The Organizational Structure of Street Gangs in Newark, New Jersey: A Network Analysis Methodology

by
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ABSTRACT

The social organization of street gangs has remained an empirical topic of interest for decades. In part, this may be due to the fact that different sources of data often reveal varied levels of organization. Specifically, law enforcement accounts typically suggest higher levels of cohesion than do investigations relying on interviews with or observations of street gang members. It is possible this divergence may be a product of methodological specifications. This manuscript suggests that seeking specific information from experienced law enforcement (i.e., avoiding generalities) in combination with using appropriate analytic methods (e.g., network analysis) holds utility. In constructing this argument, the article presents research from a problem analysis of the local street gang landscape in Newark, New Jersey. The analytic strategy uses visual analysis and descriptive statistics to assess general organization, sub-group cohesion, and individual social positions within four street gangs. Findings indicate that Newark street gangs generally lack cohesion. Pockets of intense connections and clear variations in individual social positions are evident, however. Therefore, the results highlight the layered nature of street gang organization. In its conclusion, the paper discusses methodological implications of these results for the utility of law enforcement data and network analysis, both for gang research as well as other criminological topics of interest.

Introduction

The social organization of street gangs has remained an empirical topic of interest for decades (Decker, 2001). In part, this may be due to the fact that gang structure has criminogenic importance–as gangs become more cohesive and tight, the context to support an intense exchange of deviant or criminal definitions becomes stronger and fosters more crime (see Klein, 1971, 1995; c.f. Cartwright, Howard, & Reuterman, 1970). At the same time, there is a divergence among data sources with regard to how organized street gangs typically are. The vast majority of empirical work suggests that the

general gang landscape consists of transient, flexible, relatively flat, decentralized groups (Curry & Decker, 2003; Decker, 1996; Decker & Van Winkle, 1994, 1996; Klein & Maxson, 1994; Klein, Maxson, & Cunningham, 1991), though a handful of scholars suggest street gangs are well-structured and entrepreneurial (Padilla, 1992; Sanchez-Jankowski, 1991; Skolnick et al., 1988; Taylor, 1990). Even so, public perception continues to include an unrealistic assumption of tight organization and structure (Sanders, 1994). This perception is likely influenced by the fact that some law enforcement, government, and media sources support this notion (Conley, 1993; Fox & Amador, 1993; Ward, 2005).

In all likelihood, this disagreement supports the view of many researchers that law enforcement data/perceptions of street gangs are not as accurate as direct observations or interviews with/surveys of gang members themselves (see Klein, 1995). Indeed, some academics have suggested that police data are biased towards revealing "worse" gang problems by the personal interests of the agency (Bursik and Grasmick, 1995; Hagedorn, 1990). The productive question to ask is what may be producing this divergence.

It may be the case that law enforcement agencies believe that highly organized gangs are relatively more dangerous for public safety. Such viewpoints fit within a moral panic framework (McCorkle & Miethe, 1998) and may help certain department secure funds (Zatz, 1987). At the same time, however, it is worth asking if this divergence may be a product, at least in part, of methodological choices. First, St. Cyr (2003) found that gang task force members in St. Louis had quite different perceptions of gangs than other subjects did, in large part because they had no direct experience with gangs and relied on media accounts (see also Takata & Zevitz, 1990). It is not a surprise then that failing to ensure that the sources of law enforcement data have street experience may produce inaccurate statements. Second, questions or measures meant to capture social organization may also, unintentionally, court general responses if they are too broad. Research has shown that even when gang members are pushed past general questions to provide specifics about gang structure, their answers can shift and provide insight (Decker, Bynum, & Weisel, 1998). Thus, there is a possibility that research which explicitly attempts to seek specific information from law enforcement officials–who have experiential knowledge–may reveal a view of street gang organization that is consistent with the empirical literature.

At the same time, a relatively novel (at least in criminology) analytic technique may hold utility. Network analysis can provide unique insight into the layered, often nuanced, nature of group organization, as well as

differential individual-level positions within a social network. At a minimum, this technique can move past the discussion of whether a gang is organized or not, or whether a member is core or peripheral, in favor of a discussion with finer distinction. More practically, if one is seeking specific and detailed data about gang organization in order to avoid "general statements", this method is well-matched and can handle such information.

This paper comments on these issues by describing a local problem analysis of street gangs in Newark, New Jersey. Relying on network analysis, this inquiry will comment on how well data on the specific relationships among gang members produced by law enforcement "match" what typically defines the empirical literature. Accordingly, the next section discusses gang organization, with a particular focus on police perceptions. The paper then progresses to a description of network analysis, with a focus on its use in criminological research. After reviewing the data and analytic method, findings on the group structure of local street gangs, as well as individual social positions, are presented. Finally, the discussion section reviews the implications of these findings for gang research, as well as for criminological methods, in general.

Street Gang Organization

The discussion of street gang organization is often coupled with a consideration of drug sales. Decker and Van Winkle (1994) reviewed the literature on gangs and drugs and articulated two sides of the debate. The instrumental-rational view suggests that gangs are rational, formal, cohesive, and organized groups that have hierarchies, rules, and specialized social roles (Sanchez-Jankowski, 1991; Skolnick, 1990; Skolnick et al., 1988; Taylor, 1990). Still, this side has minimal empirical support when compared to the opposing viewpoint, which sees gangs as informal groups that lack cohesion and true organization (Curry & Decker, 2003; Decker, 1996; Decker & Van Winkle, 1994; Klein & Maxson, 1994; Klein, Maxson, & Cunningham, 1991). Indeed, Klein (1995, p. 61), when reviewing the structure of a traditional street gang, states that a typical gang: "is an amorphous collection of subgroups, cliques, pairs and loners. This is not the picture of a tight structure. It's loose and somewhat fragmented, despite each member's commitment to the group and the submersion of his own identity into that of the group…This is not an organization that can readily act as a unit."

