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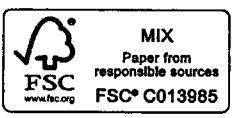

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Chapter 12

Competitive Adaptation in Militant Networks: Preliminary Findings from an Islamist Case Study

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Introduction

There is widespread agreement among scholars and practitioners that terrorism scholarship suffers from a lack of primary-source field research (Horgan, 2012). Moreover, terrorism studies have largely failed to integrate ethnographic research into computational modelling efforts that seek to represent and predict terrorist behavior. A growing number of scholars and practitioners recognize the value of mixed methods and interdisciplinary approaches to studying actors that engage in political violence themselves or support the use of political violence by like-minded groups. The vast majority of terrorism scholarship is based on secondary

sources, which restricts the database from which scholars can develop theories and test hypotheses. The project outlined in this chapter addresses these shortcomings by combining the strengths of ethnographic field research with sophisticated computational models of individual and group behavior. This chapter provides an interdisciplinary framework from which to study the behavior of militant groups that either carry out acts of political violence themselves or support the use of violence by others. Specifically, we analyze data from news reports and interviews concerning the militant activist group Al-Muhajiroun (AM). Using competitive adaptation (Kenney, 2007) as a comparative organizational framework, this project focuses on the process by which adversaries learn from each other in complex adaptive systems and tailor their activities to achieve their organizational goals in light of their opponents' action. Our approach combines the analytical richness of ethnographic research with computational modelling to provide a meso-level model of militant networks that function in complex adaptive systems. This chapter presents preliminary results of AM, a former Islamist group in the United Kingdom that was banned by British authorities in 2010.

Organisational Learning and Competitive Adaptation in Militant Groups

As conceived in this study, terrorist groups engage in acts of political violence against civilian non-combatants in order to terrorize a wider audience, generally in pursuit of some political aim (Hoffman, 2006). Militant groups like AM do not engage in terrorism themselves but their rhetoric highlights the efficacy of violence for achieving certain political objectives, such as repelling perceived foreign invaders of Muslim lands. What separates militant networks like AM from more general political activists is the focus on violence in their discourse and their stated aim of overthrowing Western (and non-Western) governments to create a global Islamic caliphate based on Shariah (Islamic law) (Raymond, 2010; and author interview (Kenney) with AM leader, London, November 4, 2010).

Definitions aside, terrorist and militant networks alike are frequently characterized by opacity, decentralization, fluidity and illegality. It is precisely these qualities that give merit to network approaches for detecting changes in groups that engage in or support the use of political violence. Network analysis can provide predictive insights about how structural and relationship variables influence emergent group behavior. Network analysis can also assist practitioners in the prediction of violent behavior, including terrorism. Using network analysis, recent work by Magouirk and Atran (2008) demonstrates that the assumption of top-down indoctrination fails to account for important horizontal sources of radicalization in Jemaah Islamiyah (a Southeast Asian militant Islamist terrorist organization). Those in leadership roles do indeed indoctrinate junior members, but small group dynamics play an equally important role as members facilitate and reinforce the indoctrination of each other, thus contributing to emergent violence.

Jordan et al. (2008) and Vidino (2007) similarly find that the perpetrators of major terrorist attacks, as with the Madrid bombings and the Hofstad Group, may not be formally affiliated with global jihadist movements. In sum, proscribed groups tend not to behave like formal bureaucracies, making the flexibility of network approaches to terrorist detection all the more critical. Related, and contrary to conventional wisdom, scholars are finding that militant social networks do not always form for the purpose of carrying out violent acts. Recent works by Perliger and Pedahzur (2009, 2011), Sageman (2004, 2008) and Rodriquez (2005) all suggest that social processes within existing nonviolent networks are responsible for causing groups to drift towards the use of violence. Thus in order to predict an established group's likelihood of exhibiting violent behaviors, scholars must focus on the internal structure, relationships and decision-making of the group and how external variables (such as the joining of a new member, the removal of an existing member, or changes in environmental constraints) affect these dynamics.

Cumulatively these studies suggest that terrorist and militant groups are amorphous and in a state of flux, subject to change as a function of internal group dynamics or in response to external stimuli. Few studies, however, specifically examine how unconventional groups learn in their unique and conflict-based environments. Nevertheless, some recent work offers useful insights into how militant and terrorist organizations learn and adapt within the adversarial environments in which they operate. Jackson et al. (2005a, 2005b) examined organizational learning in several terrorist groups, including the Provisional Irish Republican Army, Aum Shinrikyo, Jemaah Islamiyah, Hezbollah, and the radical environmentalist Animal Liberation Front and Earth Liberation Front. Separate studies by Hamm (2005, 2007) draw on court documents contained in the 'American Terrorism Study' database and the criminological literature on social learning to explore how some violent political extremists acquire the skills to perform their tradecraft. While these studies offer insights into how numerous militant groups train their members and develop certain technological innovations, they do not systematically examine the internal processes of group learning and interpretation, as experienced by militants themselves. Moreover, these studies do not take into account the broader competitive environments in which militant groups operate.

