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CROSSING BORDERS: MEXICAN DRUG TRAFFICKING ORGANIZATIONS INFLUENCE ON INTERSTATE GANG STRUCTURE

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CROSSING BORDERS: MEXICAN DRUG TRAFFICKING ORGANIZATIONS INFLUENCE ON INTERSTATE GANG STRUCTURE

A Thesis

Presented to the

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San Bernardino

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ABSTRACT

Not only has gang membership been expanding, but the formation of cooperative ties with Mexican drug trafficking organizations (MDTOs) has been increasing as well. Collaborative relationships with MDTOs appear to be the driving force behind the continuing gang expansion and its subsequent effects. Using social network analysis, this study examines the linkage between MDTOs and American-based gang activity and the potential influence that MDTOs may have in U.S. drug market through their associations with American street gangs. Findings show the MDTOs to be extensively linked to each other by their affiliations with U.S. gangs, and a high level of connectivity exists between U.S. gangs and MDTOs. In addition, various centrality measures indicate the Sinaloa Cartel to have the broadest reach into the illicit drug market, as this cartel is affiliated with the highest number of gangs. The current study provides support for the continuance of multijurisdictional collaboration, and reaffirms the need for law enforcement to continue to explore the non-traditional approaches to crime and intelligence analysis.

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CHAPTER ONE

INTRODUCTION

The Problem

"Street gangs continue to impact communities across the United States and do not show signs of decreasing membership nor declining criminal activity" (National Gang Intelligence Center, 2015). Not only has gang membership been expanding (National Gang Intelligence Center, 2011), but the formation of cooperative and collaborative ties with Mexican drug trafficking organizations (MDTOs) has been increasing as well. One such example discussed in the California Attorney General's special report on transnational organized crime,(Harris, 2014) details a collaboration and subsequent indictment involving the Mexican Mafia and La Familia Michoacana. "The Project", a collaborative agreement, is considered to be one of the most significant alliances in recent years between the drug trafficking organization, La Familia Michoacana, and the Mexican Mafia, a powerful prison/street gang. Under the agreement, LFM provided the Mexican Mafia, $500,000 upfront, a share of drug proceeds, and discounted rates for meth. In return, the Mexican Mafia provided LFM protection of meth shipments and routes, protection of distribution territory in Southern California, protection of LFM inmates, and debt collection services (Harris, 2014). As reported by the 2015 National Gang Report, 96 gangs are purported to have partnered with MDTOs with the intent to commit cross-border crime, the selling of

street drugs is reported to be the cross-border crime most frequently committed. Whereas, according to the National Drug Intelligence Center, approximately 15 gangs were reported to have been assisting Mexican DTOs in U.S. illicit drug trafficking in 2010 (National Drug Intelligence Center, 2011). For profit and power, unless the drug routes from Mexico are shut down, collaboration between MDTOs and Gangs is expected to continue (National Gang Intelligence Center, 2015). Gang evolution and adaptation have been suggested as contributing factors to the increasingly sophisticated criminal networks of gangs observed by law enforcement. These networks appear to be more violent than gangs of past times, and more involved in drug trafficking and distribution. A partial explanation may be found in the growing interconnectivity between street gangs and MDTOs. Aggressive recruitment by MDTOs in order to expand their drug trafficking operations has been attributed to the increase in gang membership (National Gang Intelligence Center, 2011). Not surprisingly, gang and drug-related criminal activity is also on the rise.

Present Study

The growing threat of criminal influence by Mexican drug trafficking organizations (MTDOs) on interstate gang structure poses a significant risk to public safety in communities throughout the United States (National Drug Intelligence Center, 2011). For this reason, this study answers three research

questions in an attempt to uncover the structure and interconnectedness of the Mexican drug trafficking organizations based on relations with U.S. based gangs.

a) How interconnected are Mexican drug trafficking organizations (MDTOs) with each other through their ties to U.S. based gang alliances?

b) Which U.S. gangs have the greatest interlock with Mexican drug trafficking organizations (MDTOs)?

c) Which Mexican drug trafficking organizations has the broadest reach into the U.S. illicit drug market? In other words, which MDTO is positioned to have the greatest influence into the U.S. illicit drug market through their connections with U.S. based gangs?

To answer these questions, a set of networks were generated from data extracted from the 2011 National Gang Threat Assessment (NGTA) produced by the National Gang Intelligence Center (NGIC), a component of the FBI. The NGTA report reports on which street gangs, prison gangs, and outlaw motorcycle gangs have reported ties to MDTOs. To understand the geographical component of drug trafficking in the United States, six undirected affiliation networks were generated by linking each gang associated with a specific MDTO to the state wherein they are known to operate.

The results of the study showed that the MDTOs are extensively linked to each other by their affiliations with U.S. gangs, and a high level of connectivity exists between U.S. gangs and MDTOs. Furthermore, the link between the Sinaloa and Tijuana was two times stronger than any of the other ties.

Additionally, Hermanos de Pistoleros Latinos, Latin Kings, Mexican Mafia, and MS-13 are interconnected because of their ties with the various MDTOs. The findings of the study provide support for both the continued use of collaborative approaches in tackling the gang problem, as well as the need for analytic approaches that are more group focused. The naming convention of gangs was a noted limitation to the study, as some names may not necessarily be an accurate reflection of gang's affiliation.

Thesis Organization

The remaining chapters of this thesis provide a detailed report of the research. First, Chapter two reviews the relevant literature. This chapter begins with a discussion of MDTOs and the evolution of American street gangs from turf centered groups to drug trafficking organizations that evidence some collaborative relations. Next, the discussion shifts to an investigation of the structure of drug trafficking organizations and the utility of social network analysis for mapping these group structures. This chapter concludes by stating the three research questions driving the present study.

Chapter three describes the methodology used to examine interstate gang structure of MDTO affiliated gangs. The first section of this chapter describes the source data used to generate affiliation networks linking MDTOs to American gangs. Then, after describing the network generation process, centrality measures are described and the analytic strategy outlined. Chapter three

concludes with a discussion of the limitations of the study. In Chapter four, results are presented for each research question. Chapter five will discuss the results and implications of the research.

CHAPTER TWO

LITERATURE REVIEW

Drug Trafficking

Gang proliferation over the recent years is contributing to increased rates of crime and gang-related violence across the United States, although the effects of criminal gang activity are not uniformly observed over the states and regions. While law enforcement has attributed the expansion of gangs and gang membership to many factors, collaborative relationships with Mexican drug trafficking organizations (MDTOs), also referred to as drug cartels, appear to be a driving force behind the continuing gang expansion and its subsequent effects. Such effects include the increasingly sophisticated criminal networks observed by law enforcement and the associated gang-related crime observed across the United States (National Gang Intelligence Center, 2011). These networks appear to be more organized than gangs of the past times, and more involved in drug distribution and drug trafficking.

While geographic proximity is likely to be a significant element in explaining the interconnectivity and structure of gangs across the states, it is arguable that the influence of MDTOs and inter-gang associations related to the states might account for the varying volume of inter-state linkages. Associations between gangs in general exist out of conflict and competition for money and power. Gang-related crime and violence are frequently associated with these

relationships, as often they either are the cause of it, or result from it (Decker & Curry, 2002). Evolving gang behavior makes it difficult for law enforcement to determine the nature of relationships between gangs. Collaborations are fluid and motivated by the gangs' drive to attain their goals, whatever the cost.

It has been reported that U.S. gangs are not only collaborating and partnering up with homogeneous gang types, but rivals and MDTOs as well (Descormiers & Morselli, 2011; National Gang Intelligence Center, 2015). MDTOs employ U.S.-based gangs to expand their drug distribution territory in order to further their influence within the illicit drug market, which in turn generates more revenue. Conversely, establishing ties with MDTOs enables gangs the ability to make money and gain power—the two primary objectives of gangs. The NGIC suggests that the increase in violent crime may be a result of the newly formed associations that gangs have with the Mexican drug trafficking organizations (National Gang Intelligence Center, 2011). Moreover, important subgroups can be found within larger gang networks; these groups are often an interest and concern for law enforcement. Included in these are groups of inter-gang conflict or collaboration/co-operation, knowing both will enable law enforcement to better anticipate the consequences of policy directives and anti-gang suppression.

Based on the discussion above, the focus of this thesis is on studying the structure of gang and Mexican DTO affiliations. This chapter includes three related discussions. The first section reviews the literature on gang evolution;

the second section reports on what we know about the structure of groups involved in drug trafficking; and lastly, the final section explains how social network analysis could be used to investigate the structure of gangs and drug trafficking organizations.

Gang Evolution/Adaptation

Current government reports (National Gang Intelligence Center, 2011; 2013) suggest that many gangs are becoming more sophisticated in structure and behavior, and exhibiting characteristics similar to organized crime. Through a process of evolution, gangs have adapted to the changes of society by altering their organizational or structural stance (Ayling, 2011; Weisel, 2002). Sullivan (2008) suggested the evolution of gangs could be explained through an organizational framework of generational evolution. Based on politicization, internationalization, and sophistication, gangs can be categorized into three conceptual generations—first, second and third. Based on his observations of gangs, Sullivan described first generation gangs as being primarily turf-oriented. Second generation gangs are described as business-oriented drug gangs. Third generation gangs, the most evolved and complex in nature, are described to resemble cartels and other highly sophisticated, powerful entities (Sullivan, 1997;2008).

Ayling (2009) compared gang adaptation to the concept of resilience in ecology. Gangs that have found success in transforming into criminal organizations have done so because they were able to overcome obstacles. In

order for gangs to survive and prosper through the ever changing conditions of society that sometimes challenge their existence, they must be flexible and able to adapt (Ayling, 2009). These changing conditions include the increase in gang members/competition, changes to law enforcement policy and practices, the expansion or contraction of illegal markets and the availability of new technologies (Ayling, 2009).

Ayling (2011) suggested that applying the framework of evolutionary theory may be useful in understanding the observed evolution towards a more organized form and asserted that evolution has been an influence in the change of modern day gangs and gang structure. She argued that gang evolution has resulted in more profit-oriented behavior seen in gangs, as they are specializing in illicit markets, such as drugs, like that of organized crime groups. From an organizational perspective, these gangs will have a formalized and hierarchical structure (Ayling, 2011).

One of the key findings included in the 2011 National Gang Threat Assessment confirmed Ayling's arguments. The finding suggested that historical rival gangs of all types (OMG, street, and prison) are working collaboratively with drug trafficking organizations (DTOs) for profit and influence. Starbuck, Howell, and Lindquist (2001) reported, in the Midwest, drug alliances were being established between former gang rivals, suggesting the notion that profit may outweigh loyalty.

Drug Trafficking Organizations. Drug trafficking organizations or DTOs are defined by the U.S. Department of Justice (National Drug Intelligence Center, 2010) as "complex organizations with highly defined command-and-control structures that produce, transport, and distribute large quantities of one or more illicit drugs." From the review of past literature on drugs and gangs, and the findings of the NGTA (National Gang Intelligence Center, 2011), it would appear that gang expansion is not only a likely result of meeting the two main objectives for gangs; profit and power, but the associations between U.S. gangs and Mexican drug trafficking organizations (MDTOs), are an important component as well. Due to geographic proximity, it would seem likely that the states closest to the border of Mexico would be the only states under threat from drug trafficking. While this may have been the case at some time in the past, it is no longer the case (Finckenauer,Fuentes, & Ward, 2000). States on the east coast are connected to the west coast through drug trafficking and drug smuggling.

Mexican Drug Trafficking Organizations

While traditionally, the Mexican drug cartels were once known to be hierarchically bound by familial ties. More recently they have been reported to be flatter and loosely networked groups, a result of the splintering of the large DTOs that has said to have occurred. It has been suggested that the major cartels have aligned into two factions, each group “led” by a large rival cartel of the opposing group. One group, “led” by the Juarez Cartel—also included the Tijuana Cartel, Los Zetas and the Beltrán-Leyva Organization. The other group

"led" by the Sinaloa Cartel—and included the Gulf Cartel, Sinaloa Cartel and La Familia Cartel (Beittel, 2015).