The vast majority of research on street gang organization supports this latter viewpoint–it is rare to find empirically rigorous investigations that reveal structured, cohesive street gangs. As Yablonksy's (1962) research on New York City gang members revealed, "each gang member seemed to have

his own unique image of the gang. The wide variations of response tended to refute the widely held image of the violent gang as cohesive, tightly organized group–the one so prevalent in the literature" (p. 106). Likewise, in her organizational analysis of four gangs in Chicago and Los Angeles, Weisel (1999) found that, while gangs could be labeled formal organizations, they were, in practice, quite disorganized. In particular, "…rules are present, but not adhered to, meetings occur but irregularly and informally, leadership is ephemeral, and role specialization is limited" (Weisel, 1999, p. 213). This notion that street gangs typically do not evidence tight organization and cohesion has emerged from investigations across an array of cities, including Denver (Esbensen, Huizinga, & Weiher, 1993), Kansas City (Fleisher, 1998), Seattle (Fleisher, 1995), St. Louis (Decker & Van Winkle, 1994), and Milwaukee (Hagedorn, 1988).

Within this aggregate finding, however, researchers have found that there is some variation with regard to the structure/organization across gangs (Decker et al., 1998; Fagan, 1989; Klein & Maxson, 1989; Thrasher, 1927). At the same time, there is variation across data sources. For example, Takata and Zevitz (1990), relying on surveys and interviews of adults and youth in Racine, found that adults tended to view street gangs as formal groups that are a serious problem, whereas youth (including gang members) viewed street gangs as less serious and less organized. Based upon his interviews with gang members, Yablonsky (1959) argued that most gangs did not meet the stereotype of being well-organized and cohesive. Rather, they were characterized by little cohesion, shifts in membership, diffuse roles, unclear leadership, and limited consensus regarding norms–accordingly, he termed them "near groups". Yablonksy was clear to point out that this diverged from the common viewpoint of police, the media, and many adults.

Police Perceptions of Street Gangs

Perhaps the clearest concern about the validity and reliability of police data regarding gangs comes from researchers who have adopted a moral panic perspective. Zatz (1987), studying law enforcement in Phoenix in the late 1970s, argued that police essentially constructed a gang problem as a means of acquiring LEAA funds. By reviewing juvenile court records and interviewing social service agencies, she suggested that police had exaggerated the number and size of local gangs, as well as the seriousness of the problem. McCorkle and Miethe (1998) also found that police played a primary role in the creation of a moral panic regarding street gangs in Las Vegas. On a related note, Katz (2001) investigated what factors produced and structured the emergence of a police gang unit in a Midwestern city.

Although the police department did not actively engage in constructing the gang problem, the department nonetheless created and operated a gang unit in response to pressure from community stakeholders. As a consequence of such research, some academics believe that the perceptions of law enforcement are systematically biased–or perhaps pressured–towards constructing serious, organized, violent street gangs.

Nonetheless, many researchers continue to rely on police data when studying gangs (see for example Klein, 1995; Maxson, Gordon, & Klein, 1985). In this context, it is useful to distinguish more and less reasonable research uses of police-based information. When Katz (2003) investigated the validity of gang intelligence files, many "red flags" emerged.   In particular, there was a significant knowledge gap between the people who had street level expertise and those who maintained the intelligence files (in addition, such files were rarely updated or purged). Moreover, St. Cyr (2003) found that a task force meant to address the gang problem in St. Louis viewed gangs in a manner more consistent with moral panic, across an array of measures, when compared to juvenile detectives (as well as gang and non-gang youth). When discussing this divergence, she stated: "the police were exposed to gangs largely from job…experiences, and task force members' exposure came through the media…" (p. 41).

As a general principle, law enforcement sources can be most useful when queried about specific problems about which they may have particular expertise (Kennedy et al., 1996, 1997). Klein (1995) argues strongly for the veracity of his data stemming form interviews with law enforcement, suggesting that dialogues with researchers about specific issues can reveal valid expertise. This viewpoint is not without corroboration–Weisel (2002) found that police views of street gangs were not markedly different from gang members' own views. In addition, Maxson (1998) found that surveys of law enforcement were fairly consistent with previous ethnographic work suggesting that, as opposed to public viewpoints, gangs were not proliferating because of entrepreneurial migration.

At a minimum, therefore, in order to avoid general statements that are likely shaped by media accounts as opposed to direct experience, people removed from the gang landscape should not be data sources. At the same time, particularly in the context of Katz's (2003) work, it would appear prudent to not rely on intelligence files when interested in nuanced information, such as gang organization and structure. Stelfox (1996: 31) offers a particularly persuasive comment: "As a consequence of the restrictions on the type of intelligence which can be stored in a database there is a great deal of intelligence which officers come by during the course of

patrol and investigations which cannot be recorded in any official system. This leads to a heavy informal exchange of information between officers and places a premium on personal knowledge and access to information sources (it also, incidentally, puts a great deal of tactical intelligence beyond the control of managers)." The implication is that, despite its maligned status in certain circles, police data can hold utility, if gathered in a considerate manner. The question now is whether there are certain methodological specifications that would best complement this data source. Is there a method that can shed unique insight on specific information regarding the social organization of street gangs? This paper suggests that network analysis is ideally suited to such an inquiry.