Drawing on organizational and complexity theory, Kenney (2007) describes how organizational knowledge is leveraged by competing networks that interact in complex adaptive environments. Kenney dubs this process 'competitive adaptation', which explains how organizational learning occurs within an environment that is typically (though not always) characterized by hostility and multiple actors pursuing opposing goals. A network-based theoretical approach to the study of militant groups allows for modelling of both the internal organizational dynamics of militant groups and broader strategic interactions between militant groups and governments. Competitive adaptation is thus the framework from which we approach our study of militant groups, and we employ ethnographically based network analysis as our primary tool when modelling this framework.

Research on various militant networks offer qualitative descriptions of group structures and how those structures may account for group behavior (Horgan and Taylor, 1997; Kenney, 2007; Wiktorowicz, 2005). We seek to expand on these findings by using a mixed-methods approach to analyze one particular militant network. Quantitative metrics such as degrees of separation allow us to measure the connectedness between network leaders and rank-and-file members. As we discuss below, connectedness has important implications for network hierarchy, specifically the leader's ability to exert influence over his followers. 'Betweenness centrality' measures the extent to which each network member (or agent) links disconnected groups in the network. Agents scoring high in betweenness centrality serve as gatekeepers, connecting otherwise disparate nodes to the broader network. This facilitates information-sharing throughout the network, which, in turn, contributes to organizational learning. 'Eigenvector centrality' measures each agent's connection to other, well-connected nodes in the network. Agents scoring high in this measure have the ability to disperse information and mobilize resources rapidly in response to problematic situations and changing conditions (Hanneman and Riddle, 2005). Together with qualitative analysis of ethnographic data, these quantitative metrics allow us to study the evolution of the militant network over time. In the competitive adaptation framework, we expect that social network properties, such as connectedness, betweenness centrality, and eigenvector centrality for a political movement vary across time in response to changes in their environments.

When studying organizational learning and competitive adaptation in militant and terrorist networks, we seek to examine these networks in their entirety, beyond the social context. Specifically, we recognize that in order to understand group dynamics, learning, evolution, decision-making and emergent behavior, it is necessary not only to examine the roles and relationships of individual agents and groups within organizations, but also how those agents relate to locations in space, as well as the knowledge and resources leveraged by agents within organizations, in order to fulfill group tasks. Carley (1999) writes that an organization can be described as an 'ecology of networks' that continually evolves as agents within the organization learn, move and interact. A network of social roles within an organization might appear very different from a network of knowledge and expertise, which in turn might be very different from the network of resources or geographic proximity. Kenney's (2007) work on competitive adaptation similarly emphasizes the importance of organizational properties beyond those associated with individual human agents, arguing that the flow of knowledge, routines and artifacts within organizations is as important as the flow of personnel. We conceptualize militant networks consistently with these arguments and expect that they 'learn' when their participants receive information about their activities, process this information through knowledge-based artifacts, and apply the information to their practices and activities.

The case study presented in this chapter provides a detailed, yet preliminary, analysis of these two hypotheses by focusing on one militant network that, under

a variety of names and organizational platforms, has been remarkably active over the past fifteen years in spite of being targeted for disruption by British authorities (Raymond, 2010; Wiktorowicz, 2005).

Case Study: The Evolution of Al-Muhajiroun

Al-Muhajiroun (AM) is not a terrorist organization but a political activist group that pushes the boundaries of free speech and association with belligerent, violence-laced rhetoric and inflammatory public demonstrations that sometimes result in criminal charges being filed against its members and associates. In recent years numerous AM-affiliated individuals have been convicted of inciting racial hatred, solicitation to murder, and terrorist fundraising by overstepping the bounds of legally permissible speech at their provocative rallies (Simcox et al., 2010). Indeed, the call to violence, under certain conditions, is a cornerstone of AM's rhetoric. The group has consistently supported the use of political violence overseas (outside of Britain) in what it maintains is a defensive, Islamically correct response to the aggressive foreign policies of Western states, including Britain and the United States. Beyond certain activists' incendiary protest speeches, other AM-affiliated individuals have been convicted of more direct involvement in violence over the years, including arson attacks and attempted petrol bombings in Britain (Simcox et al., 2010). Moreover, Al-Muhajiroun's goal has always been to replace Western governments with a global Islamic caliphate, an objective that, to be successful, would require political violence on a grand scale.

Founded in 1996 by Omar Bakri Mohammed and officially disbanded for several years in 2004, former AM members continue to engage in their provocative brand of political activism in the United Kingdom under the banner of several successor groups included in our study. Work by Wiktorowicz (2005) indicates that AM not only exhibits adaptive behavior as it interacts with British authorities, but that the relatively liberal political and social environments of the United Kingdom often condition these interactions, providing both advantages and disadvantages to each side. Wiktorowicz shows how freedom of the press in the United Kingdom has been a double-edged sword for AM, allowing the group to publicize its ideas to potential recruits, but also resulting in AM's widespread condemnation in British society, damaging its local operations (Wiktorowicz, 2005). AM's ostracism in Britain led to it being banned from using public venues under the AM name, loss of the group's charitable organization status in the United Kingdom, and increased police scrutiny of group activities, resulting in arrests of its members and associates.