- Gulf Cartel — As one of the oldest organized crime groups in Mexico, the Gulf Cartel operates in a northern section of Mexico—directly below the most southern portion of the Texas border. This cartel is known for its ongoing rivalry with Los Zetas.
- Juarez Cartel — As once one of Mexico's most powerful drug trafficking organizations, their power has said to have declined since the arrest of one of their key players Vicente Carrillo Fuentes, also known as El Viceroy in 2014. While formerly aligned with the Sinaloa Cartel, it is now reported to be a rival and instead is aligned with the Gulf Cartel (Beittel, 2015).
- La Familia Michoacana (LFM) — An independent group that originated in the 1980's, although La Familia Michoacana was said to have "officially" disbanded in 2010, fragmented cells are still active around Mexico City (Beittel, 2015). According to a DEA report (2009), this DTO is heavily involved in the production of methamphetamine which is manufactured strictly for export to the United States (Drug Enforcement Administration, 2009).
- Los Zetas — Unlike the other cartels, drug smuggling is not their crime of focus, but instead, it is organized violence. As the once enforcer gang for the Gulf Cartel, Los Zetas have been described

as "the most technologically advanced, sophisticated and violent of these paramilitary enforcement groups" (National Drug Intelligence Center, 2008).

- Sinaloa Cartel — Known as the largest and most powerful of the cartel groups. The Sinaloa Cartel is different when compared to the other major Mexican drug trafficking groups discussed here. Unlike some of the other DTOs, the Sinaloa Cartel has not fractured following the arrests of key high-level operatives, nor has it diversified into other criminal activity
- Tijuana Cartel — While the Tijuana DTO's area of influence, the city of Tijuana, is small, it has seen high levels of violence. The violence stems from the rivalry which exists between the DTOs regarding the use of the lucrative drug corridor. At one time the Tijuana organization, once operated by the seven siblings of the Arellano Felix family was regarded as one of the two dominating DTOs, the other being the Juarez DTO. Both DTOs are "tollgate" organizations, as they control the drug smuggling routes from their areas to the United States (Beittel, 2015).

Collaboration. While relationships of conflict are most common and are likely to occur because of inter-gang competition over territory or differences between gangs such as race and ethnicity, collaborative relationships between gangs are possible too and often form as a result of similarities or the homophily

principle (McPherson, Smith-Lovin, & Cook, 2001). Homophily exists when two individuals, or groups, have similar characteristics, such as being of the same race, or having the same goals and beliefs, i.e., earning a profit from drug sales. Collaborative relationships do not only occur within gangs, but also between them. Collaborative relationships observed between historically rival gangs bring into question what we think we know about typical gang behavior member as (Fleisher, 2005). While these relationships are not considered to be the norm, they are not that uncommon either. Gang affiliation is not always the deciding factor when it comes to relations between gangs. Ethnographic research by Fleisher (2005) found that gang affiliation did not impede the social, economic, or personal relationships among women gang members (Fleisher, 2005). Collaborative relationships are occurring more often (NGIC, 2011), and may be associated with developments within the illegal drug trade. For example, Starbuck, Howell and Lindquist (2001), found that cooperative relationships are occurring between rival gang members from Chicago and Los Angeles for drug profit.

Since 2001 increasingly collaborative relationships has been observed between MDTOs and US based gangs, these relations are suggested to have contributed greatly to the increase in crime and drug related violence seen in the United States (National Drug Intelligence Center, 2010). Because of these collaborations for mutually beneficial purposes, the U.S. continues to experience

gang expansion and drug trafficking operations continue to flourish (National Gang Intelligence Center, 2015).

Threat assessments and other government documents report that the particular gangs collaborating with MDTOs are not the traditional, turf-oriented street gangs, but instead appear to be a combination of criminal groups characterized as second and third generation gangs. Research (Brands, 2009; Franco, 2007; Federal Bureau of Investigation, 2005) suggests gangs of this nature may function more like sophisticated criminal organizations as they have ties to organized crime groups, some of which operate internationally. Additionally, gangs such as these often play a role in other criminal activities in which MDTOs are connected to. For example, various government agencies report MS-13, and other Hispanic gangs to be involved in smuggling drugs and weapons on behalf of MDTOs (National Drug Intelligence Center, 2010).

Structure of Groups Involved in Drug Trafficking

While there is some recent research documenting the structure of gangs and drug trafficking organizations, research regarding the structure of Mexican drug trafficking organizations or the co-offending structure of MDTOs and U.S. based gangs is sparse. Furthermore, the information that is available, comes from gray source literature; agency reports, and state and federal threat assessments. As this information is not empirically based, nor peer reviewed, it does not contain the same amount of rigor as other sources of information.

Not all criminal groups have the same network structure, therefore the strategies used to disrupt the network, should also be different (Xu & Chen, 2008). Even within the category of gang groups, network structures are expected to be different. The network structure of motorcycle gangs, for example, is likely to be more like that of the structure of organized crime groups (McNally & Alston, 2006). Street gangs and prison gangs are likely to have different structural qualities as well. Decker, Bynum and Weisel (1998) suggested that prison gangs are more like organized crime groups when they are inside of prison. Knowledge of network structure can provide invaluable insight as to the flow of information, goods, and communication between individuals, as well as criminal groups, such as gangs (Sparrow, 1991b).

Research (Klein & Maxson, 2001; Sanchez-Jankowski, 2003; Skolnick, Correl, Navarro, & Rabb, 1990) has suggested that gang structure may vary and be dependent upon the particular gang type, or criminal activities they are involved in. Specifically, gangs involved in drug trafficking are thought to be structurally different from traditional turf-oriented gangs. Moreover, Decker and Pyrooz (2011) suggest that gangs can best be seen on a scale ranging from highly structured, referred to as instrumental-rational, to completely lacking a structure, referred to as informal diffuse, with many variations in between.

To better understand the configuration of drug trafficking organizations, Eck and Gersh (2000) sought to study the two contrasting views of drug trafficking structure. Behavioral data of 620 drug traffickers collected from 1995-

1197 in the Washington/Baltimore High Intensity Drug Trafficking Area (HIDTA) was examined to determine which of the two hypotheses would be accepted. The first view, referred to as concentrated industry posited that drug trafficking structure is hierarchical in nature, while the second view, called cottage industry postulated there to be a more cellular structure found. The results showed that 60.4% of cases involved individuals or groups of individuals formed by loosely knit associations, while 39.1 % were crime organizations. These results are suggested to provide more support for the cottage industry hypothesis (Eck & Gersh, 2000).

Decker and Van Winkle (1994) suggested that group organization, thus group structure, is important to look at when examining gang activity, especially activities like drug trafficking, that bring profit to the gangs. Further, Felson (2008), proposed group co-offending such as that of organized crime may be an extension of person to person co-offending, he termed this as “extended co-offending”.

Knowing the organizational structure of gangs and MDTOs involved in drug trafficking is an essential element in contending with gang in the United States. Further, knowing the co-offending structure of MDTOs and U.S. based gangs would aid intervention methods, as well as support the development of more effective policies for public safety.

Social Network Analysis

Prior research (Ayling, 2011; Papachristos, 2006; Skolnick et al., 1990) calls for the use of innovative methodologies, both quantitative and qualitative, to better understand gang organization. In particular, Papachristos (2006) suggests that social network analysis will aid in the forming a clear and precise explanation of the problem, so as to support the development of effective intervention policies. A growing literature applies social network approaches to mapping the structure of drug trafficking organizations.

Structure of Drug Trafficking Groups

While McNally and Alston (2006) and McGloin (2005) both utilized various network centrality measures to identify key players and subgroups (also referred to as cliques), found within the networks, the purpose of the studies differed. Through key player analysis it is possible to identify individuals who are important, due to their structural position relative to other individuals within the network. Key players often play roles which are important to the way a network operates, fully understanding these allows for the development of more effective interventions. In a similar fashion, clique analysis may provide information regarding individuals that are operating together. McNally and Alston (2006) sought to understand the structure and hierarchy of an outlaw motorcycle gang network for intelligence-led policing. The study findings did not support the true power structure or influence of the criminal network that was expected. Due to the hierarchical nature of outlaw motorcycle gangs, it was expected that the

president of the chapter would be ranked first in regards to degree centrality. When the degree centrality of the chapter members was measured, it was found that the vice-president had the highest degree centrality with a score of 54.00, followed by two members tied with a score of 39.00. The president ranked third with a score of 35.00. Moreover, these findings suggest that when examining organized gang networks with a known hierarchy; the face validity of the hierarchical structure should be considered when allocating resources for intervention efforts (McNally & Alston, 2006).

On the other hand, McGloin (2005) was interested in studying the structural characteristics of street gangs in New Jersey for future individual and group-level policy interventions. Her findings revealed SNA to be a useful tool for the problem analysis of gangs and also gave support to policy implications that would focus on the cut-points (sole connections among individuals or groups of individuals) of gangs in Newark within a "pulling levers" strategy. Furthermore, she stated that the social network approach is unlike other forms of analysis, as it focuses on the dynamic interactions among people rather than the more well-known conventional analysis in which the attributes of people are examined. Knowing the interactions (networks), as well as the relationships between gangs and gang subgroups can be of great importance to law enforcement and intelligence agencies (Xu & Chen, 2005; Malm, Bichler, & Nash, 2011).

Additionally, social network analysis is used in analyzing the structure of ethnic-based drug trafficking networks. Based on judicial sources, Calderoni

(2012), used the network approach to compare the social organization and structure of two drug trafficking mafia groups. The results of the study suggested that even when drug trafficking groups differ in regards to elements such as division of labor and status, their operational structure may still be similar. He found that only a few individuals were highly active in each of the networks, suggesting the network was resilient to law enforcement intervention, as the central players would be replaced if necessary (Calderoni, 2012). In comparison, Tenti and Morselli (2014) used a network approach to provide better insight into the structure of group co-offending networks and between differently ethnic-based groups involved in the Italian cocaine market. Their findings suggest that drug trafficking organizations operate in a way that is like a legitimate business. When needed, groups, regardless of ethnicity, work in a cooperative fashion to pursue and meet the common set objectives (Tenti & Morselli, 2014).

It is this information that enables law enforcement and intelligence agencies to develop the most effective strategies to disrupt the networks. As with traditional forms of analysis, social network analysis has measures that appear to be more useful and popular in particular fields and with certain data compared to others.

Social Network Statistics

Centrality. To identify the relationships within the social network, various social network analysis statistics can be utilized. Centrality measures are often applied to criminal networks to determine important positions of the nodes within

the overall network. According to Morselli (2010), centrality measures are widely used in criminological research when examining and assessing various structural positions of individuals. Centrality measures often used are: degree centrality, betweenness centrality and closeness centrality.

Threat Assessments

While some research (Van Duyne & Vander Beken, 2009) has been critical regarding the use of threat assessments, other studies (Albanese, 2008; Hamilton-Smith & Mackenzie, 2010; Klerks, 2007) have provided support for their continuance. Hamilton-Smith and Mackenzine (2010) reviewed and identified the various approaches to threat and risk assessment, and found the ACPO (Association Chief of Police Officers) tool to be a promising advancement to the area of threat assessments. In particular, they suggested that risk assessments be routinely completed and used in conjunction with other analyses. As another option for assessing organized crime, Albanese (2008) argues for the application of a risk assessment model to assess illicit markets attached to the organized crime groups, rather than the groups themselves. He suggests that this may provide information regarding the presence of organized crime in an area where it was not previously known to exist. Furthermore, Klerks (2007) asserted that while he is a “believer” in the NTA (National Threat Assessment for Serious and Organized Crime), he has concerns regarding the reliability of the finished

product, as the methods used to synthesize the information are more subjective than formal (Klerks, 2007).

Research Aims

Based on the literature reviewed, while we know that gangs are cooperating with Mexican drug trafficking organizations, we do not know much about their co-offending network structure, or what effect that structure has on gang activity at a regional or national level. As suggested by the 2011 NGTA gangs will continue to expand not just locally, but throughout the United States. Also, prior research recommends using social network analysis and various network measures to examine organized crime group structure (Malm, Bichler, & Nash, 2011; Morselli, 2009).

The goals of the current study are three-fold. The first goal is to uncover the structure and interconnectedness of the Mexican drug trafficking organizations (MDTOs) based on the relations they have with U.S. gangs. The second goal is to examine the interlocking structure of the U.S. gangs based on the associations they have with Mexican drug trafficking organizations. The third goal is to determine which MDTOs is positioned to have the greatest influence on the U.S. illicit drug market.

CHAPTER THREE

METHODOLOGY

Research Questions

Drawing information about the associations among Mexican drug trafficking organizations (MDTOs) from two national threat assessments, this study examines the linkage between MDTOs and American-based gang activity. Accomplishing the goals set out for this study, requires answering three related questions:

1.) How interconnected are Mexican drug trafficking organizations with each other through their ties to U.S. based gang alliances?

2.) Which U.S. gangs have the greatest interlock with Mexican drug trafficking organizations?

