

NETWORK ANALYSIS TOOLS AND METHODS IN ANALYZING COORDINATED RESPONSE AGAINST ORGANIZED CRIME

Organize Suçlarla Ortak Mücadelenin Analizinde Ağ Analiz Araç ve Yöntemleri

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Özet

Çeza adalet sistemi kurumları arasında güçlü ve etkili bir işbirliği ve ilişki kurulması organize suçların soruşturulması ve kovuşturulmasının önemli bir unsurudur. Bu çalışma, suç soruşturma ve kovuşturmasında sosyal ağ analizini kullanarak kurumlar arası işbirliği ve ilişkilerin incelenmesine yeni bir perspektif getirmesi açısından özgün bir araştırmadır. Bu çalışmada, organize suçlara karşı yargı organlarının birlikte hareket etmelerini teşvik eden ve bunu engelleyen faktörler yazından çıkarılmış ve bu teorik çerçeve ağ analizi araç ve yöntemlerinin kullanılabilirliği açısından tartışılmıştır. Araştırmanın bulguları, önerilen modeldeki altı etmen açısından ağın büyüklüğü, merkeziyet ve ağ içindeki alt grupların incelenebileceğini ortaya koymuştur. Bununla ilgili olarak, yasal çerçevenin ağın büyüklüğü ile ilgili olduğu bulunmuştur. Diğer taraftan, kurumların ağ içindeki merkeziliğinin güven, kurumsal yapı ve kurumların önceliklerinden etkilendiği tespit edilmiştir. Son olarak, kurumlar arası rekabet ve kurumlara olan suç bağlantılarının ağ içinde alt grupların oluşumunda etkili olduğu bulunmuştur.

Anahtar Kelimeler: Kurumlar arası ağlar, Ağ teorisi, Ağ analizi, Organize suçlarla koordineli mücadele, Birlikte hareket.

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Abstract

Building a strong and effective relationship among criminal justice (CJ) agencies is an essential component of investigation and prosecution of organized crimes. This research is unique in terms of bringing new perspective of analyzing interorganizational collaboration and relations by using social network analysis (SNA) in the process of crime investigation and prosecution. In this study, factors encouraging and hindering collective action among judicial organizations in response to organized crime are derived from literature and this conceptual framework is discussed for the purposes of usability of network analysis tools and methods. Findings of the study revealed that network size, centrality and cliques in the network can be investigated based on six factors in proposed model. In this regard, legal and policy framework found to be related to network size. Centrality of organizations, on the other hand, affected by trust, organizational structure and priority perceptions. Finally, competition among agencies and criminal links to the organization found to be important in the formation of subgroups and cliques within the CJ network.

Key Words: Interorganizational networks, Network theory, network analysis, Coordinated fight against organized crime, Collective action.

Introduction

Collaboration among criminal justice authorities is a necessity in crime investigation and prosecution. It is critical for the authorities to share information and resources with partner organizations. Due to changing society and technological advances, understanding and prevention of crimes have become more complicated. Responding “wicked” crime problems requires planned and coordinated effort by public organizations dealing with them.

Building a strong and an effective relationship among parties of criminal justice system and sharing available information have become essential to investigate and prosecute crimes effectively (Gul, 2010). This is particularly important in the investigation of organized crime and terrorism since they are primary security threats for many countries around the world. Public authorities such as police, gendarmerie, and coast guard, office of public prosecution, and courts can be listed among

these organizations which are officially responsible to investigate and prosecute crime. It is noted that coordinated response among these agencies is needed in fight against those crimes in terms of crime prevention measures as well as crime investigation processes. However, inter-organizational network among public authorities in the process of criminal investigation and prosecution has been given very little attention by scholars. In addition, no specific method is suggested to examine relations among criminal justice organizations. Even though social network analysis (SNA) is widely used to study inter-organizational relationships, most of studies in this field focused on interagency network in response to disasters, mental health problems, extreme events and emergency situations (Comfort and Kapucu, 2006; Provan and Milward, 1995). Some other studies examined network in criminal organizations giving attention to terrorism and organized crime (Fellman and Wright, 2004; Koschade, 2006; Krebs, 2002; Unlu and Kapucu, 2009). But all these research efforts intensified on identifying the network either among crime/terror organizations or network among their members.