In response to the negative ramifications of publicity, AM has adopted a strategy of organizational proliferation, diversification and obfuscation in order to spread the group's ideology and connect with potential recruits while avoiding the costs associated with the AM label, and without risking organizational death in the event of a police crackdown (Wiktorowicz, 2005). Kenney (2009) discusses this

adaptive dynamic between the British government and AM in depth. Following the disbanding of AM in 2004, the group's leadership established two new groups called Al Ghurabaa (The Strangers) and the Saved (or Saviour) Sect, both of which attracted many AM members. When these successor groups faced the threat of legal proscription by the British government, former AM leaders created the 'Ahlus Sunnah wal Jamaah', an invitation-only Internet discussion forum (Kenney, 2009). More recently, interviews and ethnographic data in this research suggest that former AM members and associates have created several new platforms or groups to facilitate their ongoing activism, including Muslims against Crusades, Supporters of Sunnah, and Salafi Media (source: author interviews (Kenney) with AM members, November–December 2010 and June 2011, field notes November–December 2010, June 2011).

Whereas AM's name changes are a clear example of adaptive behavior within the competitive environment in which it operates, it is equally interesting that groups such as AM often fail to adapt, or learn the wrong lessons, despite their experiences. Kenney (2010) explains that militant groups might fail to adapt within their environments not only due to simple mistakes and human error, but potentially due to the underlying structures, ideologies or rules guiding an organization's behavior. The religious underpinnings of AM clearly condition the incentive structure of individual AM members and leaders, influencing how they adapt or fail to do so (Kenney, 2007). Kenney (2010) notes that AM's religiosity has led its leadership to conclude that their need to respond to external pressure, including pressure that may result in the imprisonment of individual activists, is limited. As one leader puts it, 'we believe Allah's will is there to protect us' and that their fate is already predetermined (Kenney, 2010, p. 924). From these examples of both adaptive and non-adaptive behaviours, we can see that AM is an interesting and relevant case study of how a militant group evolves and adapts (or fails to evolve and adapt) in a Western democracy.

Primary and Secondary Source Data for Network Analysis

The data used in this study have been collected from a variety of primary and secondary sources, including newspaper articles and original interviews with 69 respondents. Kenney conducted the interviews during several months of fieldwork in Britain. For this research, he met with and formally interviewed 41 individuals that were actively affiliated with AM or one or more of its successor groups. Kenney interviewed an additional 28 respondents that included government officials, researchers, and former AM members that have since left the group. In addition to these interviews, Kenney conducted ethnographic fieldwork in London, attending political demonstrations and public dawah (preaching) stalls organized by AM's current successor groups and socializing with activists at several locations.

From the newspaper articles we constructed a thesaurus of known AM members and associated Islamists, representing a total of 364 individuals (agents). In order

to protect the anonymity of our respondents, we did not use any interviews for this purpose. We also created additional thesauri of AM front and successor groups (n = 353), events (n = 27), locations (n = 940), resources (n = 139), tasks (n = 560) and knowledge attributes (n = 3,240). These data were then semantically processed using the text analysis program 'AutoMap' (Carley et al., 2011a). AutoMap has been used by other researchers to extract networks representing mental models (Carley, 1997), semantic networks (Kim, 2011), and social networks (Frantz and Carley, 2008) from text extracts. It has been applied to a variety of domains ranging from email assessment (Frantz and Carley, 2008) to command post operations (Chapman et al., 2005) to media framing for stem cell research (Kim, 2011). By way of illustrating AutoMap's functionality in this research, we used the software program's word proximity command to identify a link between Mohammed Babar and Omar Bakri from the following sentence in the newspaper articles dataset: '[Mohammed] Babar, 31, told the court that he met Omar Bakri Muhammad, the exiled leader of Al-Muhajiroun, a radical Islamist group, during a visit to Britain' (Woolcock, 2006, p. 16).

Social network analyses were conducted using ORA, a network analytics program with integrated network statistics, graph analytics and visual analytics for performing traditional social network analysis as well as dynamic network analysis (Carley et al., 2007, 2011b). ORA is used to assess both the social network data (e.g. who is connected to whom) and the meta-network data (e.g. connections among who, what, why, how, where, and when). It has been widely used by researchers in many countries where illustrative applications include covert networks (Carley et al., 2009), public health organizations (Merrill et al., 2010), emergency care units (Effken et al., 2011), citation networks (Meyer et al., 2011), and stem cell research (Kim, 2011). Using various statistical procedures, graph-based metrics, and visual-based assessments the analyst can assess the data for a single network or a set of networks, determining which actors, groups or locations are critical; changes in this criticality over time; spatial characteristics of behavior; and emergent leaders and group capabilities. The analyst first visualizes the network, runs analyses, and then interprets the results based on the meaning of the various measures such as betweenness and eigenvector centrality. Many statistical procedures and their interpretations are defined in the ORA help documentation (Borgatti and Lopez-Kidwell, 2011; Carley et al., 2011b; Wasserman and Faust, 1994).

