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# Monitoring and Disrupting Dark Networks A Bias toward the Center and What It Costs Us

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## **Monitoring and Disrupting Dark Networks**

**A Bias toward the Center and What It Costs Us**

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# Monitoring and Disrupting Dark Networks

## A Bias toward the Center and What It Costs Us

Nancy Roberts, Ph.D. and Sean Everton, Ph.D.

### Abstract

The goal of this article is to explore this analytic bias—how it is manifested, why it appears so extensive, and what unwitting limitations it imposes on our strategic options to counter terrorism. We use data from a study of the Syrian opposition network that was conducted in the CORE Lab at the Naval Postgraduate School in Monterey California (Lucente and Wilson 2013). The original study sought to provide a window into the armed opposition units against the regime of Syrian President Bashar Assad. This article proceeds as follows: We begin by reviewing the various strategies that can be used for disrupting dark networks. These can be broken down into two broad categories – kinetic and non-kinetic. The former uses coercive means for disruption while the latter seeks to undermine dark networks using with subtler applications of power. Drawing on a previous analysis, we illustrate how some of these strategies can be implemented, while at the same time highlighting our own bias in that study toward central actors. We then turn to an analysis of the Syrian opposition network, highlighting how a central focus can blind analysts to other important aspects of a network; in this case, elements that ultimately aligned themselves with the Islamic State of Syria (ISIS). We conclude with some implications for the future use of SNA to monitor and disrupt dark networks.

**Keywords:** ISIS, Terrorism, Counter-Terrorism, Strategy, kinetic and Non-Kinetic, Electronic Warfare, Capacity-building.

### Introduction

The interest in dark networks—covert and illegal networks (Milward and Raab 2006; Raab and Milward 2003) that seek to conceal themselves and their activities from authorities—has been long-standing. Analysts have explored secret societies (Erickson 1981; Simmel 1906), criminal networks (Sparrow 1991), and price-fixing conspiracy networks (Baker and Faulkner 1993). And increasingly after 9/11, they have used social network analysis (SNA) as a tool to track and disrupt them (Carley, Lee and Krackhardt 2002; Koschade 2006; Krebs 2002; Magouirk, Atran and Sageman 2008; McCulloh and Carley 2011; Pedahzur and Perliger 2006; Rodriguez 2005; Sageman 2004).

In an early review of this literature (Roberts and Everton 2011), especially the strategies used to counter terrorism, we identified a bias toward the kinetic approach—targeting of terrorists for the purpose of neutralizing, capturing, or eliminating them and their supporters. As our program of research and operational experience evolved, we came to understand that the sole reliance on the kinetic approach was too limiting. The “one-size-fits-all” kinetic approach prevents analysts from exploring the subtleties of a situation and developing strategies to fit a particular context. We therefore identified and recommended a range of strategic options from the kinetic to the non-kinetic. We briefly review these options in section one below to serve as a reminder that



tracking and disrupting terror networks call for a more nuanced understanding of terrorism and the strategies to counter it.

As we expanded our exploration of terror networks, we uncovered another bias in our counterterrorism research. Although the choice of strategic options gradually expanded, the metrics and tools used to analyze these networks still were limited in scope. Analyses tended to focus on the removal of central nodes and brokers or the breaking of central ties and links among individuals, groups, or organizations. The pattern appeared to be widespread; the preferred metrics in counterterrorism had an analytical bias toward the network's center.

Our goal in this paper is to explore this analytic bias—how it is manifested, why it appears so extensive, and what unwitting limitations it imposes on our strategic options to counter terrorism. We use data from a study of the Syrian opposition network that was conducted in the CORE Lab at the Naval Postgraduate School in Monterey California (Lucente and Wilson 2013). The original study sought to provide a window into the armed opposition units against the regime of Syrian President Bashar Assad. This article proceeds as follows: We begin by reviewing the various strategies that can be used for disrupting dark networks. These can be broken down into two broad categories – kinetic and non-kinetic. The former uses coercive means for disruption while the latter seeks to undermine dark networks using with subtler applications of power. Drawing on a previous analysis, we illustrate how some of these strategies can be implemented, while at the same time highlighting our own bias in that study toward central actors. We then turn to an analysis of the Syrian opposition network, highlighting how a central focus can blind analysts to other important aspects of a network; in this case, elements that ultimately aligned themselves with the Islamic State of Syria (ISIS). We conclude with some implications for the future use of SNA to monitor and disrupt dark networks.

