

# Assessing Vulnerable and Strategic Positions in a Criminal Network

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## Abstract

This study focuses on individual positioning within an illegal drug distribution network surrounding a reputed criminal organization (the Quebec Hells Angels). The aim is to distinguish between participants who were positioned vulnerably and/or strategically during a period when the network was targeted by an intensive law-enforcement investigation. Two centrality measures are used throughout the analysis. Degree centrality accounts for the number of direct contacts surrounding a participant. Betweenness centrality accounts for a participant's brokerage leverage by measuring the scope of indirect relationships that s/he mediates. The final results reveal how differential positions in the network influence the judicial outcomes (arrests) within the case. Participants with high degree centrality were more likely to be arrested. Participants with high betweenness centrality were less likely to be arrested. Most importantly for law-enforcement concerns, those participants with high brokerage level were less likely to be members of the Hells Angels, thus suggesting that targeting strategies must take consider the patterns that represent an offender's network at any given time, rather than simply focusing on an offender's status and reputation within a criminal organization.

## Keywords

criminal network; social network analysis; centrality; drug trafficking; law-enforcement

The idea that social network analysis may offer methods and paths for crime analysis and more practical applications during criminal investigations has been suggested in past research for almost 20 years. Sparrow (1991), Peterson (1994), and Klerks (2001) have all demonstrated how approaching criminal operations from a network perspective allows us to manage complex investigative data containing many individuals and countless interactions, while also providing the visual and analytical techniques that

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lead to an evidence-based understanding of the overall structure of a criminal network and the positioning of a variety of key participants therein.

Recent case studies of diverse drug trafficking and other criminal market operations pursued this line of inquiry and found that, like noncriminal networks, criminal networks are generally shaped for flexibility, making them resilient to law-enforcement targeting and intervention (Morselli, 2009). In Pearson and Hobbs' (2001) research with convicted drug traffickers and law enforcement representatives, flexible networks were the norm. Similar conclusions were raised by Icduygu and Toktas (2003) in their research on human smuggling in the Middle East and Turkey. Even in street gang research, more flexible group configurations that revolve around a handful of cut-points in a particular geographical location have been found (McGloin, 2005).

Such findings from past research contribute further to Reuter's (1983) consequences of product illegality thesis. The logic is that, when kept in check by law-enforcement controls and other competitors in the criminal market, the typical criminal firm is likely to be a small and short-lived venture. In such a hostile setting, flexible group formations are more suitable than the more rigid forms of organizational structures that generally guide law-enforcement and popular perceptions of criminal markets.

Some may argue that such loosely structured networks are restricted to areas and markets that are more competitive and comprised of small and ephemeral action groups. But Kenney's (2007) research on the Colombian cocaine trade tells us that flexibility is the norm even when we focus on the more notorious (or stereotypical) criminal organizations or cartels. Kenney's fieldwork with law-enforcement, intelligence officials, and former drug traffickers found that, contrary to the popular view, cocaine trafficking in Colombia has never been dominated by one or more monopolistic criminal organization. Instead, the trade is more fluid and diffused. Cocaine trafficking in Colombia, in short, was flat and not vertical. This pattern is typical of criminal markets and organized crime in general.

The present study contributes to this ongoing research on the flexibility of criminal networking. The focus is on individual positioning within an illegal drug distribution network surrounding a reputed criminal organization. The aim is to distinguish between participants who were positioned vulnerably and/or strategically during a period when the network was targeted by an intensive law-enforcement investigative operation. The final results reveal how differential positions in the network influence the judicial outcomes within the case.

Social network analysis offers many concepts and measures that are applicable to criminal settings. Most important, and unlike many approaches that rely on an assumption, speculation, or claim regarding the order of things in a specific criminal setting, social network analysis offers a method to search and assess structure. Past research has largely restricted itself to what is arguably the most common and straightforward network concept: centrality. However, and following the same "flexible order" line of inquiry, centrality takes on different meanings and implications when approaching it in a criminal setting. The uniqueness and variability of centrality in crime will be developed in the following section. Subsequent sections will present the data source used for the current case study, analytical framework, and findings that will allow us to clarify this issue and assess its implications for practical settings.