The preliminary findings presented below are based primarily on an ORA analysis of the network extracted by AutoMap from 1,079 AM-related newspaper articles published between 1996 (the year AM was formed in Britain) and 2009. At several points in the discussion below we compliment these social network measures with qualitative data drawn from the first author's (Kenney's) interviews and field notes. These interview data have not yet been processed by AutoMap, nor analysed by ORA. This will be done in the next phase of the project, the findings for which will be reported in subsequent publications. In this chapter, we draw on the interview data and field notes to add qualitative depth to the quantitative network measures drawn out by ORA. The newspaper articles used in this analysis

were collected from Lexis Nexis Academic, an electronic database that contains full-text articles from over 2,000 newspapers throughout the world published from 1980 onwards. Duplicate articles and those not primarily concerned with AM were excluded from the dataset. In the following discussion, these data are divided into three time periods corresponding to major events in the group's history. Network A runs from AM's founding in 1996 through October 4, 2004, when the group voluntary disbanded under government pressure. Network B begins with the 7/7 bombings on the London Underground in 2005, an event that sparked Omar Bakri's flight to Lebanon, through to July 16, 2006, the day before the British government officially banned AM's successor organizations, Al Ghurabaa and the Saved Sect. Network C runs from this ban through the end of 2009, the cut off point for our Lexis Nexis data collection.

Preliminary Findings for the Al-Muhajiroun Network

In each network presented below (Table 12.1) nodes represent specific AM members and associated Islamists (a total of 364 individuals) that we extracted from the newspaper dataset using AutoMap. Segmenting the AM networks into three distinct time periods corresponding to major events in the group's history allows us to track changes in the social network measures over time. This adds an essential dynamic component to our understanding of AM's evolution, particularly when combined with our qualitative analysis of the ethnographic data.

Table 12.1 summarizes the changing relationship between Omar Bakri, AM's founder and spiritual leader, and other agents in the wider AM network. The numbers in each column provide the cumulative totals (i.e., two degrees of separation gives the cumulative total of rows 1 and 2, and so forth). The totals given in the bottom row indicate the total number of agents detected in the network, including isolates that were not connected to Bakri in this analysis.

Table 12.1 Omar Bakri's sphere of influence

Degree of separation	Network A 1 Jan 1996–4 Oct 2004	Network B 7 Jul 2005–16 Jul 2006	Network C 17 Jul 2006–31 Dec 2009
1	19	13	7
2	65	32	14
3	83	41	18
4	84	42	23
Isolates	102	38	68
Total	**186**	**80**	**91**

Note: The figures presented in rows 1 to 4 are cumulative (the row provides the total number of agent nodes connected to Bakri during each time period).

Several characteristics of Bakri's connectedness to the network merit discussion. First, during any time period, if an agent is not connected to Bakri, that agent is not connected to anyone in the network (i.e. that node is an 'isolate' and the Lexis Nexis newspaper data do not support a relationship between these individuals and Omar Bakri. While it is possible that some isolates are not involved in AM, these individuals are still included in the dataset of potential Islamist associates because they were identified as such through a thorough hand coding and verification process. Second, at any point in time, every agent in the network who is connected to Bakri is connected to him by no more than four degrees of separation. Third, Network A is a superset of Networks B and C. In other words, no new agents connect to Bakri subsequent to the first time period. These findings underscore the significant, yet evolving, impact Bakri's leadership has had on the AM network and Bakri's connectedness to other agents in the AM network changes over time, particularly after he left Britain for Lebanon.

Figure 12.1 depicts this changing relationship. As might be expected, Bakri's direct connections to other agents in the network declines significantly following his move to Lebanon, shortly after the 7/7 attacks on the London Underground and the growing pressure he faced from British authorities. In Network A, Bakri is connected to 83 of 84 agents by no more than three degrees of separation. From Network A to Network B, where the July 7 2005 cutoff approximates with Bakri's move to Lebanon, his total connections within the network drops by exactly half, from 84 to 42.

While everyone remains connected to Bakri within four degrees, the proximity of these connections declines following Bakri's move to Lebanon and the ban on AM's successor groups, Al Ghurabaa and the Saved Sect. In Network A, 65 individuals are connected to Bakri by no more than two degrees of separation;