3.) Which of the Mexican drug trafficking organizations has the broadest reach into the U.S. illicit drug market? In other words, which MDTO is positioned to have the greatest influence into the U.S. illicit drug market through their connections with U.S. based gangs?

This chapter begins with a description of the data sources and the process used to generate the gang affiliation networks. Next, the structural statistics are explained and analytic strategy is described. The chapter concludes with a discussion of the methodological limitations.

Process Used to Build Affiliation Networks

Data Sources

Two data sources were used to obtain information about gang affiliations: 1) the 2011 National Drug Threat Assessment produced by the National Drug Intelligence Center (NDIC), and 2) the 2011 National Gang Threat Assessment produced by the National Gang Intelligence Center (NGIC).

2011 National Drug Threat Assessment (NDTA). This document reports the threats posed to the United States by trafficking and the abuse of illicit drugs. Included in this assessment is detailed information on gangs that have been identified as having an involvement with various drug trafficking organizations (DTOs) and their level of activity within the illicit drug trade. The NDTA 2011 consolidates information provided by 2,963 state and local law enforcement agencies gathered from a 2010 NDIC National Drug Threat Survey. As well, state and local law enforcement contributed to the report by providing information through personal interviews with NDIC Field Intelligence Officers. This comprehensive annual report provides policymakers and counterdrug task forces timely information about the scope of the emerging national threats related to illicit drugs, including gangs and violence.

2011 National Gang Threat Assessment (NGTA). This document describes emerging gang trends and threats posed by the various criminal gangs and other

related criminal groups, such as transnational criminal/drug trafficking organizations, to communities throughout the United States. Extending beyond drug involved gangs, this document attempts to provide a broader census of gang activity.

The 2011 NGTA consolidates information supplied by 170 federal gang task forces and 476 local, state, regional and federal law enforcement and intelligence agencies from across the United States, with the exception of Vermont (Vermont did not report in 2011). The information from law enforcement intelligence, open source information, and data collected from the NDIC, including the 2010 NDIC National Drug Threat Survey (NDTS).[1] Since 2005, the NGIC has released a total of three threat assessments; one in 2005, 2009, and the current 2011 version, each building and expanding upon the findings of the previous report.

The 2011 NGTA includes a listing of active gangs with a known and visible presence in each state, details about drug trafficking activities that the identified gangs are involved in, and links to Mexico-based transnational criminal organizations (e.g., Los Zetas, Sinaloa Cartel). While it is unlikely that a network analysis was intended by the producers of the 2011 NGTA, the appendix of this document includes a listing of each gang present in each state. This information provided the foundation for the current study.

[1] The National Drug Threat Survey is a national study targeted to capture information about drug activity throughout the United States. The survey has a relatively high response rate with 2,963 out of the 3,465 agencies contacted providing information (National Gang Intelligence Center, 2011).

Table 1. Gangs With Ties to Mexican Drug Trafficking Organizations [2]

Arizona New Mexican Mafia	La Nuestra Familia	Texas Mexican Mafia
Aryan Brotherhood	Latin Kings	Texas Syndicate
Avenues	Lennox 13	Tri-City Bombers
Bandidos	Mara Salvatrucha (MS-13)	Vagos
Barrio Azteca	Mexican Mafia	Vatos Locos
Barrio Westside	Mongols	Westside Nogalitas
Black Guerilla Family	Norteños	Wetback Power
Bloods	Satins Disciples	Wonder Boys
California Mexican Mafia	Sureños	18th Street Gang
Crips	Tango Blast	
Hardtimes 13		
Happytown Pomona		
Hells Angels		
Hermanos de Pistoleros Latinos		

Note: Adapted from the 2011 National Gang Threat Assessment (National Gang Intelligence Center)

Table 1 tells only part of the story, as it just identifies gangs that have ties to MDTOs, it does not link the gangs to any particular cartel(s). The data utilized to link the gangs to the specific cartels was compiled from other tables and information contained in the various governmental reports. Shown in Table 2 is a sample of these links.

[2] While this list of gangs is reported to have ties to MDTOs, not all gangs from this table were included in this study due to the inability to identify a specific link to any of the cartels.

Table 2. Sample of Data Depicting Known Allies of the Gulf and Juarez Cartels

Cartel	Aligned With
Gulf	La Familia Michoacana (D) Latin Kings (S) MS-13 (S) Mexikanemi (Texas Mexican Mafia) (P) Partido Revolutionary Mexicano (P) Raza Unida (P) Sinaloa (D) Tango Blast (P) Texas Chicano Brotherhood (P) Texas Syndicate (P)
Juarez	Bandidos (O) Barrio Azteca (P) Crips (S) Hermanos De Pistoleros Latinos (P) Latin Kings (S) Los Carnales Los Zetas (D) New Mexico Syndicate (P)

Note: D= drug cartel, O= outlaw motorcycle gang, P= prison gang, S= street gang

The National Gang Threat Assessment (2011) does not provide the national and regional level gang affiliation for the gang subsets listed in the appendix of the report. Gangs that have been identified and labeled as national-level or regional level are present in multiple jurisdictions, including locations outside of the United States. These gangs are often considered to be more of a threat over a larger geographical area than a local or neighborhood gang (not found in multiple jurisdictions), due to their ability to collaborate and form associations with drug trafficking organizations (DTOs). In some cases, gangs may take on the name of national or regional level gang, but even though they share a gang name, they may or may not be affiliated. On the other hand, a

gang subset may be aligned or affiliated with a national-level gang, but they are named in such a fashion that the national-level group affiliation is not readily ascertainable, for example, *Sons of Samoa*. Although, the Sons of Samoa, a street gang found in multiple states (Utah, Washington, Alaska, California, Missouri), the group does not have a national affiliation in its name, yet it is widely considered to be a Crips affiliated subset.

A systematic search of Lexis-Nexis, and other electronic databases (e.g., Criminal Justice Abstracts, EBSCO, Google Scholar, Google, and National Criminal Justice Reference Service) was used to obtain peer-reviewed research articles, books, or news articles to obtain information about national-level gang affiliation and gang type classifications for some subsets not described fully in the 2011 NGTA.

By piecing together information about each local gang (subset) identified in the threat assessments it was possible to link local gangs to their regional or national US-gang affiliation, as well as MDTOs. Since the reports provided state lists, it was also possible to link each local gang subset to a state.

Generating the Network. With four connected units of analysis—local gang subset, state, regional or national gang affiliation, and MDTO affiliation, several different types of affiliation networks could be generated. A sample of the data file can be seen in Table 3. As this table is merely for illustrative purposes only a subset of data is shown. The data displayed in Table 3 is representative of the information used to generate a MDTO affiliated gang-to-state network based on

Juarez Cartel gang affiliations. The data shown illustrate the state-to-state connections of the Juarez Cartel based on the ties to gangs that are known to exist in those states.

Table 3. Partial Data File of Juarez Cartel Subnetwork

STATE	GANG SUBSET	REGIONAL/NATIONAL AFFILIATED GANG	CARTEL
ALABAMA	BANDIDOS_MC	BANDIDOS	JUAREZ
ALABAMA	CORNER_BOYS_CRIPS	CRIPS	JUAREZ
ALABAMA	GREEN_ACRES_CRIPS	CRIPS	JUAREZ
ALABAMA	LATIN_KINGS	LATIN_KINGS	JUAREZ
ALABAMA	LATINO_BLOODS_CRIPS	CRIPS	JUAREZ
ALABAMA	WESTSIDE_CRIPS	CRIPS	JUAREZ
ALASKA	50150_CRIPS	CRIPS	JUAREZ
ALASKA	88_STREET_CRIPS	CRIPS	JUAREZ
ALASKA	ALTADENA_CRIP_GANGSTER	CRIPS	JUAREZ
ALASKA	COMBAT_CRIPS	CRIPS	JUAREZ
ALASKA	COMPTON_SWAMP_CRIPS	CRIPS	JUAREZ
ALASKA	LATIN_KINGS	LATIN_KINGS	JUAREZ
ALASKA	LOCC_DOWN_CRIPS	CRIPS	JUAREZ
ALASKA	LOCO_LATIN_CRIPS	CRIPS	JUAREZ
ALASKA	MOUNTAIN_VIEW_CRIPS	CRIPS	JUAREZ
ALASKA	SONS_OF_SAMOA	CRIPS	JUAREZ
ALASKA	TONGANG_CRIP_GANG	CRIPS	JUAREZ
ALASKA	WESTSIDE_CITY_CRIPS	CRIPS	JUAREZ
ALASKA	TONGANG_CRIP_GANG	CRIPS	JUAREZ
ALASKA	50150_CRIPS	CRIPS	JUAREZ
ALASKA	88_STREET_CRIPS	CRIPS	JUAREZ
ALASKA	LATIN_KINGS	LATIN_KINGS	JUAREZ
ARIZONA	DUCE_NINE_CRIPS	CRIPS	JUAREZ
ARIZONA	EASTSIDE_CRIPS	CRIPS	JUAREZ
ARIZONA	EASTSIDE_MARIA_CRIPS	CRIPS	JUAREZ

Constructing the Networks

Two sets of undirected affiliation networks were generated in order to answer the three research questions. First, a set of networks were constructed to examine the structure of the MDTOs and their allies (research questions 1 and 2). By connecting each of the major Mexican drug trafficking organizations (cartels) as identified in the NGTA, to the US-based criminal groups and organizations they are aligned with as denoted in the various data sources. This resulted in a two-mode cartel-to-alliances network. In total, the MDTOs and their alliances generated an undirected network that was comprised of seven[3] MDTOs linked to 32 alliances by 70 ties (see Figure 1).

[3] As there was a unique network for each Mexican drug cartel, seven affiliation networks should have been generated, but due to the lack of U.S. based gang connections to the Beltran-Leyva organization, a network based on the ties of the gangs to the Beltran-Leyva organization could not be generated.

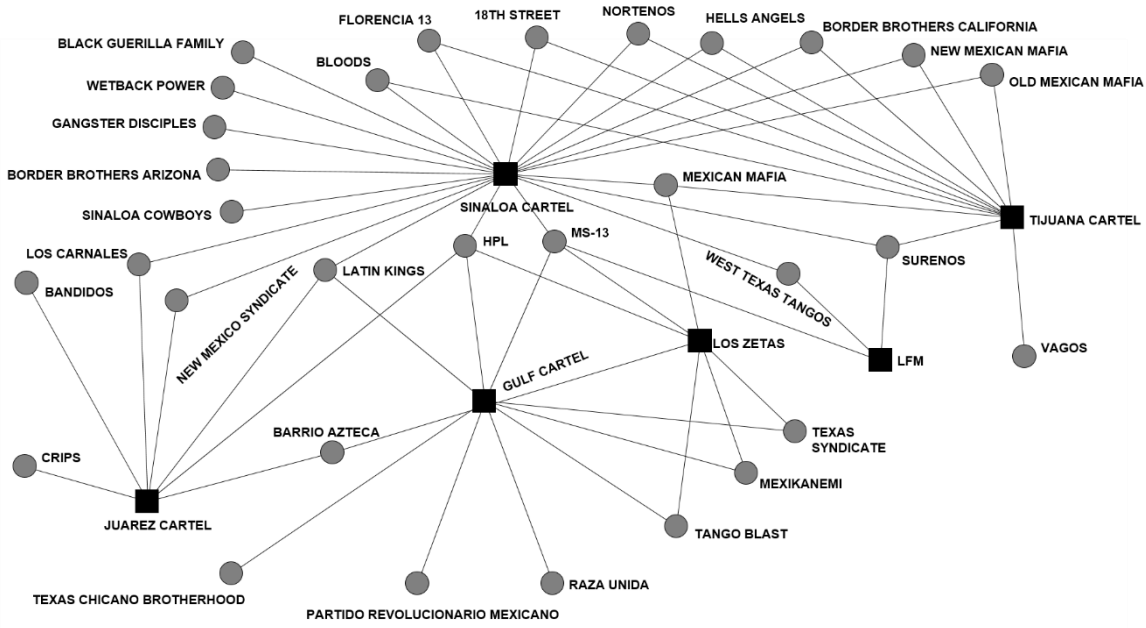


Figure 1. Sociogram of Mexican Drug Trafficking Organizations-to-Alliance Affiliation Network

Deriving Networks

The next step in the network generation process is to derive 1- mode networks (one network for each mode-see Figure 2.) in order to uncover the possible hidden connections between the cartels and gangs. The projection process was accomplished by selecting one of the modes of the 2-mode network to focus on, and then estimating connections between node pairs based on the number of things they have in common (Everett & Borgatti, 2013). The same procedure was repeated for the second mode as well. The sociogram shown in Figure 2a depicts a 2-mode gang-to-cartel network. This sample network has seven nodes; three cartels and four gangs, which are illustrated by the different

shapes; cartels are squares and gangs are circles. The lines connecting the shapes represent unique pairings (ties) between the cartels and gangs.

