, the questionnaires did not ask specific questions about the Terrorism Liaison Officer (TLO) cadre, but every follow-up interview covered some aspect of each fusion centers’ TLO program at some point during the discussion. As presented in Chapter 3, TLO cadres are essentially networks of police officers, fire chiefs, private industry representatives, or other stakeholders that have a direct and open line of communication with the fusion center. Some TLOs may even maintain a physical presence in a fusion center on a full or part-time basis. This organizational variable represents how connected the fusion center is within its jurisdiction to key stakeholders. Because the information was provided in the course of interviews, only the consistent data emerging from the conversations could be used to create a variable.

Another variable that was not included in the questionnaires but that emerged from interviews was the approximate average number of days directors and analysts spent outside the fusion center, and the number of briefings they gave, on average, per month. Through the interviews, it was possible to establish an approximate number of days outside the fusion center and briefings delivered per month for each participating fusion center. In most cases, fusion center personnel volunteered information for the most recent month. Because the data would eventually be aggregated to the fusion center level, this was considered an organizational and not
an individual analyst level variable. Also, in describing their duties and responsibilities, analysts or directors from each participating fusion center provided information about the number of intelligence and information sharing products disseminated per month.

In sum, data were gathered through the questionnaires and interviews on 17 organizational variables. Seven of these 17 variables were based on categorical data and assigned an appropriate binary code (1 for “yes” and 0 for “no”). These and the remaining continuous variables are reported with descriptive statistics in Table 4.5.

Table 4.5 Descriptive Statistics for Organizational Variables

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Mean</th>
<th>Min.</th>
<th>Max.</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time Analysts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Analysts</td>
<td>21.7</td>
<td>7</td>
<td>54</td>
<td>18.16009</td>
</tr>
<tr>
<td>Part Time Analysts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Analysts</td>
<td>1.3</td>
<td>0</td>
<td>8</td>
<td>2.496664</td>
</tr>
<tr>
<td>Interns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Interns</td>
<td>1.3</td>
<td>0</td>
<td>3</td>
<td>1.05935</td>
</tr>
<tr>
<td>Terrorism Liaison Officers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of TLOs</td>
<td>302.1</td>
<td>50</td>
<td>774</td>
<td>251.4374</td>
</tr>
<tr>
<td>Secure Room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.9</td>
<td>0</td>
<td>1</td>
<td>0.316228</td>
</tr>
<tr>
<td>Years in Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous operation</td>
<td>8.8</td>
<td>5</td>
<td>13</td>
<td>2.149935</td>
</tr>
<tr>
<td>Co-Located with EOC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.2</td>
<td>0</td>
<td>1</td>
<td>0.421637</td>
</tr>
<tr>
<td>Co-Located with JTTF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.1</td>
<td>0</td>
<td>1</td>
<td>0.316228</td>
</tr>
<tr>
<td>Regional Coordination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of fusion centers</td>
<td>3.9</td>
<td>0</td>
<td>10</td>
<td>3.900142</td>
</tr>
<tr>
<td>All Hazards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.9</td>
<td>0</td>
<td>1</td>
<td>0.316228</td>
</tr>
<tr>
<td>All Crimes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Analysts in the Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total days in the field</td>
<td>12.2</td>
<td>0</td>
<td>40</td>
<td>12.41683</td>
</tr>
<tr>
<td>Briefings by Analysts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number given</td>
<td>9.7</td>
<td>1</td>
<td>30</td>
<td>9.580652</td>
</tr>
<tr>
<td>Briefings by Director</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number given</td>
<td>3.1</td>
<td>1</td>
<td>7</td>
<td>2.024846</td>
</tr>
<tr>
<td>Products Per Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal product line</td>
<td>10.777</td>
<td>1</td>
<td>60</td>
<td>18.71348</td>
</tr>
<tr>
<td>Easily Accessible Website</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.7</td>
<td>0</td>
<td>1</td>
<td>0.483046</td>
</tr>
<tr>
<td>Law Enforcement Parent Agency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>0.8</td>
<td>0</td>
<td>1</td>
<td>0.421637</td>
</tr>
</tbody>
</table>

N = 10

The organizational variables cover many aspects of fusion centers that are consistent with observations from the case studies. For example, the dataset includes variables for personnel, the jurisdictions and organizational ties (such as TLO cadres), access to classified information,
organizational maturity, the mission and focus, services provided to stakeholders, and information about the parent agency.

4.2.2.2. Analyst Level

The analysts participating in the research were asked to complete three questionnaires in addition to the internal stakeholder questionnaire. The majority of questions asked respondents to provide short answers, or to select background information from a list or roster. Only the data reported as continuous or categorical values are included in the descriptive statistics in Table 4.6.

Table 4.6 Descriptive Statistics for Analyst Questionnaire I: Professional Experience and Background

<table>
<thead>
<tr>
<th></th>
<th>Explanation</th>
<th>Mean</th>
<th>Min.</th>
<th>Max.</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Months in Position</td>
<td>Current position/role</td>
<td>44.51</td>
<td>7</td>
<td>87</td>
<td>26.46551</td>
</tr>
<tr>
<td>Analyst Clearance, TS+ (Y/N)</td>
<td>Yes/No</td>
<td>0.4</td>
<td>0</td>
<td>1</td>
<td>0.516398</td>
</tr>
<tr>
<td>Intelligence Analysis</td>
<td>Skill Level*</td>
<td>73.625</td>
<td>36</td>
<td>90</td>
<td>17.25755</td>
</tr>
<tr>
<td>Information Analysis</td>
<td>Skill Level*</td>
<td>77.673</td>
<td>48.7</td>
<td>90</td>
<td>12.79926</td>
</tr>
<tr>
<td>IT</td>
<td>Skill Level*</td>
<td>45.133</td>
<td>29.5</td>
<td>73.7</td>
<td>16.76058</td>
</tr>
<tr>
<td>Language</td>
<td>Skill Level*</td>
<td>26.583</td>
<td>0</td>
<td>82</td>
<td>26.24872</td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>Skill Level*</td>
<td>73.03</td>
<td>39</td>
<td>96.5</td>
<td>18.36221</td>
</tr>
<tr>
<td>Writing</td>
<td>Skill Level*</td>
<td>78.007</td>
<td>58.7</td>
<td>90</td>
<td>10.88727</td>
</tr>
<tr>
<td>Data Entry</td>
<td>Skill Level*</td>
<td>79.05</td>
<td>25</td>
<td>95</td>
<td>21.99608</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>Skill Level*</td>
<td>65.808</td>
<td>50</td>
<td>80.5</td>
<td>11.12874</td>
</tr>
<tr>
<td>Planning</td>
<td>Skill Level*</td>
<td>72.75</td>
<td>43.3</td>
<td>94</td>
<td>14.11138</td>
</tr>
<tr>
<td>Threat Assessment</td>
<td>Skill Level*</td>
<td>62.3</td>
<td>26.7</td>
<td>83</td>
<td>18.52874</td>
</tr>
<tr>
<td>Research</td>
<td>Skill Level*</td>
<td>74.078</td>
<td>54</td>
<td>91</td>
<td>13.01944</td>
</tr>
<tr>
<td>Open Source Data Collection</td>
<td>Skill Level*</td>
<td>76.853</td>
<td>50</td>
<td>94.5</td>
<td>13.92965</td>
</tr>
<tr>
<td>Use of Limited Access Databases</td>
<td>Skill Level*</td>
<td>66.915</td>
<td>29.7</td>
<td>90</td>
<td>18.00449</td>
</tr>
</tbody>
</table>

*Skill level was measured on a sliding scale of 0-100, with 0 representing no skill and 100 representing expert skill level.

The majority of continuous variables for Analyst I were for reported skill levels across 12 skill categories. These categories were labeled but not implicitly defined because skills like verbal communication or open source analysis could mean different things to different analysts.
in different settings. Each category was developed after feedback from the test group on the skills that were most likely to be found within a population of analysts from across the national network. The distinction between intelligence analysis and information analysis, for example, is a deliberate one. I defined intelligence as the result of information analysis, and involving specialized skills, techniques, or processes to turn data and information into actionable intelligence products beyond what is necessary to process and analyze data points or information.

The analyst clearance variable was aggregated to the fusion center level, and reported whether at least one analyst in the participating fusion centers holds a Top-Secret or higher security clearance. The data revealed that four of the fusion centers reported analysts with Top-Secret or higher active clearances. Although this variable is treated as an analyst level variable here, it could also be constructed as an organizational level variables since it is aggregated to the fusion center level, and because hiring and retaining cleared analysts requires resources.

In Table 4.6, the bold variables represent the five most highly prioritized skills based on the mean across all the fusion centers in the sample. Language, IT, Threat Assessment, Statistical Analysis, and Use of Limited Access Databases were the five lowest rated skills among all analysts.

These data were reported by analysts as their self-assessed skill level, but are interpreted in this research as a prioritization of skills to try and mitigate validation problems. The assumption is made here that self-assessed skills and prioritization of skills are closely related since individuals are most likely to identify the skills they have the greatest confidence in, or have invested in. This addresses, at least in part, issues of validation that accompany self-assessments of skills or abilities. The reported scores were aggregated by fusion center and can be found in Table 4.6.
For the Analyst III questionnaire, which asked questions regarding the analysts’ roles and responsibilities, several variables were created using responses along a range of values. The average briefings variables were calculated by assigning a numerical value for each range that analysts selected in their answers. For example, 0 was coded 0, 1-3 was coded 1, and so on, up to 5. The individual responses were then aggregated by fusion center. The mean was calculated and reported with the descriptive statistics in Table 4.7.

For the remaining categorical variables, the average number of “yes” responses was calculated with an average based on the number of total respondents for each fusion center. This percentage (out of 100) was then reported and used to calculate the descriptive statistics in Table 4.7. For example, 49.6 percent of analysts reported getting some feedback from the FBI on the products they submit. The remaining data were all short answers and provided context on the analysts’ perceptions of their roles and responsibilities, and were only used to inform the researcher. These questions primarily asked analysts to talk about their views of performance assessment, how they felt they should be assessed, among other related questions.

Table 4.7 Descriptive Statistics for Analyst Questionnaire III: Roles and Responsibilities

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Mean</th>
<th>Min.</th>
<th>Max.</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Briefings Received (Monthly)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal agencies</td>
<td>1.47381</td>
<td>0.5</td>
<td>2</td>
<td>0.502883</td>
</tr>
<tr>
<td>Average Briefings Given (Monthly)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal agencies</td>
<td>1.951667</td>
<td>0.4</td>
<td>4.5</td>
<td>1.564073</td>
</tr>
<tr>
<td>Access to Classified Info.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>78.5</td>
<td>50</td>
<td>100</td>
<td>21.86448</td>
</tr>
<tr>
<td>Access to FBI-Net</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>10</td>
<td>0</td>
<td>75</td>
<td>24.15229</td>
</tr>
<tr>
<td>Task Force Officer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>2.5</td>
<td>0</td>
<td>25</td>
<td>7.905694</td>
</tr>
<tr>
<td>Receive Feedback from DHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>42.6</td>
<td>0</td>
<td>100</td>
<td>36.45149</td>
</tr>
<tr>
<td>Receive Feedback from FBI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>49.6</td>
<td>0</td>
<td>100</td>
<td>31.97985</td>
</tr>
<tr>
<td>Member of JTTF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>22.5</td>
<td>0</td>
<td>100</td>
<td>38.0971</td>
</tr>
<tr>
<td>Other Task Force(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes/No</td>
<td>34.1</td>
<td>100</td>
<td>100</td>
<td>36.67106</td>
</tr>
</tbody>
</table>

N = 10
4.2.2.3. Network Level

The tie multiplexity data were gathered in the Analyst II questionnaire. Analysts were asked to identify the number of each type of tie (formal, informal, professional) they maintained across nine different relationship categories derived from the case studies presented in Chapter 3 (see Table 3.1). The response matrix allowed respondents to choose a representative range for the number of ties they maintained in a given category. The ranges were 0, 1-3, 4-6, 7-10, 11-14, and 15+ for each category.

Each category was accompanied by a comprehensive description so that analysts could understand what was being asked of them. Informal ties are those that occur from general interaction that is not structured in any way. In a fusion center, informal ties may be the friendships that emerge between analysts, or between analysts and liaisons that share the same office space, and interact on a consistent basis. Formal ties are those that are determined by an analyst’s job description, such as those relationships that are the result of a weekly scheduled meeting with partner agencies, or because the analyst is a regular point of contact for area police departments. Finally, professional ties are defined as the relationships that result from attendance at conferences, or that may not be part of an analyst’s normal job duties but still form important links with other agencies or organizations. This distinction was intended to help analysts provide responses, and to sort the data, but was not part of the actual data analysis.

For each of these three categories, analysts could identify up to nine different types of entities with which they maintain the ties. These were drawn from the case studies introduced in Chapter 3 of this dissertation (see Table 3.1). The Analyst II questionnaire asked analysts to report whether they maintained informal, formal, or professional ties with individuals from each of the nine types of entities. For instance, an analyst could report having 1-3 informal ties with
other fusion centers in the network, and 4-6 formal ties, and 0 professional ties. The difference between each type of tie was explained in the question description.

The purpose of this data is to establish the presence of tie multiplexity across the three categories and five types of possible ties that fusion center analysts maintain, which is a measure of relationships strength. For example, do fusion center analysts tend to maintain strong ties with law enforcement or federal agencies? According to the descriptive statistics, the mean shows that analysts’ relationships in this sample are strongest within their own organizations, or with law enforcement entities. They are the weakest with federal agencies and other fusion centers in the network.

After reviewing the data, it became clear that the nine different types of ties could be collapsed into five basic types. This allowed a simpler comparison between each fusion center, and still accomplished measurement of tie multiplexity. After this process, the five remaining types included analysts’ ties internal and external to the fusion centers, as well as those ties internal and external to the formal network. The original nine types of entities with which fusion center analysts maintain ties, as derived from the two case studies in Chapter 3, and the collapsed types, can be found in Table 4.8.

<table>
<thead>
<tr>
<th>Questionnaire Categories</th>
<th>Collapsed Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ties Within the Fusion Center (1)</td>
<td>1. Ties Within the Fusion Center</td>
</tr>
<tr>
<td>Ties Within the Fusion Center/Non-Fusion Center Staff (1)</td>
<td>2. Ties With Other Fusion Centers</td>
</tr>
<tr>
<td>Ties With Other Fusion Centers (2)</td>
<td>3. Ties With Federal Agencies</td>
</tr>
<tr>
<td>Ties With the FBI (3)</td>
<td>4. Ties With Law Enforcement</td>
</tr>
<tr>
<td>Ties With DHS (3)</td>
<td>5. Ties With Non-Law Enforcement</td>
</tr>
<tr>
<td>Ties With the Intelligence Community (non-FBI/DHS) (3)</td>
<td></td>
</tr>
<tr>
<td>Ties With State/Local Law Enforcement (4)</td>
<td></td>
</tr>
<tr>
<td>Ties With State/Local Non-Law Enforcement</td>
<td></td>
</tr>
<tr>
<td>(Fire, EMS, etc.) (5)</td>
<td></td>
</tr>
<tr>
<td>Ties With the Private Sector (5)</td>
<td></td>
</tr>
</tbody>
</table>
The data were aggregated for each fusion center. The resulting numerical ranges provided in the questionnaires for the categories of ties were used to identify how many ties analysts in a fusion center maintained with each type of tie. This required taking the highest reported number from each of the informal, formal, or professional categories for each fusion center and translating from the ranges provided in the questionnaire which were 0, 1-3, 4-6, etc. A numeric value of 0-5 was then assigned to each range. For example, if one analyst reported having 1-3 formal ties, zero informal ties, and 11-14 professional ties with law enforcement, and this number was the highest reported within the fusion center, that row was calculated 1+0+4=5. The descriptive statistics were then calculated for all fusion centers and are reported in Table 4.9.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Min.</th>
<th>Max.</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the Fusion Center</td>
<td>10.5</td>
<td>2</td>
<td>15</td>
<td>5.126185</td>
</tr>
<tr>
<td>Other Fusion Center(s)</td>
<td>5.3</td>
<td>1</td>
<td>10</td>
<td>3.433495</td>
</tr>
<tr>
<td>Federal Personnel</td>
<td>6.7</td>
<td>2</td>
<td>15</td>
<td>4.001389</td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>12.8</td>
<td>5</td>
<td>15</td>
<td>3.735714</td>
</tr>
<tr>
<td>Non-Law Enforcement</td>
<td>7.1</td>
<td>0</td>
<td>13</td>
<td>5.237684</td>
</tr>
</tbody>
</table>

N = 10

It should be noted that this data demonstrate the number and depth of ties, which is interpreted as multiplexity or tie strength. Although there are other ways to measure the strength of relationships, this dissertation focuses on the number of ties maintained with various entities that fusion center analysts interact with on a routine basis as an indicator of the strength of these relationships. With this data, patterns of relationship strength can be compared simultaneously with other factors, as well as contrasted between effective or ineffective organizations operating in the same network.
4.3 Initial Observations of the Data

Observations of the data introduced above provide an overview of the sample. These data and the observations can be grouped by the dependent and independent variables, with the independent variables grouped by level of analysis.