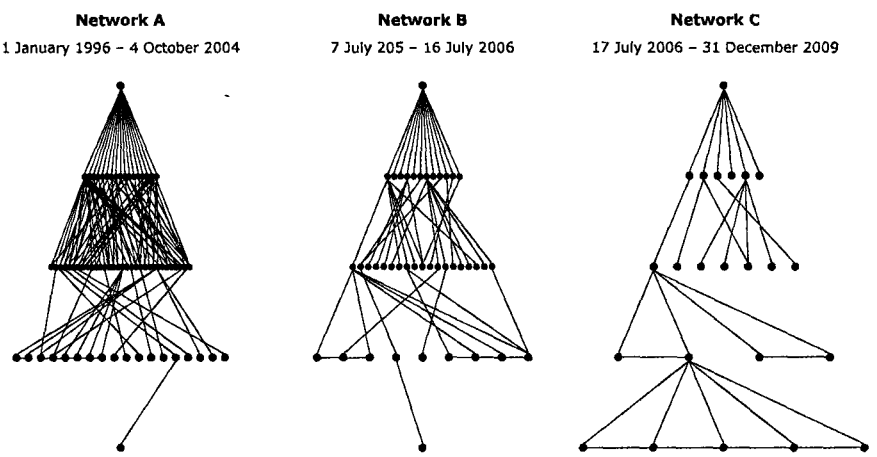

Figure 12.1 Omar Bakri's changing sphere of influence

in Network C this number drops to 14 individuals. The ability to influence other agents does not normally extend beyond the second degree, suggesting that Bakri's influence over AM members in Network C is less than a quarter of his original influence in Network A. This shift suggests a gradual distancing between Bakri and the rest of the AM network, which has continued to evolve since he left Britain. Such a shift is consistent with the ethnographic data uncovered by the first author (Kenney) during his fieldwork in London. Numerous interviews with AM leaders and members, and ethnographic observation of these and other network figures at several protests, public dawah stalls, educational lessons, and Internet chat rooms strongly suggest that Bakri's leadership has changed from direct oversight to a position of (geographically removed) symbolic leadership (source: author (Kenney) interviews with AM members, November–December 2010 and June 2011, field notes November–December 2010, June 2011).

Several of Bakri's long-standing students and AM veterans still based in Britain, including Anjem Choudary and Abu Izzadeen, have essentially replaced their mentor as day-to-day leaders of the evolving AM network. More recently, a new, third generation of leaders has emerged that have had little or no direct contact with Omar Bakri. These individuals became involved with AM through one of the successor groups, such as Islam4UK and Street Dawah, that were created after Bakri left Britain. These young leaders also formed their own groups, with Muslims against Crusades being the most prominent example. They receive guidance from senior AM veterans like Choudary but not, apparently, from Bakri himself.

Omar Bakri remains important in the AM network but his role is now limited to delivering audio and video lectures that his followers can access online and advising the senior AM veterans that occasionally seek his counsel. Interview and ethnographic data from this research also suggest that while Bakri's departure from London initially represented a major blow to his British students, they eventually adapted to this setback by learning new ways of communicating with their spiritual leader via online communications technologies, and by the emergence of new operational leaders that assumed day-to-day authority for directing AM's operations in Britain (source: author (Kenney) interviews with AM members, November–December 2010 and June 2011, field notes November–December 2010, June 2011). Government efforts to disrupt Al-Muhajiroun, though initially successful, gradually weakened as the AM network adapted to the setback by learning how to function effectively in a new, more hostile counter-terrorism environment without enjoying regular access to their former operational leader.

Other measures of leadership allow a comparison of Bakri's role in the network to the roles of other network elites. Agents in the network may score high along one or more dimensions of leadership without ever holding a position of formal leadership in the organization. Because informal leaders can be critical to organization functions, various metrics of network elites can aid in identifying agents important to the network, and in detecting meaningful changes in the network across time. For example, betweenness centrality measures the extent to

which a given node (an agent) constitutes the most efficient path between other nodes in the network. For all node pairs that have a shortest path to a particular node, betweenness centrality is calculated as the percentage of node pairs that pass through this node. This metric assesses which agents present the 'best paths' between other agents, suggesting that individuals ranking high in this metric are likely to serve as brokers or gatekeepers between different subgroups within the network (Table 12.2).

Table 12.2 rank orders AM agents in terms of their betweenness centrality across the three time periods. During any given period, Bakri ranks behind five to nine other agents in the network. While Osama bin Laden's and Mohammed Omran's high betweenness centrality rankings in the AM networks are most likely artifacts of the newspaper data, the high betweenness centrality of several other agents merits discussion.

Anjem Choudary, Abu Izzadeen, Abu Uzair, and Abdul Saleem were all long-standing students of Omar Bakri's, each of whom played important roles in AM and its various successor groups. For example, Abdul Saleem served as a key broker for AM, connecting different militants in Britain and Pakistan, even organizing the

Table 12.2 Betweenness centrality across networks A, B and C

Rank	Network A		Network B		Network C	
1	Abdul Saleem	0.042	Abdul Saleem	0.078	Abu Izzadeen	0.013
2	Osama bin Laden	0.037	Abu Hamza	0.060	Osama bin Laden	0.012
3	Abu Hamza	0.035	Abu Izzadeen	0.051	Anjem Choudary	0.011
4	Hassan Butt	0.020	Osama bin Laden	0.039	Abu Hamza	0.009
5	Saladhuddin Amin	0.013	Saladhuddin Amin	0.027	Mohammed Omran	0.009
6	Abu Qatada	0.011	Omar Bakri	0.020	Omar Khyam	0.008
7	Omar Sharif	0.011	Omar Sharif	0.018	Abdul Saleem	0.007
8	Waheed Mahmood	0.010	Abu Uzair	0.018	Abu Qatada	0.007
9	Mohammed Omran	0.010	Hassan Butt	0.016	Omar Bakri	0.005
10	Omar Bakri	0.009	Anjem Choudary	0.011	Mohammed Babar	0.005