This study's focus is twofold: The study aims to conceptually examine the factors contributing and hindering collaborative efforts in crime investigation and prosecution process. Then it proposes social network analysis as a useful method in the measurement of these factors. In this regard, the study seeks the answers of the following research questions:

- Which factors do have an impact on interorganizational relationship in the criminal justice system of Turkey?
- How effectively the relations among CJ organizations can be examined by using network analysis methods?
- How do organizations become key actors in an interorganizational network?

In an effort to answer these questions, this study will at the first stage review the literature on interorganizational network in a general framework. Then, it will focus on network of criminal justice organizations when they coordinate their efforts against organized crimes. Specifically, the study will examine what make the criminal justice organizations willing to coordinate with other agencies in the system and what makes them reluctant to work together with other partners in the system. Finally, the study will propose a tool to measure and evaluate this

relations using social network analysis. Next section reviews the literature on networks among organizations in general and focuses specifically networks among criminal justice agencies.

1. Interorganizational Networks and the Criminal Justice System

A growing number of studies on interorganizational collaboration indicate that public organizations increasingly establish relations with agencies in their environment and work as partners in a decentralized form. Literature suggests that the factors affecting quantity and quality of relations among organizations can be grouped into a few categories. This set of variables also influential on the relationships among agencies in the criminal justice system. Beginning with the definition of partnerships in interorganizational settings, this section provides reasons on why organizations look for ways to work together. It also reviews the formal and informal coordination and collaboration among organizations that are in charge of crime investigation.

1.1. Interorganizational Collaboration

The term partnership has no single definition however in general, researchers agree that it states cooperative efforts among more than one organization directed towards a common goal which is not easily achievable by a single organization. Organizations create relations to take joint actions and achieve common goals especially in chaotic environments. There is growing interest in building inter-organizational relationships. Several types of organizing are developed as a response to inadequate effectiveness of traditional structures of bureaucratic organizations (Kapucu, 2005; Rosenbaum, 2002).

Significant emphasis has been given to partnerships and networks among organizations in various settings. Potential factors that are likely to affect formation of interorganizational networks widely discussed in literature including but not limited to organizational structure, failure of bureaucratic structures, resource dependency, trust among agencies and domain consensus of organizations (Agranoff, 2006, Alexander, 1995; Bardach, 1998; Gulati, 1995; McGuire, 2006; Oliver, 1990).

Organization itself, first of all, considered a determinant for tendency to work together with others. More centralized organizations tend to put less

effort in a collaborative action. On the other hand organizations with a decentralized structure, probably because of their own experience on organizing their subunits, will participate in interorganizational collaborations. Having complex responsibilities and delivering broad services make organizations inclined to take place in partnerships. Flexible information flow within an organization can be an indicator of ability to act together with other institutions. For organizations with hierarchic bureaucracies in which tasks of subunits determined strictly, on the other hand, is not easy to take action with organizations in their environment (Alexander, 1995). Some researchers are seen collaboration as a consequence of failure of traditional bureaucratic organizations. These forms of traditional organizations switch their structure to a more effective way of service delivery (Krueathep et al., 2008; Rosenbaum, 2002).

Today's problems are "wicked" and interdependent to each other. Copenhagen Center claims that "no single actor, public or private, has the all-encompassing knowledge, overview, information or resources to solve complex and diversified problems" (cited in Martin, 2006:48). Complex nature of these problems calls for comprehensive collaboration among organizations at different levels. A responsive mechanism to the interconnected issues can be developed by forming inter-organizational networks.

If organizations experience resource constrains and cannot generate needed resources they tend to create relations with other organizations (Oliver, 1990). Nevertheless, cost/benefit of interaction is another important factor of participation in a partnership. If cost associated with collaboration less than potential benefits of it organizations will be reluctant to collaborate. Financial risk perceptions of organizations are essential at this point to decide whether to be a participant in a collaborative action. Interagency work requires time resources and commitment. Sometimes organizations find these costs too high compared to rewards gained from collaboration (Bardach, 1998; Alexander, 1995).

Trust has been seen as a major factor which allows agencies to deal with uncertainties and facilitates formation of networks (Butler and Gill, 1995). There is great deal of ongoing discussion on role of trust in interorganizational relations in the literature. Nevertheless, many authors

agree with that building trust requires time investment and communication on variety of issues (Gulati, 1995; Webb, 1991; Oliver, 1997).

