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## CIDOB Seguridad y política mundial

07

### UNDERSTANDING SMALL-WORLD TERROR NETWORKS: TOWARDS A POST-AL-QAEDA WORLD

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#### Introduction

Global capitalism brought about global terrorism. In parallel with the development of a global network society, fostered by the new information and communication technologies that emerged in the 1980s, a new type of extreme terrorism appeared in the post-Cold War international arena. Its causes are numerous, ranging from the democratization of technologies to the redefinition of the role of the states and their crisis of sovereignty, and the proliferation of non-state actors. In all these aspects, it is a product of our times. The dual character of this globalization period can be described as being split between the “vertebrate” feature of the nation-state world system; and a new nature of non-state world capitalism that can be defined as “cellular”, following the interesting concept elaborated by the American anthropologist, Arjun Appadurai. He has described the new terrorist networks as “connected yet not vertically managed, coordi-

nated yet remarkably independent, capable of replication without central messaging structures, hazy in their central organizational features yet crystal clear in their cellular strategies and effects”. These organizations, he writes, “clearly rely on the crucial tools of money transfer, hidden organization, offshore havens, and nonofficial means of training and mobilization, which also characterize the workings of many levels of the capitalist world” (Appadurai, 2006).

This new way of organizing the activities around the world has been very profitable for a privileged minority of global corporations and individuals, while bringing unprecedented prosperity to a large number of people, be it in south-east Asia, China or Latin America. Yet this new organisational phenomenon also has a dark side in terms of security, since along with its demonstrated capacity for destruction, came the emergence of transnational terrorism with its randomness, resilience, daily impact in the media and a surprising ability to elude traceability and

**Abstract:** Within the generic study of terrorism as a subset in the field of security studies, this paper provides some insight of small world networks’ structure and operation in the framework of the present state of knowledge of network science. It discusses the significance of understanding their nature and performance as an important source of power in international affairs, arguing that traditionally organized, rigidly hierarchical responses to terror security threads are not adequate to counter them in an efficient manner, in the context of a fast growing information age within a complex globalization process.

This paper aims to sharpen awareness of networks science power and influence in the information age, and how integrating culture and identity as central factors of their growing and evolving nature might provide some ideas to better build policy responses that highlight the exercise of soft power options. It also intends to provide some insights that might encourage policy-oriented ideas to promote the rising of a post-al-Qaeda world, that would liberate our societies (and our politicians) from their current fear, and prevent an overreaction in the event of a major terror attack like the one we witnessed in 2001.

**Keywords:** Globalization, security, information age, networks science, al-Qaeda

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disruption. It emerged as part of the complex system created by a highly communicated, decentralized, flexible, disorganized and transnational world economy and globalization. Yet this new form of terrorism, which can be characterized as an emerging aspect of specific types of social networks formed by alienated young men who undergo a process of radicalization and grow into becoming fanatics ready for martyrdom, can cause indiscriminate death and seriously harm strategic targets and innocent civilians alike, in their home countries, and in the Western world.

The relatively poor understanding of terror network dynamics, a superficial command of the impact of their actions on public opinion through mass media, both in the West and in the Arab-Islamic world, and political manipulation by government leaders for domestic reasons, have resulted in the unfortunate performance of the everlasting “war on terror” strategy as a whole. Placing fighting against terror in the category of “war” has resulted in a major error. Politicians seem not to be aware of what Sun Tzu wrote over 2500 years ago in his iconic book, *The Art of War*: “There is no example of a country that has taken profit of a prolonged war” (Sun Tzu, 2007). They seem not to take into account what, several centuries later and closer to our own time, Alexis the Tocqueville stated in 1840: “There are two things that a democratic people will always find very difficult, to begin a war and to end it”.<sup>1</sup> It was not until a new administration took office in the White House that the “war on terror” was called to an end by the US’s 2010 National Security Strategy. Lessons from that major error can and must be learned. An improved understanding of network dynamics and an increased sensibility of the key role of the media and political behaviour could help to improve the security governance of the post-war on terror and move steadily towards a post-al-Qaeda world.