Note: Figures presented are normalized ratios.

movement of British Muslims into Pakistan, and from there into the insurgency in Afghanistan. Once back in Britain, Saleem acknowledged that he received military training in Afghanistan and Pakistan, and sought to recruit other young Muslims to do the same. Interestingly, according to interviews in this research, Saleem is no longer involved in AM-related activities, suggesting the network may have lost access to this important resource (source: author interview with AM member, June 2011). Unlike Saleem, Abu Hamza al-Masri was not Bakri's student but his associate and erstwhile competitor. Abu Hamza led the militant Supporters of Shariah group, which collaborated with AM in some conferences and political protests until Hamza's arrest for terrorism-related offences in 2004. Following the dissolution of Hamza's Supporters of Shariah group, some of his students migrated to the AM network, where they remain active in AM's successor groups (source: author interview with AM member, June 2011).

Eigenvector centrality offers a very different measure of agents' elite status within a network (Table 12.3). This measure calculates the degree to which a given node is considered central to the network to the extent that its neighbours are central.

Table 12.3 Eigenvector centrality across networks A, B and C

Rank	Network A		Network B		Network C	
1	Abdul Kahar Kalam	1	Abdul Kahar Kalam	1	Anjem Choudary	1
2	Omar Sharif	1	Omar Bakri	1	Abdul Saleem	1
3	Abdul Karim	1	Richard Reid	1	Willie Brigette	1
4	Younis al Hayyari	1	Abdul Karim	1	Omar Bakri	0.960
5	Abu Obeida	1	Younis al Hayyari	1	Saladhuddin Amin	0.918
6	Ramadan Shallah	1	Ezzit Raad	1	Jawad Akbar	0.787
7	Ezzit Raad	1	Fadal Sayadi	1	Omar Khyam	0.704
8	Abdul Koyair	1	Abdul Koyair	1	Waheed Mahmood	0.407
9	Abdul Qassim	1	Anjem Choudary	0.626	Abu Izzadeen	0.390
10	Mohammed Salim	1	Abu Izzadeen	0.562	Abu Hamza	0.343

Note: Figures presented are normalized ratios.

Well-connected agents connected to other well-connected agents score high on this metric, while the formula discounts nodes possessing many connections, as well as accounting for the fact that most nodes will have some connections. The eigenvector centrality measure is calculated using the largest positive eigenvalue of the adjacency matrix representation. Notably, Omar Bakri's eigenvector centrality ranking actually improves in networks B and C, after he leaves Britain for Lebanon. While Bakri's direct connections to the network rank-and-file suffer while in exile, his continued association with the AM leadership (i.e. other well-connected nodes) maintains his high scores on this measure. This is consistent with the first author's interviews and ethnographic data, which found that AM leaders in Britain maintained regular contact with Bakri through various communications technologies. Moreover, several current AM leaders even visited Lebanon, where they sought to meet with their religious leader (source: author interviews with AM members, November–December 2010 and June 2011, field notes November–December 2010, June 2011).

Others, such as Richard Reid and Omar Sharif, appear to score high in eigenvector centrality as a function of their involvement in highly publicised, terrorism-related incidents rather than playing a central role in AM. Richard Reid was the shoe-bomber that tried and failed to bring down a transatlantic flight from Paris to Miami several months after the 9/11 attacks. Omar Sharif attempted, and failed, to ignite a suicide bomb vest outside a bar in Tel Aviv in 2004 (Wiktorowicz, 2005). While both Reid and Sharif reportedly attended AM lessons or rallies, they were not formally affiliated with the movement (*Al Jazeera*, 2003; Brown, 2002). Such individuals may be part of tight cliques, meaning they are highly connected to others in their group while they do not encounter discounts for connections to many nodes in the AM networks that they do not possess. Similarly, Omar Khyam, Jawad Akbar, Saladhuddin Amin, and Waheed Mahmood were convicted of belonging to a terrorist cell that planned to bomb different 'soft targets' in London. Interviews conducted in this research suggest that while several members of this cell had previously navigated AM circles, they were not actively involved in the group at the time of their apprehension (source: author (Kenney) interviews with AM members, November–December 2010). Likewise, Ezzit Raad, arrested in 2005 for his role in a terrorist plot in Australia, and Younis al Hayyari, an Al-Qaeda affiliate shot dead in Saudi Arabia in 2005, were part of terrorist cliques in their respective countries and do not appear to have been involved with AM in Britain.

Conclusions

The findings discussed in this chapter, though preliminary, are significant not only for what they tell us about a banned Islamist group that openly espouses the use of political violence against Western governments under certain conditions, but for highlighting the value of mixed methods in studying such militant networks more

generally. Unlike much of the literature in terrorism studies, the research project described here combines quantitative and qualitative analysis of primary and secondary source data, all focused on a single case study with national security implications for Britain and other countries. In blending quantitative analysis of secondary source newspaper articles with qualitative analysis of primary source interviews and field notes, we have uncovered findings that neither approach could reveal in isolation.