It is essential to note that trust is especially associated with two concepts: expectations and risk taking. Clearly determined roles and purposes help organizations in understanding of mutual expectations. Participants of a collaboration come together to fulfill aims which are at least to some extent agreed upon. However, each organization's purpose might be different to participate in collaboration. For some of them, their own organizational aims might outweigh while some others focus on common goals. Both partner agencies and their managers have agendas which might sometimes be "hidden." Organizations naturally come to table with their own aims, agendas and interests; in addition, there are an imbalance among their power and influence. Organizations which are more powerful and central to collaboration tend to dominate the partnership and dictate their priorities to other partners. These range of goals and agendas of participating agencies have an essential role in shaping expectations. Legitimate and achievable expectations are central to trust building (Vagen and Huxham, 2003; Broussine and Miller, 2005).

Trust building and sustaining are highly related to risk taking in collaborations. Many scholars have claimed that risk is perceived by practitioners as the fear of being exposed opportunistic behaviors. The outcomes of collective actions might be owned by one or more members of collaboration unjustly (Kapucu, 2005; Gulati, 1999; Bardach, 1998). Vagen and Huxham (2003) argue that risk management for organizations is further than protecting themselves against opportunistic actions. As stated their study: "Risk management must be concerned with ensuring that any future collaborative advantage can realistically be envisaged and shared. Consequently, risk management suggests an upfront negotiation of the collaborative aims, to clarify potential partners' expectations as well as their willingness and ability to enact the agreed collaborative agenda." Expectation might be resulted from previous experiences or they basically might be related to anticipations (Gulati, 1995).

Some scholars argue that trust should be preexisting condition for interagency cooperation (Webb 1991; Ring 1997). On the other hand, some other researchers claim that trust is result of relational history between organizations (Alexander, 1995; Gulati, 1995; Das and Teng, 1998). Trust building is described by a number of authors as a cycle

which includes mutual expectations and potential risks. Whenever organizations work together they have expectations and take risk to achieve common goals and receive expected outcome. Whenever expectations are met trust becomes much stronger. This positive relationship history encourages organizations to participate future partnerships by reducing perceived risk (Vagen and Huxam, 2003; McAllister, 1995).

Domain consensus among organizations is seen another determinant of network formation. Domain can be described as a field of activity in which organization works to fulfill its goals in accordance with its mission. Domain consensus is considered as a precondition for establishment of relations. If organizations agree on their domains they are likely to cooperate with each other. On the other hand any conflict on domain between organizations might be perceived as inference to their area of activity which is an obstacle to collaborative action (Alexander, 1995).

1.2. Partnerships in Criminal Justice System

Partnerships in CJ system implemented effectively in the area of crime prevention and it is argued that it worked better than any other approach. Rosenbaum (2002) claims that there are several reasons for that partnerships work in criminal justice system especially in fighting against crime as preventive measures. Crime and related problems are complex issues and solutions should be comprehensive. Collaborations are more likely to define crime problem accurately since they have various approaches and theories about causal mechanisms of crime. As stated by Rosenbaum “each agency brings a unique set of skills, experiences resources and interventions strategies to the table. The partnership provides a mechanism to exploit this capital by developing and implementing comprehensive and coordinated community-wide strategies at different levels” (2002:180). Despite a large number of researches on cooperation in crime prevention (Rosenbaum, 2002; Stern, 1987; Crawford and Jones, 1995; Liddle et al., 1994), there are only a few studies on collaboration among criminal justice organizations during the investigation process. Focusing on collaborative investigation strategies of cooperative crime and prosecution capacity of CJ agencies, these

studies come up with that most of cooperation among criminal justice agencies are informal and based on personal relationships. They emerge during daily duties among officials. Informal networks among investigators, assistant prosecutor and other personnel were based trust among them and more effective on specific case investigation. It is suggested that speediness and flexibility of informal networks provide quick respond to unpredictable criminal activity. Scholars pointed out that personal links and informal interactions are central components of building trust among officials from CJ organizations for more an effective cooperation. Professional meetings such as interagency trainings, conferences, workshops and seminars are crucial contributors to building and developing informal networks (Benson and Cullen, 1998; Dandurand, 2007).

On the other hand, formal networks in this field are uncommon when compared to in the area of crime prevention even though they are more likely to provide long range planning and developing proactive strategies in the fight against crime. Literature suggests that both formal and informal collaboration among authorities in criminal justice system depends on several factors. Formal networks take much effort, time and financial resources. On the other hand informal networks are relatively easy to establish and have flexible nature. Although there no plenty of research on this area, a few studies come up with that informal interactions are more common in this field (Benson and Cullen, 1998; Heinz and Manikas, 1992). Collaboration among CJ organizations affected by organizations' structure, legal framework, given priority by agency to specific crimes, trust between organizations, competition between agencies and criminal links to organizations.