4.3.1 Organizational Effectiveness

The dependent variable presents meaningful variation across the cases. The mean revealed that internal stakeholders assessed effectiveness at nearly 8.5 percent higher than external stakeholders. This is an expected result because external stakeholders by definition do not share the same stake in the individual organizational outcomes, and may have fewer interpersonal connections with individuals in each of the organizations. The standard deviation, however, showed a wider range for external stakeholders than for internal stakeholders.

By removing scores of 0 and 100, the minimum and maximum ranges reflected that all of the fusion centers in the sample fell within 58-87 percent when assessed by the external stakeholder group, and 69-85 percent by the internal stakeholders. The major difference here is in how the least effective fusion centers were measured, which is a difference of 11 percent for those reported to be at the lowest end of the scale by internal stakeholders.

The reputation data also displayed variation in perceptions by stakeholders. When calculating this data, the reputation scores were not divided between the internal and external stakeholder groups because the purpose of this was simply to identify the fusion centers with more positive or negative reputations across all respondents. Because effectiveness was based on being familiar with or having observed fusion center information sharing or products, it was essential to distinguish between the audiences. Reputation, however, could rest on a variety of
possible factors that are inherently complex and difficult to define, and is therefore of the greatest value to this dissertation as an aggregate result.

The data reveal a wide range between the most reputable and the least reputable fusion centers. Only three fusion centers had more negative than positive reputation mentions in the questionnaires (see Table 4.3), with the seven remaining fusion centers having at least one more positive than negative mention. However, the four most highly effective fusion centers were also the most reputable by a wide margin.

The conceptual framework introduced in Chapter 3 suggests that reputation is related in some way to effectiveness. In this dissertation, reputation is used to validate perceptions of effectiveness among stakeholders. In Table 4.3, it is possible to begin to identify how individual fusion centers fared in terms of stakeholder perception for both effectiveness and reputation. Fusion centers FC2, FC4, FC5, and FC7 were considered the most effective and had the most positive reputations. They were also the highest scoring fusion centers in both the external and internal categories by a wide margin. In addition, their reputation scores were generally much higher than fusion centers with negative reputations.

Conversely, fusion centers on the lower end of the scale were more varied in their perceived outcomes. For example, FC1, FC3, FC6, FC9, and FC10 were given significantly lower external scores than internal scores by stakeholders. In some instances, there was a great deal of distance between the two scores. However, FC1, FC9, and FC10 shared a higher number of positive mentions than negative mentions for reputation. This observation indicates that at least in this sample, fusion centers can be perceived as reputable without being perceived as effective.
4.3.2 Organizational Level

The data revealed significant variation across several indicators of organizational capacity. The highest standard deviations were for the TLO, full time analyst, analysts in the field, briefings by analysts, and products per month variables. That these variables showed the greatest ranges in minimum and maximum scores was not surprising, because these are oftentimes the distinguishing features of fusion centers that are determined by their locations, the threat picture in their jurisdiction, and their parent agencies’ priorities.

The lowest standard deviations were for those variables related more closely to standard operating procedures, or things that are associated with federal guidance. For example, all but one fusion center reported having a secure room, which is a general standard for intelligence and information sharing facilities. All of the fusion centers classified themselves as all-crimes, meaning they were in support of all types of law enforcement activity, and all but one classified as all-hazards, meaning the fusion center plays some role in preparing for or responding to natural as well as man-made hazards.

As is widely the case throughout the network, in this sample eight out of 10 fusion centers are parented by state or local law enforcement agencies. Very few fusion centers were co-located with either an EOC or a JTTF, meaning that within this sample physical proximity was not clearly associated with a positive or negative outcome. And while some fusion centers reported part-time staff and interns, the majority of the personnel in this sample are full-time employees.

The age of the fusion centers in the sample is also reflective of the larger national sample. The sample included a fusion center that has been in continuous operation for 13 years, with the youngest fusion center being only five years old. The mean and standard deviation for this
variable also indicate that the sample is reflective of the national network, and reflects the time period in which certain federal grant funds were available for fusion center startups. Time in operation in this dissertation is used to show organizational maturity.

Perhaps one of the more surprising variables is regional coordination, which showed that some fusion centers are working on a regular basis with up to 10 fusion centers in their regions, whereas some fusion centers reported zero coordination in their regions. This result may be somewhat reflective of the scarcity of fusion centers in some geographic regions, as well as the density of fusion centers in other areas. One example of this is Southern Shield, which has members throughout the southeast that meet on a regular basis to share information, best practices, and to align similar investigative or analytical efforts. Fusion centers in other regions also reported coordination, but not as much as those situated in the southeastern United States.

The descriptive statistics for the number of briefings given by directors and the number given by analysts each month shows that analysts spend, on average, more time providing briefings than do directors, although it should be noted that the total for analysts was aggregated to the fusion center level. The number of days analysts spent in the field, however, ranged widely with a mean of 12.2 and a minimum of zero and a maximum of 40 days. Finally, the number of products per month ranged from one per month to 60 per month. The mean for products per month of 10.7 and the standard deviation of 18.71348 reveals a wide variance in the number of products distributed by fusion centers in this sample.

The variation in these variables is significant because they are some of the distinguishing factors of organizational capacity that are visible to those outside the fusion center, namely the stakeholders. An organization’s products are disseminated on closed web-based networks that can be viewed by other network member organizations, as well as individuals in the federal
government. The amount of time analysts spend in the field or the number of briefings given per month by analysts and directors are yet another indicator of how visible the fusion center is within its jurisdiction.

4.3.3 Analyst Level

This dissertation asserts that analysts are critical to fusion center outcomes. While the raw data do not make causal connections between analyst level variables and effectiveness, the findings do illustrate important variation across the sample in several key areas.

The two descriptive variables for analysts are the average number of months analysts spent in their positions, and their clearance level. There is a wide deviation in values for the months in position, but on average analysts have spent approximately three and a half years in their current positions. Within the sample, analysts ranged from one to over seven years in the same fusion center, and in the same position within their fusion center.

For the analyst clearance variable, analysts were asked to report the highest clearance level in their fusion center. Only four fusion centers reported an analyst with a Top Secret or higher clearance, which was established as the point of distinction. Top Secret clearances are more difficult and costly to obtain than Secret clearances, which many fusion center analysts hold. Top Secret clearances are also a good threshold for distinguishing between analysts and fusion centers, because classified briefings held by the DHS, FBI, or other federal agencies may require a Top Secret clearance level or higher to attend.

Although the questionnaires provided a short answer opportunity for respondents to describe their type and level of training, the results were so varied that it was not possible to create a variable related to training. Despite the difficulty of gathering and interpreting the
training data, there was significant variation in how analysts assessed and prioritized their own individual skill sets.

This data is important to this research because it appears that how high or low analysts prioritize certain skills provides a way of distinguishing between the analysts in each fusion center. There was a significant amount of deviation between the results for all 13 skills, with the lowest standard deviation reported for writing (since most analysts likely value their ability to write clearly) and the highest for language skills, which are not as common. Although there is no comparison here between each case, there is enough variation across these skill categories to indicate that certain patterns may emerge when a deeper analysis of analysts’ skills is conducted in the next phase of the research.

In Analyst III, respondents were asked to provide information on their roles and responsibilities. Analysts were asked to report the number of briefings they give and receive on a monthly basis. On average, analysts gave more briefings than they received. These statistics roughly correspond with the number of days analysts and directors spend in the field, although those variables were reported and aggregated for the entire organization and not the individual analysts.

The majority of analysts (78.5 percent) reported having at least some access to classified data. Again, this corresponds roughly with the fact that nearly every analyst had at least a Secret level clearance. Access to FBI-Net, however, was very limited, and few analysts reported being Task Force Officers. It is worth nothing that in interviews, analysts and directors consistently reported that connectivity to the FBI—both interpersonal connections and connectivity to information sharing databases—was critical to fusion center operations, but was generally limited.
Regarding feedback on their intelligence and information products, 49.6 percent of analysts reported receiving some level of feedback from the FBI when products are shared with the Bureau. A reported 42.6 percent of analysts reported receiving feedback from DHS personnel. The purpose of this variable was to establish the presence of mechanisms for providing feedback to analysts so as to improve the quality of their reporting products and intelligence reports. This observation indicates that despite the presence of DHS liaisons in every fusion center, and the presence of some FBI personnel in most fusion centers, feedback is reaching fewer than 50 percent of analysts. This may be by design however, because in some fusion centers it may be that only one or two analysts are responsible for receiving or responding to feedback from federal agencies.

4.3.4 Network Level

This research assumes that bilateral dyadic ties are significant to fusion center outcomes. When aggregated to the fusion center level, analysts reported an average of 10.5 ties within their own fusion center, and 12.8 with the law enforcement community. This was an anticipated result because all but two fusion centers in the sample are parented by state and local law enforcement agencies. Even civilian employees appear to be closely connected with law enforcement personnel, which is an indicator of the ability of the fusion center as an organization to blend personnel from outside the law enforcement community with sworn officers in the same work environment.

Relationships with non-law enforcement and federal personnel were significantly below the strength of multiplex ties within the fusion center and with law enforcement. This may be explained in part by the fact that not all analysts interact routinely with federal agencies, and that
in most fusion centers, there may be only be a single representative from DHS or the FBI. The same is true of non-law enforcement entities such as the private sector, which may have a single liaison with the fusion center.

Across all the types of ties that analysts maintain, there was considerable variation, once again pointing to the possible presence of patterns that could emerge upon closer examination and comparison of each case. The standard deviations were fairly consistent for each tie category, but there was a wider gap between the means for each type and the minimum and maximums calculated for each type.

The descriptive statistics also reveal that there are fewer ties between analysts working in the same fusion center, as well as between analysts and other fusion centers, federal personnel, and non-law enforcement entities. In interviews, subject matter experts confirmed that these results are consistent with practice inside fusion centers, because a fusion center may only have one person who interacts on a regular basis with federal agencies or other fusion centers in the network. It does appear, however, that analysts do, in fact, maintain a variety of ties with various entities, and that there is variation across the number of the ties maintained by each of the fusion centers in the sample.

The least occurring multiplex ties were those with other fusion centers. In terms of individual ties between analysts in different fusion centers, the mean was 5.3 ties when aggregated to the organizational level. This variable corresponds closely with the organizational capacity variable regional coordination. Regional coordination was only reported as an average of 3.9 interactions per fusion center per month, indicating that individual analysts tend to maintain connections with other fusion centers at a higher rate than that reported at the organizational level.
This observation is important for all fusion centers because it emphasizes the importance of the fusion center analyst in being able to build and maintain strong (or multiplex) relationships across the network. In interviews, analysts revealed that they were able to identify analysts in other fusion centers that were subject matter experts. Because the network has identified points of contact across the entire nation, analysts are then able to reach out and tap these areas of expertise. One answer to the question “what value do fusion centers add to the domestic intelligence community?” is simply that these ties now exist and are maintained by analysts in fusion centers across the nation. Tie multiplexity provides evidence that the ability to make these critical connections and reinforce them over time now exists, and can be measured in terms of strength.

4.4 Summary

In summary, the data collection resulted in a dataset containing data on multiple levels, from the organization itself to analysts’ traits and characteristics and the relationships between analysts and key stakeholders. Although the data resulted in interesting observations about the makeup and features of fusion centers in the sample, observations alone do not answer the research questions. The next chapter contains analysis of the data to identify how these fusion centers arrived at the outcomes perceived by stakeholders.
CHAPTER 5: IDENTIFYING THE PATHS TO FUSION CENTER OUTCOMES

5.1 The Configurational Approach

QCA offers an alternative to traditional variable based statistical and qualitative case studies by introducing a set theoretic approach based on the principles of Boolean algebra (Ragin 1987, 2000, 2008). At its core, QCA is a configurational approach to systematic comparison of a relatively few number of cases, and is based on set theoretic principles that enable researchers to unravel causal complexities inherent in social phenomenon (Rihoux and Ragin 2009; Fischer 2011). Developed by Charles Ragin in the late 1980’s, “QCA is based on the assumption that causality in the social reality is complex….that different combinations of causal conditions can lead to an outcome…. and that the effect of a condition is dependent on its combination with other conditions” (Fischer 2011, p. 29; see also Ragin 2008).

The goal of the researcher applying QCA is to better understand how causal factors combine or work together to produce an observed outcome. One of the more basic assumptions of QCA is that the world is complex, and that a combination of potentially causally relevant conditions\(^8\) result in observed outcomes (Fischer 2011). QCA fits in neatly with the objectives of this dissertation because, in a general sense, merely describing network structure is not enough to allow researchers to explain outcomes in network settings (Fischer 2011).

This research presents both structural and compositional factors (Knoke and Yang 2008) that relate to an individual organizational outcome and aims to view both of these factors not as independent of each other as in traditional regression analysis, but rather as configurations of conditions. QCA has the capacity to handle the inherent complexities of the fusion center context, unlike traditional quantitative methods that actually strip the data of their complexities,

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\(^8\) QCA has its own distinct terminologies, such as referring to conditions instead of variables, and these terms are used throughout this chapter to ensure consistency with accepted standards of practice.
and is well suited to address the complex causalities of multilevel issues underlying inter-organizational networks (Raab, Lemaire, and Provan 2013).

QCA also addresses multiple conjectural causation, or equifinality (Ragin 2008; Rihoux and Ragin 2009). Equifinality is present when multiple cases display the same outcome, but arrive at the outcome via different causal paths or solutions in QCA terminology. Without a means of addressing equifinality, it is much more difficult to achieve meaningful results when working with small-N datasets. The concept of equifinality is important in this dissertation because it is possible, if not likely, that fusion centers sharing the same effectiveness outcome take unique combinations of causal conditions, and therefore unique paths, to the outcome.

According to Raab et al. (2013) there are three additional reasons for using the configurational approach and QCA to generate new theoretical insights related to inter-organizational networks. First, networks should be understood as clusters of interconnected structures and practices as viewed from a systemic perspective. Second, because inter-organizational relations and networks are made up of nested social entities that jointly produce outcomes, an analysis of inter-organizational relations and networks should be made up of complex configurations that also encompass characteristics of social entities at different levels of analysis. Finally, the core attributes and contexts of inter-organizational networks have not received enough scholarly attention, leaving a gap in the literature.

QCA is used by researchers to arrive at “new insights, which may then be taken as a basis for a further theoretical development or for reexamination of existing theories” (Berg-Schlosser, De Meur, Rihoux, and Ragin 2008, p. 16). This is yet another reason why QCA works well alongside the assumptions of network analysis—it accepts and emphasizes the complexity in
network settings while still enabling researchers to generalize about the variation in outcomes within network settings (Fischer 2011).

5.2 Basic QCA Steps Applied in this Research

Ragin has introduced a basic form of crisp-set QCA, fuzzy-set QCA, and multi-value QCA.

Crisp sets are those in which membership in a set can be described as on or off using binary code. This research applies crisp set QCA (csQCA) because of its desirable simplicity in determining membership, and because the paths (discussed later in the chapter) could be clearly identified using crisp sets.

Each application of QCA is unique to the researcher’s questions and cases, but there are, however, several steps common to most applications. The approach applied in this dissertation closely mirrors the steps prescribed by Ragin and adapted by other researchers that have applied the approach to network research. For this research, the process outlined by Rihoux and De Meur (2009) was used as the baseline, and modified according to other recent applications of QCA into a six-step process (Fischer 2011; Legewie 2013) (see Table 5.1).