### **Generic Strategies**

Our earlier research in counter terrorism explored two generic approaches to disrupting dark networks:<sup>1</sup> *kinetic and non-kinetic* (Roberts and Everton 2011). The kinetic approach involves aggressive and offensive measures to eliminate or capture network members and their supporters. Its objective is to target enemy combatants for the purpose of neutralizing, capturing, or eliminating them. The non-kinetic approach involves the use of restrained, non-coercive means for combating dark networks. It involves a more subtle and patient application of power by seeking to undermine terror networks “more through cooperation and collaboration with partners than through unilateral American action, more with the diplomatic and economic tools of national power than with the military, stressing inspiration rather than prescription” (Brimley and Singh 2008:313).

Two strategies emerge from the kinetic approach: *targeting and capacity-building*. *Targeting* is U.S. led and *capacity-building* is host-nation led. Both can be pursued at the individual, group, and organizational (i.e., institutional) levels. For example, *person-level targeting*, often referred to as man-hunting (Marks, Meer and Nilson 2005), goes after individuals such as Saddam Hussein, Abu Busab al-Zarqawi, or key al Queda and ISIS leaders in Syria and Iraq. *Group-level targeting* focuses on particular teams, groups, or a subset of a terror network. Examples include

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<sup>1</sup> Dark networks are defined here as illegal and covert networks (Raab and Milward 2003).

the round-up of specific groups fashioning IEDs in Iraq (Peter 2008), the disruption of the Syrian recruitment network bringing jihadists into Iraq (Felter and Fishman 2007), and the shut-down of the financial network supporting the Indonesia-based Jemaah Islamiyah (JI) (Abuza 2003). Organization-level targeting puts the microscope on a particular organization to limit its activities or shutting it down. Examples include Malaysia's successful effort to close down Luqmanul Hakiem, a jihadist religious boarding school (Rabasa 2005) and its closure of the Al-Qaeda-linked Islamic NGO, Pertubuhan al Ehasan in 2002 (Abuza 2003).

*Capacity-building* occurs when the U.S. military works "through, by, and with" indigenous forces to build their capacity to conduct effective targeting operations against common enemies as capacity-building. Here, the focus is on training and advising others' security forces to become a professional force rather than pursuing a U.S.-led security strategy (Fridovich and Krawchuck 2007). Although some U.S. military references treat capacity-building as an example of the indirect approach, we prefer to characterize it as kinetic because of its use of aggressive, coercive tactics. Operation Enduring Freedom in the Philippines in 2002 was one such example. Special Operation Command forces deployed to Basilan, a southern island, to advise and train the Armed Forces of the Philippines (Fridovich and Krawchuck 2007; Krawchuck ND; Wilson 2006). The outcome of this effort was to reduce the threat posed by the Abu Sayyaf Group (ASG). By 2005, the armed strength of the ASG fell from an estimated 1,000 in 2002 to somewhere between 200 and 400 in 2005 (Lum and Nicksch 2006; updated 2009). Like the targeting strategy, capacity-building can involve person-, group- or organization-targeting. The non-kinetic approach, like the kinetic approach, can be U.S. or host-nation led, depending on resources and capabilities. The intent is to secure the population's safety and support and undermine the enemy's influence and control. *Five strategies emerge from the non-kinetic approach: institution-building; psychological operations (PsyOp); information operations (IO); rehabilitation, and tracking and monitoring.*<sup>2</sup>

The *institution-building strategy* promotes reconstruction in war-torn communities. It requires the active involvement of Civil Affairs forces that provide humanitarian and civic assistance and work in tandem with inter-governmental and inter-agency partners in the reconstruction process. The emphasis is on building healthy host-government institutions of governance, rule of law, and economic development (Fridovich and Krawchuck 2007; Kilcullen 2009). Interestingly, contemporary just war theorizing sees institution-building as a necessary criterion of what it means to fight a "just war" (Allman and Winright 2010).

The *psychological operations (PsyOp) strategy* involves the dissemination of information for the purpose of influencing the emotions, perceptions, attitudes, objective reasoning, and ultimately the behavior of foreign nationals (individuals, groups, organizations, governments) so that they are more aligned with US goals and objectives during times of conflict and peace (U.S. Special Operations Command 2003). Psychological operations also are employed to counter adversary propaganda and to sow disaffection and dissidence among adversaries to reduce their will to fight and ultimately to induce their surrender. One example was the UK's plan to split the Taliban from within by securing the defection of its senior members and a large number of their supporters. It followed from Gordon Brown's decision to put much greater focus on courting

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<sup>2</sup> Our original article included only four non-kinetic strategies. A fifth was added to a later publication (Everton 2012).