The purpose of the present essay is to shed some light on this issue by examining a general overview of what we know about social networks dynamics. We will develop a special focus on what the small-world theory can bring in terms of analysis and comprehension, as terror networks are increasingly associated with this type of self-organizing structure. We will show how small-world networks can be very efficient, can handle sensitive information well, and are very difficult to tackle. We will discuss how the shape and dynamics of these networks of collective violence directly affect their behaviour. We will also attempt to show why the genesis, morphology and topology of these networks should to be studied and understood in order that the rules based system of government develops immunity to the activities of these

networks, given their capacity to disturb the economy, media and politics. The picture will not be complete without an effort to understand how the technological, socioeconomic and political context derived from global capitalism is affecting both individuals and social group behaviour. This analysis will try to demonstrate how providing an analogical answer to a digital challenge, and using vertebrate structures to tackle cellular organizations, has resulted in a strategy of limited effect. As it is increasingly being argued, bringing social science methodology to the study of this phenomenon is crucial. Finally, it may be important to clarify to the reader that the biological, social and communication metaphors that we use through the essay should not be taken as exact correlates. That is, human society is not a cellular body, nor an informatics program. They may share some structural similarities, but social relations should be studied empirically by themselves, not only through biological or technological models. Here we use them to facilitate comprehension through analogy, but would not give us by themselves the complete picture. It is by combining that analogy with the sociological and psychological aspects of terror networks and their participants that we can grasp their implications as a complex product of our global era.

## Networks, media and the local factor

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Networks are about communication. Life itself has to do with a network of communicated elements which are in permanent interaction. The exchange of information is essential to survival and evolution. The simplest kind of life is predicated on information contained in a cell bent by a membrane of proteins that is, to a degree, permeable to the

environment which surrounds it. It is able to communicate thereby with the outside world. This, of course, has to do with thermodynamics and entropy: any isolated system will tend to an even distribution of disorder and eventually collapse. It is only through interaction and permeability, in fact, through communication, that systems manage to survive, grow and reproduce. Our social system, also based in a complex system of communication and interaction, has seen a fast development of information and communication technologies since 1980. This has fuelled a proliferation of social networks which are so extensive that controlling their dynamics is no longer manageable with the classic methods of intelligence, let alone knowing where and when they appear, for which purpose, and how they mutate, reconfigure or suddenly disappear just to reappear unexpectedly somewhere else. The poor quality of intelligence is due not only to frequent prejudice against certain groups of people, outdated methods of analysis and sometimes poor quality of sources and data, but to a general lack of rigorous contrast and feedback of external views, attributable to the secret and self-contained nature of the discipline. The consequences are felt at all levels of society. From financial flows and criminal gangs to transnational

1. Alexis de Tocqueville. *Democracy in America*. Vol. 2. Chapter 22. George Lawrence (trans.); J.P. Mayer (ed.). New York: Anchor Books, 1969.

terrorism, the question of how we understand the social networks' self-organizational dynamics and their cellular nature is central, if we are to secure an effective management of their complexity and anticipate future consequences of their behaviours in our "vertebrate" nation-state political system.

The abundance of inexpensive, easily accessible and highly efficient communication systems has had a particularly powerful impact on social network dynamics, especially at a time when light and flexible networks are being established to tackle and challenge traditional hierarchical structures such as nation-state systems and national armies, both inherited from the modern industrial era. This asymmetrical state of affairs has jeopardized most traditional ways of organizing security in recent years. No doubt e-surveillance and extensive data mining from identified web-sites, chat rooms and suspect individuals are doing their job, but the combination of fast, agile, devious networks and an increasingly ubiquitous and influential system of mass media can be lethal as 9/11 demonstrated. One of the key problems for tackling terrorism is the mass media fascination for spectacular violent action that exponentially magnifies the action itself producing an over amplified impact. This, of course, is the effect the terrorist desires. Where the bombers themselves commit suicide in performing the terrorist act in the name of martyrdom, and are linked even remotely to al-Qaeda, then they magnify the effect still further.