<table>
<thead>
<tr>
<th>Table 5.1 Steps Applied in QCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
</tr>
<tr>
<td>Step 2</td>
</tr>
<tr>
<td>Step 3</td>
</tr>
<tr>
<td>Step 4</td>
</tr>
<tr>
<td>Step 5</td>
</tr>
<tr>
<td>Step 6</td>
</tr>
</tbody>
</table>

The first step according to Rihoux and De Meur (2009) is to identify relevant cases and causal conditions through a research design and data collection process that is consistent with the logic of the comparative method. This requires building a dichotomous data table that is transparent for the justification of thresholds and minimums used to code the data (Rihoux and
De Meur 2009). These variables are then coded into crisp sets of binary data by assigning membership (1) or non-membership (0) as determined by the standard for membership. This determination of membership is discussed in greater detail below on page 119.

The calibration process is used to determine the membership of conditions in a set. In general, calibration is only successful when the researcher has good theoretical grounding and substantive knowledge of the cases (Ragin 2008). According to Ragin, when applying QCA, “it is possible to have the best of both (qualitative and quantitative) worlds, namely, the precision that is prized by quantitative researchers and the use of substantive knowledge to calibrate measures that is central to qualitative research” (2008, p. 82).

The second step is to test for necessary conditions by plotting the calibrated sets against the outcome (Legewie 2014). If necessary conditions are found, these variables can be excluded from the truth tables to simplify both the tables and the final results. The process for finding and analyzing necessary conditions is discussed in greater detail later in this chapter.

Two other types of conditions also emerge from the analysis: sufficient and INUS conditions. A condition is sufficient when it isn’t necessary for the outcome, but is a subset of the outcome. INUS conditions are not sufficient for the outcome by themselves, but are part of causal solutions that are sufficient. Sufficient and INUS conditions form the various causal solutions that are produced over the next two steps.

The third step is to construct a truth table with the calibrated sets minus the necessary conditions, and to resolve contradictions. The truth table is simply the table of configurations that contains the combinations of conditions associated with a given outcome (Rihoux and De Meur 2009). The free fsQCA software tool can be downloaded and used to develop a data matrix, or truth table (Ragin 2000). These tables, which might contain many rows and combinations of conditions, are used to analyze necessary and sufficient conditions.
conditions relating to outcomes, are minimized using a process outlined by Ragin for this purpose (2000, 2008). Once again, the software tool performs this calculation with only minor adjustments by the researcher when results conflict. After the tables have been minimized, the researcher can analyze the results, which are reported in three types of solutions, or combinations of conditions that occur when the outcome is present: complex, parsimonious, and intermediate.

Complex solutions combine the rows coded with membership in the outcome, and do not allow for any simplifying assumptions to be included in the analysis (Legewie 2013). Complex solutions are in fact the most complex of the three types. Parsimonious solutions use remainder rows to simplify the solutions, and reduce the causal recipes to the smallest number of conditions possible (Legewie 2013). Remainder rows are those that did not have enough cases to be included in the truth table, but that can be used to simplify the solutions. The inclusion or exclusion of logical remainders is made automatically, and without regard to theoretical or substantive arguments on whether the assumptions make sense (Legewie 2013). Intermediate solutions are typically the most simplified, and apply simplifying assumptions that must be checked for consistency with theoretical or empirical knowledge (Legewie 2013). Although there is no standard solution that is more applicable in every case, researchers must examine the data and select the solution that is most appropriate based on theoretical grounding.

The fourth step is to analyze the outputs of the preceding step and to measure for the negation of the outcome (Legewie 2013). This is facilitated by having two datasets—one for the presence of the outcome and the other for the absence, or negation of the outcome—and performing the functions for analyzing the two datasets using whatever software package has been selected by the researcher for performing the QCA analysis. The conditions that form the solutions are sufficient conditions, meaning they are not necessary for the outcome but are
sufficient in combination with other conditions (including the necessary conditions) to lead to the outcome.

The fifth step is to determine whether the solutions make theoretical sense. Ultimately, the point of this step is to ensure that the results make theoretical sense to the researcher and are consistent with other observations and subject matter expertise. This is where the researcher’s own subject matter expertise and knowledge of the cases is applied directly to the analysis, like when calibrating the data (Ragin 2000).

The final step is to repeat the process for the negation of the outcome (Schneider and Wagemann 2010). This is because variables may appear in both the causal recipes for the presence of the outcome, and the negation of the outcome. This further enables the researcher to draw theoretical insights from the negation of the outcome.

5.3 Step 1: Calibrating the Data

The calibration process in csQCA begins after the data have been gathered and sorted, and involves reviewing the raw data and descriptive statistics to identify variables that display variation in outcomes across the cases. Due to the small sample of only 10 fusion centers, this could be done manually for all of the variables in the dataset. The initial review of the dataset involved revisiting the descriptive statistics for the variables, or conditions, presented in Chapter 4 to identify the conditions that demonstrated the most variation. This process was conducted systematically for all 49 variables introduced in Chapter 4, including the effectiveness and reputation outcome conditions (see Table 5.2 below, for excluded conditions).

Because the positive reputation outcomes for the most highly rated fusion centers were consistent, as were the negative reputation outcomes for the most poorly rated fusion centers,
reputation was simply used to validate membership in the outcome category (see below) for the most highly effective fusion centers. As a result, only the effectiveness outcome was reported as the outcome condition for this dataset. The highest scoring fusion centers were labeled as the most highly effective, and the remaining fusion centers were given the label of less effective.

This labeling, however, does not suggest that less effective fusion centers are ineffective. Rather, less effective fusion centers simply were not among the most highly rated and reputable fusion centers within the sample. In other samples, such as a larger sample of the entire network, some of the less effective organizations might in fact be among the most effective organizations. Also, the approach used to calibrate the dependent variable is only intended to distinguish between organizations and does not represent an absolute measure of effectiveness.

A similar approach was used to calibrate the independent variables. For the organizational level variables, I reviewed the descriptive statistics for commonality across the cases or theoretical irrelevance to identify conditions that should be excluded from the dataset. Lack of variation is also a criterion for exclusion, according to Rihoux and De Meur (2009). For example, only one fusion center was co-located with an FBI Joint Terrorism Task Force (JTTF). This variable met both tests for exclusion—there was no meaningful variation in the data and no theoretical importance to justify inclusion. In contrast, co-location with an emergency operations center (EOC) was retained as part of the QCA dataset even though only two fusion centers reported co-location. This was because co-location with an EOC indicates the possibility for a higher level of interaction with emergency management partners, and this was an important aspect of the network and its ability to foster relationships with other stakeholders.

In addition, six other organizational conditions were removed. Every fusion center reported a secure room for viewing classified information, and each fusion center identified itself
as having an all crimes focus. Likewise, all but one fusion center identified itself as having an all hazards focus. Only two fusion centers were not parented by law enforcement agencies at either the state or local levels, and all ten fusion centers had a website or information posted on the parent agency’s website that could be easily accessed by entering the search terms “[insert state/locality] fusion center” in a popular search engine.

Another of the organizational conditions that was excluded, regional coordination, was removed because it did not differentiate between another condition at the network level that measured the strength of relationships between analysts in different fusion centers. The mean of 3.9 indicated that fusion centers do interact with and engage other fusion centers in their regions, but the more valuable insight is whether this happens at the analyst level. Due to the potential for conflict between the organizational level condition and the network level condition, this variable was excluded.

<table>
<thead>
<tr>
<th>Table 5.2 Conditions Excluded from QCA Dataset</th>
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</thead>
<tbody>
<tr>
<td><strong>Organizational Level</strong></td>
</tr>
<tr>
<td>Co-Located with JTTF</td>
</tr>
<tr>
<td>Secure Room</td>
</tr>
<tr>
<td>All Hazards</td>
</tr>
<tr>
<td>All Crimes</td>
</tr>
<tr>
<td>Easily Accessible Website</td>
</tr>
<tr>
<td>Law Enforcement Parent</td>
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<tr>
<td>Regional Coordination</td>
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The analyst level conditions that were excluded from the QCA dataset fell into two categories: skill related conditions and analyst characteristics and attributes. The four skill conditions were Information Technology (IT), writing, language, and limited network access.
Nearly all of the analysts in the sample prioritized writing, while very few analysts in the sample reported any prioritization of the three remaining skills. In order to calculate skills, as discussed in the previous chapter, the average skill prioritization assigned by individual analysts was aggregated to the fusion center level. Although some of these skills reported means and standard deviations similar to retained conditions, a closer analysis of the data revealed that very few analysts reported capabilities for each of these four skills. Even though there was sufficient data, I could not place any confidence in these conditions as truly representative of the entire sample.

The conditions for characteristics and attributes included both categorical and continuous variables, and required a careful examination of the descriptive statistics and theoretical relevance. First, the fact that nearly every analyst in the sample reported having at least a Secret level security clearance negated the significance of the condition for analysts’ access to classified information. Second, the fact that every fusion center had a secure room for viewing classified information indicated this condition could be excluded.

The access to FBI-Net was limited among the fusion centers in the sample, with analysts in only one fusion center reporting access. The same was true of the Task Force Officer and feedback from DHS and the FBI conditions. It was learned through the interviews that only one or two analysts may be assigned to receive feedback from the DHS and FBI, or feedback is limited to the director making this condition irrelevant at the analyst level. Additionally, the JTTF conditions for analysts, as well as conditions pertaining to other task forces were repetitive of other questions in the questionnaires, and were excluded.

All of the network level conditions were included, however, after they were collapsed from nine down to five separate types, due to their theoretical importance. At the conclusion of this process, the initial 49 variables were reduced to a total of one outcome condition.
(effectiveness) and 30 conditions distributed between the organizational, analyst, and network levels. These conditions would form the final QCA dataset that could then be calibrated according to the procedures outlined by Rihoux and Ragin (2009) for this purpose.

As mentioned previously, calibration is the process of determining membership in the outcome set by assigning binary code to represent in (1) or out (0) for each condition. This process is completed for each condition, and the researcher must make a determination on where to set the threshold for in/out membership. Although there are multiple ways to determine membership, there are several considerations that should guide this step (Rihoux and De Meur 2009). First, membership in the outcome category should be consistent with theory, or guided by careful observation and analysis of the cases (fusion centers). Second, the membership thresholds should be appropriate for the data in hand, such that the thresholds can be easily justified or repeated and still maintain consistent membership results. Finally, researchers may use manual thresholds such as the mean of aggregate values or the presence of a condition in the case, but only when consistent with the first two considerations.

Both the mean and the presence of a condition were used to establish membership for continuous and categorical variables that remained after the reduction process described above. For example, based on a cursory analysis of the descriptive statistics in Chapter 4, the number of part time staff in a fusion center did not appear significant because there was so little variation between the cases. However, the presence of part time staff in the organization may represent additional organizational capacity, and seven of the ten fusion centers reported at least one part time staff member. Therefore, if the fusion center reported at least one part time staff member, the condition was coded as 1. If the fusion center did not report any part-time staff, the condition was coded as 0.
Table 5.3 Calibrated Conditions by Level of Analysis

<table>
<thead>
<tr>
<th>Condition</th>
<th>Membership Determination</th>
<th>Outcome Included/Excluded*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Mean (75.7946)</td>
<td>4/6</td>
</tr>
<tr>
<td><strong>Organizational-level:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLOs</td>
<td>Mean (302.1)</td>
<td>3/7</td>
</tr>
<tr>
<td>Years in Operation</td>
<td>Mean (8.8)</td>
<td>5/5</td>
</tr>
<tr>
<td>Regional Coordination</td>
<td>Mean (3.9)</td>
<td>5/5</td>
</tr>
<tr>
<td>Full Time Staff</td>
<td>Mean (21.7)</td>
<td>4/6</td>
</tr>
<tr>
<td>Part Time Staff</td>
<td>Presence</td>
<td>4/6</td>
</tr>
<tr>
<td>Interns</td>
<td>Presence</td>
<td>7/3</td>
</tr>
<tr>
<td>Co-Location w/EOC</td>
<td>Presence</td>
<td>2/8</td>
</tr>
<tr>
<td>Analysts in the Field</td>
<td>Mean (12.2)</td>
<td>3/7</td>
</tr>
<tr>
<td>Briefings by Analysts</td>
<td>Mean (9.7)</td>
<td>4/6</td>
</tr>
<tr>
<td>Briefings by Directors</td>
<td>Mean (3.1)</td>
<td>3/7</td>
</tr>
<tr>
<td>Products Per Month</td>
<td>Mean (10.77)</td>
<td>2/8</td>
</tr>
<tr>
<td><strong>Analyst-level:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Months in Position</td>
<td>Mean (44.51)</td>
<td>4/6</td>
</tr>
<tr>
<td>Average Briefings Received</td>
<td>Mean (1.47381)</td>
<td>7/3</td>
</tr>
<tr>
<td>Average Briefings Given</td>
<td>Mean (1.951667)</td>
<td>4/6</td>
</tr>
<tr>
<td>Analyst Clearance</td>
<td>Presence</td>
<td>8/2</td>
</tr>
<tr>
<td>Intelligence Analysis</td>
<td>Mean (73.625)</td>
<td>7/3</td>
</tr>
<tr>
<td>Information Analysis</td>
<td>Mean (77.673)</td>
<td>9/1</td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>Mean (73.03)</td>
<td>8/2</td>
</tr>
<tr>
<td>Data Entry</td>
<td>Mean (79.05)</td>
<td>8/2</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>Mean (65.08)</td>
<td>3/7</td>
</tr>
<tr>
<td>Planning</td>
<td>Mean (72.75)</td>
<td>4/6</td>
</tr>
<tr>
<td>Threat Assessment</td>
<td>Mean (62.3)</td>
<td>3/7</td>
</tr>
<tr>
<td>Research</td>
<td>Mean (74.078)</td>
<td>7/3</td>
</tr>
<tr>
<td>Open Source Data Collection</td>
<td>Mean (76.853)</td>
<td>9/1</td>
</tr>
<tr>
<td><strong>Network-level:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties Within the Fusion Center</td>
<td>Mean (10.5)</td>
<td>6/4</td>
</tr>
<tr>
<td>Ties with Other Fusion Centers</td>
<td>Mean (5.3)</td>
<td>5/5</td>
</tr>
<tr>
<td>Ties with Federal Agencies</td>
<td>Mean (6.7)</td>
<td>5/5</td>
</tr>
<tr>
<td>Ties with Law Enforcement</td>
<td>Mean (12.8)</td>
<td>6/4</td>
</tr>
<tr>
<td>Ties with Non-Law Enforcement</td>
<td>Mean (7.1)</td>
<td>6/4</td>
</tr>
</tbody>
</table>

The data reported through the questionnaires as continuous variables (e.g. the number of TLOs, the number of products per month, etc.) were calibrated using the mean from
the descriptive statistics tables. For example, if a fusion center reported a number of TLOs above the mean, that variable was coded 1, and if the number was below the mean, it was coded 0. This process was completed for all of the variables in Table 5.3 using the raw aggregated data and descriptive statistics from Chapter 4.

The QCA calibration process outlined by Ragin and others demands that researchers avoid applying too strict a threshold for inclusion and exclusion. When applying the mean standard, it is important to ensure that the threshold is reasonable. For example, if only one case could meet the threshold for membership then the mean needed to be re-examined as a reasonable cutoff. Each condition was examined to ensure that this was not the case across all 30 conditions. Since none of the conditions excluded less than two fusion centers, the means standard was accepted as a reasonable threshold for each of the continuous variables, or conditions.

The first test used the calculated mean from the descriptive statistics tables in Chapter 4 for each condition that was reported as a continuous variable. These conditions and the means used to assign membership can be found in Table 5.3. For example, the mean for the outcome variable, effectiveness, was used to determine which fusion centers would be included in the dataset for the presence of the outcome (total effectiveness score of or greater than 75.7946), and the dataset for the negation of the outcome (total effectiveness score of less than 75.7946). By applying this threshold alone, five of the ten fusion centers met the standard for inclusion in the presence of the outcome.

Reputation was used as a validating mechanism. For each fusion center that met the minimum threshold for membership in the highly effective category, the reputation data were used to validate that measure. The minimum accepted score for reputation was set at ten positive
mentions. This was arbitrary, but based on the assumption that ten positive mentions represented an overwhelmingly positive response from both internal and external stakeholders and was more likely to indicate a positive reputation. By combining these two thresholds, only four of the five most effective fusion centers met the standard for membership in the outcome condition. These four were labeled as the most highly effective fusion centers in the sample, because they met both standards.

The same analysis was conducted for the negation of the outcome. In order to be assigned membership in the negation set, the fusion center had to meet two criteria: fail to record a total effectiveness score above the mean, and fail to record a positive reputation. As a result of this analysis, three fusion centers met the threshold for inclusion in the negation of the outcome. These fusion centers were labeled as less effective because they met both standards for membership.