“moderate” Taliban leaders and “tier-two” foot soldiers who fought more for money and a sense of tribal loyalty than for the Taliban’s ideology as well as from the U.S.’ consideration of a divide-and-conquer strategy to peel away some lower-level members of the Taliban and win back the population (Cooper 2009; Rubin 2011). The intent was to alter local jihadists’ perception that partnering with al Qaeda enabled them to achieve their political goals. PsyOp approaches also include deception tactics that attempt to turn terrorists or sub-groups within an organization against each other.

The *information operations (IO) strategy* uses integrated employment of electronic warfare and computer network operations to combat terrorism. Electronic warfare refers to any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the adversary. Computer network operations is one of the latest capabilities developed in support of military operations and stems from the increasing use of networked computers and supporting IT infrastructure systems by military and civilian organizations. Along with electronic warfare, it is used to attack, deceive, degrade, and disrupt information operations capabilities and to deny, exploit, and defend electronic information and infrastructure. Examples include the disruption of fund transfers, the monitoring of charitable donations, the detection of money laundering, black market activity and the drug trade. Activities also include interventions to compromise terrorists’ cell phone and online connections and the use of these platforms to locate jihadist leaders and their followers.

The *rehabilitation strategy* uses moderate preachers to counsel terrorists and to instill in them a more balanced view of Islamic teachings. Singapore’s counter-ideological program founded by Muslim scholars who seek to “correct” the thinking of its detainees is one such example (Ramakrishna 2005, 2009, 2012). Established in 2003, the Religious Rehabilitation Group is an unpaid, all volunteer group of Islamic scholars who supplement their formal religious training with a year-long course in counseling. Even before counseling sessions can begin, both male and female counselors study the “Jihad Manual” that prepares them to counter terrorists’ ideological distortions. Typically one counselor works with a member of the Singaporean Internal Security Department and a government psychologist on a particular detainee.

In 2005 counselors began working with detainees’ families, especially the spouses, aided by the Interagency After-Care Group, which focused on the welfare of the detainees’ families. The Interagency After-Care Group provides financial assistance, teaches wives skills and helps them find work, and ensures the continued education of the children by negotiating school fee waivers and providing them with pocket money. The Religious Rehabilitation Group also extends its influence into the wider Muslim community by giving talks, sponsoring fora, disseminating publications, and even hosting a website, the aim of which is to “immunize” the minds of Singaporean Muslims against violent radical Islamist ideologies. In addition, the Singapore government is attempting to forge closer ties between Muslims and non-Muslims through the Community Engagement Program, Inter-Racial Confidence Circles in neighborhoods, workplaces, and schools. Similar rehabilitation programs also have been introduced to other countries such as Indonesia, Saudi Arabia and Yemen.

Finally, the *tracking and monitoring strategy* draws on John Arquilla’s (2009) insight that sometimes the best strategy is to do nothing at all. Not exactly nothing, but sometimes our

information on a dark network can be incomplete, so rather than taking immediate action, it is better to track and monitor certain actors with the hope of improving our knowledge of the network, which will in turn improve the selection of strategies adopted down the road:

In the successful strikes against al Qaeda affiliates in Singapore, Morocco and Saharan Africa, the key doctrinal approach was to wait and watch for a considerable period, then to swarm the targets simultaneously at their moment of maximum illumination. This strategic patience grew out of the understanding that striking at nodes *as* they were identified might actually reduce the ability to detect and track other cells in the networks in question. It is a curious doctrinal point about netwar: the more that is disrupted, the less may be known (Arquilla 2009:34).

To summarize, in this section we have distinguished between two general approaches to countering dark networks: kinetic and non-kinetic. The former approach pursues aggressive measures designed to eliminate or capture network members and their supporters, while the latter employs neither bombs nor bullets but instead uses non-coercive means to counter networks and impair a combatant's will to fight. It includes activities such as the reconstruction of war-torn areas, the disruption of electronic fund transfer networks, information campaigns to win over the "hearts and minds" of local populations, efforts at the rehabilitation and reintegration of dark network members into civil society, and the tracking certain members in order to improve our knowledge and understanding of the network.