Suicide bombing is not new: the first recorded suicide for political purposes was the biblical Samson who pulled down the temple of Dagon and killed himself and the Philistines. This was already a terror act with a political goal. Talal Asad observes that this story, which involved the killing of a large number of innocents, is recounted in the Bible as an act of triumph. It is a religious suicide through which God's enemies are killed with God's assistance and a new political world is initiated. "Samson's final act redeems not only his heroic status but also his people's freedom" (Asad, 2007). So the idea of committing suicide to kill innocent people for religious and political reasons is not new. What is new is that it is relatively easy and not particularly expensive for a group of otherwise ordinary individuals to carry on such an action, sneak through security holes, take the attacked target by surprise and produce catastrophic effects. The media propensity to magnify the violence of terrorist actions, turning it into a shockingly voyeuristic phenomenon, assists the attainment of their objectives not the least of which is that of forcing the authorities to overreact. The images of the destruction of the twin towers in particular, as icons of American super-power, broadcast on TV screens around the globe sent a powerful message to the world: this is a new era, with new actors, an era where even the single remaining superpower, can be struck at home. A global audience suffered the devastating psychological and emotional effects of images that have a far more important traumatic impact than the actual damages or casualties resulting from the attack. The resulting declaration on the part

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of the Bush administration of a "war on terror" created the conditions which allowed the terrorists to legitimize their action and extend its reach. Equally the terrorists may have underestimated both the impact of the events of 9/11 and the determination of the United States in addressing the issues it raised. It may be that neither party took into account Newton's third law, which holds that for every action force there is an "equal and opposite" reaction force.

Hence, poor understanding of "the local factor" of informal social networks in Iraq, Afghanistan or elsewhere, has turned out to be one of the unexpected challenges of the counterterrorism campaign. Sociological -if not anthropological- analysis and the use of social science methodology might help build a successful strategy in which understanding the world vision of the opponent becomes a key tool for avoiding major mistakes. The role of the media is also critical in this approach. It has become clear that the "war on terror" lost the key battle, namely that of "hearts and minds" (Tathamn, 2006). The Obama administration has started an effort to minimize the significant damage produced, not only in logistic losses and personnel casualties, but also at the symbolic, collective and imaginary level. Once the monopoly of the image is lost to the Internet, satellite TVs, mobile phone cameras and other digital image electronic devices, the prestige of the allegedly "moral superiority" of Western values -human rights,

freedom, democracy and the rule of law- have been the principal casualty of this confrontation. Even though double standards are constituent of the nature of international relations, resentment against Western double-standard policies can be found everywhere, starting from the Palestinian-Israeli conflict, explicitly men-

tioned by Osama bin Laden as one of the justifications for his global jihad against America and the infidel West. Arrogance in not taking into account how local Al Jazeera-like TVs were telling the war story undermined the daily efforts of troops on the ground.

Thus there is a remarkable lack of understanding of how local dynamics work and develop under conditions of turmoil. With strong motivation, deep personal commitment and the right links and connections, terrorist groups of all sorts proliferate, fuelled by the combination of existent informal networks, easily accessible communication technology and intense jihadist propaganda. Where the context is unstable - that is in weak states with immature institutions and corrupt power structures - the challenge may become overwhelming, as has lately be seen in Afghanistan, Pakistan, Mauritania, Somalia or Yemen.

Obviously, terror cells can also develop in Western cities and display very different patterns. Networks can be integrated by sophisticated, well educated medical doctors from the Pakistani diaspora or by immigrant Moroccans of modest backgrounds, as has been seen in England and Spain respectively. It is worth recalling the simplicity of the narrative and

the means required to articulate a network capable of a major terror act by looking at the Madrid train bombings in March 2004. The case illustrates how a cell can operate with little more than inspiration and determination. A gang of friends, gathering frequently in a public telephone call centre and probably inspired by an Islamist document posted on a radical web site, decided to bring together a group of acquaintances and relatives –originating mostly from the Moroccan town of Tetouan– to engage in some action. Apparently, the network had three leaders –two Moroccan (a PhD student formerly granted by the Spanish International Cooperation Agency, and a minor drug dealer) and an Algerian ex-Groupe Islamique Armé (GIA) activist– who had a different degree of former connections to global jihadists related to the al-Qaeda nebula. Further research on this matter appears to establish a stronger connection to al-Qaeda commanders in Northern Waziristan through an activist, Amar Azizi, particularly well connected to Northern African terror networks. A network of 40 people was put together, out of which 25 participants ended up directly involved in the action. The leading member in charge of logistics and financing –the drug dealer– knew a minor Spanish criminal who had access to some explosives stolen from a mine in Asturias, on the northern coast of the country. In exchange for some hashish he managed to get the explosives and the detonators, connect them to very basic, inexpensive mobile telephones, carry them in back-packs onto the trains, leave them lying on the floor and step down at the next station. A simple phone call to each mobile did the rest. The total cost of the operation has been calculated to figure between 41,000 and 54,000 Euros (Corte Ibáñez, 2007). As a result, 191 people were killed and nearly 2000 were injured.