For 25 of the remaining 30 conditions, the mean was calculated and applied as the membership threshold (see Table 5.3). For the last five categorical variables, a simple presence test was used to assign membership. If the fusion center reported the presence of the condition, then that condition was coded as present (1), or as absent (0) if the condition was not reported. For example, it was determined that the number of interns was less important than the presence of interns. If a fusion center director indicated that the fusion center maintained a cadre of interns, then that variable was coded as present.

The final result of the calibration process was a table of binary coded data for each variable, including the dependent variable. Each variable was given an abbreviated label at the top of the column with rows delineated by fusion center. The Excel file that was used to
determine and assign membership was then saved as a Comma Delimited (.csv) file, which is the only file type accepted by the fsQCA 2.5 software package.

For the first outcome set, the outcome was the presence of the outcome variable as the four highly effective fusion centers coded as 1 and the other fusion centers coded as 0. The second dataset was coded for the three less effective fusion centers with membership in the outcome category. All of the other variables retained their same coding in both datasets and were not altered. After these two datasets had been converted into .csv files, the two datasets could be opened in the fsQCA 2.5 software. The free version of fsQCA 2.5 that can be downloaded from the COMPASSS Software website (www.compasss.org) was used in this research.

5.4 Step 2: Testing for Necessary Conditions

The first calculation conducted in the fsQCA 2.5 software package is to test for the presence of necessary conditions in the dataset. Necessary conditions are simply those required to produce the outcome. The fsQCA 2.5 software package has the capability to identify necessary conditions for all of the variables in the QCA dataset.

When identifying necessary conditions, the software produces an output that assigns a consistency and coverage score. Consistency measures the degree of necessity or sufficiency between a condition and an outcome within a given data set (Legewie 2013). Coverage provides a measure of empirical relevance for each condition (Legewie 2013).

In csQCA, the process can be completed in two simple steps. First, the fsQCA 2.5 software package has crosstabs function to search for row percentages in the dataset. Once the software has calculated the row percentages, it is then possible to determine the presence or absence of a necessary condition based on the consistency and coverage scores.
5.4.1 Highly Effective Fusion Centers

The necessary conditions for the four highly effective fusion centers are presented in Table 5.4. Not all of the necessary conditions, however, are consistent with observation and theory. Each of the conditions, as well as the process for determining which conditions were valid, is discussed in what follows.

Table 5.4 Necessary Conditions for Highly Effective Fusion Centers

<table>
<thead>
<tr>
<th>Variable</th>
<th>Consistency</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interns</td>
<td>1.00000</td>
<td>0.571429</td>
</tr>
<tr>
<td>~EOC</td>
<td>1.00000</td>
<td>0.500000</td>
</tr>
<tr>
<td>Analyst Clearance</td>
<td>1.00000</td>
<td>0.500000</td>
</tr>
<tr>
<td>~Briefings by Analysts</td>
<td>1.00000</td>
<td>0.666667</td>
</tr>
<tr>
<td>Intelligence Analysis</td>
<td>1.00000</td>
<td>0.571429</td>
</tr>
<tr>
<td>Information Analysis</td>
<td>1.00000</td>
<td>0.444444</td>
</tr>
<tr>
<td>Verbal Communication</td>
<td>1.00000</td>
<td>0.500000</td>
</tr>
<tr>
<td>Data entry</td>
<td>1.00000</td>
<td>0.500000</td>
</tr>
<tr>
<td>~Planning</td>
<td>1.00000</td>
<td>0.666667</td>
</tr>
<tr>
<td>~Threat Assessment</td>
<td>1.00000</td>
<td>0.571429</td>
</tr>
</tbody>
</table>

~ = Full non-membership

The Interns variable tracked the presence of interns in a fusion center. As an organizational variable, the presence of interns seems consistent with effective organizations because interns may indicate organizational capacity. For example, if a fusion center is able to recruit and manage interns, it likely possesses the capacity to recruit, assess, and train personnel and can reduce the administrative workload on full-time analysts. Interns may also represent a pipeline of talent for the fusion center. Therefore this necessary condition is valid with a perfect consistency and adequate coverage value.

The ~EOC necessary condition indicates none of the highly effective fusion centers in this sample were co-located with an EOC. However, in conducting this research, other fusion centers outside the sample that were perceived as effective and reputable are co-located with the
jurisdiction’s EOC. In addition, even those fusion centers that are not co-located often have personnel with assigned roles or functions in an activated EOC. Therefore, co-location with an EOC may have little (if any) bearing on the outcome. This variable can be dismissed as a necessary condition when interpreting the results because it is not consistent with observations and knowledge of each individual case.

The Analyst Clearance variable was constructed by determining the number of fusion centers that reported having at least one Top-Secret or higher security clearance held by an employee of the fusion center (excluding liaisons or federal personnel). This condition is meaningful because at least one representative of the fusion center is able to attend highly classified briefings and access classified databases. This access provides many spillover benefits for the entire fusion center, including legitimacy for the fusion center and its personnel. Anecdotally, high level clearances have long been considered necessary for a successful fusion center. This finding provides further empirical evidence that even a limited number of Top Secret or higher clearances can have benefits for an organization.

The ~Briefings by Analysts variable indicates that in highly effective fusion centers analysts are not devoting as much time each month to briefings and presentations as analysts in other fusion centers. This may indicate that in highly effective fusion centers, analysts have more time to devote to their analysis. This finding was also supported by interview data, suggesting that when it comes to providing information to stakeholders and partners—or even to colleagues—fusion center analysts must be able to produce quality over quantity.

In all four highly effective fusion centers, the ability to perform Intelligence Analysis, Information Gathering, Analysis, and Dissemination, Verbal Communication, and Data Entry were prioritized by analysts, resulting in a set of skills as necessary conditions for the outcome.
Intelligence gathering, analysis, and dissemination are critical functions of the fusion center analyst. Verbal communication, which includes briefings, presentations, and articulating messaging, is an important skill for analysts because they need to be able to present their analysis. Data entry is another skill that is closely aligned with the previous three skills. During informal interviews held prior to the development of the surveys, current and former fusion center personnel stated that it was important to be able to understand, sort, manage, and post all types of data using technologies and other resources in the fusion center.

Information analysis, however, did not meet the criteria for coverage as discussed above. The coverage .444444 indicates that the condition covers fewer than half of the cases, and is therefore a weak necessary condition. Despite the perceived importance of information analysis, there is nothing about the cases to suggest that information analysis should be a necessary condition.

The ~Planning and ~Threat Assessment skill variables were not prioritized, which may indicate that strategic planning is distinct from pre-event or pre-incident in terms of analysts’ priorities. Also, threat assessment may be the sole responsibility of a single analyst with a critical infrastructure and key resources portfolio. Another possibility is that analysts still lack training and expertise in threat assessment within fusion centers that were part of the sample.

None of the tie multiplexity variables were found to be necessary conditions, which is consistent with theory. Ties are the currency of any inter-organizational network, but membership and participation in the network is unlikely to rest on any fixed number of ties or tie multiplexity as an indicator of strength. Nor is it likely that all highly effective fusion centers share the same types of ties and tie strength in the form of multiplexity.
5.4.2 Less Effective Fusion Centers

The other fusion centers in the sample shared fewer necessary conditions (see Table 5.5). Not all of the necessary conditions for other fusion centers are the converse of those for highly effective networks.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Consistency</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>~TLO</td>
<td>1.000000</td>
<td>0.571429</td>
</tr>
<tr>
<td>Briefings by Analysts</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>~Products Per Month</td>
<td>1.000000</td>
<td>0.500000</td>
</tr>
<tr>
<td>Briefings Received</td>
<td>1.000000</td>
<td>0.666667</td>
</tr>
<tr>
<td>Information Analysis</td>
<td>1.000000</td>
<td>0.500000</td>
</tr>
<tr>
<td>Open Source Data Collection</td>
<td>1.000000</td>
<td>0.444444</td>
</tr>
</tbody>
</table>

The necessary conditions for these fusion centers offer some key contrasts to highly effective fusion centers. The ~TLO variable indicates that none of the other fusion centers reported a TLO network that met the threshold for membership in the data. This is consistent with the case study findings, which highlighted the importance of the TLO network for outreach, incoming information, and stakeholder engagement. The ~Products Per Month condition is also consistent with the case study findings on the importance of an established product line.

The Briefings by Analysts condition includes the number of briefings reported for the entire fusion center in an average month, and is an organizational level capacity variable. There is one possible explanation. It may be that analysts in these fusion centers must manage many demands for briefings, leaving less time for training, professional development, and analysis.

The Briefings Received condition, however, is an analyst-level condition. Analysts reported the number of briefings they received on average, per month, from federal agencies. In interviews, SMEs indicated that this condition might validate efforts by Federal agencies to provide more resources to fusion centers that need them the most. It may also be true that
briefings are a substitute for other types of connectivity. For example, if a fusion center cannot afford the costs of certain FBI portals or databases, then it may be that briefings are an alternative. This condition may also be present if fusion centers simply have more federal agency liaisons than other fusion centers, which could be the result of many different factors including the significance of the jurisdiction for federal agencies or the demand for federal presence.

The remaining two necessary conditions are skill related variables. Information Analysis and Open Source Data Collection do not require access to classified databases, extensive interpersonal ties, nor a high-level security clearance. It may be that these skills are prioritized by analysts in these fusion centers because these skills require little training and fewer resources.

However, as with information analysis for the most highly effective fusion centers, open source data collection did not meet the standard criteria for coverage as discussed above. The score of .444444 indicates that open source data collection covers fewer than half of the cases, and is therefore not accepted as a necessary condition. Despite the perceived importance of open source data collection, there is nothing about the cases to suggest that this condition should be included irrespective of the coverage score, meaning it does not pass the theoretical or empirical relevance tests.

As with highly effective fusion centers, none of the network tie variables represented necessary conditions. This is consistent with theory and the expectation that less than effective fusion centers are more likely to be isolated, and therefore maintain fewer strong ties across the five types.
5.5 Step 3: Constructing the Truth Tables

With the necessary conditions established and set aside, the next step is to construct truth tables. As discussed earlier in this chapter, truth tables are used to determine the configurations of conditions present when the outcome is present (Rihoux and De Meur 2009). The tables consist of all the possible combinations of conditions that can occur for each case, and are minimized using a process designed by Ragin for this purpose (2008). In the fsQCA 2.5 software package, the crisp set analysis tool allows researchers to input the dataset and then conduct the truth table minimization process.

Truth tables were created for each level being analyzed (e.g., organizational conditions) against the outcome. By exploring the combinations of fewer conditions, it is possible to arrive at a more concise truth table construction. This was repeated for organizational, analyst, and network level conditions until a simplified truth table could be constructed with only those conditions from all three levels that were most likely to be included in a parsimonious or intermediate solution.

After creating a truth table, the consistency scores produced by the software were used to further minimize the sets, removing rows and remainders that were not applicable to the cases. The generally accepted minimum for inclusion of rows is .75 unless there is a valid reason to lower that range. I applied this baseline for inclusion and excluded any rows that did not meet this threshold. To refer to the truth tables generated in this research, please see Appendix B.

5.6 Step 4: Analyzing the Solutions

After the truth tables have been created and minimized, the resulting outputs are reported as three solutions: complex, parsimonious, and intermediate. These solutions are the “recipes” or paths to
the outcome. The output file produces consistency scores, as well as raw and unique coverage scores for each of the three solution categories. These scores establish the number of cases to which the recipes apply.

As discussed briefly in regards to necessary conditions, consistency measures how often the outcome is present when the solution is present. For example, a consistency score of .75 for a solution indicates that when the solution is present, 75% of the cases with that solution have membership in the outcome set. Consistency scores range from 0 to 1, with 1 indicating perfect consistency (Legewie 2013).

Coverage provides a measure of empirical relevance for each condition or combination of conditions (Legewie 2013), and assesses how much of the outcome is accounted for by a condition or combination of conditions (Ragin 2006). Coverage scores should be weighed against theoretical relevance and an intimate knowledge of the cases. In some instances, a low coverage score might not be enough to dismiss a condition, whereas high scores may be reported for insignificant conditions within the context of the solution. In fact, coverage and consistency scores may sometimes be in conflict because high consistency could yield low coverage (Ragin 2006).

Although there is no widely accepted minimum score for coverage to determine inclusion or exclusion, researchers must examine the conditions for theoretical relevance and then determine sufficient coverage. According to Ragin (2006), higher coverage scores are desirable, but high consistency scores will generally mean lower coverage scores. When analyzed in concert, consistency can be used to determine the degree to which instances of an outcome display the combination of conditions, and coverage can be used to assess the relevance of the combination of conditions.
After determining the solutions that provide the simplest explanation of the observed outcomes—consistent with the researcher’s own observations and theory—the truth tables can be re-constructed with those variables to ensure validity of the recipes for each case. This same process is repeated for the negation of the outcome set.

5.6.1 Solutions for Highly Effective Fusion Centers

The analysis of the dataset for the presence of the outcome for the four highly effective fusion centers produced a truth table with the following conditions (after the minimization process): TLO, Research (skill), Ties Within the Fusion Center, Ties With Other Fusion Centers, Ties With Federal Agencies, and Ties With Law Enforcement. This truth table produced three solutions for four fusion centers with various combinations of the above conditions (see Table 5.6).

Table 5.6 Parsimonious Solutions for Highly Effective Fusion Centers

<table>
<thead>
<tr>
<th>Solution</th>
<th>Interpretation</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLO*le</td>
<td>Fusion centers with large TLO cadre but without multiplex relationships</td>
<td>0.400000</td>
<td>0.400000</td>
<td>1.000000</td>
<td>FC2, FC4</td>
</tr>
<tr>
<td><em>OwnFC</em>OFC</td>
<td>Analysts have multiplex relationships inside and outside their jurisdictions</td>
<td>0.600000</td>
<td>0.000000</td>
<td>1.000000</td>
<td>FC5, FC7</td>
</tr>
<tr>
<td><em>OFC</em>LE</td>
<td>Analysts have multiplex relationships with law enforcement</td>
<td>0.600000</td>
<td>0.000000</td>
<td>1.000000</td>
<td>FC5, FC7</td>
</tr>
</tbody>
</table>

Solution Coverage: 1.000000
Solution Consistency: 1.000000
Consistent with QCA best practices, uppercase letters indicate presence of a condition and lowercase indicates absence of a condition.
Model: \text{effectiveness} = f(\text{TLO, Res, OwnFC, OFC, FA, LE})
Consistency Cutoff: .90
Assumptions: None

The solutions indicate complete coverage and consistency (1.000000). Although it is more common to have high consistency scores for small-N research than medium- or large-N
research, the values for coverage and consistency indicate that the solutions explain all four cases and carry empirical weight (see Table 5.6).

There is a single solution for cases FC2 and FC4 with complete consistency. The solution indicates that a large TLO network (TLO), coupled with the absence of multiplex law enforcement ties (le), is sufficient for the outcome (effectiveness) in addition to the necessary conditions identified in the previous step. Two solutions were produced for FC5 and FC7 and consist of ties: ties within the fusion center (OwnFC), ties with other fusion centers (OFC), and ties with law enforcement (LE). Once again, these solutions provide complete consistency and adequate raw coverage values.

When equifinality is present, further analysis of the raw and unique coverage values can reveal the empirical significance of the solutions (Ragin 2008). This analysis is referred to as partitioning the coverage values (Ragin 2008). While raw coverage shows how much of the total membership in the outcome is covered by a solution, unique coverage can indicate whether cases conform to more than one solution (Ragin 2008). Even with a small number of cases, the raw and unique coverage scores still show that the recipes apply to all of the cases, and the solution coverage and consistency values of 1.00000 indicate that none of the solutions apply to the less effective fusion centers.

Although the solutions and findings will be discussed in greater detail later in this chapter, it is important to note that the coverage and consistency scores have added significance due to the fact that similar cases shared solutions. Both FC2 and FC4 share internal organizational and personnel similarities, whereas FC5 and FC7 are parented by large state level law enforcement agencies. This pattern indicates that the solutions—and the fact that one of the solutions is very distinct from the other two—are valid, even with a small number of cases.
5.6.2 Solutions for Less Effective Fusion Centers

The fusion centers that were calibrated for the negation of the outcome—as discussed above—were also analyzed using the same process as for the highly effective cases. These less effective fusion centers should not be thought of as ineffective. Rather these fusion centers, for a variety of reasons, are simply not perceived by stakeholders as the most highly effective organizations within the sample. It is important to recognize that their membership in this category might be altered in another sample, or under another threshold for membership in the most highly effective category.