### **Network Centric Counter-Terrorism Strategies**

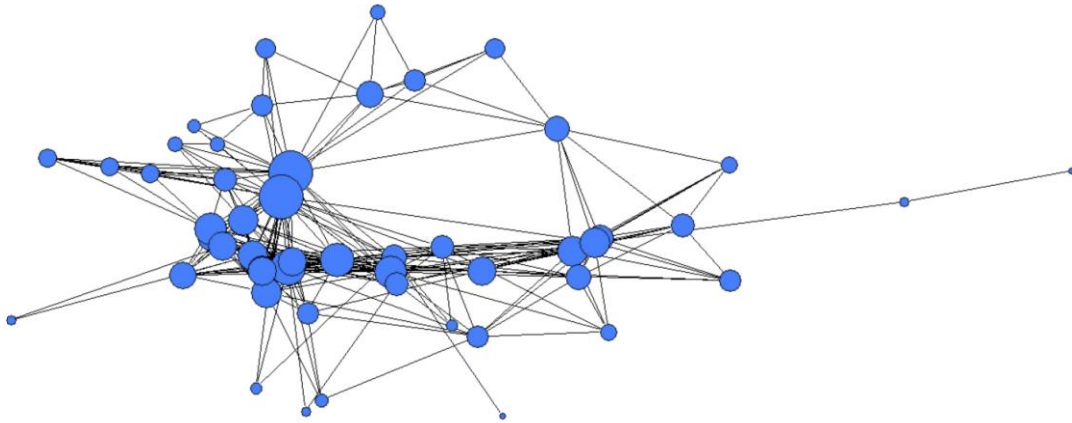
The above framework broadened our range of options to counter terror networks beyond the kinetic to the more expansive non-kinetic strategies. But no matter what the level of analysis or whether the strategies were U.S or host-nation led, a retrospective analysis of our research identified a pattern. We focused on the removal of central nodes and brokers or the breaking of central ties and links among individuals, groups, or organizations.

For example, in our examination of the Noordin Top network (Roberts and Everton 2011), we created two multi-relational<sup>3</sup> networks—an operational network and a trust network. We then estimated four basic centrality measures (i.e., degree, closeness, betweenness, and eigenvector) for the operational network at the individual level (metrics not shown). Figure 1 identifies the most central nodes of the operational network by varying node size by degree centrality.<sup>4</sup> We then described how a deception campaign—a non-Kinetic, PsyOp Strategy—could be waged against these central individuals "where the messages and observables (would) resonate the greatest" (Anonymous 2009:8-9).

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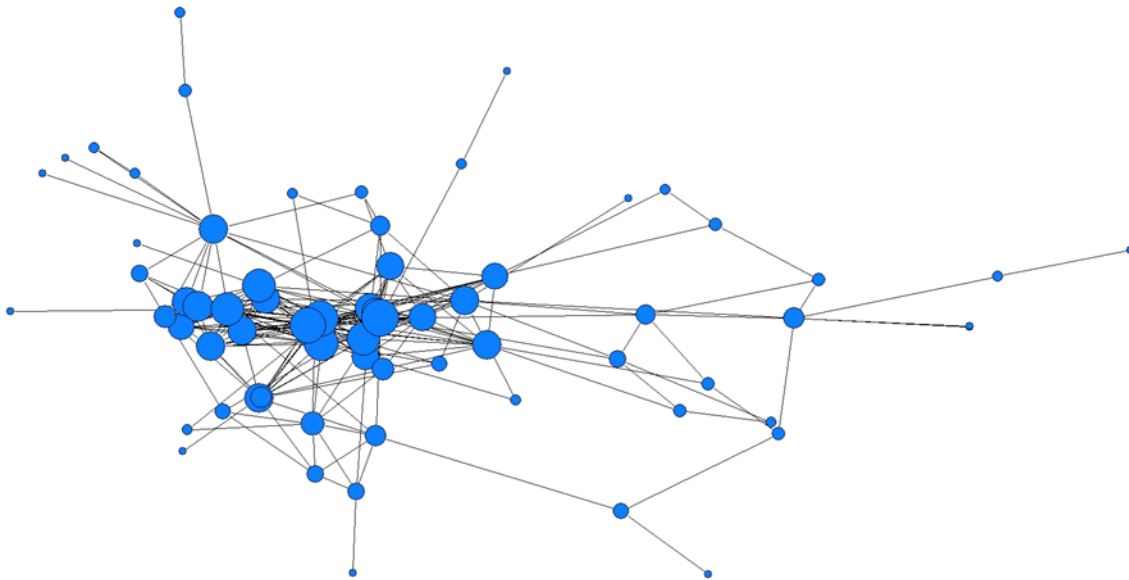
<sup>3</sup> These multi-relational networks are referred to as multiplex (multiple types of relational networks) that are combined and "stacked" together.