Network Analysis

The central goal of network analysis is to reveal the presence of any regular patterns in social relationships (Knoke & Kuklinski, 1982; Wasserman & Faust, 1994). Network analysis relies heavily on graphical displays of social data, though analytic methods have evolved over recent years (see for example Bonacich, 1987; Doreian, 1986). Visual displays remain useful, however. At a basic level, they can provide clarity to the pattern of relationships within a network of multiple actors that at matrix simply cannot convey at the same visual level. For example, if one studies wiretaps among a drug trafficking network (similar to Natarajan, 2000), recognizing pockets of intense communication among a group of 10 individuals would be relatively easy, but exponentially more difficult as the network expands into the hundreds.

Graph theory and statistical techniques have expanded the capability of network analysis. One example is the capacity to identify the "most prominent" actor in a social network, together with cohesive subgroup(s). One can also use techniques to identify structural equivalence within the graphical pattern of social relations–that is, actors in the network who occupy identical social positions (Wasserman & Faust, 1994), which can provide the base for a taxonomy of the subjects. It may also be possible to collapse the sociogram into a display of the relations among these positions, lending even more clarity to the data under examination. These examples illustrate the capacity of network analysis to examine, describe, and quantify social relationships among actors, something that holds particular utility in street gang research.

Although network analysis is relatively uncommon in criminology, it has been used on occasion. For example, some researchers have used it to address inter- and intra-organizational relationships within the criminal

justice system, focusing on such issues as intelligence sharing and whether network structure predicts policy adoption (Alter, 1988; Curry & Thomas, 1992; Gustafson, 1997; Miller, 1980).   Other research focused on the relationship among perceived causes of general and specific forms of crime, such as drug use (Campbell & Muncer, 1990; Muncer et al., 1992). Network analysis has been used to address such questions as whether or not criminal networks actually exist (Coles, 2001), what delinquent and organized crime networks look like (Finckenauer & Waring, 1998; Krohn & Thornberry, 1993; McAndrew, 2000; Sarnecki, 2001), as well as whether network structural mediates the effects of delinquent peers (Haynie, 2001). Finally, another stream of the literature has suggested its use in law enforcement investigations, particularly in cases of organized crime and criminal conspiracy (Coady, 1985; Davis, 1981; Howlett, 1980; Ianni & Ianni, 1990; Sparrow, 1991).

   The absence of network analysis as a major analytical strategy within gang research is surprising. Krohn (1986) suggested that network analysis holds theoretical importance, since network structure and its constraints on behavior may help to explain delinquency patterns across diverse populations. This is particularly relevant since gangs are inherently social groups. Indeed, Fleisher (2002:200) notes, "…gangs are social networks composed of individual gang members, and that gang member behavior is determined in part by a gang member's location in the structure of the social network." Cohen (1990) also stresses that gangs are collectivities–that is, he defines their members as relational affiliates. The dynamic nature of the relationships between gang members is a defining part of the organization and can exert a robust influence on the behavior of the group, both collectively and as individuals. Interestingly, most gang literature has focused on social relations and activities (see Thrasher, 1927; Whyte, 1943; Yablonsky, 1962)–it simply has not utilized an analytical technique that can capture and appropriately describe such data.[1] Recent gang research has begun to rely on network analysis, helping to shape a growing sense of its potential utility (see for example McGloin, 2005a; Papachristos, 2006).

   Network analysis emerged as an important tool in the Boston Gun Project, as researchers sought to understand the gangs that were involved in violent, criminal behavior by investigating the relationships among them (Braga et al., 2001; Kennedy et al., 1996, 1997, 2001). This analysis helped to explain why particular geographical areas experienced such violence, given the concentration of contentious relationships. It also illustrated what gangs were most integral to the network–that is, the gangs that had the most connections–which highlighted their vulnerability for law enforcement

intervention. Thus, rather than addressing one gang set to the exclusion of the remainder of the landscape–a common strategy within law enforcement (Stelfox, 1996)–the knowledge of the connections among the gangs provided unique leverage when undertaking an intervention strategy.

Whereas the Boston Gun Project focused on the gang as the unit of analysis, if one is going to use this technique to shed insight on internal gang structure, it requires shifting the unit of analysis to the gang member. Previous sections argued that it is better to ask about specifics than to rely on generalities when seeking information on street gangs. Accordingly, the questions and method should be suited to eliciting specific information and allowing the analytic technique to make judgments about the level of social organization within a gang. One manner in which to achieve this is to solicit information about the relationships among gang members and "build up" the social organization of the gang. Typical research on gang organization asks gang members to report on the presence and importance of rules and meetings, internal discipline, and reported cohesion within the group (Cartwright, Howard, & Reuterman, 1970; Decker, 2001; Weisel, 1999; Yablonsky, 1962). This certainly does shed light on elements of organization, but more systematic ways to investigate the structure of street gangs are available. The question before us now is whether such a systematic way (i.e., network analysis), in combination with more specific queries put before law enforcement, reveals social organizations consistent with moral panic and stereotypes or with the majority of scholarly work, largely based on observations and interviews/surveys with gang members.