Only three fusion centers had membership in the negation of the outcome. Because FC1, FC9 and FC10 met at least one threshold for highly effective fusion centers (specifically that their effectiveness scores or reputation scores were positive) only the three fusion centers that met neither the effectiveness or reputation thresholds could be included in the truth table. They are cases FC3, FC6, and FC8. Of note, FC3 and FC6 are both state level fusion centers, whereas FC8 is a major urban area fusion center.

A truth table with the following variables (after the minimization process) included: Research (skill), Ties Within the Fusion Center, Ties With Other Fusion Centers, and Ties With Law Enforcement (see Table 5.7). Using the fsQCA 2.5 software, solutions were found for all three fusion centers (see Table 5.7). This truth table produced two solutions for three fusion centers with various combinations of the above conditions.

There was also some distinction in terms of the raw and unique coverage values for these solutions when contrasted with the most highly effective fusion centers, but once again, due to the small number of cases with membership in the negation of the outcome, the scores indicate
complete coverage of the solutions. These scores indicate that the solutions also carry empirical weight (see Table 5.7).

<table>
<thead>
<tr>
<th>Solution</th>
<th>Interpretation</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>RES<em>ownfc</em>le</td>
<td>Fusion centers without multiplex relationships</td>
<td>0.666667</td>
<td>0.666667</td>
<td>1.000000</td>
<td>FC3, FC6</td>
</tr>
<tr>
<td>OWNFC<em>ofc</em>LE</td>
<td>Fusion center with few multiplex relationships</td>
<td>0.333333</td>
<td>0.333333</td>
<td>1.000000</td>
<td>FC8</td>
</tr>
</tbody>
</table>

Solution Coverage: 1.000000
Solution Consistency: 1.000000
Consistent with QCA best practices, uppercase letters indicate presence of a condition and lowercase indicates absence of a condition.
Model: $\text{effectiveness} = f(\text{Res, OwnFC, OFC, LE})$
Consistency Cutoff: .90
Assumptions: None

For FC3 and FC6, the solution consists of no multiplex relationships (ownfc and le) and analysts that prioritize research skills (Res). This solution indicates a high degree of isolation due to the lack of multiplex relationships. On the other hand, FC8 has multiplex relationships within its jurisdiction, but not outside the jurisdiction with other fusion centers (ofc). This could be due in part to the fact that FC8 is in a major urban area, and therefore may not invest in building relationships outside of its immediate jurisdiction.

Much like with the highly effective cases, similar organizations share solutions. The solution for FC3 and FC6 included research skills and an absence of ties within the fusion center and with law enforcement. Both of these organizations share similarities in organizational capacity, and both are state level fusion centers. However, FC8 is parented by a major urban area and is found to have a solution that is consistent with its operational environment and context.
5.7 Step 5: Analyzing the Theoretical Consistency of the Solutions

Before discussing the solutions, it is worth revisiting the observation that these solutions are grouped by organizations that share certain similarities. For example, the recipes distinguish between FC2 and FC4, and FC5 and FC7, which share certain organizational similarities. This indicates the importance of organizational level factors in determining the appropriate causal paths (recipes) for effectiveness. The differences between these solutions, however, extend to analyst level and network tie variables as well.

In addition, equifinality is present for both outcome sets. This is reinforced by the fact that fusion centers sharing similarities at the organizational level also share similar solutions, or paths to the outcome. In what follows, the solutions are dissected and analyzed in an effort to better understand each case and the variety among the solutions to effective and less effective outcomes.

5.7.1 Findings for Highly Effective Fusion Centers

The solutions for the four highly effective fusion centers are distinguished by organizational level conditions and the divergence in relationships maintained by the analysts. The FC2 and FC4 solution, in addition to the necessary conditions, consists of a large TLO network and the absence of multiplex ties to law enforcement. Within the operational contexts of these two fusion centers, this recipe is consistent with the organizational structure and mission of these organizations. Both FC2 and FC4 are known for the quality of their intelligence and information sharing products, and their skilled analysts (which are known throughout the network for various areas of expertise). In addition, both organizations are parented by state or major urban area police departments with close ties to at least two federal agencies.
Although the actual makeup of the TLO cadres was not captured by this research, interviews with analysts from FC2 and FC4 revealed that law enforcement officers make up the bulk of their TLO cadres. This is especially significant since all but two analysts in the dataset were civilian employees, indicating that analysts need not have a law enforcement background to leverage resources and connectivity with the law enforcement community through the TLO cadre.

When combined with the necessary conditions, the recipe for FC2 and FC4 is contained in Table 5.8. The necessary and sufficient conditions include all three levels of analysis. From this snapshot, it is possible to determine that both FC2 and FC4 are invested in their TLO cadres, have intern cadres, employ analyst(s) with high level security clearances at the Top Secret level or higher, and the analysts do not conduct as many briefings as those in other fusion centers. This was supported by interviews with analysts in FC2 and FC4. In fact, both FC2 and FC4 are highly regarded for the quality of their TLO cadres and often host delegations of analysts from other fusion centers who want to implement the best practices they have developed.

<table>
<thead>
<tr>
<th>Table 5.8 Necessary and Sufficient Conditions for FC2 and FC4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Level</strong></td>
</tr>
<tr>
<td>TLO Interns</td>
</tr>
<tr>
<td>Analyst Clearance</td>
</tr>
<tr>
<td>~Briefings by Analysts</td>
</tr>
<tr>
<td><strong>Analyst Level</strong></td>
</tr>
<tr>
<td>Intelligence Analysis</td>
</tr>
<tr>
<td>Verbal Communication</td>
</tr>
<tr>
<td>Data entry</td>
</tr>
<tr>
<td>~Planning</td>
</tr>
<tr>
<td>~Threat Assessment</td>
</tr>
<tr>
<td><strong>Network Level</strong></td>
</tr>
<tr>
<td>~LE</td>
</tr>
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</table>

*EOC was excluded because it was not consistent with other findings

The analysts in FC2 and FC4 are highly skilled and prioritize essential skill categories that are consistent with federal guidance. At the network level, however, it appears that FC2 and
FC4 are not as closely connected to the law enforcement community as other fusion centers. This is explained, at least in part, by the organizational and analyst level results.

In both FC2 and FC4, analysts are known for their skills and the ability to conduct advanced analysis that results in high quality products. Emphasis in both fusion centers, based on interviews, is placed on the quality of these products and not quantity. Both organizations are also known for their excellent TLO cadres. As a result, these fusion centers establish their legitimacy and maintain their reputations by enabling analysts to conduct analysis, and invest in relationships primarily at the organizational level. The findings do not de-value the importance of multiplex ties, but rather indicate that these organizations are investing limited resources into products and stakeholder engagement at the organizational level, and less so on relationship building or maintenance at the level of individual analysts.

On the other hand, the two solutions for FC5 and FC7 indicate that analysts prioritize research skills, and have multiplex ties with other fusion centers and the law enforcement community. Ties with the law enforcement community and those within the fusion center are interchangeable for both solutions because FC5 and FC7 are parented by and housed within state law enforcement agencies that heavily utilize the criminal intelligence and investigative support capabilities of the analysts. Analysts and directors in both fusion centers placed a heavy emphasis on their roles and responsibilities in supporting law enforcement activities. Table 5.9 contains the necessary and sufficient conditions for FC5 and FC7.

Both FC5 and FC7 share the same geographic region, which has several working groups, committees, and task forces set up to address regional threats or criminal activities, such as drug and human trafficking. Analysts with expertise in a particular area are leveraged by other fusion centers that share seats in these regional working groups or joint efforts. The research skill is
prioritized in such a setting because analysts can leverage ties with these individuals that may cross organizational boundaries within the region to research threats, trends, or notable patterns related to their areas of expertise.

<table>
<thead>
<tr>
<th>Table 5.9 Necessary and Sufficient Conditions for FC5 and FC7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Level</strong></td>
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<td></td>
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<tr>
<td><strong>Analyst Level</strong></td>
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<tr>
<td><strong>Network Level</strong></td>
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</tbody>
</table>

*EOC was excluded because it was not consistent with other findings

The key difference between the four fusion centers is the TLO condition and the multiplex ties not reported by FC2 and FC4. Unlike FC2 and FC4, the critical ties are maintained at the analyst level in FC5 and FC7. It should also be pointed out, however, that even though FC5 and FC7 did not have large TLO networks—thus their non-membership in this set—they do heavily invest in the quality and maintenance of their TLO cadres through training, outreach, and providing other resources or services.

In both solutions, ties at either the organizational level or at the analyst level are critical distinguishing factors, but they alone are not sufficient for the outcome. Instead, tie multiplexity or relational ties at the organizational level are INUS conditions, which, combined with other conditions, are sufficient for the outcome.

The type of ties also seems to be closely related to organizational and analyst level variables. In FC2 and FC4, the analysts are known across the network for their skills and
products, but the ties are at the organizational level. Conversely, FC5 and FC7 maintain ties with other fusion centers in their region, aided by task forces and joint efforts, as well as the law enforcement community at the individual analyst level.

5.7.2 Findings for Less Effective Fusion Centers

For FC3 and FC6, the necessary and sufficient conditions in Table 5.10 indicate an absence of multiplex ties within the fusion center and with the law enforcement community. Based on the observation that ties within the highly effective fusion centers and ties with law enforcement are interchangeable for fusion centers parented by law enforcement agencies, this solution is consistent with the negation of the effectiveness outcome. This solution also suggests that FC3 and FC6 are at least somewhat isolated within their AORs, from federal agencies, and other fusion centers in the network.

<table>
<thead>
<tr>
<th>Table 5.10 Necessary and Sufficient Conditions for FC3 and FC6</th>
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<tbody>
<tr>
<td><strong>Organizational Level</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Analyst Level</strong></td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Network Level</strong></td>
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</table>

In FC3 and FC6, fusion centers appear to lack the same organizational capacity of highly effective fusion centers. Notably, the absence or lack of a strong TLO network and of regular products per month, coupled with the number of briefings analysts give to stakeholders indicates that analysts may not be able to devote as much attention to developing high quality analytical products as those analysts in highly effective fusion centers. In addition, analysts in FC3 and
FC6 reported fewer prioritized skills, and the absence of ties both internal and external to the organization.

It is not entirely clear why the research skill is coupled with the absence of these ties. That research is prioritized by these fusion centers may indicate an internal focus on that skill, or simply the job descriptions in those fusion centers (which are unknown to the researcher) for the analysts that participated in the surveys. Job performance and promotion may also be based on some aspect of research tasks or functions within the fusion center. Another explanation may be that analysts in these fusion centers prioritize research as a skill, or simply lack proficiency in other skills that would otherwise be given higher priority.

The conditions for FC8 indicate that analysts in this fusion center have multiplex ties with individuals in the fusion center and with law enforcement (Table 5.11). This is consistent with the case because FC8 is parented by a major metropolitan area police department. FC8 is also a large fusion center in terms of the number of personnel it employs. As a result, it is likely that FC8 is focused almost entirely on its AOR, and less connected throughout the network. It may be this factor—an isolation resulting from the enormous responsibility of preventing terrorist attacks and managing a multitude of threats and hazards facing a major urban area—that explains the isolation.

<table>
<thead>
<tr>
<th>Table 5.11 Necessary and Sufficient Conditions for FC8</th>
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</thead>
<tbody>
<tr>
<td><strong>Organizational Level</strong></td>
</tr>
<tr>
<td>Briefings by Analysts</td>
</tr>
<tr>
<td>~Products Per Month</td>
</tr>
<tr>
<td><strong>Analyst Level</strong></td>
</tr>
<tr>
<td>Briefings Received</td>
</tr>
<tr>
<td>Information Analysis</td>
</tr>
<tr>
<td><strong>Network Level</strong></td>
</tr>
<tr>
<td>Within Fusion Center</td>
</tr>
<tr>
<td>With Law Enforcement</td>
</tr>
<tr>
<td>~Other Fusion Centers</td>
</tr>
</tbody>
</table>
It should be noted that FC8 was very near the threshold for effectiveness, but was far from being perceived as reputable based on the criteria for membership in the highly effective outcome. This supports the observation that visibility and connectivity both within the AOR (through the TLO network) and with other nodes in the network are critical for building and maintaining a positive reputation, even when the fusion center may be perceived as effective in other areas.

5.8 Summary of QCA Approach and Findings

The key findings are that necessary and sufficient conditions consist of conditions from all three levels of analysis, and that the solutions demonstrate equifinality. While the necessary conditions only included organizational level and analyst level characteristics, the solutions indicated the importance of ties for achieving both desirable and undesirable outcomes in the fusion center network, but also suggest that ties alone are not sufficient to produce outcomes.

Several observations are worth additional consideration. In two highly effective fusion centers (FC2 and FC4), skilled analysts and a strong TLO cadre contribute to effective outcomes, more so than individual level ties with various communities (law enforcement, other fusion centers, etc.). When analysts do have these additional ties, however, as evidenced by FC5 and FC7, they are able to demonstrate effectiveness without organizational level ties. This suggests that while ties are critical, it is not always essential for analysts to maintain multiplex ties.

For other fusion centers not in the highly effective category, the absence of organizational capacity, analyst skills, and ties could be observed. Even when analysts reported multiplex ties within their own fusion center and with law enforcement, as in FC8, these ties are not enough to
overcome the lack of analyst level skills and organizational capacity present in the most highly effective fusion centers.

Network settings present problems of complex causality that are difficult to unwind with models set on predicting outcomes. Traditional qualitative or quantitative methods likely would not have revealed the same complexity in the relationships between conditions at multiple levels of analysis in the form of causal recipes like those produced by this application of csQCA. Rather, QCA presents a way for researchers to examine what is actually occurring, and then develop propositions and corresponding hypotheses that can then be tested further to predict outcomes.
6.1 Contributions: Revisiting the Research Questions and Conceptual Framework

This dissertation offers a contribution by demonstrating the complexity of organizational outcomes that are the result of configurations of conditions from multiple levels of analysis within a whole network. By better understanding organizational level outcomes, I argue that network scholars can learn more about whole network outcomes and spur future inter-organizational network theory building efforts. The research and findings presented in the previous chapters address three research questions emerging from the literature review pertaining to variation in outcomes, reputation as a viable proxy for effectiveness, and tie multiplexity.

6.1.1 Re-visiting the Research Questions

The first research question asked: Why do organizational outcomes vary in whole networks? The research findings indicate that the variation is explained, at least in part, by configurations of conditions across all three levels of analysis. For the four highly effective fusion centers, two causal paths were discovered, and together with the necessary conditions, included variables from all three levels of analysis. Both paths shared other similarities, namely analyst skills and organizational capacity, and were distinguished by the presence or absence of various types of ties or relationships.

For the less effective fusion centers, two distinct solutions emerged. The first path was distinguished by the absence of multiplex ties, combined with a lack of organizational capacity and analysts with fewer skills than those analysts in highly effective fusion centers. The second path included multiplex ties within the fusion center and with law enforcement, but revealed isolation beyond the organization’s immediate jurisdiction. This was coupled with the same lack...
of organizational capacity and analysts that prioritized fewer skills than analysts in highly effective fusion centers.

The key takeaway of these findings is that the mix of conditions found at multiple levels of analysis matters for organizational outcomes. Fusion center outcomes vary because the paths to effectiveness vary based on organizational factors like capacity, the skills and abilities of analysts, and the relationships that analysts maintain with communities of practice internal and external to the network. While strong ties may be able to better leverage capacity, it does not appear from the cases that ties alone compensate for a lack of capacity. Based on the sample analyzed in this research, the most highly effective organizations have high capacities and strong ties. Analysts in these fusion centers were also very skilled. On the other hand, less effective organizations lacked both in capacity and relationships, and analysts prioritized fewer skills.

The findings also revealed a disparity between organizational effectiveness and reputation outcomes, suggesting that the answer to the second research question—Is reputation a viable proxy for effectiveness when evaluating organizational level outcomes in whole networks?—may be that reputation is not always a viable proxy for effectiveness. The stakeholder perception data—even before the QCA analysis was conducted—revealed variation between reputation and effectiveness outcomes across the sample. For example, four of the six fusion centers that did not meet the threshold for membership in the highly effective category—some of which scored well below the threshold for inclusion based on effectiveness—were perceived as reputable by stakeholders. Only one fusion center met the effectiveness threshold but not the reputation threshold for membership in the highly effective category.