<sup>4</sup> Unless otherwise noted, we created the network graphs presented in this paper with the social analysis tool, *Pajek* (Batagelj and Mrvar 2015).



**Figure 1: Operational Network (Degree Centrality)**

We followed a similar in developing a targeting strategy (kinetic) for the trust network at the individual level. The trust network, which consisted of the friendship, kinship, religious and school networks, is shown in Figure 2. As with the operational network, the size of the node reflects degree centrality. We then discussed the prospects for a targeting campaign given the distinct core-periphery structure of this network.



**Figure 2: Trust Network (Degree Centrality)**

Despite our best efforts to develop and expand our strategic options, we kept returning to the use of centrality metrics to analyze the network and develop our strategies. This emphasis on centrality metrics is not uncommon. In fact, it appears to be the starting point for most analyses of dark networks (see e.g., Cunningham et al. 2013; Famis 2014; Gerdes 2015; Nash and Bouchard 2015; Patel et al. 2015).

What we wish to explore for the remainder of the article is what this pull toward the center may cost us. In the case that follows, we illustrate how centrality measures do provide important insights about the network's central nodes. However, we also learned the hard way that our bias



toward the center can and does obscure other aspects of the networks that had equal and potentially more value.

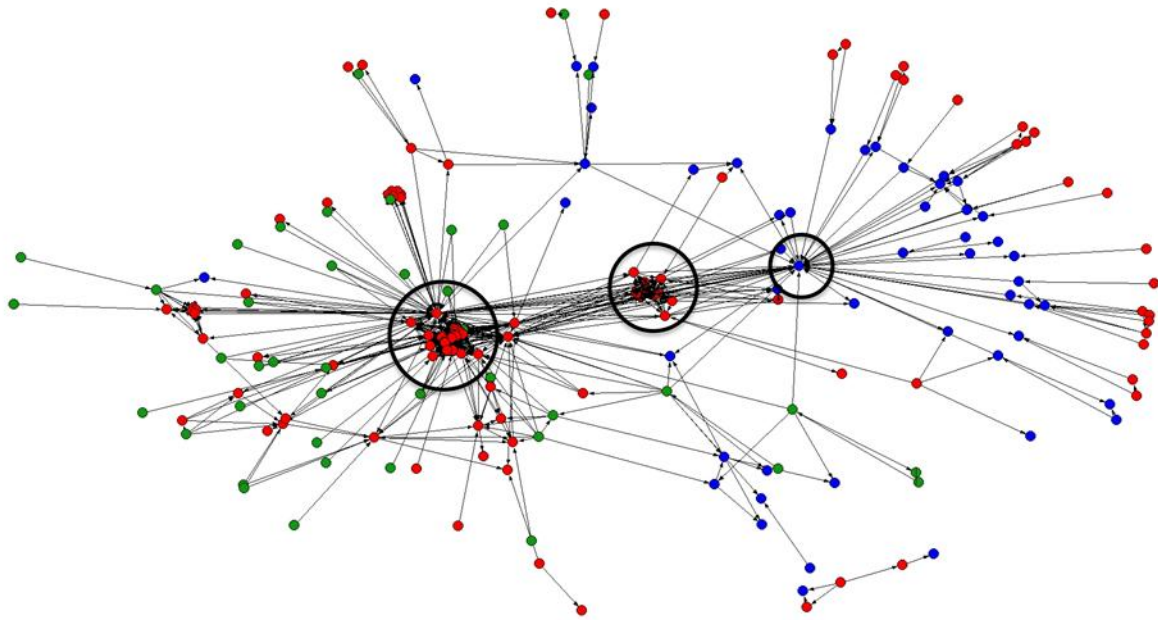
### **The Case: Syrian Resistance Network**

The year was 2011. The outbreak of rebellion and conflict against the Syrian regime of President Bashar Assad regime of Syria prompted concerns over Syria's chemical weapon sites. Resistance groups against Assad were proliferating and some included Jihadists rebel groups. The U.S. was concerned that the Syrian arsenal of chemical and biological weapons would fall into the hands of jihadists. Thus the U.S. government raised the question: Was it possible to distinguish among these rebel groups? Was it possible for the U.S. to identify and work with some of these rebel groups while at the same time minimizing and avoiding contact with the jihadists?