The Current Focus

Klein (1995:103) notes: "We badly need more careful research on gang structures…The gang phenomenon is complex, and it challenges us as social scientists and interested laypersons." This investigation therefore revisits the issue of street gang organization. In particular, it also comments on the efficacy of police data as the source of such an inquiry along with the complementary analytic strategy of network analysis. As opposed to seeking general information about perceived cohesiveness of the gang, the frequency of meetings, and the adherence to rules, this research adopts the gang member and his or her associations as the focus of interest. This shift in measurement provides the opportunity to investigate: (1) the general structure and organization of the street gang networks, based on the connections among its members, and; (2) the differential social positions that members occupy within these groups. Both streams of inquiry rely on visual inspection through sociograms, as well as summary statistics that help to clarify these

graphs.

Research Strategy
Data

The data under use here come from the North Jersey Gang Task Force, a collaborative project helmed by Rutgers University-Newark that had the goal of addressing local gang problems. Group interviews of law enforcement officials from a variety of criminal justice agencies–the Newark Police Department, the Essex County Sheriff's Office, the Juvenile Justice Commission, and the Essex County Department of Parole–form the foundation of the project data. The focus groups engaged in collective semi-structured interviews, 32 over the course of one year. These interviews solicited the subjects' experience-based knowledge, a method similar to that utilized in the Boston Gun Project. In particular, they commented on the number of gangs in Newark, along with their respective territories, characteristics, histories, and relationships with other gangs. They also provided information on known gang members active in Newark, as well as associations among the gang members, including relationship type.

When identifying the existing relationships among gang members, the groups were prompted to describe the nature of each identified associate. Categories of association include: (1) the two subjects were recent co-defendants; (2) they are the relatives; (3) they "run" together, which means they hang out together and commit crime together; (4) they know each other well because they grew up in the same neighborhood for an extended amount of time (this often captured cohabitating in the same public housing area); (5) they know each other because they were recently in the same prison at the same time (this was confirmed through records from the Department of Corrections)[2]; or any permutation of the previous categories. Therefore, for every identified gang member, the group provided data on the quantity *and* quality of his or her known associates. Unlike some previous research, the data were not limited to a certain specified number of associates (Haynie, 2001, 2002), but were rather bounded by the experiential knowledge of the interview subjects.

Consistent with New Jersey Code, a gang was defined as: three or more people who are associated in fact, that is people who have a common group name, identifying, sign, tattoos or other indices of association, and who have committed criminal offenses while engaged in gang related activity (NJSA 2C:44-3h). Gangs included in this analysis had clear, definable geographic territories, and biker gangs, white supremacist groups, and cults were excluded. Gang member was defined as: "Any person who participates

in or with a criminal street gang; has knowledge that gang members engage in or have engaged in criminal activity; and willfully promotes, furthers, or assists in any criminal conduct by members of that gang" (BJA, 1997, p. 31).

At the completion of data collection, 736 active gang members in Newark were identified within four street gangs: Bloods, Crips, Almighty Latin King and Queen Nation, and the Netas[3]. Table 1 shows the distribution of members across the street gangs, and the age and race/ethnicity for subjects. The literature has noted greater ethnic heterogeneity within gangs (Howell et al., 2002; Klein, 1995), but the gang members identified in Newark are all minorities, namely African-American and Hispanic. This ethnic distribution largely reflects the population of Newark, New Jersey. According to the 2000 Census, Newark is nearly 54% African-American and approximately 30% Hispanic. Though the Census does not treat these two variables as mutually exclusive, it is nonetheless true that ethnic and racial minorities are, in fact, the majority in Newark. At the same time, the growth in Caucasian membership is disproportionately seen in small cities and rural environments (OJJDP, 1998). Finally, as a commentary, when Decker (1996) obtained his snowball sample from gang members themselves in St. Louis, rather than law enforcement, it was still 96% African-American.

The average age of the identified gang members is 27, which may lead some to ask if the focus is on youth gangs or adult criminal organizations? Recent years have shown an impressive broadening of the age range witnessed in street gangs (Howell et al., 2002; Klein, 1995). In short, while age of the sample may be older than expected, this is not remarkably inconsistent with the field. Additionally, the sample is only 1.1% female, despite the fact that some researchers estimate that one quarter to one third of all gang members in the nation are female (Maxson & Whitlock, 2002). Curry and Decker (2003) argue that females are undercounted by law enforcement because they are less involved in crime and therefore less likely to come to the attention of police. Given that this research is interested in criminally active gang members, and relies on the expertise of law enforcement, the small proportion of females is not surprising. Even when gang members themselves define a sample (Decker, 1996), it is often predominately male. Moreover, Miller (2001), who studies female gang members, admits this is a particularly difficult population to access.

Analytic Strategy

The network data and subsequent graphs were based on mutual (i.e., non-directional) relationships. Network data can be dichotomous (a relation is either present or absent) or valued. In this case, the data are multi-

relational–they include information on different types of associations–but are dichotomous across relations. Given that a matrix, which contains the data for the network analysis, allows only one value for a mutual relationship between two actors, mutual exclusivity is a relevant and important issue. Thus, the permutations of these relationships must be included as categories under this variable. As such, every gang member had a single value that reflected his or her relationship in reference to every other person in his or her respective gang.