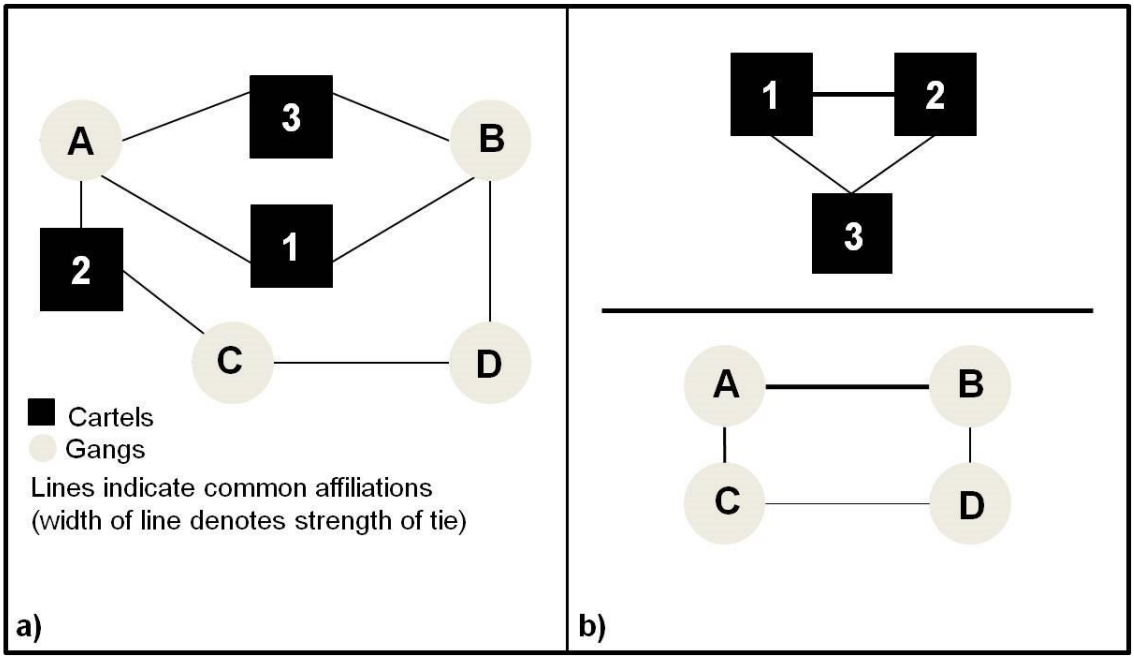


Figure 2. Example of a 2-Mode Cartel-to-Gang Affiliation Network (a) and the Two Derived 1-Mode Networks (b) Cartel-to-Cartel (top) and Gang-to-Gang (bottom)

Figure 2a shows that Cartel 1 and Cartel 3 are directly associated with two of the same gangs, as indicated by the lines connecting circles to the squares. These common ties are: Gang A, and Gang B. While this information might be surmised from an affiliations matrix, more complex interconnections for a greater number of groups is more easily identified through the two projected 1-mode networks shown in Figure 2b.

The top image of Figure 2b is a sociogram of the projected 1-mode cartel-to-cartel association network, estimated through the number of shared gangs. Three cartels are shown. Variation in the widths of lines connecting cartels illustrate the number of gangs that are shared between the cartel pairs. This is a valued network, in which the ties strengths are based on the number of shared associations. The more gangs that are shared between the pair, the thicker the line connecting them will be. For example, Cartel 1 and Cartel 3 share more gangs, than Cartel 2 and Cartel 1), as seen by the line width in the sociogram pictured in the bottom image of Figure 2b. Figure 2b (bottom) illustrates a sociogram of the 2nd mode (gang-to-gang) of the affiliation network. Just as with the cartel associations 1-mode network, estimated gang ties are based on having something in common, in this case, cartels. Gang A and Gang B have two cartels in common, while Gang A and Gang C only share one.

Generally, these projected networks are interpreted to suggest the possibility of hidden connections. As used here, the fact that two cartels are aligned with the same gangs suggests that they are more likely to associate with each other than not because of their overlapping connections (de Nooy, Mrvar & Batagelj, 2011). The additional benefit to using a projected network is that they significantly extend the number of analytic tools available for examining network structures (Everett & Borgatti, 2013). Thus, using these two network projections, this study can answer two of the research questions. The 1-mode MDTO-to-MDTO network permits an estimation of the likely connectivity among seven

MDTOs through their U.S. based gang alliances (research question 1). To answer the second research question, which US gangs interlock MDTOs, the derived network linking gangs by their association MDTOs was used (research question 2).

To answer research question three, six undirected affiliation networks were generated from a second network generation process. This time a 2 - mode network was constructed by linking each gang associated with a specific MDTO to the state wherein they are known to operate. Repeating this process for each cartel resulted in six gang-to-state affiliation networks. Each gang-to-state affiliation network was then projected into a one-mode network in the same fashion as previously discussed with the cartel-to-alliances network. Deriving a 1-mode network revealed state-level interconnectivity. This means that a tie exists between a pair of states when law enforcement reported that the same gang groups are present in each state. Stronger ties were interpreted to reflect more co-occurrence of gangs located in both states that are affiliated with an MDTO.

The generation of unique cartel networks allowed for the comparison of the relative geographic reach of each MDTO through their affiliations with U.S. gangs. One cartel may have more of an influence on certain states or a particular region of the country than another cartel simply based on the gang affiliations of that cartel. For example, if MS-13 is known to affiliate with Los Zetas, and the MS-13 gang is found in all 50 states, then Los Zetas may have

more of a geographic reach on the drug trade in comparison to another cartel that is associated with gangs in a few states.

Structural Statistics

Measures of Individual Position

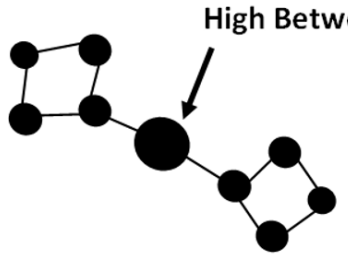
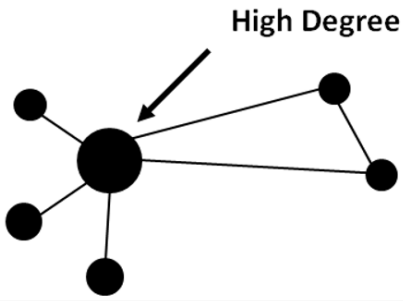
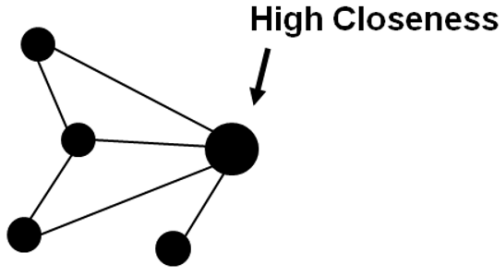
Betweenness Centrality. Betweenness centrality captures the relative influence or control an actor may have on the flow of information or materials through the network. Betweenness is calculated on binary networks: ties exist or not, there is no value assessed on the connection. Betweenness centrality extends the notion of utilizing a node's centrality to determine importance, strength, and influence. Instead of merely knowing which actors are important as determined by the number of direct contacts it has, knowing a node or actor's betweenness may indicate a node's importance due to the position it has within the network. Being aware of the indirect connections actors have with others may be just as important as the direct contacts it has (Morselli, 2010).

This measure is based on the shortest paths or geodesics that exist from that node to all others (Freeman, 1978). It is a relative, standardized assessment of the number of times an actor lies along the shortest path between any other set of actors (see Table 4). A node/actor will have a high betweenness score due to its position connecting most pairs of other nodes/actors with the shortest distances or geodesics. Because a node with a high score must be used to convey materials or information throughout the network more than others, nodes

are positioned to take on the role of "gatekeeper" and thus have the ability to control the flow of goods, gossip, money, or in this case, illicit drugs (Faust, 1997).

Degree Centrality. Degree Centrality is often interpreted as an indication of the relative popularity or influence of each actor in the network. As the most straightforward measure of centrality, degree centrality is simply defined as a count of the direct ties or contacts that a particular node has in the network (Freeman, 1978). Values are normalized to compare across networks of different sizes (see Table 4). The node with the highest count of ties would be said to have the highest degree centrality, which is often used as a measure to determine importance within a network. The relative difference between node scores can be illustrated by varying how symbols are depicted in a sociogram as can be seen in Table 4. As an example, when applied to the undirected cartel network, the cartel that had the most U.S. based gang ties has the potential to have the greatest degree of influence over others in the network (Wasserman & Faust, 1994).

Table 4. Measures of Centrality

Betweenness Centrality $C_B(n_i) = \sum_{j<k} \frac{g_{jk}(n_i)}{g_{jk}}$ Where g_{jk} = the number of geodesics (paths) connecting jk, and $g_{jk}(n_i)$ = the number that actor i is on. Normalized equation : $C'_B(n_i) = \frac{C_B(n_i)}{[(g-1)(g-2)/2]}$	
Degree Centrality $C'_D(n_i) = \frac{d(n_i)}{g-1}$ g = the number of nodes in the graph/sociogram d (degree) = the number of ties adjacent to n_i	
Closeness Centrality $C'_C(n_i) = \frac{\text{g-1}}{\left[\sum_{j=1}^{g} d(n_i, n_j)\right]}$ $C'_C(n_i)$ = Closeness is based on the length of the average shortest path between a vertex and all vertices in the graph.	

Closeness Centrality. Closeness centrality, also calculated using a binary network, was used to estimate the reachability of the cartels into the U.S. illicit drug trade. Similar to betweenness, this centrality statistic is distance based and provides the inverse of the distance of each actor to every other actor in the network. Given that closeness is an inverse measure of centrality, high

closeness centrality is indicated by lower scores. An actor having high closeness centrality (low score) would likely be able to reach the other actors in the network in just one step. When normalized, the scores range between 0 and 1, and can be viewed as the inverse of the average distance between actor i and all the other actors. Reachability or unity is achieved when the actor is adjacent to all other actors; that is, when the actor is maximally close to all other actors, and has a score of 1. For this statistic to be utilized the network being analyzed must be connected, which means the network does not have any isolates (Wasserman & Faust, 1994).

Network-Level Measures

To understand the structure of the networks as a whole, the following group level statistics were calculated.

Density. The total number of connections is divided by the total number of possible connections. Indicates the overall connectivity and social cohesion in a network.

Average Path Length. Average path length is defined as the average number of steps required to reach any of the other nodes in the network.

Centralization. Measures of centralization (degree, betweenness, closeness) capture the extent the network to which is structured around a single node. For example, degree centralization measures the extent to which the network is centered around a single node in terms of degree.

Measures of Similarity

Two statistics were used to examine the similarity of the ties present in the six state based cartel networks. The first, Pearson's correlation coefficient, measured the direction and strength of relationship between pairs of networks. Then, to determine the degree of similarity and level of significance between pairs of networks the Jaccard coefficient was examined. The Pearson's correlation coefficient is used to measure if a positive relationship exists between pairs of networks, while Jaccard coefficient measured the extent to which the cartel networks were similar based on the ties between the cartel pairs. These two measures were used to compare the structures of the state based cartel networks. All analysis and structural statistics were generated with UCInet 6.[4]

Interconnectivity of the unvalued cartel network was also examined through the number of direct ties or degree centrality that each of the Mexican-based DTOs potentially have with the other MDTOs, the Sinaloa Cartel and Los Zetas have the highest degree centrality or a score of 5.00 (Table 7). The observed ties that MDTOs theoretically have with one another are depicted in the sociogram shown in Figure 5. The Sinaloa Cartel and Los Zetas are directly tied to five other MDTOs; Gulf, Juarez and La Familia Michoacana cartels have direct ties to four other MDTOs, the Tijuana Cartel is directly tied to three other MDTOs

[4] Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.

and the Beltran Leyva Organization is directly connected to only one of the other MDTOs.

Analytic Approach

Answering research question one and two required the use of centrality statistics, and sociograms were produced to visualize the structural differences of the various MDTO networks in order to determine their interconnectedness. The size of the nodes varies to illustrate degree centrality scores and the width of ties reflects the number of shared gangs between each pair of cartels, or the number of shared cartels between each pair of gangs, depending on which of the derived networks is being examined.