To answer this question, researchers (Lucente and Wilson 2013) gathered social network data on individuals, military units, and political organizations with ties to the Syrian Resistance movements. These were collected from a variety of social media sources, such as the Facebook, Twitter, and YouTube websites used by Syrian civil-military opposition elements, as well as a number of different reports from outlets such as the Institute for the Study of War (ISW) (Berman 2012; Bolling 2012; Holliday 2011, 2012a, b; O'Bagy 2012a, b, c), the Syrian National Council (Syrian National Council 2012), and Middle East Security Reports 2-6 (Sharp and Blanchard 2012). The research resulted in a multi-modal network consisting of 133 individuals, 60 political organizations, and 59 military units,<sup>5</sup> a network graph of which is presented in Figure 3 where red nodes indicate individuals, green nodes indicate political organizations, and blue nodes indicate military units.

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<sup>5</sup> The original researchers treated the multi-modal data as what social network refer to as a one-mode network, which was technically incorrect since individuals are generally considered a different type of actor than political groups and military units. Ideally, they would have coded all of the data at the individual level using the leaders of the military units and political groups rather than the units and groups themselves. That granular level of data was simply unavailable, however, so the military units and political groups essentially functioned as "stand-ins" for the leaders of those units and groups. Thus, it is legitimate to treat and analyze the network as a one-mode network. The data have also been refined and cleaned since the original analysis, so the number of actors in the network is somewhat different. The network's structure remains essentially the same, however.



**Figure 3: Syrian Resistance Network (isolates hidden); Node Color Reflects Individuals (Red), Political Organizations (Green), Military Units (Blue)**

Based on their analysis of the network's density and centralization, Lucente and Wilson concluded that it was federated network in that its units were "spread geographically throughout the operational battlefield," which provided them with a great deal of autonomy (Lucente and Wilson 2013:24). Quoting Patti Anklam (2007:67), they note that in a federated network, "the core network serves as the hub of multiple, relatively autonomous hubs" (Lucente and Wilson 2013:24). This is a possible interpretation, but Figure 3 suggests a somewhat more complex story.<sup>6</sup> To be sure there are a number of actors on the periphery that are not tied to one another, but almost all have direct or indirect ties to either a central actor or a cluster of central actors (circled in Figure 3). Thus, the network appears to be neither a hierarchy nor a federation but a mix of the two. Indeed, centralization analysis of the network yields mixed results. In terms of degree (2.81%) and betweenness (6.81%) centrality, the network's centralization is quite low, while in terms of closeness (66.94%) and eigenvector (73.17%) centrality, the network's centralization is quite high.<sup>7</sup>

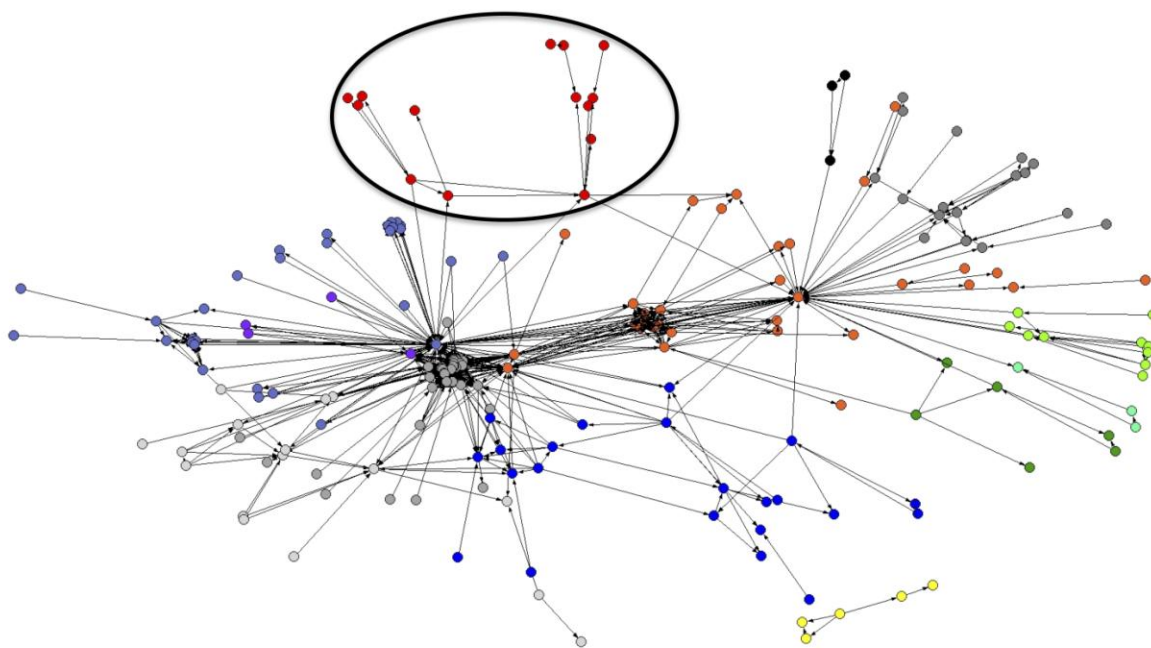
More importantly for our analysis is that Lucente and Wilson focused on the relatively small and centrally group of actors (circled in Figure 3) that appeared to function as brokers in the network, in particular those who lay "between the rebellion's political and armed opposition" (Lucente and Wilson 2013:24). There is nothing inherently wrong with such a focus since actors in positions of brokerage between insurgent groups should be of interest to researchers and