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The program "Netminer" was used to produce a series of sociograms to illustrate the organization of various gangs in Newark.[4] Sociograms show the social connections among identified gang members. The nodes of each graph represent gang members and links represent the associations among the nodes. This analysis therefore provides different types of useful information for understanding organizational features of gangs: visual displays of the connections among gang members in Newark; whether different gangs have different organizational structures; and, whether gang members occupy different and definable social roles. Graphic displays are

consistent with Maltz's advice: "… to develop methods of displaying data that permit the reviewer to *see* relationships within the data" (1998, p. 399).

Other features of network analysis provide statistics for description and comparison. The analysis proceeds as follows. First, it focuses on how connected the networks are, by examining density coefficients for each street gang. This provides an index of how cohesively organized the street gangs in Newark are. Next, it shifts focus to a search for sub-groups or smaller pockets of cohesion, by identifying cliques, or groupings in which every person is directly connected to every other person. This approach focuses on the gang member and his or her associations as the unit of analysis to make statements about the organization of the overarching gangs. This is consistent with Short (1985), who points out that such micro-level processes can shed insight on macro-levels of explanation. The analysis next examines individual social positions within the street gang networks. The discussion of social position within gangs tends to revolve around a dichotomy of core and peripheral members (Curry & Decker, 2003; Klein, 1995; Thrasher, 1927). This analysis will move beyond this characterization by focusing on the level of connected-ness within the gang.

Results
Street Gang Organization

The interview subjects identified four primary constellation street gangs (see Footnote 3) in Newark: the Bloods; the Crips; the Latin Kings; and, the Netas. The Bloods, the largest gang in Newark, consists largely of African-American males. Like all street gangs in Newark, they are "cafeteria-style" offenders (see Klein, 1995), engaging in a large range of offenses, but they are disproportionately involved in drug offending. Of the 378 Bloods, 305 (81%) have linkages to fellow gang members. In fact, there are a total of 5183 linkages within the overall network. Like the Bloods, the Crips are predominately male and African-American. Its members also engage in criminal activities ranging from homicides, assaults, property crime, drug crime, and public order offenses. Of the 80 identified Crips, 68 (85%) are connected across 244 linkages. The Almighty Latin King and Queen Nation is a Puerto Rican street gang that has strong familial ties, as illustrated by the intergenerational nature of the group. Of the 141 identified gang members, 92 (65%) are connected to at least one other individual, across 635 linkages. Finally, the Netas are also a Puerto Rican gang with roots in the prison system of Puerto Rico. They still have strong ties within the prison systems and have one of the oldest histories in Newark. For the Netas, 84 of the 137 (61%) identified gang members have some association(s) across 301 connections.

Figure 1 illustrates the social organization of the Bloods. The nodes represent individual gang members and the linkages represent a relationship between the connected individuals.   A sociogram provides a visual, preliminary, account on the cohesion of the street gangs under focus. If a graph is "connected", then every node (i.e., gang member) is connected to at least one other node in the graph (Wasserman & Faust, 1994). In such a graph, every node may be linked to any other node in the network in either a direct or indirect fashion. When a graph is "disconnected", however, it is divided into components, or sub-graphs that have no connection or path among each other (Wasserman & Faust, 1994). Figure 1 indicates that the Bloods network is disconnected, and contains 11 isolated groupings within the supposed boundaries of one street gang (illustrated by the squares with dotted lines in Figure 1). This is the first indication that the networks under study are not very cohesive. It is interesting to note that these sub-groups are not indicative of sets or chapters of the over-arching gang. If the components represented bounded sets within these constellation gangs, "disconnected" would not necessarily indicate low social cohesion. The data, however, illustrated a "mix" of set allegiances in many components for the Bloods, as well as a lack of exhaustiveness. For instance, one component may contain Gangsta Killer Bloods (GKB) and Double ii members (Blood sets), while other components may still contain members of those same sets.   The sociograms for the other gangs are remarkably similar to that for the Bloods.[5]

Another way to assess gang organization is to determine the density of each respective network. If a gang is tightly and intimately socially connected, it should have a high level of density, as indicated by the density coefficient. A clear formula exists for calculating density in dichotomous graphs, in which a tie is either present or not.

Formula 1.   2L /g (g-1); where L= number of linkages, and g = number of nodes in the network (source: Wasserman & Faust, 1994)

A suggested formula also exists for valued graphs (that speaks to the average values of each linkage). Calculating density for a multi-relational network is less straightforward (Wasserman & Faust, 1994).   Perhaps the most conservative method is to treat the every linkage equally–such that an association exists or it does not.   Calculated in this way, the density coefficients that emerged for Newark street gangs were similar across groups. Ranging from 0 (no connections within the network) to 1 (the network is saturated–everyone is directly connected to everyone else in the network), the density coefficients were: Bloods = .073; Crips = .078; ALKQN = .066, and; Netas = .032. While no traditional threshold or standard exists to signal high, medium, or low levels of cohesion within street

gangs, these values certainly suggest minimal levels of cohesion.

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    Findings so far suggest that street gangs in Newark are not cohesively organized.   Some connections might be omitted dues to limits of police knowledge–one should remember that these data have similar limitations as other forms of "official"data (e.g., arrests) and may be incomplete. Moreover, individuals' knowledge of social networks is rarely exhaustive (Sparrow, 1991). However, it is unlikely that limited police knowledge is

wholly responsible for density coefficients that are so low (all are under .10 within a range of 0 to 1). Data limits might be partly at work, but these results are evidence of limited connectedness among members of Newark street gangs.