It should also be noted that highly effective organizations reporting organizational level ties (like Terrorism Liaison Officer cadres) or multiplex ties across the network also shared the
most positive reputations, reinforcing Podolny’s (2001) findings that networks are prisms though which reputation may be viewed by others in the network. Therefore, organizations with multiplex ties, or inter-organizational ties within their jurisdictions, skilled analysts, and organizational capacity are the most likely to report positive reputations (Shane and Cable 2002; Ebbers and Wijnberg 2010).

Although the relationship between effectiveness and reputation is not clearly established in this dissertation, what has been established is the fact that a positive reputation can result from different factors than those contributing to effectiveness. This means that an organization can be reputable without being effective. However, the findings also point to the fact that within the sample, highly effective organizations have the most positive reputations. Therefore, stakeholder-based organizational reputation may be an important means for validating effectiveness measures. This may be especially true when effectiveness measures are tied to stakeholder perceptions of information sharing products or services (Shane and Cable 2002).

The third research question asked: *Is the presence of tie multiplexity necessary for positive organizational effectiveness and reputation outcomes in whole networks?* Ties are one of the distinguishing factors between highly effective fusion centers—which displayed the presence of ties as either organizational (TLO cadres) or individual level ties with various communities of practice—and less effective fusion centers, which reported fewer or weaker relational ties. However, the findings indicate that multiplex ties are not always necessary for positive organizational outcomes like effectiveness and reputation, because organizations may be able to leverage organizational level ties (liaisons for example) in place of individual level multiplex ties.
Accordingly, the findings suggest that multiplexity should be measured alongside other variables and as a possible explanation for outcomes as an INUS condition. As explained in Chapter 5, INUS conditions are those that are not sufficient for the outcome by themselves, but are part of causal solutions that are sufficient. The implication is that relationships are critical to desirable outcomes but only in combination with other factors. For example, a fusion center may invest heavily in relationship building and maintenance, yet still fall short of effective outcomes in the eyes of stakeholders. However, it must be noted that this research only measured multiplexity as relationship strength. Other dimensions, such as frequency or intensity, could result in different combinations of conditions making up the paths to observed organizational outcomes.

6.1.2 Revising the Conceptual Framework

The original conceptual framework (see pg. 74) tried to explain organizational outcomes perceived by stakeholders, and was based largely on the observations from the case studies of two fusion centers. The research findings validated many of the basic assumptions in the original framework, but also highlight the need for some changes. As with the original framework, dotted lines represent relationships that appear to exist, but that are not explained by the research findings.

First, the findings indicate the importance of variables at all three levels of analysis and validate this portion of the original framework. Accordingly, the three levels should remain the same in any revised conceptual framework.

Second, the original framework placed intelligence and information sharing into a single frame. The findings and interviews with analysts revealed that the act of analysis and the act of
information sharing are two distinct but closely related activities. For example, the highly effective fusion centers were known for the quality of their analytical products, but do not share the same types of relationships with their stakeholders. Two of these highly effective fusion centers maintain strong ties within their jurisdictions through a well-established liaison network, while the two other highly effective organizations maintained strong ties with other fusion centers in addition to ties within their jurisdictions.

**Figure 6.1 Revised Conceptual Framework for Organizational Level Effectiveness**

![Conceptual Framework](image)

I have interpreted this to mean that highly effective fusion centers maintain ties, whether at the organizational level (TLO or liaison cadres) or at the individual level (multiplex ties), but that ultimately their effectiveness is based on the quality of their products. Ties then are the vehicles whereby critical intelligence and information is obtained to develop, enhance, or improve the quality of their products, as well as share these valuable products with stakeholders.

Conversely, less effective organizations generally did not have strong ties or well developed product lines, even though at least one fusion center maintained strong relationships with law enforcement. Even multiplex ties, however, may not be enough to improve the quality
of intelligence and information sharing products because analysts in these organizations prioritized much fewer skills, which is compounded further by a reported lack of organizational capacity.

To be effective, it seems that organizations within whole networks need to achieve a level of capacity, hire and retain skilled individuals, and build and maintain multiplex relationships (or liaison cadres) that can be used to fully leverage the organization’s capacities and personnel. When this is the case, stakeholders will likely take notice, as evidenced by the high reputation scores reported for the most highly effective fusion centers.

The conditions at all three levels of analysis appear to be working in concert towards effectiveness outcomes, but analysis and sharing seem to be two separate yet closely related activities. As a result, these findings are interpreted in the conceptual framework as a distinction between intelligence and information sharing, and the analysis function, with a linkage (see the dotted line in Figure 6.1) between them depicting a relationship that should be explored further. Future research should focus specifically on examining the relationship between analytical functions and the actual sharing of information as a product of the relationships between individuals and organizations.

Finally, while the original conceptual framework presented perceived effectiveness outcomes as the result of information sharing, reputation was indicated as a result of effectiveness. However, the findings showed that reputation can be a distinct outcome that isn’t associated with the effectiveness outcome for an organization. This was evidenced by the fact that some fusion centers were reputable without being effective and effective without being reputable. Whereas effectiveness is assessed by stakeholders based solely on intelligence and information sharing products, reputation is far more likely to rest on interpersonal and cognitive
dimensions of perception, as well as products and services. Therefore, the revised framework proposes that effectiveness and reputation should be dual outcome variables.

The precise nature of the relationship between reputation and effectiveness, however, remains unclear, and there are three lingering areas that remain unanswered. First, because this research is not longitudinal, I was not able to establish how perceptions of reputation change over time in relation to changes in perceived effectiveness. As a result, the revised conceptual framework in Figure 6.1 depicts the relationship between effectiveness and reputation as a dotted line, showing that effectiveness does interact in some way with an organization’s reputation, and that this interaction is bilateral.

Another interesting aspect of reputation that remains unanswered by this research and the revised framework is the role of relational ties in influencing reputation. For example, future research could examine whether factors like trust or friendship resulting from relational ties between individuals in a fusion center have a direct bearing on the organization’s reputation. This would contribute to a better understanding of the effect of ties on reputation.

Finally, an element that remains unclear is the precise nature of the relationship between a positive or negative reputation and the impact that reputation has on the organization’s visibility, capacity, and ties. The case studies suggested that the WRTAC and NCRIC are able to leverage their reputations to bring additional resources (and therefore capacity) to their organizations (see Provan et al. 2009), but the data collected in this research was not adequate for illuminating the way in which this actually occurs.

Although these findings are presented within the context of a whole network designed to share intelligence and information, the scholarly contribution pertains more broadly to whole networks across a variety of policy areas. The conceptual framework captures a process for
working backwards from observed outcomes, thereby linking what stakeholders value to specific outputs or conditions across levels of analysis. By applying this framework to other policy areas, such as public health or emergency management, scholars can advance theory building so that it appreciates the organizational and individual level actor characteristics and relationships that provide the greatest value to whole network constituencies.

6.1.3 QCA Propositions and Possibilities for Future Research

The findings and observations that inform the conceptual frameworks also highlight areas where further research is needed to establish and clarify important relationships between effectiveness, reputation, and organizational and individual level variables or conditions. The QCA approach does not yield new theories, but can aid researchers by generating “some new insights, which may then be taken as a basis for a further theoretical development or for reexamination of existing theories” (Berg-Schlosser et al. 2008, p. 16). These new insights can take the form of propositions, which can then inform the development of hypotheses for testing with QCA or another approach (Bacharach 1989). The purpose of this section is to present propositions that emerged from the findings.

The first proposition addresses the variation in the outcomes reported for each organization based on stakeholder perception. Two stakeholder groups—one internal and another external to the network—provided perception-based assessment of a representative sample of the network. By engaging two different stakeholder communities with visibility of the organizations in the network it was possible to compare and contrast the effectiveness scores for each organization. For eight of the 10 fusion centers included in the QCA dataset, internal
stakeholders assessed the organizations’ effectiveness higher than the external stakeholders did for the same organizations.

This may be explained by the fact that internal stakeholders have both a greater degree of familiarity with other member organizations in the network, and a greater stake in how the network as a whole is perceived. Future research should build from the following proposition to better establish the reasons for this disparity in assessment between the two stakeholder groups:

*Proposition 1 – Internal stakeholders will provide a more positive assessment of a network member organization’s products and services than external stakeholders.

Together, the assessments of internal and external stakeholder groups provides a more reliable measure of an organization’s perceived effectiveness than those from only internal or external stakeholders.*

The second proposition addresses the configurational nature of organizational outcomes in whole network settings. The causal solutions or paths for highly effective and less effective fusion centers revealed that specific configurations of conditions at three levels of analysis within the network resulted in the observed variation in effectiveness.

As discussed above, the distinction between the paths for the highly effective organizations was the type of relational ties maintained by the organization or individual analysts. For the less effective fusion centers, paths to the outcome were distinguished both by organizational factors, individual skills, and ties.

In a broader sense, as discussed above, multiplex ties were found to be a distinguishing condition between the various solutions, but they are not by themselves a determining factor,
making them an INUS condition. While tie multiplexity at the analyst level may close gaps resulting from a lack of organizational capacity within an organization, at the individual-participant level it is not sufficient to ensure highly effective outcomes.

The key implication is that multiplexity must be considered in addition to other factors, and future research should look more closely at other dimensions of relational ties to better understand their role in shaping organizational outcomes within whole network settings. Therefore, the following proposition suggests that future research continue to unpack the conditions that form the solutions or paths to observed organizational level outcomes in whole networks:

**Proposition 2 – Configurations of organizational capacity and individual participant (actor) variables, as well as the presence and strength of relationships contribute to organizational outcomes in whole networks. When organizational capacity and individuals’ skills are similar, the presence and strength of various types of multiplex relationships will distinguish between the solutions, or paths, organizations take to reach observed outcomes.**

The results of the stakeholder questionnaires—aggregated to both the internal and external stakeholder responses—indicated that although an organization may be effective in terms of the quality of its products and services, that organization may not be reputable. The opposite was true for some of the less effective organizations. However, all of the highly effective organizations were also reputable.
Although network scholars have used reputation as a proxy for effectiveness within inter-organizational networks (see Provan et al. 2009), the implication of the finding is that the factors that contribute to organizational reputation may not always be the same as those factors contributing to organizational effectiveness, and that individuals form perceptions of reputation through the prism of the network (Podolny 2001). This finding leads to the following proposition:

*Proposition 3 – Stakeholder perceptions of organizational reputation are inadequate as standalone proxies for organizational effectiveness, but can serve to validate stakeholder perceptions of organizational effectiveness for the most highly effective organizations.*

The QCA results also revealed that the prioritization or de-prioritization of certain skills by analysts were necessary conditions for both highly effective and other fusion centers. For example, all highly effective fusion center analysts prioritized intelligence analysis, data entry, and verbal communication. Analysts from the less effective fusion centers only prioritized information analysis, which may require less training or expertise relative to the other skill categories, leading to the following proposition:

*Proposition 4 – Individuals in highly effective organizations will prioritize a greater number of task-related skills relevant to their roles and responsibilities than analysts in non-highly effective organizations.*
This proposition applies to organizations more generally, and is not limited to organizations in whole network settings. For example, Rainey and Steinbauer (1999) offered a proposition that states “the more the task design in the agency provides extrinsic and intrinsic rewards to individuals and groups, the more effective the agency” (p. 21). The skills of individuals clearly matter for outcomes, and in this research skills were determined based on task-related functions within a specific organizational setting. Future research could build from Proposition 4 to find linkages between the task related skills and abilities that individuals prioritize and the extrinsic and intrinsic rewards that they provide to the individuals. This could explain, for example, why analysts in the most highly effective organizations prioritize a different set of skills than analysts in less effective organizations.

These propositions present possible avenues for further research building from the findings and observations in this dissertation pertaining to effectiveness and reputation outcomes at the organizational level in whole network settings. In addition to these propositions, there are several important limitations and considerations that can inform future research.

### 6.2 Known Limitations and Considerations

This research was limited by several factors. First, despite the best efforts of this researcher, it was not possible to gather a larger dataset. Even within the fusion centers that did agree to participate, the number of respondents was fairly limited due to the organizational structure of the organizations, the demands of tasks and responsibilities on the fusion center analysts, or other factors that were not disclosed. Although only four fusion centers actually declined to participate, three others could not participate within the timeframe established for the research, leaving only 11 participating fusion centers, and just 10 for the analysis.
The results of this research must be considered within the context of a limited sample. The original sample of 18 fusion centers represented nearly one quarter of the national network, but the final sample only included 14 percent of the network. The number of fusion centers included in the analysis represented only 12.8 percent of the entire network. Despite this limitation, the sample did include a cross section of highly reputable fusion centers and those that are not highly effective for a variety reasons.

Second, even though the dissertation relies on multiple vantage points for stakeholder perception, there are limits to how well respondents actually know or understand the performance of the fusion centers in the sample. There is also an inherent bias of stakeholders depending on their positioning inside or outside the network. For example, some respondents were known to be advocates of the network, and others prominent critics. Every effort was made to include a wide range of respondents to counteract these limits, but researchers conducting survey data are ultimately limited by the knowledge and free recall of respondents, and cannot fully eliminate the bias of survey and interview participants.

Despite these limitations, the research and findings open doors for future research, in addition to those outlined in regard to the conceptual framework and the propositions discussed above. First, although reputation appears to be significant, and every fusion center in the original sample clearly had a reputation, there is much more to unpack regarding the value of reputation to organizations in whole networks, and the antecedents to positive reputations. The case study observations revealed that at least one fusion center leveraged its reputation to bring resources into the organization (see Provan et al. 2009), but the way in which this is done and the impact on outcomes over time was not established by this research and presents a potentially fruitful line of future inquiry.
Second, the configurational approach applied to the data collected for this research may reveal different results if applied to a larger sample of fusion centers from across the network. Although the results may not be significantly different in terms of stakeholder perception, there would likely be additional causal paths that may lead to a different set of propositions.

Third, the propositions presented above may provide fruitful avenues for future research, especially if other traditional methods are applied to predict outcomes. This research should also go further into the importance of understanding outcomes by including variables and observations from multiple levels of analysis within the network (Kilduff and Brass 2010). Emphasis of future research should be placed on establishing causation between conditions at multiple levels of analysis and organizational outcomes, and seek to predict outcomes based on the presence or absence of specific conditions.

Fourth, individual level characteristics examined in this research did not include any demographic variables such as age, sex or race. At a glance, the raw data suggested that sex may carry significance in terms of analysts’ skills and capabilities. Although this was not tracked by the questionnaires or in interviews, it seems that female analysts often hold prominent positions in fusion centers despite the fact that only a handful of fusion centers are directed by women. For example, analyst supervisors at both the WRTAC and NCRIC were female. Is this just a random result of the fusion centers sampled in this research, or might an analysts’ sex have some bearing on the other analyst level variables that were significant to organizational outcomes? In addition to sex, variables such as age or career progression might add another important dimension to the dataset and findings.

I did not capture information on the directors’ characteristics or ties, focusing instead on the analysts. This could be an important line of inquiry that speaks to the literature on the role of
managers in networks, because fusion center directors may share a different set of characteristics and attributes than analysts (Agranoff and McGuire 2001; McGuire 2002; Provan and Kenis 2008). For example, in some instances the director may be an employee of a different agency than the analysts. Directors may also be sworn when the analysts are civilian employees, adding another intriguing operational and structural dynamic. Directors also play the role of advocate, and are often the most visible individual from outside the fusion center. This means directors may have more to do with reputation than the analysts. By understanding directors more generally, and unpacking their ties and interpersonal networks, researchers would be able to learn a great deal about how these variables relate to effectiveness and reputation.

Finally, training and its link to individual actor-level variables as well as to organizational capacity was not fully explored in this analysis. The questions regarding the type of training most consistent with highly effective outcomes and reputations did not provide enough clarity to be included in the dataset. Analysts were given the opportunity to provide short answers, but the results were so varied and inconsistent, they resulted in data that could not be included in the final dataset. Future research on individual actors in whole networks should be more specific and speak to different categories for types of training, length of training, or prioritized training. In addition, it may be beneficial to differentiate between the training received over the course of an entire career versus the training received since being employed by a network member organization.

6.3 Informing Practice in the Domestic Intelligence Community

The methods applied in this dissertation lend themselves to practical applications of the data. This is true for practitioners at all levels of government in the domestic intelligence community.
The results may also be broadly applicable for any public or private organizations operating in whole networks, including the following specific observations.