<sup>6</sup> This is not the same network graph presented by Lucente and Wilson (2013: 25, Fig. 2), which they generated using the graph drawing program, *Gephi* (Bastian, Heymann and Jacomy 2009). It shows the network as consisting of two main clusters separated by a central cluster of a small group of actors whereas here the central cluster is broken down into three separate but central clusters.

<sup>7</sup> The standard centralization algorithm calculates the variation between the centrality scores of all actors in the network with the highest centrality score in the network. See Everton (2012:152). Centralization indices were calculated with the social network analysis program, UCINET (Borgatti, Everett and Freeman 2002).



analysts. However, by limiting our focus to only central actors we can blind ourselves to other elements of a network that may also prove to be important.



**Figure 4:** Syrian Resistance Network (isolates hidden); Node Color Reflects Subnetwork

Consider, for instance, Figure 4, which presents the same network, except now the color of the actors' nodes reflect the subnetwork to which they were assigned by the Louvain clustering algorithm (Blondel et al. 2008) as implemented in Pajek (Batagelj and Mrvar 2015).<sup>8</sup> As the figure indicates, the Syrian opposition network is far more complex than it initially appears. In particular, the Louvain algorithm identified 13 different subnetworks, suggesting that although some actors and clusters are more central than others (for example the orange colored nodes located at the center of the graph), there are numerous subnetworks that may be worthy of analysts' attention. In particular, note the red colored subnetwork toward the top of the graph (circled). What is intriguing about this subnetwork is that it contains elements that often shifted their alliances but ultimately aligned themselves with the Islamic State in Syria (ISIS).<sup>9</sup> This fact, however, is completely lost if we only focus on the network's central actors. In other words, while focusing on a network's central actors can provide important information about the network, limiting ourselves to only those actors can obscure other aspects of a network that may have equal and potentially more value.

<sup>8</sup> There are numerous social network analysis clustering algorithms that assign actors to distinct subnetworks based on the network's pattern of ties. In general, these algorithms assume that ties within a subnetwork are denser than across subnetworks. The Louvain method is a widely accepted clustering algorithm that has been implemented in numerous social network analysis packages. In Figure 8 node color indicates the subnetworks to which the various actors have been assigned by the Louvain algorithm.

<sup>9</sup> This was determined by the names of the individuals, political organizations, and military units included in this subnetwork.



## Implications

This brief analysis suggests several implications for the use of social network analysis to monitor and disrupt dark networks. First, the fact is that metrics, and in particular centrality metrics, tend to drive analyses of dark networks. Second, our use, some would say overuse, of centrality metrics then influences our description of the network and our visualization of its underlying structure. Third, much of this partiality for things central is a function of our visualization process that leads us to focus on what is central over what is not.

*Centrality bias tends to drive analysis.* The tendency for analysts to gravitate toward centrality metrics goes back at least to 1934 in Jacob Moreno's ([1934] 1953) classic study, *Who Shall Survive?*, in which he identified the sociometric "stars" of the networks he examined. Since then, centrality's properties have been repeatedly examined experimentally (Bavelas 1948, 1950; Cook and Emerson 1978; Cook et al. 1983; Emerson 1972a, b; Leavitt 1951), and social network analysts, such as Linton Freeman (1977, 1979), Phillip Bonacich (1972, 1987), Noah Friedkin (1991), and Steve Borgatti & Martin Everett (e.g., Borgatti 2005; Borgatti and Everett 2006; Everett and Borgatti 2005) have refined and expanded the measures of centrality, many of which are incorporated into current SNA software programs.<sup>10</sup> As we saw above, however, other methodological approaches, such as clustering algorithms, can be helpful for identifying aspects of dark networks that centrality metrics may not. This is not to suggest that social network analysts ignore these other metrics. They do not. It is just that these other methods do not appear to receive the same attention that centrality metrics do.