## Vulnerable and Strategic Forms of Centrality in a Criminal Network

Centrality comes in many forms. One individual could be central because he or she has many contacts, whereas another may have few contacts but remains central because he connects others who are not in contact with each other. The former scenario illustrates the individual with a high-volume or degree of contacts and is measured by *degree centrality*, which is essentially a straightforward count of the number of direct connections surrounding a node in a given network. The second scenario depicts the individual with a more quality-based set of contacts and is measured by *betweenness centrality*, which adjusts for one of the main limits in the degree centrality measure—that some participants may have a lower degree of direct contacts in the network but are nevertheless centrally positioned as key intermediaries or brokers within the network. Thus, whereas degree centrality accounts for direct connectivity, betweenness centrality measures the level of indirect connectivity surrounding an individual.

Previous research has elaborated on how centrality may take on different meanings in criminal networks. Having a high degree of contacts is generally argued to be an indication of importance, influence, or control in a noncriminal network. Sparrow (1991), for example, argued that the central node held a position of strength within a criminal network and removing that strength would weaken the network. Others, however, have argued that degree centrality has come to signify visibility within a criminal network. Peterson (1994), for example, maintained that nodes positioned at the centre of a criminal network were the most connected participants and, therefore, the most vulnerable, and such centrality was therefore an indication of vulnerability. One study that provides empirical evidence to address whether actor centrality is a sign of strength or vulnerability is Baker and Faulkner's (1993) analysis of price-fixing conspiracies. They found that the participants who had higher degree centrality were more likely to be found guilty and receive greater sentences. What Baker and Faulkner's findings suggest is that having a high degree of contacts in a criminal network is primarily an indication of a participant's visibility and the more strategic participants in the network would, therefore, be more content in remaining peripheral, and not directly central, to the action taking place.

Whereas visibility is a property that is best captured by degree centrality, betweenness centrality brings another sense to the network, one of strategic action that is better suited for the risk/efficiency trade-off that is generally contemplated when organizing criminal ventures. Betweenness centrality fleshes out the intermediaries or the brokers within a network. A broker is positioned between disconnected others within a network and "brokers do better" (Burt, 2005, p. 7, 11) because others come to rely on them and because they maintain a competitive edge by controlling the information asymmetries that make up entrepreneurial networks. Participants on either side of the brokerage position rely on the broker for indirect access to resources beyond their reach. The broker is pivotal within such a social configuration and profits from the reliance of others. In turn, the group that emerges around the broker benefits overall because the broker extends the collective venture to wider reaches and a greater variety of opportunities.

The brokerage component is also related to the level of competition in a criminal setting. Past research established that criminal markets are hostile settings in that they demand intense competition from participants and result in important economic disparities. Criminal network research has helped us understand the factors accounting for an offender's status as a *have* or *have-not* within such competitive arenas. In an inmate survey, Morselli and Tremblay (2004) found that offenders who reported higher criminal earnings were also the most personally organized. Such offenders were not part of fixed and easily identifiable organizations. They were, instead, higher earners who operated autonomously, and who were more likely to have more contacts than lower earners in the sample. Most important, their personal criminal networks were more likely to follow brokerage patterns. This was particularly true for offenders who participated in criminal markets.

Similar findings pointing to the benefits of brokerage have emerged in a variety of criminal settings. Morselli (2005) conducted two case studies on the evolution of individual criminal networks across lengthy careers in international cannabis smuggling and Cosa Nostra racketeering and found that brokerage was highest during the peak levels of success in each criminal career. Although not as explicitly focused on the brokerage effect, past research has recognized that such a networking pattern was an important feature in organized crime. Coles (2001), Klerks (2001), and Williams (1998) reviewed past research on brokerage and concluded that the presence of multiple brokers in a criminal network is more likely in groups that indicate a higher degree of sophistication or organization. The value of brokers has also been a consistent finding in studies of illegal drug trafficking (Desroches, 2005; Natarajan, 2006; Pearson & Hobbs, 2001; Zaitch, 2002), human smuggling (Kleemans & Van de Bunt, 2003; Zhang, 2008; Zhang & Chin, 2002), ringing networks (Bruinsma & Bernasco, 2004), and general criminal enterprise settings (Finckenauer & Waring, 1998; Haller, 1990).