**The deep interconnectedness and tight intertwining between terrorism, politics and the media make it difficult to predict the consequences of actions frequently following what physicists will call a nonlinear pattern.**

This is a distinctive example of how a spontaneous self-organizing network with minor connections to the remaining jihad lead by al-Qaeda can cause extensive damage to rules-based societies. On top of the bombing’s lethal effect, the action induced some major communication mistakes by the government that ended up affecting the coming election’s results. The Spanish government at the time considered admitting the Islamist origin of the bombings to be contrary to their electoral interest: connections might be established with its widely contested policy of enthusiastic support of the Anglo-American intervention in Iraq. The Prime Minister and his crisis committee decided to place the blame on the Basque terrorist organization Euskadi Ta Askatasuna (ETA), while evidence which confirmed Islamist authorship, was leaked to the press. One unanticipated consequence of the criminal action, therefore, was that this small, spontaneous network was able to claim that it had toppled a major western government. The newly elected Prime Minister, fulfilled his promise during the election campaign of immediately withdrawing Spanish troops from the Coalition authorities in Iraq. Although this was different in terms and scale from the events of 9/11, this event represents once again an example of the powerful interaction between a terror act, media action and political overreaction.

This example is particularly interesting for what it shows us about the self-organising character of such networks. It is this that allowed the phenomenon to evolve freely into a small-world network –or even a networks of networks– developing as it did so an impressive robustness and enduring flexibility. But understanding these dynamics and anticipating their performance is difficult precisely because these complex social phenomena are still poorly understood owing to their “emergent” nature (Johnson, 2001). In this regard, research by professors Christakis and Fowler has established that social networks have *emergent properties*, those being “new attributes of a whole that arise from the interaction and interconnection of the parts”<sup>2</sup>. The deep interconnectedness and tight intertwining between terrorism, politics and the media make it difficult to predict the consequences of actions frequently following what physicists will call a nonlinear pattern, a pattern where logic and common sense do not apply in a complex dynamic that operates “on the edge of chaos”. The combination of network proliferation and unpredictable outcomes of terror actions is impressive and requires further analytical insights.

**Small-world network’s topology and dynamics**

In order to shed some light on the terror networks that have developed since 2001, it might be helpful to look at how an informal social network can be established and evolve into a small-world one. One example, that complements the example of the Madrid train bombers’ plot, concerns the everyday life of a layman – let us call him K. The following account seeks to illustrate how an informal social network can start and grow out of a very simple idea and motivation, and how a simple node can potentially become a hub. The story is as follows.

K was born on 17 September. When he was a child, the date coincided with the beginning of the new school year, a day which most children associate with the end of the long foot-loose summer holidays. Later on, beginning with K’s twenty-sixth birthday, this *rentrée* spirit provided the context for an annual celebration of the end of the summer by holding a gathering of friends, taking advantage of the fact that everybody was looking forward to seeing each other after the summer break. The challenge each year was to get as many different people as the number of years K was celebrating. At the age of 26 it was an easy task, and became easier at the age of 30 and even at 35. Then, when the children were born and the crowd was ageing, it became more difficult. Fortunately

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2. “The idea of emergence can be understood by an analogy: A cake has a taste not found in any one of its ingredients. Nor is its taste simply the average of the ingredients’ flavours –something, say, halfway between flour and eggs. It is much more than that. The taste of a cake transcends the simple sum of its ingredients. Likewise, understanding social networks allows us to understand how indeed, in case of humans, the whole comes to be greater than the sum of parts” (Christakis & Fowler, 2009).

the “*soirée de rentrée*” had become popular among friends and acquaintances, and through these gatherings a kind of informal network was born, a network of people who met once a year with old friends and new, unexpected people.