2. Proposed Framework for Understanding of Networks in CJ System

The literature review revealed that there several motivating factors that encourage organizations to collaborate with others while working to reach their organizational goals. Literature suggested that flexible and decentralized organizational structures, trust among organizations and domain consensus are especially important to foster coordination and collaboration among agencies. Hierarchical structures and distrust, on the other hand, may play a negative role in formation of relations. The following section proposes an outline in the investigation of relations

among organizations in the criminal justice system when dealing with organized crimes. Six concepts are suggested to understand which factors contribute organizations being collaborative and which others cause them withhold their effort from collaboration. These factors are legal and policy framework, priority perceptions of crime by authorities, criminal links to legal authorities, trust among agencies, organizational structures.

2.1. Legal and Policy Framework

In many countries partnerships to fighting against crime are encouraged and in some countries legally required. For instance, police agencies in US are supported by several local and federal government funds to create partnerships such as community policing activities. Moreover, British Crime and Disorder Act requires partnership among public authorities such as police agencies, local governments and other organizations to prevent disorder and crime (Hough and Tilley, 1998).

In addition to financial supports to development of partnerships in crime prevention field, organizations in criminal investigation and prosecution area are legally encouraged to work with each other. This legal framework shapes organizations work and information flow. Almost all organizations involve in crime investigation are dependent on the work outputs of other actors in the investigation process. For example there is a sequential dependency among police, prosecutor and judge. At this point timeliness and quality of work become an essential issue in terms of quality of whole process (Benson and Cullen, 1998).

Relations among police, prosecution office, court, and correction offices differ from country to another depending on legal requirements of that country. Elstner et al. (2008) examined police and prosecution relationship within criminal justice system in European countries and identified several similarities and differences and found that in most of countries police agencies and prosecution offices are legally independent institutions. Police have a supportive function to prosecution office within investigation process and legally obligated to inform the prosecution office. Prosecutors have legal power on police agencies in all countries studied in the investigation process. On the other hand, the degree of this power varies in criminal justice systems of different countries. In general, police have the responsibility to inform prosecutor.

However every single prosecution system has various rules on that issue in terms of severity of case or allowed time to give information. All these regulations considered as an important factor affecting information, resource and work flow among agencies.

2.2. Priority Perceptions of Crime by Authorities

Crime investigation might be initiated either by an individual's report or by police based on information gathered. Basically public authorities aim can be described as solving crime and eliminating circumstances that are suitable to commit a crime. Crime investigation is very long process from identifying a crime to enforcement of sentence. After suspicion of a crime, investigation process includes basically collecting evidence, interrogation, and prosecution steps (Puonti, 2004).

Studies showed that of police and prosecutors decisions on whether to investigate/prosecute a crime depends on priority of crime beside other factors. Agencies' resources are limited and work load is huge. There are many actions considered as crime and there are many types of crime to be investigated or prosecuted. For example, when police decides to investigate any burglary case it takes into account prosecutor point of view on that type of crimes. If prosecutor not willing to prosecute burglaries, police also would not initiate an investigation after learning prosecutor's attitude toward this type of crime. Most probably prosecutors' behavior would be caused by courts decisions on that issue. If some time ago several suspects were acquitted by court prosecutor would tend to not prosecute the case. In these kinds of situations organizations are more likely to spend their scare resources on other crimes which are perceived as more important than others by organizations in CJ system. High priority crimes-perceived as important-brings cooperation and receives support from organizations in the system. When an agency knows that it can receive support for certain type of crime that sort of crimes are more likely to be investigated. This cycle has an impact on decision of investigator or prosecutor based on potential support level from other agencies in the system. Solvability and blameworthiness of crime are factors contributing to priority perceptions of organizations. Therefore prosecutors choose the cases which are considered as high priority crimes by other agencies in the system, solvable in a short term by relatively less effort and whose offenders most likely to be sentenced.

Organizations learn priority considerations of other organizations in the length of time. As a result, crimes do not have priority always remain not investigated, although they are considered as a crime by law (Benson and Cullen, 1998). Previous research showed that disagreement on different priority attributes of agencies are seen as hindrances in coordination among agencies. Therefore agencies are suggested to come together to set common priorities, assess threats and identify strategic targets (Dandurand, 2007).