First, the data provide a snapshot of what fusion center analysts look like in fusion centers that were the most highly effective according to stakeholder perception, as well as those in other fusion centers not deemed highly effective by the same stakeholder group. The analysis revealed the skills and ties unique to individual analysts can distinguish between the paths to highly effective or other less effective outcomes. With these results in hand, decision makers can refer not only to the commonalities and patterns among those analysts in the highest performing fusion centers, but also understand the unique combinations of analyst characteristics that may only work best in certain organizational contexts.

Second, the data reveal what high performing fusion centers—at least according to stakeholder perceptions—look like in various regions and operating environments across the nation. These include organizational features that figure most prominently in the results, and how different combinations of these conditions interact in order to produce desirable outcomes.

Third, to date there has been little if any systematic research analyzing primary data on fusion center personnel, organizational capacity, and ties between individuals and organizations. At a time when resource constraints are challenging growth for individual organizations, it is important that all stakeholders, from Congress to local police departments understand where resources should be directed or re-directed. While the data and findings are not without limits, they can at the very least inform decisions regarding the allocation of resources.

The fourth observation is that stakeholder perception can be a strong indicator of fusion center effectiveness, as discussed above. At the very least it could enable evaluators to distinguish between organizations or validate other metrics. The key factor is to establish the
right group of stakeholders, meaning stakeholders that represent all levels and sectors that can speak to the outputs and outcomes of individual fusion centers and fusion centers in various regions.

Additionally, the findings provide evidence to suggest that fusion centers at both the state level and in major urban areas located in very different parts of the country and at different levels of government are capable of demonstrating effectiveness as an outcome by taking different paths to that outcome. This is the concept of equifinality discussed earlier in this dissertation. By setting minimum standards or thresholds for things like personnel, or training programs, practitioners may run the risk of emphasizing areas that would conflict with the most direct path to the outcome for fusion centers.

For example, it should not be concluded from this research that because the most highly effective fusion centers met a minimum N for membership that the N is suitable as a standard or goal. The size of a TLO cadre in one state might be significantly larger than a higher quality but smaller TLO cadre in another state; by setting a minimum standard for the size of the TLO cadre, organizations could be incentivized to focus on an area or capacity that may not result in a more desirable outcome. This is the value of examining causal combinations, as opposed to traditional quantitative analysis of dependent and independent variables, and demonstrates the danger of placing too much emphasis on output based metrics alone.

Finally, the findings illustrate the value of taking a configurational approach to better understand complex causality in inter-organizational networks. This approach could be applied to a larger sample of the national network of fusion centers, as well as other domestic intelligence and information sharing networks at all levels of government.
6.4 Summary

Are fusion centers effective? That question could not be answered in a single dissertation, but the findings in this dissertation demonstrate that at least some fusion centers are effective in the eyes of their primary stakeholders, which suggests that these fusion centers are adding value within their jurisdictions. It is intuitive, then, to suggest that when fusion centers are adding value within their jurisdictions, they are in fact adding value to the national network and the broader intelligence community. While there are some organizations that still need to improve in certain areas, the findings suggest that given the right set of conditions, this is entirely possible.

Fusion centers may never be able to fully prevent or protect against all acts of terrorism, but this would be an unreasonable expectation for any intelligence and information sharing network. Members of Congress, federal agencies, and the practitioner community would do well to transition away from absolute output based metrics and instead focus on measuring outcomes as defined by fusion center stakeholders, incorporate the various network aspects such as relationships, and apply this information to strengthen the network’s member organizations. Scholars can play an important role by continuing to build theory that unpacks the many factors contributing to organizational level outcomes within whole network settings, and thereby inform the practitioner community.
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Appendix A: IRB Documentation
Appendix A.1: Online Consent Form

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Informed Consent for Participants
in Research Projects Involving Human Subjects

Title of Project: Measuring Network Effectiveness: Applying the configurational approach to explain why organizational outcomes vary across the national network of fusion centers

Investigator(s): Andrew Coffey, ABD: acoffey5@vt.edu/828-499-0605
Patrick Roberts, PhD: robertsp@vt.edu/202-549-4987
Robin Lemaire, PhD: rlemaire@vt.edu/540-231-0664

I. Purpose of this Research Project

In the United States 72 officially recognized state and major urban area fusion centers “fuse” threat-related information through coordinated effort across the domestic law enforcement and intelligence communities. In order to assess fusion centers—to determine whether they are or are not effective—key stakeholders led by DHS have devised output-based performance measures reported through an annual assessment process. Output measures alone, however, fail to capture the inherent complexity of organizational and network outcomes in a national inter-organizational information sharing network.

The purpose of this research is to explore why outcomes at the individual fusion center level vary across the network by examining unique configurations of causal conditions at multiple levels of analysis. The research will examine the organizational layers that determine how well, or how poorly, a fusion center executes its critical tasks. These layers consist of both organizational and individual human characteristics.

The research findings will lead to a dissertation in fulfillment of requirements for a Ph.D. in Public Administration and Policy at Virginia Tech. It is expected that up to 200 survey participants and up to 15 interview subjects will be involved in the research. The research results may be published in academic journals or in another format upon completion of the dissertation.

II. Procedures

By clicking “I agree” below, you will be led through an online survey that should require between 30 and 45 minutes to complete. The survey consists of questions that identify your own professional characteristics, and the relationships you maintain with colleagues and other individuals who support or are supported by you in the fulfillment of your duties.

III. Risks

There are no apparent physical, mental, or emotional risks resulting associated with participation in this research.
IV. Benefits

There are no direct monetary benefits or individual recognition resulting from participation in this research. The findings, however, will inform fusion center operations by isolating the factors that contribute to fusion center effectiveness.

No promise or guarantee of benefits has been made to encourage you to participate.

V. Extent of Anonymity and Confidentiality

All data collected through surveys and interviews will be kept confidential. Only essential information that identifies individual respondents will be collected (name, physical or mailing addresses, email address, phone number, etc.). The research team will have exclusive access to the data during the collection and analysis process, and all stored data will be password protected. The aggregate data (void of identifying information) may be shared with the National Fusion Center Association after the results have been published.

The Virginia Tech (VT) Institutional Review Board (IRB) may view the study’s data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

VII. Subject's Consent

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

_____________________________ Date ______________________
Subject signature (electronic)

VIII. Freedom to Withdraw

You are free to withdraw from this study at any time without penalty. You are free to choose not to answer any questions that you choose, or not respond to what is being asked of you, without penalty.

Please note that there may be circumstances under which the investigator may determine that a subject should not continue as a subject.

IX. Questions or Concerns

Should you have any questions about this study, you may contact one of the research investigators whose contact information is included at the beginning of this document.

Should you have any questions or concerns about the study’s conduct or your rights as a research subject, or need to report a research-related injury or event, you may contact the VT IRB Chair, Dr. David M. Moore at moored@vt.edu or (540) 231-4991.
Title of Project: Measuring Network Effectiveness: Applying the configurational approach to explain why organizational outcomes vary across the national network of fusion centers

Investigator(s): Andrew Coffey, ABD: acoffey5@vt.edu/828-499-0605
Patrick Roberts, PhD: robertsp@vt.edu/202-549-4987
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I. Purpose of this Research Project

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The purpose of this research is to explore why outcomes at the individual fusion center level vary across the network by examining unique configurations of causal conditions at multiple levels of analysis. The research will examine the organizational layers that determine how well, or how poorly, a fusion center executes its critical tasks. These layers consist of both organizational and individual human characteristics.

The research findings will lead to a dissertation in fulfillment of requirements for a Ph.D. in Public Administration and Policy at Virginia Tech. It is expected that up to 200 survey participants and up to 15 interview subjects will be involved in the research. The research results may be published in academic journals or in another format upon completion of the dissertation.

II. Procedures

By signing this consent form, you will agree to participate in an interview that should require no more than 30 minutes to complete.

III. Risks

There are no apparent physical, mental, or emotional risks associated with participation in this research.

IV. Benefits
There are no direct monetary benefits or individual recognition resulting from participation in this research. The findings, however, will inform fusion center operations by isolating the factors that contribute to fusion center effectiveness.

No promise or guarantee of benefits has been made to encourage you to participate.

**V. Extent of Anonymity and Confidentiality**

All data collected through this interview will be identified in the dissertation and published documents as your responses. By signing this consent form, you agree to the use of your identifying information.

The Virginia Tech (VT) Institutional Review Board (IRB) may view the study’s data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

**VII. Subject’s Consent**

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

________________________________________________________________________ Date__________

Subject signature

**VIII. Freedom to Withdraw**

You are free to withdraw from this study at any time without penalty. You are free to choose not to answer any questions that you choose, or not respond to what is being asked of you, without penalty.

Please note that there may be circumstances under which the investigator may determine that a subject should not continue as a subject.

**IX. Questions or Concerns**

Should you have any questions about this study, you may contact one of the research investigators whose contact information is included at the beginning of this document.

Should you have any questions or concerns about the study’s conduct or your rights as a research subject, or need to report a research-related injury or event, you may contact the VT IRB Chair, Dr. David M. Moore at moored@vt.edu or (540) 231-4991.
Appendix A.3: Descriptive Statement

Dear (name here)

Thank you for agreeing to allow the research team access to your fusion center and personnel. Please disseminate the following to your staff, and/or display it in a break room or other well-traveled area. We ask that you submit the names and contact information of staff who wish to participate in the research study within 10 days of receiving this notification.

Regards,

The ____________________________ fusion center is participating in an academic research study on the effectiveness of the national network of fusion centers. The researchers will be conducting online surveys and phone interviews with fusion center directors, fusion center employees, and other network stakeholders to gather data on relationships, functions, and other aspects of the network. It is expected that up to 200 survey participants and up to 15 interview subjects will be involved in the research. The research results may be published in academic journals or in another format upon completion of the dissertation.

If you wish to participate in the study, please notify your supervisor and provide an email address and phone number where you can be reached. Participation in this research study is completely voluntary, and in no reflects upon your job performance. There are no monetary or other benefits associated with participation in this research, and there are no known negative effects resulting from participation.
Appendix A.4: Recruitment Email (Online Participation)

Virginia Polytechnic Institute and State University
Center for Public Administration and Policy
104 Draper Rd
Blacksburg, VA 24036

John Doe
1111 Smith Ct.
Nowhere, AA 10000

Dear Xxxx:

Your contact information was provided by a representative of the __________________ fusion center. The __________________ fusion center is part of a sample of fusion centers constructed for dissertation research on network effectiveness. The research will be conducted from 2013-2014.

You are eligible to participate in this study if you are A) employed or contracted full or part time by an officially recognized state or major urban area fusion center, or B) if you have previously been employed or contracted by a state or major urban area fusion center, or C) are a federal, state, local, territorial, or tribal employee with responsibilities related to or involving state or major urban fusion centers or other domestic counterterrorism or intelligence operations, or D) have demonstrated subject matter expertise in domestic intelligence and information sharing. If you are receiving this email, you have been deemed eligible by the research team. If you are ineligible, or simply do not wish to participate, please disregard this email, or reply with the subject line “ineligible”.

By clicking “I agree” to the online questionnaire, you will be asked a series of questions about your current role, duties, and relationships with colleagues and other individuals of interest to the research. The results of this questionnaire will be aggregated with other questionnaire data, and will in no way be linked back to you as an individual. Any identifying information you submit will be used for tracking purposes only, and access to this information will be limited to the principle investigators. The findings will inform a dissertation in fulfillment of requirements for the Ph.D. in Public Administration and Policy at Virginia Tech. The results of this study may be published, and will be shared (in aggregate form) with the National Fusion Center Association.

There are no direct monetary benefits or other compensation associated with participation in this research, and you are free to decline participation at any time.

This link (insert here) will direct you to the survey. When you click the link, you will be asked to read and sign a consent form. If you wish to participate in this research, please fill out and sign the form, and follow the instructions to complete the survey.

If you have any questions, or would like more information about this research, please contact Andrew Coffey at xxx@xxxx.xxx or 123-456-7891

Regards,

Principle Investigators:
Andrew Coffey, A.B.D.
Patrick Roberts, Ph.D.
Robin Lemaire, Ph.D.
Appendix A.5: Recruitment Email (Phone Participation)

Virginia Polytechnic Institute and State University
Center for Public Administration and Policy
104 Draper Rd
Blacksburg, VA 24036

John Doe
1111 Smith Ct.
Nowhere, AA 10000

Dear Xxxx,

Your contact information was provided by __________________, due to your experience in and/or knowledge of state and local fusion centers. Your participating and insight may be helpful for dissertation research being conducted from 2013-2014.

You are eligible to participate in this study if you are A) employed or contracted full or part time by an officially recognized state or major urban area fusion center, or B) if you have previously been employed or contracted by a state or major urban area fusion center, or C) are a federal, state, local, territorial, or tribal employee with responsibilities related to or involving state or major urban fusion centers or other domestic counterterrorism or intelligence operations, or D) have demonstrated subject matter expertise in domestic intelligence and information sharing. If you are receiving this email, you have been deemed eligible by the research team. If you are ineligible, or simply do not wish to participate, please disregard this email.

Please review the consent form (enclosed). You consent will be implied by your participation in the research, should you agree to participate in a phone interview and answer (to the best of your ability) general questions about fusion centers and the fusion center network, including fusion center operations and operational dynamics (unclassified). The interview transcript will inform a dissertation in fulfillment of requirements for the Ph.D. in Public Administration and Policy at Virginia Tech. The results of this study may be published in academic journals, and will be released (in aggregate form) to the National Fusion Center Association.

There are no direct monetary benefits or other compensation associated with participation in this research, and you are free to decline participation at any time.

If you wish to participate in this research, please reply to xxx@xxxx.com with the subject line “I agree to participate.”

For more information, or to ask questions about the research, contact Andrew Coffey at xxx@xxxx.com or 123-456-7891.

Regards,

Principle Investigators:
Andrew Coffey, A.B.D.
Patrick Roberts, Ph.D.
Robin Lemaire, Ph.D.
Appendix A.6: Standard Interview Questions Pt. 1

**Interview Questions**

**Fusion Center Staff:**

- How many years have you worked in any fusion center?
- How many years have you worked in the fusion center in which you are presently employed?
- Please briefly describe your work experience over the past 5 years?
- What are the most important skills you have acquired through this work experience that are relevant to the fulfillment of the duties of your current position? Why are those skills important?
- How would you describe your fusion center’s reputation within the fusion center network? Why?
- How would you describe your fusion center’s reputation outside the fusion center network? Why?
- What are the most important ties (or relationships) fusion center analysts maintain which are critical to routine operations?
  - What about during a time sensitive investigation, or in response to a known threat?
- How do you perceive your role in sharing information with others in the network?
  - How critical is your fusion center within the region for sharing information?
- What, in your opinion, is the most important characteristic of an effective fusion center analyst? Explain why, using examples if possible.
- If you could “fix” an aspect of the fusion center network, what would it be? How would you go about fixing it?
- What is the greatest barrier to better performance for you as an analyst, and for fusion centers as organizations?
- How would you characterize the fusion centers in your state, in terms of their ability to effectively communicate information and intelligence?
  - In your region?
- Does your fusion center have a positive working relationship with other fusion centers in the network? If so, please list those fusion centers and explain why there is a positive relationship.
- Does your fusion center have a negative relationship with other fusion centers in the network? If so, please list those fusion centers and explain why there is a negative relationship.
- What are some of the best practices unique to your fusion center that you feel would benefit the entire network? Please explain why.
- Why should/should not fusion center performance be measured?
- How should the performance of fusion center analysts be measured?
- How should the value of fusion centers be measured?
Appendix A.7: Standard Interview Questions Pt. 2

Interview Questions

External Stakeholders, Subject Matter Experts, and other Contributors:

- What is your professional relationship to a fusion center(s)?
- Are fusion centers essential to homeland security (yes/no)?
  - Please explain why?
    - In your opinion, what are the most significant features of the fusion center network?
    - What specific factors make the network essential/non-essential?
- What agencies or organizations most benefit from fusion center products? Why?
- What, in your opinion, most determines a fusion center’s reputation?
- How would you describe the reputation of the fusion centers you are most familiar with? What factors contribute to their reputation’s?
- What, in your opinion, is the most important characteristic of an effective fusion center analyst? Please explain why.
- What are the most important ties or relationships for fusion centers (both individual personnel and the organization itself) to maintain in their state or locality? Please explain why.
  - In their region?
- If you could “fix” an aspect of the fusion center network, what would it be? How could it best be done, considering the current fiscal climate?
Appendix A.8: External Stakeholder Questionnaire

Q21 Please select if you agree:
☐ I have read the attached consent form and agree to participate in this research. (1)

Q11 Please provide the following information:
Your name: (1)
Your email address: (2)
Your organization: (3)
Your official title: (4)

Q2 How would you assess the following fusion centers in terms of the accuracy of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you are familiar with, have observed, or received products and services from:

(Fusion centers listed here)

Q12 How would you assess the following fusion centers in terms of the consistency of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you are familiar with, have observed, or received products and services from:

(Fusion centers listed here)

Q13 How would you assess the following fusion centers in terms of the relevance of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you are familiar with, have observed, or received products and services from:

(Fusion centers listed here)

Q14 Overall, how would you assess the following fusion centers in terms of how well they meet the expectations of their clients (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you are familiar with, have observed, or received products and services from:

(Fusion centers listed here)

Q15 How would you assess the following fusion centers in terms of how well they perform in real-world scenarios, events, exercises, or other situations (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you are familiar with, have observed, or received products and services from:
Q5 Please select the fusion centers you most admire, taking into account best practices, unique aspects, or other factors that may distinguish one or more fusion centers over others (please select at least three but no more than five fusion centers):

(Fusion centers listed here)

Q16 Which fusion centers would you least likely recommend to researchers or evaluators as case studies for best practices, exemplary performance, or other noteworthy accomplishments (please identify at least three but no more than five fusion centers)?