To answer research question three, which compares different network, normed scores of betweenness and closeness centrality were used to examine the geographic differences in the state-level connectivity that would possibly play a role in trafficking and transporting of illicit drugs. It is expected that states that have high betweenness will also have more identified drug routes/corridors going through them. Having more drug routes will likely contribute to the influence a cartel, as illicit drugs will be more accessible to those gangs that are associated in such states. High (low) closeness centrality identifies nodes (states) that have short path distances between the other nodes and is utilized as a measure of flow, as well as reachability. Notably, this measure is only accurate if whatever is flowing through the network is accomplished by traveling along the shortest paths (Borgatti, 2005). Degree centrality was used to further gauge the influence of the

MDTOs based on the interconnectivity amongst the U.S. based gangs and states. Degree centrality revealed which states and gangs potentially had the most ties. Sociograms representing the results of the data analysis were produced as well, as they added to the analysis by providing a clearer visual representation of the structural differences of the state/gang networks.

Coefficients of Similarity Comparison

Jaccard correlation coefficient and Pearson's correlation coefficient statistics were used to examine the structure of the MDTO network by examining the co-occurrence of ties within the subnetworks. The Jaccard correlation coefficient was used to compare the similarities between the cartel subnetworks. Pearson's correlation coefficient was then used to see if the similarities observed were significant or if they occurred by random.

CHAPTER FOUR

RESULTS

Mexican Drug Trafficking Organization Networks

As the goal of the research was to better understand the relationship of the MDTO networks and U.S. gangs and the resulting influence of the MDTOs on the illicit drug market in the United States, it was important to examine a range of structural elements of the MDTO networks that are often associated with influence and power. The focus of the first and second research questions was the whole MDTO/U.S. gang network, while the focus of the third question involved a more in-depth analysis of state-to-state linkage associated with each cartel.

Research Question One

Various network measures, as well as sociograms were used to assess the potential interconnectivity or cohesion of the MDTOs as revealed from their ties with US based gang alliances. The higher the number of gangs that are shared between any given pair of MDTOs, the thicker the tie line will be. Illustrated in Figure 3, the cartels Sinaloa and Tijuana are more likely to be connected due to their common affiliations with U.S. gangs, as indicated by the width of the line connecting them.

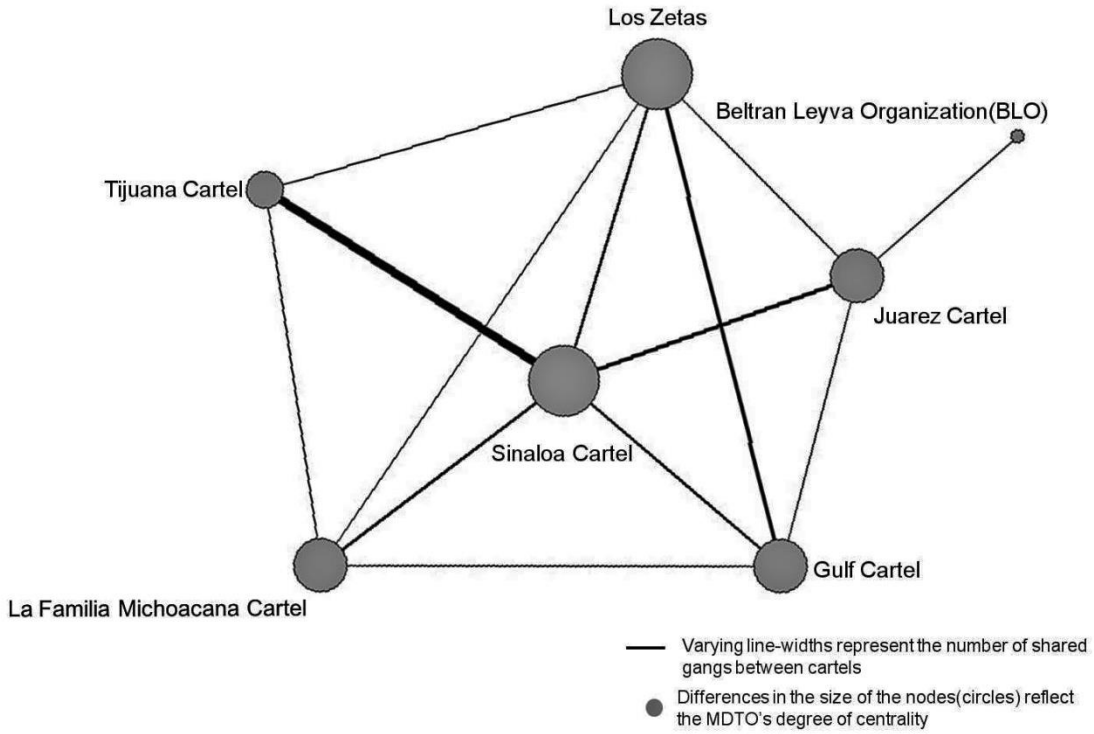


Figure 3. Interconnectivity Among Mexican Drug Trafficking Organizations

The tie that connects the Sinaloa and Tijuana cartels is two times stronger than any other tie in the valued one-mode MDTO network as seen by the thick line connecting the two nodes (see Figure 3). This line represents ten gangs that are connected to both the Sinaloa and Tijuana Cartel (see Table 6). Additionally, as reported in Table 5, the Sinaloa Cartel also has the highest degree centrality score (25.00) or most direct ties to a variety of gangs. The Tijuana Cartel and Los Zetas rank 2nd with the second highest degree centrality score of 13.00. The normed degree values are provided to aid future research seeking to

replicate or conduct a cross-network comparison. Normed degree adjusts for sample size. Larger networks inherently have the potential for larger degree centrality scores. By accounting for this tendency, networks can be compared of different sizes.

Table 5. Cartel-to-Cartel Network Degree Centrality Scores (valued)

Cartels	Degree	Normed Degree
Sinaloa	25.00	0.301
Los Zetas	13.00	0.157
Tijuana	13.00	0.157
Gulf	12.00	0.145
Juarez	09.00	0.108
La Familia Michoacana	07.00	0.084
Beltran Leyva	01.00	0.012

Table 6. Gangs Shared Between the Sinaloa and Tijuana Cartels

Gangs	Gang Type
18th Street Florencia 13 Norteños Bloods Sureños	Street
Border Brothers (CA) New Mexican Mafia Old Mexican Mafia Mexican Mafia	Prison
Hells Angels	Outlaw Motorcycle

Interconnectivity of the unvalued cartel network was also examined through the number of direct ties or degree centrality that each of the Mexican-based DTOs potentially have with the other MDTOs, the Sinaloa Cartel and Los Zetas have the highest degree centrality or a score of 5.00 (Table 7). The observed ties that MDTOs theoretically have with one another are depicted in the sociogram shown in Figure 5. The Sinaloa Cartel and Los Zetas are directly tied to five other MDTOs; Gulf, Juarez and La Familia Michoacana cartels have direct ties to four other MDTOs, the Tijuana Cartel is directly tied to three other MDTOs and the Beltran Leyva Organization is directly connected to only one of the other MDTOs.

Table 7. Cartel-to-Cartel Network Degree Centrality Scores (unvalued)

Cartels	Degree
Sinaloa	5.00
Los Zetas	5.00
Gulf	4.00
Juarez	4.00
La Familia Michoacana	4.00
Tijuana	3.00
Beltran Leyva	1.00

Note: unvalued means that the ties were not weighted

Gangs and Mexican Drug Trafficking Organization Links

Research Question Two

The derived actor-to-actor network of U.S. based gangs is shown in Figure 4. Hermanos de Pistoleros Latinos (HPL), Latin Kings, Mexican Mafia, and MS-13 are shown to have a higher degree of interlock than the other gangs resulting from their ties with the various cartels. Another group, Barrio Azteca is peripheral to the network.

The larger image in Figure 4 is a representation of the three-slice network. When graphs become visually impermeable, ties of lower values are removed to reveal the more strongly connected core of the network. This method of identifying subgroups is referred to as an m-slice, where the m denotes the minimal strength of the ties remaining in the graph. A three-slice network indicates that to be included in this image gang pairs must have four or more

affiliations in common. As a result of interlocking, these highly connected gangs are suggested to be network hubs. As hubs, these gangs are able to directly share information with others in the network, giving them more power and influence.

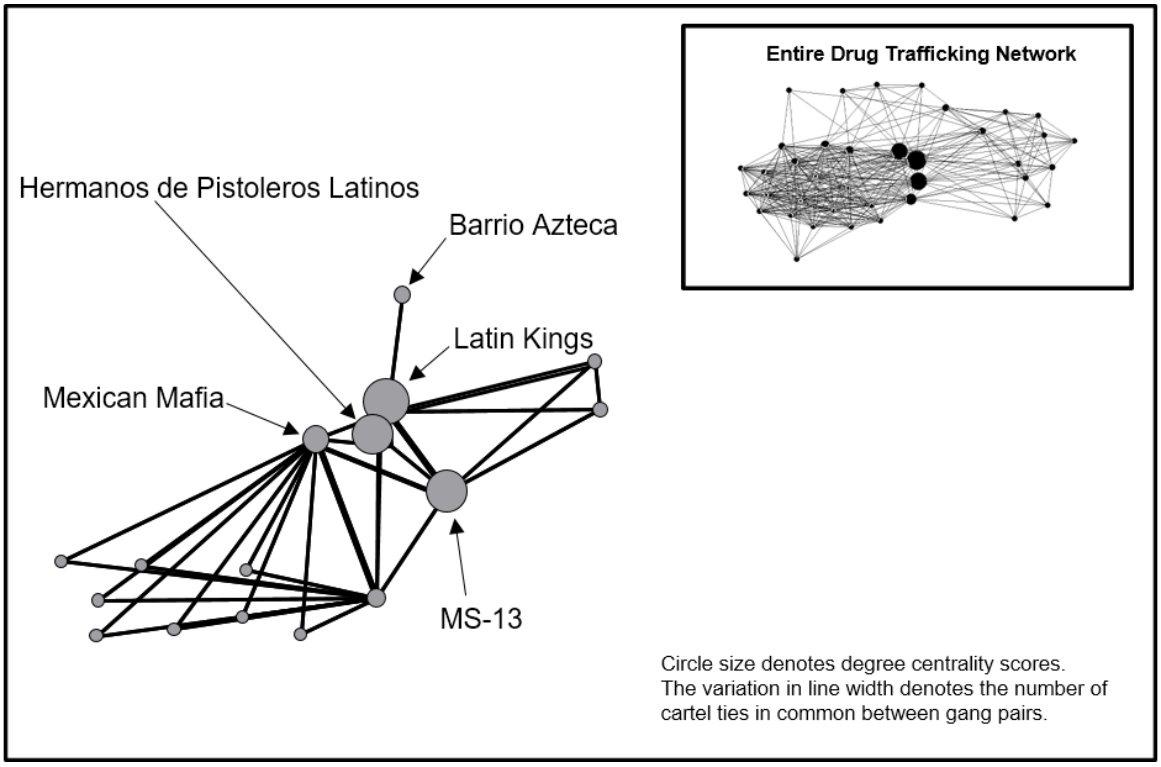


Figure 4. Gang Interlock Illustrated With a Three-Slice Network.

Each of these gangs has different characteristics, and thus, resources to contribute partnerships with MDTOs and the drug trade more generally.

- Hermanos Pistoleros Latinos — A prison/street gang which primarily operates in southern Texas. Reported to work with Los Zetas, Gulf and Juarez cartels.
- Latin Kings — A Puerto Rican street gang, known for being highly organized and violent. Reported to work collaboratively with Barrio Azteca, Mexican Mafia, Texas Syndicate, as well as Los Zetas, Gulf Cartel, Sinaloa Cartel, La Familia Michoacana.
- Mexican Mafia — A powerful prison/street gang known to operate in Canada and Mexico. Reported to have links to multiple Mexican TCOs, including Los Zetas, La Familia Michoacana, Gulf Cartel, Sinaloa Cartel, and the Tijuana Cartel.
- MS-13 — Known to be one of the fastest growing violent street gangs operating in multiple international locations. Reported to have ties to Los Zetas, Gulf Cartel, Sinaloa Cartel, La Familia Michoacana.
- Barrio Azteca — A large and violent prison gang, reported to have well-established ties to the Juarez Cartel. Also, known to have a substantial presence in Mexico as well.