Cohesive sub-groups

The search for cohesive sub-groups has the aim of uncovering "subsets of actors among whom there are relatively strong, direct, intense, frequent, or positive ties" (Wasserman & Faust, 1994, p. 249). Perhaps the strictest and most common definition of a cohesive sub-group is a "clique." While early gang researchers often used this term to refer to "sets" or sub-groups within the gang based on common attitudes (see Short & Strodbeck, 1965; Thrasher, 1927), the term clique here is operationalized more squarely in the tradition of network analysis. Subsets within the network are based on *reachability*–groupings of at least three individuals who are all directly connected to each other (Scott, 2000; Wasserman & Faust, 1994).[6] This is a quantitative method of determining cohesive sub-groups, but they may also be displayed visually. As an example, Figure 2 illustrates the Crip's cliques.

Cliques within each street gang network are pockets of tightly connected individuals within the larger gang network. Cliques vary in size, ranging from 14 to 3 among the Crips, for example. For instance, while the overall Crips network shows little cohesion, there is a sub-set of 14 gang members (the group containing C141, C142, C143, C151, C152, C153, C154, C155, C156, C157, C158, C159, C160, C161) who are all directly connected to one another across different relations. Such clusters, however, are not necessarily indicative of explicit sets. This is particularly clear in the case of the ALKQN, which, according to the official law enforcement data, has one chapter in Newark. Despite this supposed singular, insular status, the data reveal quite a few cliques. Interestingly, it looks rather similar to the patterns manifested by the Bloods, Crips, and Netas. While the overall gang network is not cohesive, therefore, and the components are not reflective of sets or necessarily tightly organized, there are identifiable sub-groups that are quite cohesive.

Individual social positions

This analysis also investigated different social positions within the gang networks. Research on gangs often assumes that while some gangs may have many members, most are peripheral players and few are core members, who are fully committed to and embedded in gang life (Klein, 1995; Thrasher, 1927; Yablonsky, 1962). Certainly, Figure 1 suggests differential

positions.

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have many members, most are peripheral players and few are core members,
who are fully committed to and embedded in gang life (Klein, 1995;
Thrasher, 1927; Yablonsky, 1962). The sociogram in Figure 1 hints at
differential social positions. The graph shows individuals who are isolates,

connected to no one, as well as individuals who are more entrenched and central to the network.

One way to establish how "central" an individual is to a social network is to determine the ratio of connections that a person manifests to all potential connections the person may have, or "degree centrality" (see also Natarajan, 2000). This measure ranges from 0, indicating the person is connected to no one, to 1, indicating the person is connected to every other person in the graph (Scott 2000; Wasserman & Faust, 1994). The higher the coefficient, the more central the person is to the social network under focus. Since the sociograms display multi-relational networks, the subjects' degree centrality coefficients were computed for all five primary relational types. Table 2 presents degree centrality coefficients for each gang by relation type.

In most cases, the range of degree centrality is less than .10, suggesting that, while the level of connectedness varies across individuals, few people are connected to more than 10% of the social network on any particular relation. This range supports the notion of a peripheral member, in that the range includes people who are not connected to anyone and/or to very few people, it is not strong support for the notion of "core members." Some people are certainly more central to the social network than others, but this is a relative term. In fact, the relation that shows the greatest range, correctional associations for the Bloods network, has a maximal degree centrality of .239. This translates into being directly connected to 90 fellow Blood members, out of a possible 378.

Degree centrality is perhaps the most intuitive measure of prominence, but there are two other ways of conceiving centrality that may interest researchers. The first view is based on *closeness*, or how close an actor or node is to all other nodes in the social network (Freeman, 1979; Wasserman and Faust, 1994). In other words, closeness centrality is inversely related to distance from other nodes (i.e., a central person has shorter paths to other actors in the network). The second view, *betweenness* centrality, hinges on the notion of being able to control interactions of communications–"the important idea here is that an actor is central if it lies between other actors on their geodesics" (Wasserman and Faust, 1994, p. 189). A person will have high betweenness centrality if other actors must go through him to get to other actors in the network. Additional analyses on the Bloods gang investigated these two measures of centrality. The average closeness centrality (which, like degree centrality has a potential range of 0-1) across Bloods members was .176 (sd=.122), with a range of 0-.36. The average betweenness centrality was markedly lower, at .007, with a standard deviation of .002 (the range was 0-.045). It is tempting to consider these

table not printed

measures of centrality as reflecting "status" or "leadership" within a gang. This research did not address these issues, per se, but rather investigated centrality in a gang across an array of social relationships. It would be interesting to compare the centrality findings with the identified leadership structure of the gangs (see also McNally & Alston, 2006).

Interestingly, whereas closeness centrality had a positive relationship with age (r=.421, p<.01), such that older members were more likely to be central, there was no relationship with betweenness centrality.   Both closeness and betweenness centrality measures had a significantly positive relationship with a gang member's official record of arrests (r=.360, p<.01; r=.115, p<.05, respectively), weapons offenses (r=.278, p<.01; r=.129, p<.05, respectively), and drug offenses (r=.176, p<.01; r=.165, p<.01, respectively). Finally, closeness centrality also had a relationship with a gang member's officially recorded history of violent offending (r=.291, p<.01).