Using quantitative social network measures, as applied to the newspaper dataset, we analyzed AM at the macro level. This allowed us to identify changes in leadership relations over time corresponding to major events in the group's development. The results of this analysis were consistent with the notion that social network properties within movements such as AM vary across time in response to changes in their environments. By measuring the degrees of separation between Omar Bakri and other network nodes we were able to track the declining density of Bakri's AM social ties and his corresponding loss of influence over his followers after he left London for Lebanon. Geographic proximity did matter for Bakri's leadership and his departure from London decreased his connectedness with the British-based members of his network.

Quantitative social network measures were also useful at the micro level of analysis dealing with specific nodes. From the betweenness centrality measure we identified several key brokers in the AM network, such as Abdul Saleem and Abu Uzair, that have not received as much media attention as other, more prominent network figures, including Anjem Choudary, Abu Izzadeen, and Omar Bakri himself. Interestingly, this finding was generated from a newspaper dataset, underscoring the ability of quantitative network measures to generate valuable insights from secondary data.

These quantitatively generated insights were supported, and extended, by qualitative analysis of the first author's (Kenney's) field research in Britain. Primary source interviews and field notes not only confirmed that Abdul Saleem had been a key broker for AM during the time periods under analysis, supporting the quantitative analysis, but that Saleem, unlike other AM leaders, is no longer actively involved in the group, suggesting the militant network has lost an important, centrally connected node. The implications of Saleem's departure from AM remain to be explored in future research. However, the qualitative analysis presented in this chapter regarding Omar Bakri's move to Lebanon suggest that the implications of Saleem's exit may not be far-reaching. Drawing on interviews and field notes, we found that Bakri's British-based students successfully adapted to their leader's move to Lebanon by learning how to function in a more hostile counter-terrorism environment. They did so by maintaining ties with their spiritual leader through online communications technologies, developing new day-to-day operational leaders in Britain, and creating numerous successor groups to Al-Muhajiroun that even today continue the network's public dawah and political activism.

As this analysis suggests, what matters is not what AM's leaders and members choose to call themselves, but how they adapt their activities in response to government pressure. To understand this competitive, adaptive dynamic, a mixed-methods approach that combines quantitative and qualitative analysis of primary and secondary data to analyze changes in network relations and activities over time is indispensable.

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References

Al Jazeera (2003). Interview with Omar Bakri Mohammed. Mecca, 1 May 2003).

Borgatti, S.P., and Lopez-Kidwell, V. (2011). Network theory. In P. Carrington and J. Scott (Eds), *The Sage Handbook of Social Network Analysis*. Sage Publications: London, 40–54.

Brown, J.A. (2002). Muslim radicals plan meeting about 9/11. *The Boston Globe*, A7 (10 September 2002).

Carley, K.M. (1997). Extracting team mental models through textual analysis. *Journal of Organizational Behavior*, 18, 533–538.

Carley, K.M. (1999). On the evolution of social and organizational networks. In S.B. Andrews and D. Knoke (Eds), *Research in the Sociology of Organizations on Networks in and Around Organizations*. JAI Press, Inc. Stamford, CT, 3–30.

Carley, K.M., Diesner, J., Reminga, J., and Tsvetovat, M. (2007). Toward an interoperable dynamic network analysis toolkit. *Decision Support Systems*, 43, 1324–1337.

Carley, K.M., Martin, M.K., and Hancock, J.P. (2009). *Dynamic Network Analysis Applied to Experiments from the Decision Architectures Research Environment,* In P. McDermott and L Allender (Eds) *Advanced Decision Architectures for the Warfighter: Foundation and Technology*. Partners of the Army Research Laboratory Advanced Decision Architectures Collaborative Technology Alliance, HPB-Ohio, Columbus, OH, 15–34.

Carley, K.M., Columbus, D., Bigrigg, M., and Kunkel, F. (2011a). *AutoMap User's Guide 2011*. Carnegie Mellon University, School of Computer Science, Institute for Software Research, Pitsburgh, PA Technical Report, CMU-ISR-11-108.

Carley, K.M., Reminga, J., Storrick, J., and Columbus, D. (2011b). *ORA User's Guide 2011*. Carnegie Mellon University, School of Computer Science, Institute for Software Research, Pitsburgh, PA, Technical Report, CMU-ISR-11-107.

Chapman, R.J., Graham, J.M., Carley, K.M. Rosoff, A., and Paterson, R. (2005). Providing insight into command post operations through sharable contextualized net-centric visualizations and analysis. In *Proceedings of the 2005 Human Interaction with Complex Systems Symposium*, Greenbelt, VA, 17–18 November 2005, http://www.cws-i.com/papers/chapman-graham-carley-rosoff-paterson-hicss2005.pdf, accessed 11 August 2014.

Effken, J.A., Carley, K.M., Gephart, S., Verran, Joyce A., Bianchi, D., Reminga, J., and Brewer, B.B. (2011). Using ORA to explore the relationship of nursing unit communication to patient safety and quality outcomes. *International Journal of Medical Informatics*, 80(7), 507–517.