2.3. Competition and Turf Considerations

Research indicates that competition among organizations and officials have an impact on the collaborative efforts among them. When a good case comes along, it is common for agencies to initiate efforts to participate in it which requires investing time and effort. At the beginning of this process agencies and individuals are reluctant to share information with other agencies. If the case becomes public they lose their control over the case and effort and energy spent on becomes fruitless in terms of agency and individual. There is a tendency among organizations and officials to arrogate good cases which can be considered credit for them. Especially, for investigators it can be used as a tool for promotion purposes (Benson and Cullen, 1998).

Dandurand (2007) noted that investigators are reluctant to share information especially organized crime cases because of sensitivity of crime data, more importantly, due to turf considerations. Systematic information sharing efforts can provide an effective investigation and prosecution by enabling detection of dynamic organized crime.

2.4. Criminal Links to Legal Authorities

Investigation and prosecution of organized crime includes some challenges in its nature. Sometimes characteristics of criminals might make it more complicated. For example, members of criminal networks might be a public figure or have political power or even under protection of a legal organization. Legal or political power of criminal might be used to avoid investigation and possible punishment during the investigation process of these sorts of cases. In addition, it is not surprising that they

are connected to the investigative and judicial agencies that are responsible to indict them (Benson and Cullen 1998; Dandurand, 2007). As suggested by Williams (2001) criminal organizations can enhance their criminal activities and provide protection for them by spanning their boundaries into the legal world. Criminals are not only connected to business and finance world but also legal authorities, politics and media in upper word. Among criminal links to licit world, connections to law enforcement officials have seen most important relations. Connection between legal and illegal world defined an 'exchange relationship' which usually includes provision of instant intelligence to criminal enterprise and different payoffs in return. Collaborative action might be suffering because these kind of dark links to the organizations and their members.

2.5. Trust among Partnering Agencies

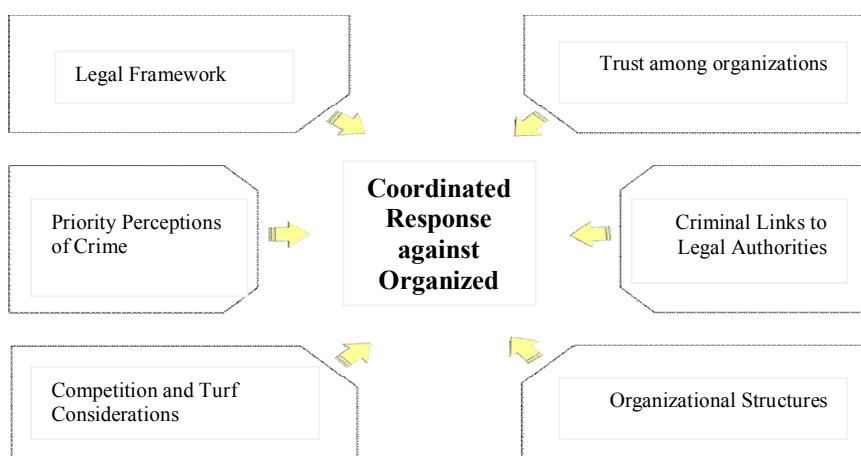
Trust among agencies has an important role to develop formal networks. However, formally coordinated response to organized crime is still rare since it requires preparation via official channels and takes time and financial resources. On the other hand, officials from different agencies form informal structures to respond against organized crime. These informal relations have advantage of flexibility and speediness (Vangen and Huxam, 2003; Dandurand, 2007). Indeed, Cole (1985) examined factors affecting decision to prosecute in King County, Washington judicial system. Most prosecutors interviewed stated that they know the police officer whom they can trust based on previous contacts. In similar way, police officers also look for prosecutors who tend to have their perspective on a case. In the judicial system Cole investigated, policemen can ask a specific prosecutor. They even postpone the submission of case until their trusted prosecutor becomes available. Preference of officials is not limited to prosecutor selection. As noted by Cole "The prosecutor can hold a case until the correct judge came up" (p.262). Although policies in that specific judicial system might not be common practice and not applicable everywhere, it can still give insight into formation of relations among judicial system actors.