Discussion

In general, this investigation revealed that street gangs in Newark are relatively flat and decentralized, which is consistent with the majority of the literature (Decker & Van Winkle, 1994, 1996; Klein, 1995; Klein et al., 1991; Sanders, 1994).   Like other research, the findings here suggest that criminology may need to reconsider its theoretical and empirical orientation toward criminal organizations (Bunker & Sullivan, 2001; Clarke & Brown, 2003; Eck & Gersh, 2000). The notion of a hierarchical, stable organized crime syndicate is less useful than the concept of social systems of criminal entrepreneurs (see Clarke & Brown, 2003).   Instead, many criminal enterprises act as loosely structured networks that, while having pockets of cohesive structure, tend to have opaque and dynamic boundaries (Bunker & Sullivan, 2001; Eck & Gersh, 2000). Spergel (1995) even suggests that gangs are more like amoebas than hierarchical business structures. In the end, the results here bring us back to the conceptions of Yablonsky (1959), who argued that gangs are not as organized as the public believes them to be, but are rather informal "near-groups". The interesting point, however, is that this finding emerged from law enforcement data, despite the fact that police are often presented as believing that gangs are tightly organized with firm hierarchies.

As noted earlier, some scholars question the validity of criminal justice data on street gangs (Hagedorn, 1990; Inciardi, 1986). If these police data were biased, it is likely it would have been in a direction consistent with moral panic and would suggest high levels of organization and cohesion (see McCorkle & Miethe, 2002).   The results here operate in the opposite

direction. Even so, the presence of gang members with no connections to other individuals in the network, called "isolates", may lead some to question these data, given the inherent group nature of street gangs. Yet, this is not a unique finding. Suttles (1968) identified individuals who did not illustrate consistent interactions with fellow gang members, but were considered to be members by their peers (see also Papachristos, 2006). In addition, the small number of identified female gang members is potentially problematic since females often play an important role in the social cohesion of a street gang (Fleisher, 1998). Drawing on law enforcement data to measure aspects of gangs and gang-member behavior is recognizably imperfect, but nonetheless it is a fairly common approach. Triangulating measures is the preferred method for getting data on hard to measure constructs, like gang organization and activity. Using these findings in combination with surveys of gang members, ethnographies, and research methods can help build our collective knowledge. In short, data emerging from different individuals from varying criminal justice agencies are important for our overall effort to better understand the organizational features and other characteristics of gangs.

Also consistent with previous research (Curry & Decker, 2003; Fagan, 1989; Klein, 1995; Thrasher, 1927; Yablonsky, 1962), the findings from the network analyses revealed that there is variation across individuals with regard to connected-ness within the social networks of the gangs. These results suggest that subsequent research should recognize this continuum rather than the dichotomy of core and peripheral members. A variety of measures revealed a continuum of prominence, that is, in many cases, related to a gang member's criminal history. Although this may reflect police knowing more about the relationships of more criminally active gang members, it is also consistent with empirical and theoretical work (Akers, 1998; Klein, 1995; McNally & Alston, 2006; Sutherland, 1947).

In short, both the findings on group organization and individual position within the gang highlight the layered nature of street gang organization. It is not simply the case that gangs are organized or not; that individuals are core or peripheral members. Indeed, a gang can appear rather disorganized at the outset, yet have cohesive sub-groups within the network, which are based on interactions and associations, not necessarily on a common set name (see Klein & Crawford, 1968; also see McNally & Alston, 2006). Additionally, discussions about the positions of gang members can move beyond how committed an individual is to the gang and the length of his or her membership to how prominent her or she is in the network.

Though this analysis is a "snap shot" of Newark gangs, it nonetheless shows a variety of positions within a gang across multiple kinds of social interactions. It was the network analysis methodology that allowed these

findings to emerge. Asking someone about group meetings, paying dues or loyalty to the gangs likely would not convey this organizational pattern. Arguably, ethnographies can convey this information, but the network analysis method provides illustrative graphs and summary statistics, allowing easier comparison across research. Uncovering these layers of group organization and individual position also takes on importance when contemplating a local gang intervention strategy (see for example McGloin, 2005a). Thus, this analytic method holds particular utility when researching of gang organization.

Methodological Implications for Criminology

By using network analysis, this article adds to the relatively small criminological literature that uses this analytic technique, answering an appeal put before our field (Coles, 2001). Network analysis is particularly amenable to inquiries into the structure of street gangs. The gang literature has some of the richest ethnographies, which provide insight lacking with other forms of inquiry. Even so, such investigations also have limitations, particularly with regard to comparative analysis. Network analysis can provide unique leverage for visual and quantitative comparison, both over time and across space. With regard to the former issue, for example, Weisel (2002) investigated the evolution of street gang organization. Relying on gang member and police officer perceptions certainly provided insight into this research question. Even so, however, should future research along this vein utilize network analysis, the possibility to visually and quantitatively take note of general structural changes, alterations in cohesive sub-groups, and shifts in individual social positions exists. Network analysis may even shed light on the social process whereby some gangs shift from a diffuse, loose structure to a more solidified nature (Thrasher, 1927).

With regard to the latter issue, gangs are unique, local phenomenon (Howell, 2000; Klein, 1995). The resolution of seminal research questions essentially rests on local studies building up into a consensus (Weisel, 2002). The growth of gangs within metropolitan areas, as well as the expansion to rural jurisdictions, (see Miller, 2001), courts comparative work, particularly in light of gang heterogeneity within urban environments (Decker et al., 1998). It would certainly be easier to engage in comparative work and have productive and appropriate debates about key issues if there were a common metric. For example, recent work by McNally and Alston (2006) used network analysis techniques when investigating an outlaw motorcycle gang. Considering the similarities in findings across gang types would shed insight on how distinct these groups truly are with regard to structure. Comparative

work within locations, but across methods, would also be interesting. One future direction in Newark could be to compare these gang networks, based on law enforcement data, with networks based on gang member informants. In short, adopting this analytic technique carries with it considerable potential benefit for gang research.