Geographic Reach

Research Question Three

To understand the geographical reach of MTDO related drug trafficking in the United States, six undirected affiliation networks were generated by linking

each gang associated with a specific MDTO to the state wherein they are known to operate. Repeating this process for each cartel resulted in six gang-to-state affiliation networks. Each gang-to-state affiliation network was then projected into a 1-mode network in the same fashion as previously discussed with the cartel-to-alliances network. Deriving a 1-mode network revealed potential state-level interconnectivity. This means that a tie exists between a pair of states when law enforcement reported that the same gang groups are present in each state. Stronger ties were interpreted to reflect more co-occurrence of gangs located in both states that are affiliated with the MDTO being examined.

Results indicate that the Sinaloa Cartel has the broadest reach into the U.S illicit drug market. This network of gangs has ties that link the Sinaloa Cartel to 50 (out of 51) states/territories, (Puerto Rico included/Vermont excluded); 23 (46%) of the 50 states/territories can reach every other state one step.

Geographic differences were also observed between the MDTOs. This may suggest that cartels use different entry points and geographic overlap is not complete. While geographic overlap is not complete, there are states that have links to more than one cartel. Recall the links connecting the states to one another are actually created by gang ties. These ties may suggest such states to be key or more important to the structure of the complete MDTO network and indicate the role a particular state and the gang ties connected to it, may play in the illicit drug market based on their centrality.

States with high degree, betweenness, and closeness scores, as well as states that ranked high in more than one centrality measure were identified as key states. The geographic location of key states may be a contributing factor to the increased reach or influence of the various MDTOs as determined by various centrality measures.

Network Structure

As reported in Table 8, there is little divergence in the number of states and average path length found in each network, despite the fact that there is variability in the number of links between states. High linkage means that at the state-to-state level, some cartels are associated with American gangs that are found in different states.

Table 8. Descriptive Statistics for State-to-State Cartel Subnetworks

	Gulf	Juarez	La Familia Michoacana	Los Zetas	Sinaloa	Tijuana
No. of states (nodes)	48	49	45	33	**50**	48
No. of ties	2040	2024	1740	944	**2332**	1926
Density	90.0%	86.0%	88.0%	89.0%	**95.0%**	85.0%
Average Path Length	1.1	1.1	1.1	1.1	**1.0**	1.1
Degree Centralization	22.45%	14.54%	24.03%	13.34%	12.94%	12.00%
Betweenness Centralization	0.35%	0.76%	0.50%	0.55%	0.01%	0.13%
Closeness Centralization	15.69%	22.13%	19.46%	16.27%	8.55%	23.10%

While the values for the networks shown in Table 8 indicate that all MDTO networks are rather dense and highly connected, the Sinaloa network has the

highest density score. For instance, the Sinaloa network has a density of 95%, meaning that 95% of all possible state-to-state links are present. Stated another way, it would be conceivable that Sinaloan drugs could reach almost every state: they have a greater coverage in the network as more states are connected to each other. On the other hand, the Tijuana Cartel has a score of 85%, suggesting that while most states are included in the network (48 states), the interconnectivity among states is not as extensive compared to Sinaloa, and disruption of supply with the removal of key hubs might be more feasible.

Notably, degree centralization is relatively high for the Gulf and La Familia Michoacana DTOs. In both, more than 20% of the states are directly connected to one primary state (the state with the highest degree centrality score). For both DTOs that state is California. This is telling, as this concentrated influence suggests that California may be a key conduit to the drug trafficking infrastructure at the state-to-state level. Closeness centralization shows similar results in that for the Juarez, Tijuana and La Familia Michoacana DTOs, one state is highly central; Arizona. Generally, this may indicate that this is a critical transshipment port for their drug trafficking activity. Betweenness centralization is low.

The graphs presented in Table 9, illustrate the high density found in these projected networks. Given the mathematical process of projecting two mode networks, this level of density is not surprising. It is more telling, that there are a few states with limited or low number of connections are the peripheral nodes

that are situated or appear to be pulled away from the main network, for example, Idaho in the Gulf network.

Table 9. Comparison of Networks by Geography

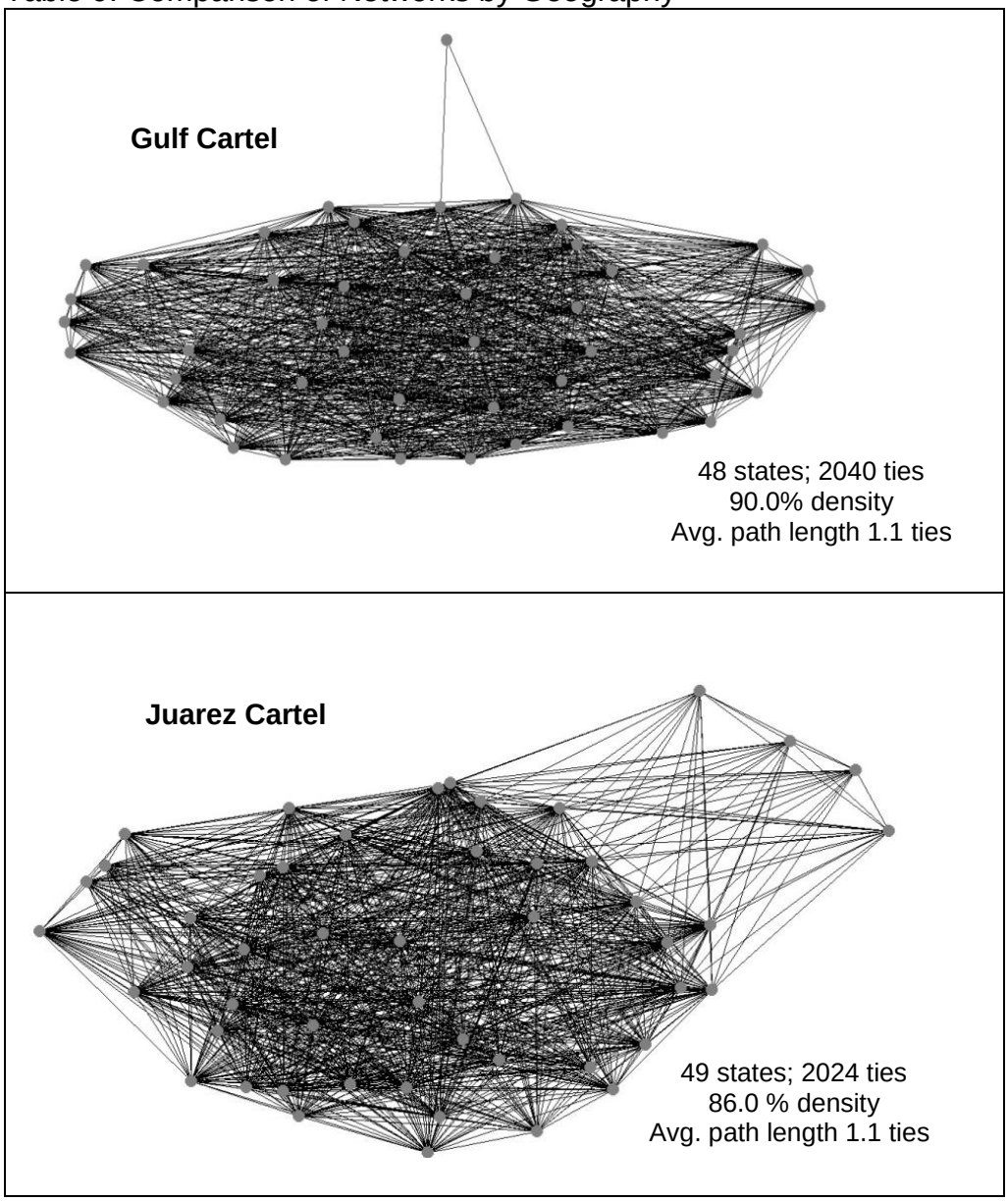
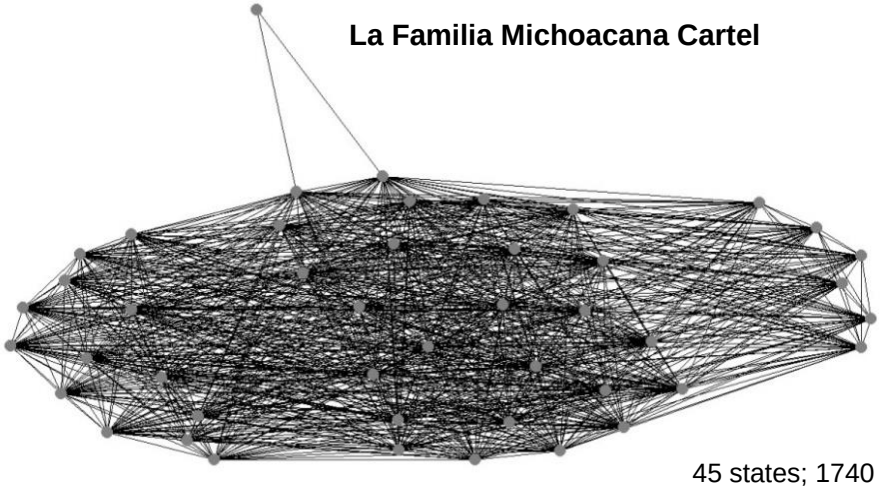