2.6. Organizational Structure

Most of criminal justice organizations have hierarchical structures and traditional bureaucracies in which tasks are determined and responsibilities are assigned to certain mechanisms. Comfort and Kapucu (2006) argue that these types of organizational structures might be effective under normal circumstances. However, they probably fail under emergency and crises condition where there is not enough time to plan their activities. Nevertheless Puonti (2004) points out that recently a switch from traditional approaches to inter-organizational networks of heterogenic agencies. Transformation from the hierarchical organization structure to interorganizational network requires change from hierarchic structure to parallel collaboration. Although in traditional system operates back and forth papers by mail, in the collaborative network people need to interact with each other, prioritize their goals and reach consensus on them trough negotiations. Complexity of crime necessitates a transformation from information exchange to more sophisticated techniques in crime investigation.

Reviewing literature on interagency cooperation and collaboration among CJ agencies, the study identified several factors affecting willingness of CJ organizations to work together in the organized crime investigation process. Figure 1 summaries relation among coordinated response to crime and affecting factors.

Figure 1: Factors Affecting Coordinated Response against Organized Crime



Coordination of response by criminal justice organizations' fight against organized crime is determined by factors identified in the Figure 1. Legal and policy framework, -in other words, how organizations are connected each other- has an important role in determination of location of organization and information flow patterns within the network. If organized crime is perceived by agencies an essential prior problem to deal with, we expect that they come together to solve the problem. Different priorities in various organizations' agendas will probably make coordination difficult. Trust also has been seen one of most important factors to form effective relations both among organizations and officials. Fight against organized crime requires much trust between authorities and individuals. Illegal connections to CJ agencies might make coordinated response effort fruitless by eliminating trust among organizations. Turf considerations at early stages of cases and also efforts to gain credit for themselves make organizations competitors which hold them exchange information. Horizontal structures of organizations give them flexibility in terms of facilitating coordination and exchange resources and information while hierarchical structures of CJ organizations hinder cooperation.

Next section provides a tool to measure and evaluate the six factors affecting interagency collaboration among criminal justice organizations. Interorganizational relationships increasingly analyzed by social network analysis methods. Density and centrality measures of network analysis can help to understand inter organizational relationships.

3. Network Analysis Method in Analyzing Coordinated Response against Organized Crime

Although network analysis is very broad concept mainly it refers to application of relations to entities. Any entity communicates with others is considered as point in the network analysis concept and called usually an "actor" or a "node". In addition to individual actors, groups departments and agencies are considered as a set of entities and examined in terms of communication and collaboration. Network analysis allows researcher to represent relational data and identify its characteristics. Relations among nodes, usually described links or ties, could be directional or nondirectional. Another feature of ties is strength which indicates the frequency of communication. Network analysis measures entities, their relations and entire network.

Scott (2000) points out that unlike conventional statistical methods network analysis emphasizes dynamic relations among individual actors, groups or organizations instead of focusing on attributes of them. In other words, similarities and dissimilarities of variables can be detected in data sets by using traditional data structure. On the other hand, network data allow us to detect relationship patterns in any given social entity.

Network analysts are always interested in how entities are embedded in network and how individual or organizational preferences lead to shape overall pattern. Actors are described by their relations rather than their attributes. Since individual points in a network are important with their connections it is common to examine them with their relations. Therefore, actors are included in network analysis along with their relations. Another essential distinction of network analysis is sampling issues of research. Instead of sampling from a population of all members of a network within any given boundary are used as subjects of network analysis research. Two different tools are used to represent relational data. Matrices are useful tools to organize relational data obtained from a network. Graphs are used to visualize structure of network where each entity represented by a point and relations between them indicated by lines (Hanneman, 2001). The following section summarizes some concepts of the network analysis and also measurements tools that are widely used in this method (Monge and Contractor 2003; Hanneman 2001; Wasserman and Faust 1994; Scott 2000).

3.1. Centrality

Determining how an actor is centrally embedded in the network can help understanding importance of that actor in the network. These evaluations provide us key actors in the network. Networks in which actors are connected to one central actor are considered highly centralized networks. There are three types of score calculation which measure centrality of actors: Degree centrality, closeness centrality, and betweenness centrality (Hanneman 2001; Monge and Contractor 2003; Wasserman and Faust 1994).

3.2. Degree Centrality

Degree centrality is defined as number of ties affiliated with a certain actor. Incoming ties toward an actor called indegree while outgoing ties described as outdegree. Actors with more links are considered more powerful since they have the opportunity to behave independently. They can access information and resources of network easily. Number of links that actors have is key determinant for non-directional ties. However, for directional ties indegree and outdegree measures become essential to evaluate centrality and significance of actor in the network. Links from many other actors to a certain actor indicate attention of other actors. Being a much connected actor by others can increase prestige of the actor. On the other hand, actors who have higher outdegree score are considered that they are capable of influencing other members of network (Hanneman, 2001).