The distinction between degree and betweenness centrality is crucial for approaching criminal networks. One recent case study of a drug distribution network surrounding the Hells Angels in Quebec examined the relative positioning of participants and found that the network was not as neatly and tightly organized as professed by law enforcement officials and the media (Morselli, 2009). Members of the Hells Angels and those participants in the drug distribution activities who did not have biker status were acting and organizing themselves at a more individual level. Indeed, organizational status had little influence on how participants in the network surrounding the Hells Angels were positioned. The most connected participants and the key brokers in the network were not members of the organization. Among Hells Angels members, formal ranks did have some influence on how participants were positioned within the wider network. Lower-level members were more likely to be high on degree centrality and low on betweenness centrality. For elite members, brokerage was higher than degree centrality. Higher-level members were, therefore, positioned more strategically and less visibly than lower-level members. Overall, organization status was important for understanding the organization itself, but not the wider network that surrounded it. In short, to understand how participants were involved in the drug distribution activities under analysis, it was necessary to examine the individual positioning of participants within that wider network and not their rank within the organization that was at the core of this network.

More often than not, criminal network participants are balancing both forms of centrality. In as much as the interplay between the two centrality measures emerged to some extent within this previous analysis (at least within the set of participants who were members in the Hells Angels), a straightforward test of this overlap was not conducted for the network as whole. This will be the focus of analyses for the present study. The following case study will examine how positioning in the drug distribution network surrounding the Hells Angels determined a participant's fate in the investigations that targeted them. Network positioning, in this case study, does not simply refer to one's degree or betweenness centrality. The assumption, here, is that few participants fit the exclusive "high-degree" or "ideal-broker" scenario and that an understanding of positioning in criminal networks requires an assessment of both forms of centrality combined. It is, therefore, the overlap between degree and betweenness centrality that is under analysis here.

The overlap between these two centrality measures provides us with four networking patterns that could be at play at any given time within a criminal network. These patterns provide us with an outlook on vulnerability and strength within a criminal network. First, criminal networks generally have a core of key participants, and we may assume that most participants are only marginally involved, making them low in both degree and betweenness centrality. Such participants may be easy targets for random law enforcement controls of a criminal network but are more likely ignored or minimally investigated in more organized police operations. Two other scenarios concern those participants in a criminal network who are high on only one form of centrality. Following insights from previous research, we should expect that participants who are high in degree centrality and low in betweenness centrality will be more likely arrested, accused, or convicted than participants who are low in degree centrality and high in betweenness centrality—in this latter scenario, the brokerage edge emerges. A final overlap consists of those participants who are high in both forms of centrality. In such a scenario, we should expect the risks associated with degree centrality to outweigh the brokerage edge that some participants may have.

## Sources and Research Design

The present study analyzes data obtained from an investigative case against members and associates of the Quebec Hells Angels. One feature that remains unique to the Quebec branch of the Hells Angels is the club's intense association with crime and violence since its arrival in the province during the late 1970s. Already reputed as a criminalized (or *onepercenter*) biker club during the 1980s and early 1990s (see Alain, 2003; Tremblay, Laisne, Cordeau, MacLean, & Shewshuck, 1989), a clear shift in the club's notoriety took place in 1994, the year in which a sixth chapter was created in the province. This last chapter was a Nomad chapter that was comprised of the most reputed Hells Angels members across the province. Although Nomad chapters are not restricted to a specific geographical territory, this new group quickly became a heavy presence in the Montreal region. In Montreal, the predominant biker clubs preceding the creation of the Nomads included members of Hells Angels chapters from outside the city and a Montreal-based group, the Rock Machine. The Rock Machine was at the core of an amalgam of small biker groups and independent drug merchants who joined

forces to form the Alliance during the latter half of the 1990s, largely in reaction to the overwhelming presence of the Hells Angels Nomads in the city's drug markets.