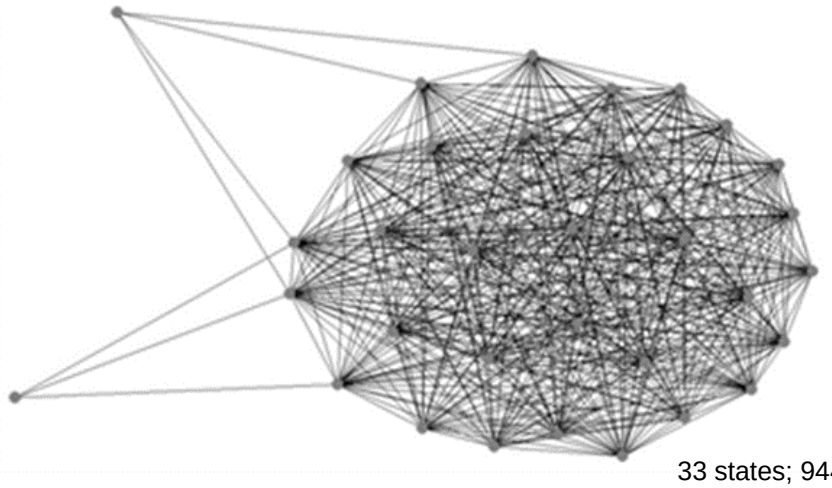
Table 9. Continued

La Familia Michoacana Cartel



45 states; 1740 ties
88.0 % density
Avg. path length 1.1 ties

Los Zetas



33 states; 944 ties
89.0% density
Avg. path length 1.1 ties

Table 9. Continued

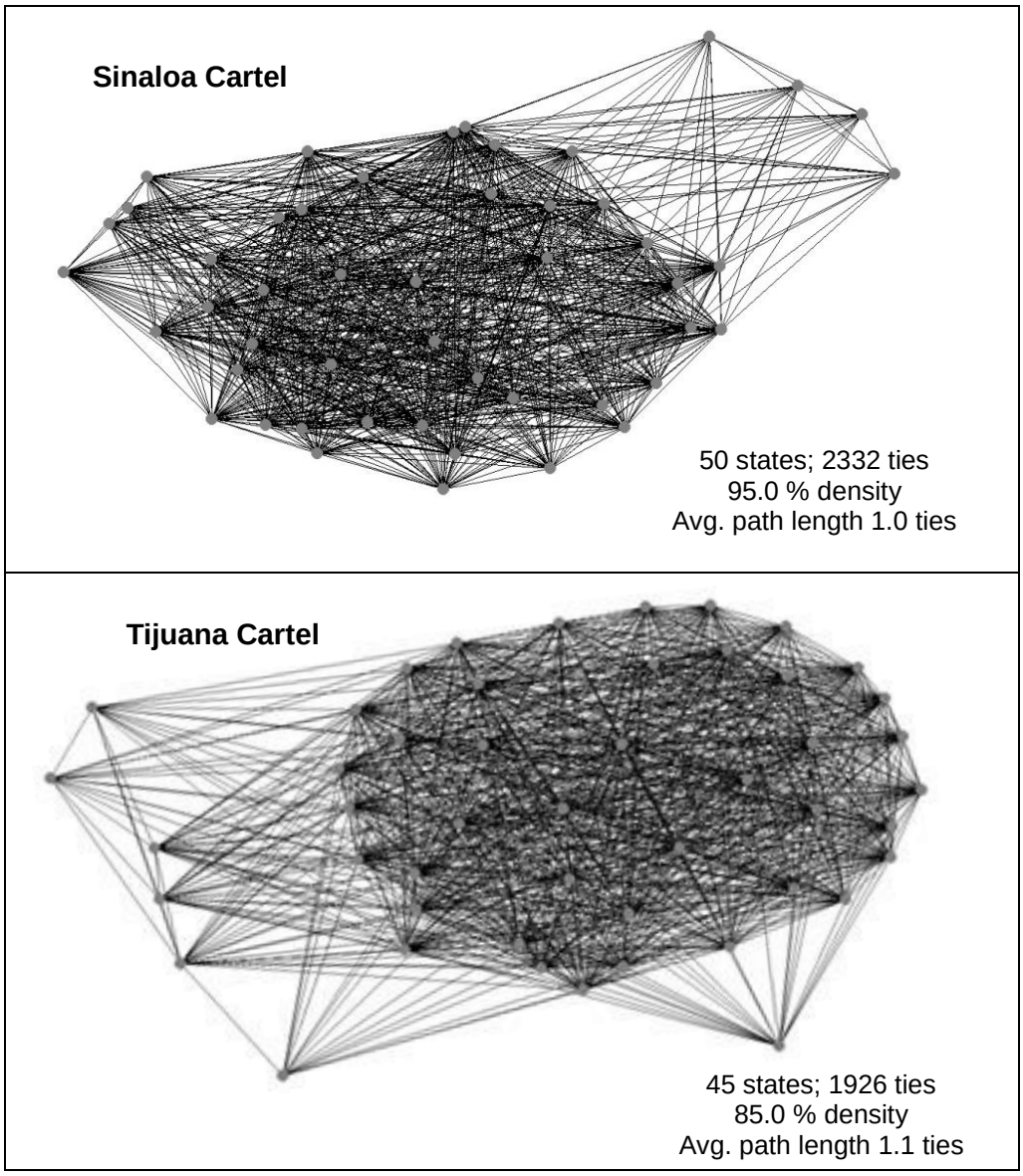


Table 10 provides a window into these dense networks. Selecting up to six states with the highest level of centrality (recall the prior discussion of centralization), we see that for each cartel, a few states are critical to the

network. Moreover, the similarity is interesting: California, Missouri and Virginia are important for all Mexican DTOs. Below, Mexican DTOs are profiled to illustrate how to interpret these findings.

Table 10. Comparison of Key States Associated With Cartel Subnetworks.

	States	Region	nDegree[a]	nBetweenness[b]	nCloseness[b]
GULF	**California**	Pacific/Southwest	**22.92 (1)**	0.08 (3)	92.16 (3)
	Missouri	West Central	3.72 (2)	**2.27 (1)**	**100.00 (1)**
	Washington	Pacific	3.28 (3)	0.19 (2)	97.92 (2)
	Florida	Florida/Caribbean	2.51 (4)	0.19 (2)	97.92 (2)
	Texas	Southwest	2.46 (5)	0.19 (2)	97.92 (2)
	Virginia	Mid-Atlantic	1.59 (9)	**2.27 (1)**	**100.00 (1)**
JUAREZ					
	Missouri	West Central	**10.43 (1)**	0.10(3)	92.31 (2)
	Florida	Florida/Caribbean	4.92 (2)	0.10(3)	92.31 (2)
	California	Pacific/Southwest	2.92 (3)	0.00	85.71 (3)
	North Carolina	Southeast	2.57 (4)	0.10(3)	92.31 (2)
	Arizona	Southwest	1.78 (5)	0.00	85.71 (3)
	Alabama	Southeast	0.59 (12)	**1.04(1)**	**100.00 (1)**
LA FAMILIA MICHOACANA					
	California	Pacific/Southwest	**26.34 (1)**	0.33 (2)	97.78 (2)
	Missouri	West Central	3.83 (2)	**2.55 (1)**	**100.00 (1)**
	Washington	Pacific	3.31 (3)	0.33 (2)	97.78 (2)
	Texas	Southwest	2.78 (4)	0.33 (2)	97.78 (2)
	Nebraska	West Central	2.78 (5)	0.33 (2)	97.78 (2)
LOS ZETAS					
	Virginia	Mid-Atlantic	**26.79 (1)**	0.00	94.11 (3)
	Texas	Southwest	21.43 (2)	**3.34 (1)**	**100.00 (1)**
	Pennsylvania	Northeast	20.98 (3)	**3.34 (1)**	**100.00 (1)**
	New York	Northeast	16.52 (4)	1.88 (2)	96.97 (2)
	Florida	Florida/Caribbean	16.52 (5)	1.36 (2)	96.97 (2)
SINALOA					
	Missouri	West Central	**14.24 (1)**	**0.15 (1)**	**100.00 (1)**
	California	Pacific/Southwest	12.79 (2)	0.08 (5)	96.08 (3)
	Florida	Florida/Caribbean	6.66 (3)	**0.15 (1)**	**100.00 (1)**
	North Carolina	Southeast	6.62 (4)	**0.15 (1)**	**100.00 (1)**
	Virginia	Mid-Atlantic	3.65 (5)	**0.15 (1)**	**100.00 (1)**
TIJUANA					
	Missouri	West Central	**12.68 (1)**	.78 (2)	97.92 (2)
	North Carolina	Southeast	6.42 (2)	.49 (5)	95.92 (3)
	Florida	Florida/Caribbean	5.31 (3)	.78 (2)	97.92 (2)
	South Carolina	Southeast	3.08 (4)	.23 (7)	92.16 (5)
	Arizona	Southwest	3.07 (5)	**.91 (1)**	**100.00 (1)**

a. Degree was calculated using a valued network.
b. The valued network was dichotomized before the calculation of betweenness or closeness.

Gulf Network. California had the highest degree centrality score (22.92). This indicates California to be in a position of influence as a network hub, associated with sending and receiving drugs. Missouri, identified as another important state to the MDTOs, had the 2nd highest degree centrality score (3.72), but was tied with Virginia for having the highest betweenness (2.27) and closeness (100.00) scores, interpreted as playing the roles as gatekeeper and flow controller.

Juarez Network. Missouri was ranked 1st in degree centrality (10.43), while Alabama was ranked both 1st in betweenness (1.04) and closeness (100.00). As Alabama, had the highest scores in two measures, this state was considered to be more central.

La Familia Michoacana Network. California once again had the highest degree centrality score (26.34), with Missouri ranking 1st in betweenness (2.55) and closeness (100.00).

Los Zetas Network. Virginia for the first time ranked 1st in degree centrality (26.79) for this network, while Texas and Pennsylvania tied for the top spot in regards to both betweenness (3.34) and closeness centrality (100.00).

Sinaloa Network. Missouri had the highest scores in all three centrality measures in this network; degree (14.24), betweenness (.15), and closeness (100.00). Other important states indicated as having high importance were Florida, North Carolina, and Virginia — all tied with Missouri for the highest betweenness and closeness scores. It would be expected that the gangs found

in these states would have a high degree of influence within the illicit drug market.

Tijuana Network. For the third time, Missouri had the highest in degree centrality score (12.68) in the network. In addition, Arizona ranked 1st for betweenness (.91) and closeness (100.00) centrality.

Table 11 describes the similarity of ties within the cartel networks. Overall, the Jaccard coefficient shows the cartel subnetworks to have a high percentage of gang ties in common. Recall that the Jaccard coefficient measures the amount of similarity between two networks in the actual paths or links that exist. It is calculated on binary networks, so either a relation exists between two networks or it does not. As this study examines state-to-state connections, a high score such as the significant Jaccard of .829 between Sinaloa and Gulf Cartel networks, is evidence that the pattern of inter-state connections is about 82.9% the same. If a tie exists between California and Oregon for Sinaloa, then a tie would likely exist between these two states in the Gulf network. A high Jaccard in this research context might indicate that if Sinaloa was unable to supply drugs to the network, the Gulf Cartel's potential inter-state distribution network could absorb Sinaloan business without having to extend much. Significant results suggest that this level of similarity did not occur by chance. Of note, the Los Zetas potential drug distribution reach into the US drug market is much different than Juarez (39% the same), Sinaloa (39.8% the

same), and Tijuana (49% the same). These results suggest that Los Zetas has a materially different drug market involvement.

Table 11. Correlations Between Pairs of Cartel Subnetworks

Jaccard Coefficients	Pearson Correlation Coefficients						
		Gulf	Juarez	LFM	Los Zetas	Sinaloa	Tijuana
	Gulf	--	**.404****	**.585****	**.383****	**.408****	**.655****
	Juarez	.784**	--	**.406****	**.166**	**.322****	**.346****
	LFM	.791**	.720**	--	**.516****	**.382****	**.615****
	Los Zetas	.463**	.390	.539**	--	**.612****	**.436****
	Sinaloa	.829**	.644**	.730**	.398**	--	**.374****
	Tijuana	.855**	.742**	.799**	.490**	.788**	--

Note: Pearson correlation coefficients appear in bold (the upper triangle) and Jaccard coefficients are in the bottom portion; ** p<.01(statistics generated with UCInet)

A Pearson correlation was run to determine the relationship between pairs of states in each subnetwork. Recall that Pearson correlations indicate similarity between pairs in nodes in terms of the value of the tie when those values are measured at the interval level. High correlations would indicate that pairs of states have similar levels of connectivity (number of shared gangs) when two networks are compared. There was a strong, positive correlation between almost all of the subnetworks. The strongest is between Tijuana and the Gulf and La Familia Michoacana networks. For one network pair, no correlation at all; Juarez and Los Zetas.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

Discussion

A common statement heard within law enforcement circles is the influence of Mexican cartels spread across the United States is a result of MDTO association with street gangs (Bunker & Sullivan, 1998; Etter, 2011; National Gang Intelligence Center, 2013). To test this supposition, this study used projected affiliation networks to examine the interconnectivity of the cartels (based on ties of U.S. gangs), the interlocking or overlaps of U.S. based gangs and Mexican drug trafficking organizations and the reach of the MDTOs in the illicit drug market based on geography. More specifically, the interconnectedness of the cartel network and the interconnectivity of the U.S. gang/Mexican drug trafficking organizations were based on the ties or links of the U.S. gangs to the Mexican drug cartels and the reach or degree of influence that the MDTOs have in the illicit drug market was based on the mix of cartel affiliated gangs present in each state. This chapter discusses the results of this research, as well as the implications, limitations and suggestions for future research.

Research Question One

How interconnected are MDTOs with each other through their ties to U.S. based gang alliances?

Results suggested that overall a high level of interconnectedness exists amongst the entire MTDO network, even though the degree of interconnectedness among cartel pairs varied. For example, the cartels, Sinaloa and Tijuana are strongly linked and interconnected as a result of their affiliations with U.S. based gangs. Additionally, the Sinaloa Cartel is linked to 15 other gangs, while the Tijuana Cartel is the only MDTO to have ties to the Vagos, an outlaw motorcycle gang, not directly connected to the Sinaloa Cartel. The group of gangs that are linked to both cartels contains all three gang types, although the majority are identified as some of the most active and violent Latino street gangs, including Florencia 13 and 18th Street. Consequently, when two cartels share gangs, as seen with the Sinaloa and Tijuana , it is suggested the shared gangs are more likely to associate with each other than not because of their co-affiliations with the same cartels (Breiger, 1974). These associations may be indicative of both alliances and rivalries as this type of relation. Between-group brokers, according to Burt (2004) allow for the flow of new ideas within the network. The Gulf Cartel and Los Zetas are the second most interconnected DTOs determined by the number of gangs shared which is five. Overall, the Sinaloa Cartel is connected to the most gangs, and because of these affiliations it is indirectly connected to the other six MDTOs and stands to have the greatest degree of power and influence.

Implications. As previously discussed, past state/federal threat assessments have suggested that it is increasingly common for U.S. based

gangs to form relationships and collaborate with MDTOs and other gangs for financial gain and increased influence; especially in terms of the illicit drug market (Federal Bureau of Investigations, 2005; National Gang Intelligence Center, 2015). Since this is a significant change from the traditional turf-oriented gangs of past decades, the use of strategic intelligence analysis may be more useful method by law enforcement in combating the sophisticated criminal organizations (Sparrow, 1991a).