Actors with high centrality scores are considered more powerful since they have ability to contact others directly. Another approach argues that having high degree is enough to be significant or powerful in the network. Having connection with actors who are connected many others is more important to have power in whole network instead of in its local neighborhood.

3.3. Betweenness Centrality

Betweenness centrality measurement of an actor's connection to other actors which are not connected any others. In other words, betweenness measures indirect links. Some of actors in the network have an intermediately role and they naturally have higher betweenness score. Actors with high betweenness score are considered as powerful in terms of controlling information flow. Their centrality comes from being between actors and removal of them would cause elimination of indirect links between other (Monge and Contractor, 2003).

3.4. Closeness Centrality

Direct or indirect connection of actors to all other actors in the network is measured by closeness centrality. Degree scores and closeness scores might not be directly related for any given actor. Closeness centrality is an essential criterion for evaluating an actor's capacity to access

information. While degree centrality counts the ties of an actor, closeness centrality gives an idea about how far is an actor to all other actors in the network.

3.5. Cliques

In a small network all actors might be connected to each other. However in relatively large networks it will probably not possible to reach all actors from one particular actor. In these types of situations we assume that there are substructures in whole network. Cliques are defined at several levels but in general it can be described as substructure of a network where points are more directly and densely connected to one another compared to other actors in the network. What kind of exchange patterns of resource and information might be performed is predictable by looking at cliques in a network. Overlapping or no overlapping structures of cliques can give an idea of potential speed of movements and spread possible conflicts in whole network. Cliques also can indicate isolated member or subgroups and bridges between subgroups which play an essential role mobilization of information and resources (Monge and Contractor, 2003; Hanneman, 2001).

4. Network Analysis Applications in Criminal Justice Administration

We proposed six-factor model based on the findings from literature which suggests that coordinated response to organized crime is affected primarily by: 1) Legal and policy framework, 2) priority perceptions of crime by authorities, 3) competition and turf considerations, 4) criminal links to legal authorities, trust among agencies, and 5) organizational structure. In this part, we discuss how network analysis tools can be applied to organized crime investigation. The three measurement that will be discussed are network size, centrality of any given organization to the network and cliques in the network.

Network size is essential in terms of interrelations among organizations. When we examine the organizations in CJ system, we do not expect very complex structure of interactions since the number or organizations which are legally determined are very limited. On the other hand if we look at interactions among subdivisions of these organizations, we can see more complicated structure of relations. Thus we can

conclude that one of our factors, *legal framework* which indicates how CJ organizations are legally connected, plays an essential role in determination of network size and information flow patterns. Depending on the country that the CJ system is in, network size might vary but in general organizations involved in the system are limited to a few organizations such as police, gendarmerie, intelligence agency, prosecution office, and judiciary and correction office.

Another network feature that needs to be taken into account is centrality measure of an actor in the network. Determining how central a node in the network gives information about how important is that organization for the network (Everett and Borgatti, 1999). A criminal justice network is a legally formed network rather than voluntary collaboration. It means that locations of nodes in the network are largely determined by regulations in contrast to other interorganizational collaborations such as emergency response networks. *Legal and policy framework* will affect the centrality of organizations. For example, when we look at the closeness centrality in a CJ network, prosecutor's office would be found most central organization to the network because of its legally determined location in the system. Law enforcement agencies are required to work with prosecution office since they are not allowed to submit the cases to judiciary. Beside the legal framework, based on relational history between agencies, *trust* might contribute to formation of more intense interactions. Trustworthiness of an agency in the network can make an organization central in the network. We argue that trust most influential factor in the formation of informal relations while legal and policy framework is most important element in the development of formal CJ network. Consequently, it is plausible that the trusted organizations will become central and power in the network by controlling information flow and resources. *Organizational structure* of any given agency might affect whether the agency has the capacity to be a central actor in the network. Taking into account that the agencies in the criminal justice system are mostly hierarchical bureaucratic organizations, the influence of structure might be less essential than trust and legal framework in centrality of an organization to the network. The organizations that tend to be structured horizontally will have advantage on being a powerful actor within the network. The last component that is very likely to influence centrality of organizations in the criminal justice system is that *priority perceptions* of organizations about organized crimes. The organizations that prioritize organized crimes will play an

essential role in the investigation and prosecution process among other organizations. It is plausible to expect that agencies those put higher priority to investigation of organized crimes will exert more effort than others. This probably will put them in the center of interorganizational relations which will higher their centrality scores when social network analysis applied.