Frantz, T.L., and Carley, K.M. (2008). Transforming raw-email data into social-network information. In C.C. Yang, H. Chen, M. Chau, K. Chang, S.D. Lang, P.S. Chen, R. Hsieh, D. Zeng, F.Y. Wang, K. Carley, W. Mao, and J. Zhan (Eds) *Proceedings of the 2008 LNCS 5075 Workshop*, Berlin Heidelberg, Springer, 413–420.

Hamm, M. (2005). *Crimes Committed by Terrorist Groups: Theory, Research and Prevention*. U.S. Department of Justice, Washington, DC.

Hamm, M. (2007). *Terrorism as Crime: From Oklahoma City to Al-Qaeda and Beyond*. New York University Press, New York.

Hanneman, R.A., and Riddle, M. (2005). *Introduction to Social Network Methods*. University of California Riverside, Riverside, CA.

Hoffman, B.M. (2006). *Inside Terrorism*, revised and expanded edn. Columbia University Press, New York.

Horgan, J. (2012). Interviewing the terrorists: Reflections on fieldwork and implications for psychological research. *Behavioral Sciences of Terrorism and Political Aggression*, 4(3), 195–211.

Horgan, J., and Taylor, M. (1997). The Provisional Irish Republican Army: Command and functional structure. *Terrorism and Political Violence*, 9, 1–32.

Jackson, B.A., Baker, J.C., Chalk, P., Cragin, K., Parachini, J.V., and Trujillo, H.R. (2005a). *Aptitude for Destruction Volume 1: Organizational Learning in Terrorist Groups and its Implication for Combating Terrorism*. RAND, Santa Monica, CA.

Jackson, B.A., Baker, J.C., Chalk, P., Cragin, K., Parachini, J.V., and Trujillo, H.R. (2005b). *Aptitude for Destruction Volume 2: Case Studies of Organizational Learning in Five Terrorist Groups*. RAND, Santa Monica, CA.

Kenney, M. (2007). *From Pablo to Osama: Trafficking and Terrorist Networks, Government Bureaucracies, and Competitive Adaptation*. Penn State Press, University Park, PA.

Kenney, M. (2009). *Organizational Learning and Islamist Militancy*. National Institute of Justice, U.S. Department of Justice, Washington, DC.

Kenney, M. (2010). Dumb yet deadly: Local knowledge and poor tradecraft among Islamist militants in Britain and Spain. *Studies in Conflict and Terrorism*, 33, 1–22.

Kim, L. (2011). Media framing for stem cell research: a cross-national analysis of political representation of science between the UK and South Korea. *Journal of Science Communication*, 10(3), 1–17.

Magouirk, J., and Atran, S. (2008). Jemaah Islamiyah's radical madrassah networks. *Dynamics of Asymmetric Conflict*, 1, 1–16.

Jordan, J., Mañas, F.M., and Horsburgh, N. (2008). Strengths and weaknesses of grassroot Jihadist networks: The Madrid bombings. *Studies in Conflict and Terrorism*, 31, 17–39.

Merrill, J., Keeling, J.W., and Carley, K.M. (2010). A comparative study of 11 local health department organizational networks. *Journal of Public Health Management and Practice*, 16(6), 564–576.

Meyer, M., Zaggl, M.A., and Carley, K.M. (2011). Measuring CMOT's intellectual structure and its development. *Computational and Mathematical Organization Theory*, 17(1), 1–34.

Perliger, A., and Pedahzur A. (2009). *Jewish Terrorism in Israel*. Columbia University Press, New York.

Perliger, A., and Pedahzur A. (2011). Social network analysis in the study of terrorism and political violence. *Political Science and Politics*, 44, 45–50.

Raymond, C.Z. (2010). *Al Muhajiroun and Islam4UK: The Group Behind the Ban. Working Paper*. International Centre for the Study of Radicalisation and Political Violence, King's College London, UK.

Rodriquez, A.J. (2005). The March 11th Terrorist Network: In its Weakness Lies its Strength. *Proceedings of 25th International Sunbelt Social Network Conference*, 16-20 February 2005, Redondo Beach, CA.

Sageman, M. (2004). *Understanding Terror Networks*. University of Pennsylvania Press, Philadelphia, PA.

Sageman, M. (2008). *Leaderless Jihad: Terror Networks in the Twenty-First Century*. University of Pennsylvania Press, Philadelphia, PA.

Simcox, R., Stuart, H., and Ahmed, H. (2010). *Islamist Terrorism: The British Connections*. The Centre for Social Cohesion, London.

Vidino, L. (2007). The Hofstad Group: The new face of terrorist networks in Europe. *Studies in Conflict and Terrorism*, 30, 579–592.

Wasserman, S., and Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge University Press, Cambridge, MA.

Wiktorowicz, Q. (2005). *Radical Islam Rising: Muslim Extremism in the West*. Rowman and Littlefield, Lanham, MD.

Woolcock, N. (2006). The Al-Qaeda supergrass who wanted to wage war in Britain. *The Times*, London, 24 March 2006, 16.