(Fusion centers listed here)

Q17 Which fusion centers do you place the most confidence in to meet the expectations of stakeholders and clients (please make at least three and no more than five selections)?

(Fusion centers listed here)

Q8 Please identify the fusion centers that, in your opinion, have had the most difficulty (for any reason) meeting the expectations of stakeholders and clients (please make at least three and no more than five selections)?

(Fusion centers listed here)
Appendix A.9: Internal Stakeholder Questionnaire

Q16 Please select if you agree:
- I have read the attached consent form and agree to participate in this research. (1)

Q17 Please provide the following information:
   Your name: (1)
   Your email address: (2)
   Your fusion center: (3)
   Your official title/position: (4)

Q2 How would you rate the following fusion centers in terms of the accuracy of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you have directly observed, partnered with, or engaged at a professional level:

   (Fusion centers listed here)

Q12 How would you rate the following fusion centers in terms of the consistency of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you have directly observed, partnered with, or engaged at a professional level:

   (Fusion centers listed here)

Q13 How would you rate the following fusion centers in terms of the relevance of their intelligence/information products or other outputs (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you have directly observed, partnered with, or engaged at a professional level:

   (Fusion centers listed here)

Q14 How would you rate the following fusion centers in terms of how well they meet the expectations of, or provide valuable services to their clients (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you have directly observed, partnered with, or engaged at a professional level:

   (Fusion centers listed here)

Q15 How would you rate the following fusion centers in terms of how well they perform in real-world scenarios, events, exercises, or other situations (with 1 being negative, and 100 being positive)? Please limit your responses to those fusion centers you have directly observed, partnered with, or engaged at a professional level:
Q3 Please list the fusion centers you most admire:

Q4 Please list the fusion centers you would most like to see your own organization forge new or more robust working relationships with for the purposes of learning their processes and/or applying their best practices:

Q5 From the following list, please identify the fusion centers your organization has had difficulty forging relationships, coordinating efforts, or sharing products with (for any reason):

Q8 From the following list, which fusion centers are you most likely to engage on a regular and consistent basis, presently or in the future, in order to better fulfill your organization's mission? (Please make at least three selections)

Q9 From the following list, which fusion centers are you least likely to engage on a regular and consistent basis, presently or in the future, due to a negative reputation and/or lack of capabilities? (Please make at least three selections)

Q6 Please identify any other organizations or entities (not including fusion centers) that your organization has had difficulty forging relationships with (for any reason).

Q10 Please list the five fusion centers you would most like to see your own organization model after:

Q11 Please list the five fusion centers you would least like to see your own organization model after:
Appendix A.10: Fusion Center Directors Questionnaire

Q19 Please select if you agree:
崮 I have read the attached consent form and agree to participate in this research. (1)

Q20 Please provide the following information:
ogra your name: (1)
ogra your email address: (2)
ogra name of your fusion center: (3)

Q1 How many staff does your fusion center currently employ? (Only provide information for full and part time employees in your fusion center; DO NOT include information on virtual personnel, liaisons from federal, state, or local agencies, or other personnel who are not directly supported by the fusion center’s operating budget)
ogra Full Time Employees (1)
ogra Part Time Employees (2)

Q3 Is your fusion center an "all-hazards" center?
崮 Yes (1)
崮 No (2)

Q4 Is your fusion center co-located with an Emergency Operations Center?
崮 Yes (1)
崮 No (2)

Q5 Is your fusion center co-located with any other agencies or organizations that share similar or related responsibilities (i.e. police intelligence or JTTFs, etc.)? If yes, please name the agencies/organizations.
崮 Yes (1) ______________________
崮 No (2)

Q6 What is the level of your current security clearance? (if "Other" please explain)
崮 Confidential (1)
崮 Secret (2)
崮 Top Secret (3)
崮 Top Secret-SCI (4)
崮 Other (5) ______________________
Q11 What is the highest level of clearance held by one or more of your employees?
- Confidential (1)
- Secret (2)
- Top Secret (3)
- Top Secret-SCI (4)
- Other (5) ________________

Q7 How frequently do you interact with the FBI Special Agent In Charge (SAC)?
- Daily (1)
- Weekly (2)
- Monthly (3)
- Several times throughout the year (4)
- Never (5)

Q12 How frequently do you interact with the DHS Regional Intelligence Officer?
- Daily (1)
- Weekly (2)
- Monthly (3)
- Several times throughout the year (4)
- Never (5)

Q13 How frequently does your fusion center produce, or participate in the development of joint intelligence products?
- Daily (1)
- Weekly (2)
- Monthly (3)
- Several times throughout the year (4)
- Never (5)

Q14 Who, or what, are your fusion center’s primary clients?

Q15 Who, or what, are your fusion center’s primary stakeholders?

Q16 What, in your opinion, are the greatest barriers to improved effectiveness for your fusion center?

Q17 What aspects of your role and/or responsibilities should evaluators pay the most attention to when evaluating your fusion center?

Q18 As a director, what relationships do you maintain that are critical to the success of your organization (please only identify other organizations and entities, not individuals)?

Q19 What professional organizations or associations do you maintain membership with?
Q20 Please describe what, in your opinion, are the best ways to measure your fusion center’s performance:

Q21 Please describe what, in your opinion, are the best ways to measure the entire network’s performance?

Q22 From your vantage point, what would be some of the best ways to measure, or evaluate, the sharing of information between your organization and the law enforcement community?
Appendix A.11: Fusion Center Analysts Questionnaire I

Q1 Please select if you agree:
☐ I have read the attached consent form and agree to participate in this research. (1)

Q2 Please provide the following information:
   Your name: (1)
   Your email address: (2)
   Name of your fusion center: (3)
   Your current position (with official title): (4)
   How long have you held your current position? (5)
   Have you held any previous positions in this fusion center? (6)
   Have you held positions in any other fusion centers? If so, please identify each organization in the space provided. (7)
   Is your current position full or part time? (8)
   Are you a sworn, civilian, or contract employee? (9)

Q3 What training have you received since your initial employment at any fusion center related to the specific tasks you perform (please describe the type of training, and the entity that provided or supported the training)?

Q4 Please answer the following:
   Do you hold an active security clearance? (1)
   What is your current security clearance level? (2)
   Is your current security clearance level sufficient to do your job effectively? (3)
   What is your direct supervisor's clearance level? (4)
   Is your direct supervisor's clearance level sufficient to do his/her job effectively? (5)

Q5 Please identify any of the following skills you possess by moving the slide to reflect your self-assessed skill level:

_____ Intelligence Analysis (1)
_____ Information Analysis (2)
_____ IT/Technology (3)
_____ Language(s) (4)
_____ Verbal Communication, Presentation, and/or Briefing (5)
_____ Writing (6)
_____ Data Entry (7)
_____ Statistical Analysis (8)
_____ Planning (9)
_____ Risk, Threat, and/or Hazard Assessment (10)
_____ Research (11)
_____ Open Source Data Collection and Analysis (12)
_____ Limited Access and/or Network Data Collection and/or Analysis (13)
Q6 Please select your highest level of education:

- None (1)
- Diploma/GED (2)
- Some College (3)
- Associates Degree (4)
- Bachelors Degree (5)
- Some Graduate (6)
- Masters Degree (7)
- Some Doctorate (PhD) (8)
- Doctorate (PhD) (9)
- Other (10)

Q7 What, if any, special certification or accreditation do you have that is relevant to your current position?

Q8 What awards or distinctions have you received for your work in any fusion center?

Q9 How would you describe your professional background? (Select all that apply)

- Military (1)
- Law Enforcement (2)
- Emergency Management (3)
- Intelligence (4)
- Government Administration (5)
- IT and/or Data Management (6)
- Cyber (7)
- Private Sector (8)
- Other (9) ____________________
Appendix A.12: Fusion Center Analysts Questionnaire II

Q13 Please select if you agree:
☐ I have read the attached consent form and agree to participate in this research. (1)

Q12 Please provide the following information:
   Your name: (1)
   Your email address: (2)
   Name of your fusion center: (3)

Q1 Please select the range (numerical) of relationships you maintain with employees in your own fusion center (and who are directly employed by the fusion center), identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last month, and involving at least one interaction every two weeks. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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<td>15+ (6)</td>
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Q2 Please select the range (numerical) of relationships you maintain with personnel who work in your fusion center, but who represent entities other than your fusion center (i.e. federal liaisons, state/local law enforcement, etc.). Identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last month, and involving at least one interaction every two weeks. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.
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Q5 Please select the range (numerical) of relationships you maintain with employees of other fusion center(s). Identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last month, and involving at least one interaction per month. Finally, please identify the fusion center(s) with which you maintain relationships. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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Q8 Please select the range (numerical) of relationships you maintain with individuals who are employed by the Federal Bureau of Investigation (FBI). Identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last month, and involving at least one interaction per month. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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Q7 Please select the range (numerical) of relationships you maintain with individuals who are employed by the Department of Homeland Security (DHS). Identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last month, and involving at least one interaction per month. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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Q6 Please select the range (numerical) of relationships you maintain with individuals who are employed by the formal Intelligence Community (other than DHS and FBI). Identify the type of relationship, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last three months, and involving at least one interaction per month. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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Q9 Please select the range (numerical) of relationships you maintain with individuals who are non-law enforcement, but are employed by the State/City that funds your fusion center (but are not fusion center employees), and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last three months, and involving at least one interaction per month. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.
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<th>Relationship Type:</th>
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<td>Professional (3)</td>
<td>Yes (1)</td>
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<td>No (2)</td>
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</table>

Q10 Please select the range (numerical) of relationships you maintain with individuals who are employed by state and/or local law enforcement, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the last three months, and involving at least one interaction per month. Note: Formal relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs; Informal relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but are deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service; Professional relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

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<td>Professional (3)</td>
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<td>No (2)</td>
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Q11 Please select the range (numerical) of relationships you maintain with individuals in the private sector, and whether that contact is enabled by technology (email, video conference, virtual connection, etc.). Please limit your answers to those relationships maintained within the
To identify the type of infrastructure with which the relationships are maintained, distinguish between Formal, Informal, and Professional relationships:

- **Formal** relationships are those outlined in your position description, those you will be regularly evaluated on, or those demanded by MOU/MOAs.
- **Informal** relationships are those not stipulated or demanded by your position description or resulting from agreements and memoranda, but deemed essential in your own determination to successfully meeting the expectations of your employer and/or providing an essential product or service.
- **Professional** relationships are those resulting from interactions that may not be formal or informal (as defined above), but may result from co-attendance at a conference, a joint exercise, event planning, a training session, or other controlled engagement.

<table>
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<th>Relationship Type:</th>
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<th>Infrastructure (eg. Power, Water, Nuclear, etc.)</th>
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<td>Professional (3)</td>
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- **0 (1)**
- **1-3 (2)**
- **4-6 (3)**
- **7-10 (4)**
- **11-14 (5)**
- **15+ (6)**

Note: For each relationship category, the table indicates whether technology is enabled (Yes) or not (No). The infrastructure type is also specified (eg. Power, Water, Nuclear, etc.).
Appendix A.13: Fusion Center Analysts Questionnaire III

Q24 Please select the following if you agree:
- I have read the attached consent form and agree to participate in this research. (1)

Q23 Please provide the following information:
   Your name: (1)
   Your email address: (2)
   The name of your fusion center: (3)

Q21 What is the most important responsibility associated with your position?

Q2 What is the least important responsibility associated with your position?

Q3 Please list the three most important factors that, in your opinion, determine how well you perform in the workplace.

Q4 What, in your opinion, are the single most important characteristics or qualities of a good fusion center analyst? Please briefly explain why the characteristic or characteristics are important:

Q5 What is the greatest challenge to improving your performance as an analyst?

Q6 What is the greatest challenge to improving your fusion center’s organizational performance?

Q7 What professional associations or organizations (if any) do you rely on for acquiring resources, networking, or for learning about best practices?

Q8 What databases or web-based networks do you access on at least a weekly basis?

Q9 How many briefings do you receive from Federal Government agencies on a monthly basis? (Please cite the number and identify the corresponding agency/agencies):
- 0 (1)
- 1-2 (2) _________________
- 3-4 (3) _________________
- 5-6 (4) _________________
- 7+ (5) _________________
Q10 How many briefings do you deliver, or assist in developing, for your fusion center's clients and/or stakeholders? (Please provide the number and identify the corresponding organizations or entities to which the briefings are delivered):

- 0 (1)
- 1-2 (2)
- 3-4 (3)
- 5-6 (4)
- 7+ (5)

Q20 Do you support the development of joint intelligence products, and if yes, how? (Please identify the entity or entities you coordinate with to develop joint products):

Q18 Who, or what, do you consider to be your fusion center's primary client?

Q19 Who, or what, do you consider to be your fusion center's primary stakeholder and/or partner?

Q17 Do you have access to classified information?

- Yes (1)
- No (2)

Q11 Do you have access to FBI-Net?

- Yes (1)
- No (2)

Q12 Are you a Task Force Officer?

- Yes (1)
- No (2)

Q13 Do you typically receive feedback and/or a followup when you submit information or products to DHS?

- Yes (1)
- No (2)

Q14 Do you typically receive feedback and/or a followup when you submit information or products to the FBI?

- Yes (1)
- No (2)

Q15 Are you a member of an FBI Joint Terrorism Task Force (JTTF)?

- Yes (1)
- No (2)
Q22 Are you a member of any task forces (other than an FBI-JTTF), information sharing groups, or other collaborative efforts? (If yes, please identify in the space provided)

- Yes (1) ____________________
- No (2)
Appendix B: Truth Tables and QCA Outputs
## Appendix B.1: Truth Table for Highly Effective Fusion Centers

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**Truth Table Analysis**


Model: \(_{eff} = f(_{tlo}, _{res}, _{ownfc}, _{ofc}, _{fed}, _{le})\)

Rows: 10

Algorithm: Quine-McCluskey

True: 1-L

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1.000000

consistency cutoff: 1.000000

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solution coverage: 1.000000

solution consistency: 1.000000

Cases with greater than 0.5 membership in term _tlo*~le: FC2 (1,1), FC4 (1,1)

Cases with greater than 0.5 membership in term _res*_ownfc*_ofc: FC5 (1,1), FC7 (1,1)

Cases with greater than 0.5 membership in term _res*_ofc*le: FC5 (1,1), FC7 (1,1)
## Appendix B.3: Truth Table for Less Effective Fusion Centers

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<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
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<td>1</td>
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<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
</tbody>
</table>


Appendix B.4: Solutions for Less Effective Fusion Centers

******************
*TRUTH TABLE ANALYSIS*
******************


Model: _eff = f(_res, _ownfc, _ofc, _le)

Rows: 9

Algorithm: Quine-McCluskey

True: 1-L

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1.000000
consistency cutoff: 1.000000

<table>
<thead>
<tr>
<th></th>
<th>raw coverage</th>
<th>unique coverage</th>
<th>consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>_res<em>~_ownfc</em>~_le</td>
<td>0.666667</td>
<td>0.666667</td>
<td>1.000000</td>
</tr>
<tr>
<td>_ownfc<em>~_ofc</em>~_le</td>
<td>0.333333</td>
<td>0.333333</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

solution coverage: 1.000000

solution consistency: 1.000000