Between 1994 and 2001, the Hells Angels and Alliance were at the heart of a lengthy biker conflict that led to a substantial number of killings in and around the city. The claim in law enforcement and media circles was that control of Montreal's illegal drug markets was at stake. Reports vary, but the most valid count maintains that, during this 7-year period, 261 victims were implicated in the confrontation between these two factions, leading to 126 murders and 135 attempted murders—55% of these victims were members or associates of the Hells Angels (for more details on these events, see Morselli, Tanguay, & Labalette, 2008). No other period in Quebec or Canadian history has been marked by such consistent and clustered homicides over such an extended period of time and around a specific group. The escalation of violence led to an important reaction by federal legislators and law enforcement officials: In 1997, Canada's first antigang legislation was brought to force. In May 1998, a province-wide infrastructure of six investigative squads (known as the Mixed Regional Teams) was established to mirror and control the six Hells Angels chapters across Quebec.

In March 2001, this investigative tandem of investigators and analysts from the Royal Canadian Mounted Police, the Sûreté du Québec, and the Montreal Police arrested more than 100 members and associates of the Hells Angels in what was "the biggest organized crime sweep in Canadian history" (Sher & Marsden, 2004, p. 254). This crackdown was named *Operation Springtime*. Criminal charges against those arrested ranged from weapons offences, money laundering, conspiracy, drug trafficking, murder, and gangsterism. The evidence assembled against Hells Angels members and associates was massive. This included the colossal collection of electronic surveillance transcripts intercepted throughout the task force investigation that led to the Operation Springtime crackdown.

The end of the court proceedings against the Hells Angels marked the beginning of the present case study. I was able to obtain the ensemble of evidence that was submitted during the trials. The present analysis examines the electronic surveillance data that were compiled during the investigations leading up to Operation Springtime. In all, police recorded 270,000 logs of interactions. Much of this information was meaningless and a first extraction of all logs that recorded nonconversational interactions (e.g., pager alerts, unanswered calls, busy signals, and wrong numbers) reduced this number considerably. During a second extraction phase, all computer files that were 400 bytes or less (the size of a file without any conversational content) were also removed. At the point, 20,502 logs were left. These logs recorded interactions between 1,500 individuals. However, not all individuals falling in the surveillance net were participants in the criminal network. The final network of 174 participants is the result of a selection process that excluded all individuals who were not targeted by the police and for whom no additional evidence could be provided to illustrate their participation in the criminal operations that were under investigation (for more details on Operation Springtime and the present case study, see Chapters 2 and 8 in Morselli, 2009).

For the subsequent analysis, degree and betweenness centrality distributions were overlapped to visually assess the positional variations within the sample of network participants. An overlap variable was then constructed by dichotomizing each variable

at the mean and creating four combinations that are at the core of the hypothetical design presented earlier: (1) participants who were low in degree centrality and low in betweenness centrality, (2) participants who were low in degree centrality and high in betweenness centrality, (3) participants who were high in betweenness centrality and low in degree centrality, and (4) participants who were high on both forms of centrality. In a final analysis, these four groups are compared for their arrest patterns and to assess the argument that degree centrality makes a criminal network participant more visible and, thus, more likely to be arrested, whereas betweenness centrality (or brokerage) makes one more strategic and less likely to be arrested.