Due to the complexity of the situation, research to combat the increased MDTO driven gang expansion, a multifaceted and collaborative approach is necessary and crucial to be effective (Texas Department of Public Safety, 2014; Sparrow, 1991b). A collaborative approach should continue to be applied not only in efforts between states and local law enforcement jurisdictions within the United States, but also with Mexico (Astorga & Shirk, 2010; Finckenauer et al., 2000). Reported by the President of the United States (Office of the President of the United States, 2011), in 2010, the DEA found success with a multi-agency effort by law enforcement investigators with a project targeted to takedown Mexican drug trafficking networks in the United States. The present study provides support for the continuance of multijurisdictional collaboration and cooperation in general, as the findings suggest the existence of a complicated web of gang networks found throughout the U.S.

Research Question Two

Which U.S. gangs interlock MDTOs?

Findings of this study indicate four predominantly national-level Latino/Hispanic gangs to have a high degree of interlock with the various MDTOs resulting from their ties to MDTOs as measured by the two statistics that are commonly used to show overlaps between networks; betweenness and degree centrality (Bichler, Schoepfer, & Bush, 2014). Developing from the high degree of interlock, two prison gangs; Hermanos de Pistoleros Latinos, and Mexican Mafia and two street gangs: Latin Kings and MS-13 are more likely to be key components to the U.S. illicit drug market as they have formed partnerships with multiple MDTOs as seen by the degree of interlock. All four gangs scored high in both measures. High degree centrality indicates a high number of direct connections in the network, while high betweenness suggests that these gangs are important due to their position in the network. As such, due to the high centrality scores, they are regarded as central and influential figures in the network.

In the 2010 National Drug Threat Assessment (National Drug Intelligence Center, 2010), two prison gangs, Hermanos de Pistoleros Latinos (HPL) and Raza Unida which operate in Southwest Border states have increased their involvement in wholesale drug distribution activities through cooperative relationships with Mexican DTOs. Through cooperative relationships, Hispanic prison gangs are able to gain access to wholesale quantities of drugs. The

National Drug Intelligence Center 2011 reported that and California Office of Attorney General (Harris, 2014). It is not surprising that these are the gangs that are most linked to the MDTOs, as this finding reinforces what is already known about the associations between Mexican drug cartels and U.S. gangs, specifically the Hispanic U.S. gangs that operate along the United States and Mexico border. The 2006 National Drug Threat Assessment reported that street and prison gangs had established relationships with Mexican cartels in order to facilitate drug trafficking within the United States. In particular, MS-13 and the Latin Kings are two gangs that played a significant role due to their prolific numbers in various parts of the country (National Drug Intelligence Center, 2006). MS-13, a Salvadorian street gang that originated in Los Angeles, California is currently found in 32 states. The Latin Kings, a Puerto Rican street gang that originated in Chicago, is found in 38 states.

In addition to the vast amount of violence and mayhem caused by the two street gangs discussed above, the extensive amount of criminal wrong doings precipitated by the Mexican Mafia and Hermanos de Pistoleros (HPL), two prison gangs, is just as significant. Actors that have high degrees of interlock tend to have more influence and power due to their connectedness with other actors.

This finding is consistent with previous research (Malm & Bichler, 2011). suggesting that when possible, cartels and gangs will collaborate with groups that are of the same ethnicity or be of the same type due to the homophily principle (McPherson et al., 2001). However, in recent years out of opportunity,

for monetary profit, as well as to engage in other criminal activities, gangs and gang members have been forming partnerships with other gang groups that are out of their normal social circle (National Gang Intelligence Center, 2011).

Implications. In regards to the method of SNA which was used in this study to examine gang expansion. While social network analysis is not the typical method of analysis used for studying gangs, this nontraditional technique has been found to be useful in various processes of crime fighting, such as problem analysis and policy intervention (McGloin, 2005; Sparrow, 1991b; Xu & Chen, 2005). The current study provided support for social network approaches to be incorporated into the construction of future threat assessments for the law enforcement and intelligence communities.

Research Question Three

Which of the six MDTOs has the broadest reach into the U.S. illicit drug market as a result of the connections the MDTO has with U.S. based gangs?

Finding of this study suggest the Sinaloa Cartel to have a great deal of influence in the U.S. illicit drug market. Sinaloa Cartel affiliated gangs have ties to 50 of the 51 states included in this study. Additionally, 46% (23) of those states can reach all of the other states within one step.

While the findings regarding the other cartel subnetworks do not indicate the same degree of reach as the Sinaloa Cartel, the reach they do have, should not be discounted. For example, although the reach of the Juarez network is suggested to be smaller in comparison, the eight states that are able to reach all

of the other states are noteworthy. The Juarez network, 16% or eight of the 49 states had the ability to reach all other network states within one step. The next network, Tijuana, contained four (8%) states that were within one step of each other. The subnetwork with the next smallest percentage of states that were able to reach all other states was the Los Zetas network, of the 33 states that made up this network, two were able to reach all of the other states within one step. Another subnetwork with a smaller number of states, the La Familia Michoacana, of the 45 states, two (4.5%) could reach all the other states in the network. The Gulf subnetwork, a network made up of 48 states had the overall smallest percentage of states (4% or 2) that were able to reach the rest of the network's states.

The extensive network of gangs with ties to the Sinaloa Cartel has the ability to reach 23 of the 50 states within one step gives the Sinaloa Cartel to have the most influence on the illicit drug market. This enhanced accessibility enables the Sinaloa Cartel to influence the illicit drug market to a greater degree, and cause harm to a greater degree as well.

It would appear the enhanced position that is held by the Sinaloa Cartel is not only from the sheer number of ties that they have with U.S. gangs, but also due to the geographic spread resulting from the ties with U.S. gangs. The 2013 National Gang Report suggests that collaboration with drug trafficking organizations has helped gangs expand their reach throughout the United States

as well, which in turn increases their profits (National Gang Intelligence Center, 2013).

Implications. As the Sinaloa Cartel's reach is broad, the "damage" that can be done is likely to be widespread as well and creates a need for enhanced inter-agency collaboration. In particular, fusion centers should focus their resources on the following gangs, Hermanos de Pistoleros Latinos, Latin Kings, Mexican Mafia, and MS-13, and the states of Missouri, California, Florida, North Carolina, and Virginia. As they are suspected of being connected to the Sinaloa Cartel. Fusion Centers are hubs for collaboration between two or more agencies. The intent of fusion centers is to support the efforts of law enforcement and the intelligence community by providing resources, expertise and information.

As the current study presents information relating to network structure and collaborative relations between MDTOs and U.S. based gangs, it may be of potential value to law enforcement in developing useful policies geared towards the disruption and dismantling of drug trafficking networks. In particular, fusion centers should focus their resources on the following gangs, Hermanos de Pistoleros Latinos, Latin Kings, Mexican Mafia, and MS-13, and the states of Missouri, California, Florida, North Carolina, and Virginia. As they are suspected of being connected to the Sinaloa Cartel, represent the hubs of drug activity in the illicit drug market.

Limitations

While the data contained in the 2011 National Gang Threat Assessment is considered to be credible and reliable as it came from multiple sources, including all levels of law enforcement and intelligence agencies and other government entities, it is not without limitations. Limitations to the original data collection protocol used to assemble information upon which to build the threat assessments is most material to the present study in that the NGIC has recognized that it may under report the existence of gangs in each state. While the NGTA and NDTA are known to be reliable products, data collection and reporting procedures should be more standardized in order to produce an assessment with better consistency. For example, the listing of gangs by state included in the NGTA was not consistent as the level of information provided for each state in the appendix varied greatly. Some state lists consisted of only the national or regional affiliation for the gangs, while other states had only the subsets listed. For example, two gangs, the Bloods and Crips were listed as being found in Arkansas—no further subset information denoted. In comparison, for California and other states, a detailed list of individual gang subsets was reported. The lack of consistency in the data made it difficult to assess the gang make-up of the states.

This raises the issue of missing data, and thus, not having a complete "picture" of the network which may generate unreliable network metrics (McGloin & Kirk, 2010; Xu & Chen, 2005). Not only is under-reporting an issue, but some

agencies and areas are completely absent from the data collection. While this may be an issue, the results produced will still be useful. Missing data is a known limitation when studying "dark" or hidden networks (Morselli & Roy, 2008; Xu & Chen, 2008).

In addition, since the data has been aggregated to the group level as discussed by the NGIC in the method section of the NGTA, a small sample of gang members missing will not affect the analysis. Despite the fact that aggregating data may be helpful in an analysis where there is missing data, in this case it is likely to have obscured the regional and local patterns of gangs and gang activity, as the details and information about the many different subsets is lost. A related issue pertains to the challenges of identifying unique groups due to the naming conventions used to by gang subsets. In some cases, gangs may take on the name of national or regional level gang, but even though they share a gang name, they may or may not be affiliated. On the other hand, a gang subset may be aligned or affiliated with a national-level gang, but their affiliation may be hidden as their subset name does not indicate an alliance. This may cause gangs to be misidentified by law enforcement; a common source for much of the crime data and information used in criminal justice research.

Further, due to the lack of consistency in the formatting of past gang threat assessments, the ability to study trends over time has not been possible, as the data provided was not able to be compared. Adopting a standardized method of

data collection, as well as an approach to synthesizing the information may provide more useful intelligence.

Additionally, when generating a threat assessment such as this, it would be useful to have a source document that contained more details as to the patterns of offending within gangs, and between MDTOs and gangs. Further, making raw data that is used in threat assessments available for use would be helpful for future research.

Future Research

From a policy or strategy standpoint, law enforcement should consider the structural characteristics of a group given the different types of relations examined when choosing how to go about disrupting the network (Ayling, 2009; Malm, Bichler, & Van De Walle, 2010).

Once relationships are uncovered, policy and intervention strategies can be developed to effectively deal with the gang and criminal networks (McGloin, 2005; McNally & Alston, 2006). In McGloin (2005), individual gang members were employed as the unit of analysis to determine characteristics of the overall network structure. In particular, the aim was to first ascertain the cohesion of the street gangs and locate any cohesive subgroups. After the initial analysis, the focus went to the structural elements, such as determining the connectedness among members within the gangs and identifying positions that may be structurally important. Findings of the study revealed four disconnected street

gangs (all density coefficients were less than 0.1; signifying very low or no cohesion), but within the gangs were cohesive subgroups (cliques) of varying sizes; some with as small as 3 people and others having over 70 individuals.

McGloin (2005) suggested that network analysis may be advantageous when the subsequent result of the investigation has policy implications, as the social network approach allows for a multitude of focuses (entire gang, a subset of actors, or certain individuals). Additionally, it was stated the biggest limitation of the study is that until the technique is tested and used to enact an intervention strategy its true utility will remain unknown. Ayling (2009) advised that from a resilience stance, law enforcement should proceed with a bit of caution when putting an intervention plan into place as it may cause unintended consequences due to the instability of gangs. In support of intervention policy, Ayling (2009) did suggest that if intervention was the best course of action then examining the gang from a resilience perspective should be considered.

Conclusion

The seemingly uncontrollable gang expansion and the related threats to public safety that continue because of collaborative ties that U.S. based gangs have with the Mexican drug trafficking organizations gives reason for the current research

The present study used social network analysis to examine the linkage between MDTOs and American street gangs, an approach suggested to provide a more complete understanding of the structure of group co-offending.

The results showed that the Sinaloa and Tijuana cartels are more likely to be connected due to their common affiliations with U.S. gangs. The following U.S. based gangs, Hermanos de Pistoleros Latinos (HPL), Latin Kings, Mexican Mafia and MS-13 were shown to potentially have a higher degree of interlock than the other gangs resulting from their ties with the various cartels. Overall, the Sinaloa cartel is suggested to have the broadest reach into the illicit drug market, due the high number of gang ties.

In conclusion, this research provides support for the continuing of multijurisdictional collaboration and the exploration of non-traditional approaches to crime and intelligence analysis to assist in providing insight as to support intervention and disruption strategies.

APPENDIX

Gang Type	Percentage
Outlaw Motorcycle	5.9%
Prison	5.6%
Street	89.0%

Variables	Percentage *(N=965)*	
Bloods	23.3	*(n = 225)*
Crips	32.3	*(n = 312)*
Gangster Disciples	8.6	*(n = 83)*
Latin Kings	4.0	*(n = 39)*
MS-13	3.3	*(n = 32)*
Norteños	3.8	*(n = 37)*
Sureños	24.2	*(n = 234)*
Wetback Power	0.2	*(n = 2)*

Outlaw Motorcycle Gangs (n=63)		
Bandidos	20	32%
Hells Angels MC	24	38%
Vagos MC	19	30%

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