While attractive to researchers, network analysis may also be a useful tool for police. Despite potential reliability problems with police data, they are integral to how police do business. This relatively simple, descriptive tool can help reveal useful information on social patterns that may be hiding in collected data. To be sure, this paper advocated for soliciting specific information from police about the relationships among gang members as a means of avoiding general, and perhaps inaccurate, statements about gang cohesion and organization. Such a process generates an immense amount of data, from which organizational themes do not easily emerge. This analytic technique can shed insight on these data and may expose findings that are inconsistent with stereotypes, fitting nicely within a problem analysis framework (see McGloin, 2005b).

In a similar fashion, geographic information systems and mapping techniques have rapidly expanded over the past few years in criminological research, as well as among criminal justice practitioners (Brantingham & Brantingham, 1999; Eck, 1998). The primarily descriptive findings that emerge from the application of network analysis, like mapping applications, can provide substantial guidance for researchers and practitioners alike. New mapping techniques have expanded how police managers utilize such information in the deployment of strategies and tactics (see for example, Ratcliffe, 2004). In the same way, law enforcement circles concerned with gang problems may benefit from applying network analysis, perhaps through collaboration with researchers and academics (McGloin, 2005b). For example, Pfautz (1961) argues that, despite the loose organization of gangs, members still act based on association characteristics or the nature of the bonds to the group. Thus, having insight on the cohesion of the group and individual positions may help law enforcement shape intervention and/or suppression strategies, guiding better allocation of resources (McGloin, 2005a, 2005b).

Network analysis also holds potential for empirical investigations other patterns than street gangs. Indeed, Coles (2001) is quite explicit in his call for criminologists to employ this technique, particularly with regard to investigations into organized crime (see also McIllwain, 1999). Moreover, Clarke and Brown (2003; see also Eck & Gersh, 2000), argue that criminal enterprises are dynamic social networks of individuals, rather than clearly

structured, hierarchical, stable entities. Network analysis is well suited to characterize and study such entities. Finally, Bunker and Sullivan (2001) argue that even the well-known South American drug cartels are adapting network structures, which allows them to expand connections and links in the legitimate business world.

Some researchers have recognized the potential of network analysis within this research domain (McIllwian, 1999; Morselli; 2003). For instance, Finckenauer and Waring (1998), and Natarajan (2000) used this technique when characterizing the organization of Russian organized crime and drug trafficking organizations, respectively. Natarajan (2000) explicitly stated that her work, in which she used wiretaps and other prosecutorial data, signals the efficacy of network analysis when studying large criminal organizations, not only to deduce the overall structure, but also to highlight actors who are central to the network.

Investigations into co-offending are also particularly amenable to a research strategy using network analysis. Given the importance of co-offending when attempting to understand criminal behavior (Warr, 1996; Zimring, 1981), as well as the suggestion that it is dynamic and fluid, rather than characterized by stable, hierarchical groups (Weerman, 2003), adopting a social network perspective is a wise strategy (Waring, 2002). Sarnecki and Pettersson (Pettersson, 2003; Sarnecki, 2001; Sarnecki & Pettersson, 2001) have recognized its potential applying network analysis to various data on co-offending groups, providing both visual displays of these social groupings, as well as some interesting contributions to the field, such as the finding that continuous co-offending partners are rare. Their analytic strategy was simply able to capture the fluctuating nature of co-offending networks. Even so, their analyses essentially stand alone, inviting replication and comparison.

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End Notes:

[1] Klein (1995: 61) does use a sociogram to illustrate his description of the structure of a traditional gang, and Klein and Crawford (1968: 267) use sociograms when discussing relations among gang members.

[2] After discussions with officials in the Department of Corrections, the interview subjects for the project, as well as various stakeholders in the North Jersey Gang Task Force, this association was deemed worthy of inclusion. In short, relevant criminal justice actors consistently stated that prison is an ideal circumstance for gang members within the same "constellation gang" (Decker, 1996) to form associations.

[3] The Bloods and Crips in Newark are "constellation gangs" (see Decker, 1996), in that they are larger amalgamations of various sets. In some areas across the country, Blood and Crips sets (such as Sex Money Murder or Grape Street, respectively) would qualify as well-defined, individual gangs. If one were to count all of these sets as individual gangs, the number of street gangs in Newark would increase exponentially. In Newark, however, some sets, as well as individual allegiances, within the Bloods and Crips change quite often. At the same time, some gang members are simply Bloods or Crips, without a specific set allegiance. Finally, social ties often cross existent set-allegiance boundaries. It is for these reasons that the gangs of focus are the Bloods and Crips, rather than any particular set.

[4] For more information on the Netminer software package, visit www.netminer.com.

[5] In the interest of space, these figures are not presented. They are available from the author upon request.

[6] It should be noted that cliques are based on the presence or absence of links–therefore, the multi-relational network is treated as a dichotomy for such analyses.

[7] The degree centrality coefficients presented in Table 2 are computed for each person within the respective gang on each relation. Thus, the ranges convey that some persons are not at all central, while others have varying levels of degree centrality.