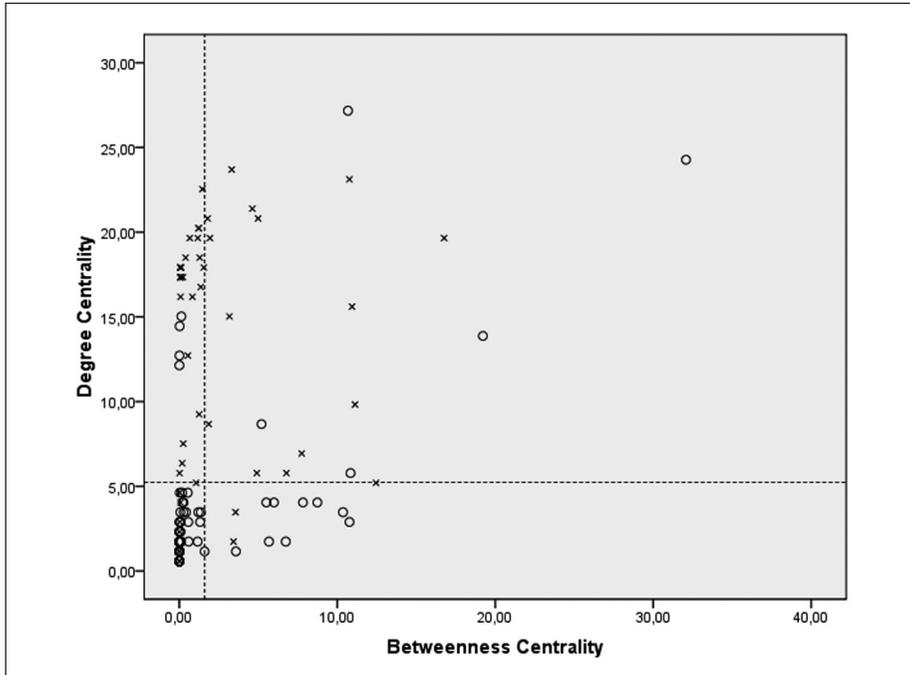
## Results

As discussed earlier, in some criminal networks, the same participants may be strong in more than one form of centrality—for example, small networks that are structured around brokerage are more likely to have one or two participants who are high in both degree and betweenness centrality. The Hells Angels network does share this overlap, but only moderately. Degree and betweenness centrality were significantly correlated ( $r = .40, \alpha < .001$ ). This suggests that there were some participants who had a relatively high volume of direct contacts while also occupying key brokerage positions but that many participants were generally “favoring” one form of centrality over the other. If we enter arrest into the model, we find the first indications that a high volume of direct contacts increases a participant’s vulnerability, whereas higher brokerage capital represents more strategic networking: A strong and significant correlation was found between degree centrality and being arrested ( $r = .63, \alpha < .001$ ); betweenness centrality is not significantly correlated with the likelihood of arrest, though the relationship is positive ( $r = .13$ ).

Figure 1 illustrates the scatter plot of degree centrality by betweenness centrality for all 174 network participants. The dotted lines extending from each axis mark the cutoff point (the mean) for each variable. The low-degree-centrality/low-betweenness-centrality group is at the lower left of the graph ( $n = 116$  participants). The high-degree-centrality/low-betweenness-centrality group ( $n = 27$ ) is at the upper left of the graph. The high-degree-centrality/high-betweenness-centrality group ( $n = 19$ ) is at the upper right of the graph. The low-degree-centrality/high-betweenness-centrality group ( $n = 12$ ) is at the lower right of the graph. Participants are also coded to identify those who were (x) and were not (o) arrested.

Probably the most obvious observation from Figure 1 is that, with two thirds of the sample falling in the low-degree-centrality/low-betweenness-centrality zone, most of the participants in this network were marginal in terms of either form of centrality. However, this group did not consist of only fringe participants—indeed, 5 Nomads and 10 other participants with Hells Angels membership status were identified in this network. Only 10% of this group were arrested, suggesting that even though reputed members of the biker organization were found in this group (all were among the 10% who were arrested), the strong majority of participants in this sizeable category were largely minor players in the drug distribution activities.

The inverse scenario is found across the graph with the high-degree-centrality/high-betweenness-centrality group. Although fewer in number (only 11% of participants),



**Figure 1.** Scatterplot of degree centrality and betweenness centrality within the drug distribution network  
 Note: o = not arrested; x = arrested.

this group was also comprised of five Nomad chapter members and seven other participants with Hells Angels membership status. Participants in this group were also among the most likely to be arrested during the Operation Springtime crackdown, suggesting that the visibility that comes with high degree centrality does outweigh any strategic capital that may come with betweenness centrality. This group also included the principal informants for the law enforcement tandem. Although both were key participants within and beyond the Hells Angels organization, their positioning may be more likely attributed to their central role in providing information that oriented the investigation.