*Leadership bias tends to drive interpretation.* Our conceptual maps and cognitive schema predispose us to "see" some things and ignore others (Axelrod 1973; DiMaggio 1997; Rumelhart 1980). We see what our conceptual schemas "program" us to see. So if our metrics signal that centrality is important, we calculate centrality measures. Finding central nodes, our schemas predispose us to attribute agency and leadership to those nodes. Thus, we begin the search for leaders. So, as the case analysis of Syria illustrates, if we find a central hub, we immediately attribute agency and leadership to the hub. Instead of asking what the hub might represent, our immediate interpretation is that leaders are in the hub and they are important and should be the focus on our attention. We confound centrality with importance and importance with leadership, most likely a consequence of our "great man" theories of history (Carlyle [1841] 2013 ; Hook 1950) and organizational studies that view leadership as a key determining factor in organizational performance (Karadağ 2015).

*Visual bias tends to drive our focus.* Another intriguing interpretation of our analysts' consistent and unflinching focus on centrality appears to be driven, at least in part, by a visual bias. Some recent research suggests centrality is important to our vision (Bindemann, 2010). In laboratory studies of visual perception, observers of images of natural scenes presented on a computer screen look at the center of scenes first, which leads Bindemann to reject alternative explanations and argue that the findings demonstrate a "bias to the screen center that forms a potential artifact in visual perception experiments" (Bindemann 2010:2577). These experiments suggest a natural

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<sup>10</sup> For example, a recent version of UCINET (Borgatti, Everett and Freeman 2002) includes at least 23 different types of centrality measures, which is far more than the number of cohesion measures it estimates (11) and clustering algorithms it implements (12).

(and unconscious) tendency in all of us to focus on the center whether it is the center of a screen or the center of a network, suggesting that analysts may not be able to transcend their bias to what is central without consciously being made aware of it. Moreover, these three biases—centrality, leadership, and visual—reinforce one another. Unless monitored and challenged, they likely will continue to be unwitting premises on which we base our analysis of dark networks.

## **Conclusion**

We began this article with a review of the various strategies that can be used for disrupting dark networks, which we noted can be broken down into two broad categories – kinetic and non-kinetic. Next we turned to an analysis of the Syrian opposition network in order to highlight how a focusing on a network’s central actors can blind analysts to other important aspects of a network, in particular, individuals, political organizations, and military units that ultimately aligned themselves with the Islamic State of Syria (ISIS).

This analysis led us to draw three important implications for the future use of social network analysis to track and disrupt dark networks: The first is that centrality metrics tend to drive the analysis of dark networks. However, as we demonstrated in this article, other methodological approaches (e.g., clustering algorithms) can prove helpful for identifying aspects of dark networks that centrality metrics may not. A second is that our conceptual schemas predispose us to attribute agency and leadership to central nodes and clusters. Instead of asking what these central actors might represent, our tendency is to assume that leaders are in the hub and thus should be the focus on our attention. Put simply, we confound centrality with importance and importance with leadership. Finally, we note that our tendency to focus on what is central appears to be driven, at least in part, by a visual bias. In laboratory studies of visual perception, observers tended to look at the center of images first, which suggests that in order to overcome their bias to that which is central, analysts have to be consciously aware of this tendency.

None of our observations and research suggests that social network analysts ignore metrics that identify key actors and clusters in a network. Our position is that analysts should not just limit themselves to centrality metrics and their interpretations, especially when examining complex distributed networks like ISIS. In the subsequent years from our initial analysis of the Syrian Resistance Network, we have learned how costly our centrality, leadership, and visual biases have been. As we view the carnage that ISIS has inflicted on people from Syria to France, we are once again reminded of people’s limited ability to see and interpret what is. While it is not possible to eliminate our perceptual and cognitive biases, at the very least we should be aware of our tendencies and be prepared to guard against them by employing SNA’s expansive set of analytical tools to explore the whole network in all of its complexity.

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