Last feature of social network analysis is cliques and subgroups that can be identified in a criminal justice network. When organizations in the system mostly focus on their own operations or at most the adjacent organizations in terms of their mission, subgroups are tend to be formed. Indeed, the police and the prosecutor and the media and law enforcement agencies were found tightly connected. *Priorities of organizations* differ from each other and this situation appears sometimes as isolated nodes in the network or usually cliques of agencies. The variation in how much importance given to a crime type (in our case organized crime) helps formation of organizations' agendas (Heinz and Manikas, 1992). As a result, organizations with similar priorities come together in subgroups. Minor, Fax, and Wells also reached similar findings confirming the argument that various priorities of different organizations hindered coordination. When agencies do not understand role of other organizations, these differences resulted in lack of communication.

Literature suggests that organizations with same interests are less likely to communicate and cooperate rather they are inclined to compete each other. *Competition* among agencies is likely to have a negative impact on coordinated response against organized crime. Taking into consideration this argument we expect that gendarmerie and police are tend to compete each other which results in that they participate in different subgroup since both are armed forces with the same responsibilities in terms of investigative roles. On the other hand investigator-prosecutor relations might be denser and mutual while judges are not directly connected these officials. Heinz and Manikas (1992) studied networks among elites in a local criminal justice system and found that "the police and prosecutors are relatively integrated elements of the system but that the judges are more loosely connected to them. Thus, the respondents who are judges were likely to be in contact with other judges and court administrators, while the police worked relatively closely with the prosecutors" (p.848).

On the other hand predetermined jurisdictions of law enforcement agencies make them responsible for investigation of crimes which are committed only within their jurisdiction. Police's involvement, for instance, would be very limited for a case committed in gendarmerie's jurisdiction. However, larger organized crime cases might be wicked because of their multi jurisdictional, even transnational nature and require involvement of all CJ organizations as well as other public and nonprofit organizations.

As we discussed before, criminal organizations always have connections to legal world which allow protecting their illicit activities from detection of law enforcement. If the agencies in CJ network have concerns about the fact that information will be conveyed to criminal organization, they will not be willing to provide information. They will be prone to connect safer organizations or officials in the network. Concerns about illegal connection to criminal enterprises are highly correlated to *trust* issue. Both factors *trust* and *criminal links to CJ agencies* can shape information flow patterns and form cliques even create isolated organizations. All these structures can be captured by network analysis methods and tools.

Conclusion

This study, first, reviewed the literature on interorganizational partnership in general. Then it overviewed the factors that might be important development of interagency relations among criminal justice organizations. It came up with a proposed conceptual model which consists of six elements that needs to taken into account when dealt with coordinated response to organized crime. These factors are legal and policy framework, priority perceptions of crime by authorities, criminal links to legal authorities, trust among agencies, organizational structures. In addition to these conceptual findings the study also examined whether these concepts are measurable using social network analysis tool and methods. Impact of these factors on overall structure of network can be seen by using network analysis tools. The study findings suggest that criminal justice network size is primarily affected by legal and policy framework. We also argue that centrality, one of most important measures of network analysis method, is influenced by legal framework, trust among agencies, their priority perceptions and organizational structures.

In terms of legal framework, law maker will give some organizations more critical roles and more central positions in the CJ network. This formal network structure, however, is prone to be affected by informal relations among actors of the network. For example, trustworthy organizations can become key actors in the network through dense relations with other agencies in system. Centrality of an organization to the network also depends on its structure. Bureaucratic organizations are less likely to become central to the network while team based decentralized organizational structures allow control of resource and information flow. To the degree an organization prioritizes the investigation and prosecution of organized crimes will have a central position in the criminal justice network. Another measure of network analysis method is cliques within the network. The quantity and quality of relations among criminal justice organizations will shape the subgroups within the network. Competition among agencies will prevent them from coordinating their efforts which will result in formation of cliques in the network. Organizations with similar priorities will come together and form subgroups with denser relations than other network members.

Finally, this study argues that the six concepts contributing to development of collaboration and preventing organizations from collaboration can be measurable by using network analysis methods. This method is especially useful for determining quantity and quality of relations among entities. Empirical investigation should be conducted to understand whether proposed concepts have an effect on development of collaboration among criminal justice organizations. Future studies should focus on application of social network analysis tools to the area of coordinated effort among criminal justice system by using relational data.

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