Although arrests were high in this last group, the highest proportion of arrests was found in the high-degree-centrality/low-betweenness-centrality group (85% were arrested). This group represents the basis of the vulnerable/strategic networking trade-off and is largely comprised of the lower-level members in the Hells Angels organization (but note that three Nomad members were also found in this group).

The final group may be described as the most strategic set of participants in the network. Indeed, only 7% of the network was found here and only 25% was arrested during the Operation Springtime crackdown. Probably most surprising for those who targeted the Hells Angels during this investigation was that only one participant in this group had membership status in the biker club. This group consists of the key broker at the Montreal Port who was smuggling the main drug consignments for the network (who was arrested), a liaison between this port broker and one of the main trafficking

groups in the network (arrested), the main money carrier (arrested), the principal participants who were actively involved in managing the profits from the drug distribution activities (not arrested), a computer expert who created an accounting program to keep track of the profits (not arrested), and a lawyer who represented three participants in the network (not arrested). As this breakdown suggests, those participants who were involved in the more peripheral activities surrounding the drug distribution that was being directly targeted during the investigations leading up to Operation Springtime were largely ignored during the final crackdown. At least in terms of networking capital, such facilitators were more pivotal to the activities under investigation than the more reputed Hells Angels members. This capacity to participate from a distance, once again, is the basis of the brokerage edge in a criminal network.

## Conclusion

Two forms of centrality provide outlooks of very different networking patterns. Degree centrality keeps one in the thick of things. Betweenness centrality keeps one active, but from a more discreet position. These network positions are not mutually exclusive, and any given criminal network participant is continuously balancing the visibility of degree centrality with the strategic benefits of betweenness centrality. The visibility that comes with high degree centrality was indeed a sign of vulnerability in the network under analysis in that the two groups of participants with high degree centrality were also the most likely to be affected by arrests—more than half the participants in each group were arrested in the final crackdown.

Though still subject to considerable interpretation, the brokerage capital that comes with high betweenness centrality (and low degree centrality) does suggest a strategic form of positioning somewhat reminiscent of Baker and Faulkner's claim that the craftier criminal network participants likely prefer the security of the periphery over the hands-on action of the core.

Knowing how a criminal network is structured and being able to assess key participants therein is a fundamental objective for any investigation. Operation Springtime was typical of Canadian investigations against criminal market groups in that it followed the traditional assumptions regarding organized crime: that the drug distribution activities were centrally structured around a formidable criminal organization (the Hells Angels, in this case) with leaders who governed the actions of all other participants. The introduction of social network analysis during an investigation brings an evidence-based assessment into the process and allows investigators and analysts to identify structure rather than assume it. Such an approach is not only essential for evaluating the traditional perceptions that guide many investigations but also for recording the ongoing interactions between participants who were or were not removed/arrested during an investigation. Within the law enforcement agency, this empirically driven process thus creates an ongoing transmission of knowledge regarding the network as a whole and each individual participant while also permitting an assessment of how the criminal network may sustain itself or adapt even after a substantial number of its participants were removed.

One important extension of this analytical approach would integrate shifts in individual network positions over time. Yearly tracking of such networking patterns could rely on

a variety of data sources (e.g., electronic and physical surveillance data, co-offending records, informant sources). A systematic assessment of participants would allow law enforcement and intelligence officials to keep track of criminal market participants as they move from one positional quadrant to the next. A participant's shift toward greater brokerage would indicate a more autonomous and more privileged place within the greater network. A shift toward greater direct connectivity and more redundant networking would indicate a decrease in autonomy and a possible drop in a participant's personal repute. Based on past research that has consistently demonstrated the importance of personal organization and standing within serious crime settings, such avenues of investigation would appear to be better suited for target assessment than any law enforcement strategy that relies on the lingering kingpin assumption.

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## Bio

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