The year K turned 46, so some 20 years since the first party, he needed to gather 46 new people if the now traditional objective was to be accomplished. K had changed job every two years on average over the previous ten years so that there was a constant turnover of people in and out of the social gathering. Provided each year K managed to gather the number of new people corresponding to his age, then some 755 people ( $26+27+28+ \dots + n+1$  up to 46) would have attended the party. Depending on the year, the attendance might well exceed its goal number. Social scientists believe that a normal person would have between 200 and 1000 connections depending, among other things, on character, profession and social status. The more extroverted, liberal and rich, the more connections you have. If the average at that particular event is 50 different connections per capita, there is a potential network of 37,750 people ( $50 \times 755$ ) who know at least somebody who has attended that particular event.

One of the consequences of this relatively large number of connections is that, during the gathering, people unexpectedly meet somebody they had never imagined they could meet at that particular place.

Consequently, one could say K (or more precisely K’s party) has become a connector, a hub that shortens the distance between one node and another. This brings us to the point that an astonishingly short number of links separate one human being from another, a

principal characteristic of small-world networks where a few nodes concentrate a big number of connections. The famous “six degrees of separation” story, a play by John Guare that helped gain acceptance for the complex networks concept says something important about this small-world approach. Towards the end of the play, Guare’s character Ouisa Kitredge delivers her famous monologue stating that she:

“...read somewhere that everybody on this planet is separated by only six other people. Six degrees of separation. Between us and everybody on this planet. The president of the United States. A gondolier in Venice... It’s not just big names. It’s anyone. A native in a rain forest. A Tierra del Fuego. An Eskimo. I am bound to everyone on this planet by a trail of six people. It’s a profound thought... How every person is a new door, opening up into other world” (Guare, 1991).

The play by Guare was inspired by Stanley Milgram, a Harvard professor who in 1967 set out to find the “distance” between any two people in the United States. He established that the median number of intermediate persons was 5.5. Round it up to six and the famous “six degrees of separation” was born. The play was written in 1991, enjoyed great success on Broadway and was afterwards made into a film which inevitably gained much wider distribution. Further

research on this six degrees of separation theory has shown that the spread of influence in social networks obeys what is called Three Degrees of Influence Rule. The rule argues that:

“Everything we do or say through our network, having an impact on our friends (one degree), our friends’ friends (two degrees), and even our friends’ friends’ friends (three degrees). Our influence gradually dissipates and ceases to have a noticeable effect on people beyond the social frontier that lie at three degrees of separation. Likewise, we are influenced by friends within three degrees but generally not by those beyond. The Three Degrees Rule applies to a broad range of attitudes, feelings and behaviours, and it applies to the spread of phenomena as diverse as political views, weight gain, and happiness” (Christakis & Fowler, 2009: 28).

But the idea of the existence of a “small-world” was implanted in peoples’ mind a long time ago. When you meet somebody you know out of the blue – or most probably somebody who knows somebody you know - in an unexpected and sometimes remote place you will exclaim “It’s a small world!” The Spanish expression for that - *el mundo es un pañuelo* - is more metaphorical meaning literally that “the world is a handkerchief”, for a handkerchief is a very modest piece of cloth. This idea of a small world where everyone is connected to everyone else by a short chain of intermediaries

has strong implications when you look at it seriously from the perspective of networks science. As Steven Strogatz, a professor of applied mathematics at Cornell University put it:

“the *small world* phenomenon is much more than a curiosity

of human social life: It is a unifying feature of diverse networks found in nature and technology. (...) many scientists have begun to explore the implications of small-world connectivity for the spread of infectious disease, the resilience of the internet, the robustness of the ecosystems, and a host of other phenomena” (Strogatz, 2003).

This line of argument fosters the conclusion that we live in a world in which no one is more than a few handshakes away from anybody else. Our world which boards almost 7 billion people<sup>3</sup> can easily be navigated by following social links, a network of 7 billion nodes in which any pair of nodes are on average 6 links from each other. This is quite mysterious, and you need some theory to understand how it happens. From describing the structure of the network to building scenarios of network dynamics and evolution, a long path has to be followed if some light is to be shed on the puzzle. We must take a broader view on the architecture of networks. The principle is basic: the layout of the network, its very structure, inevitably affects its function and shapes its dynamics.

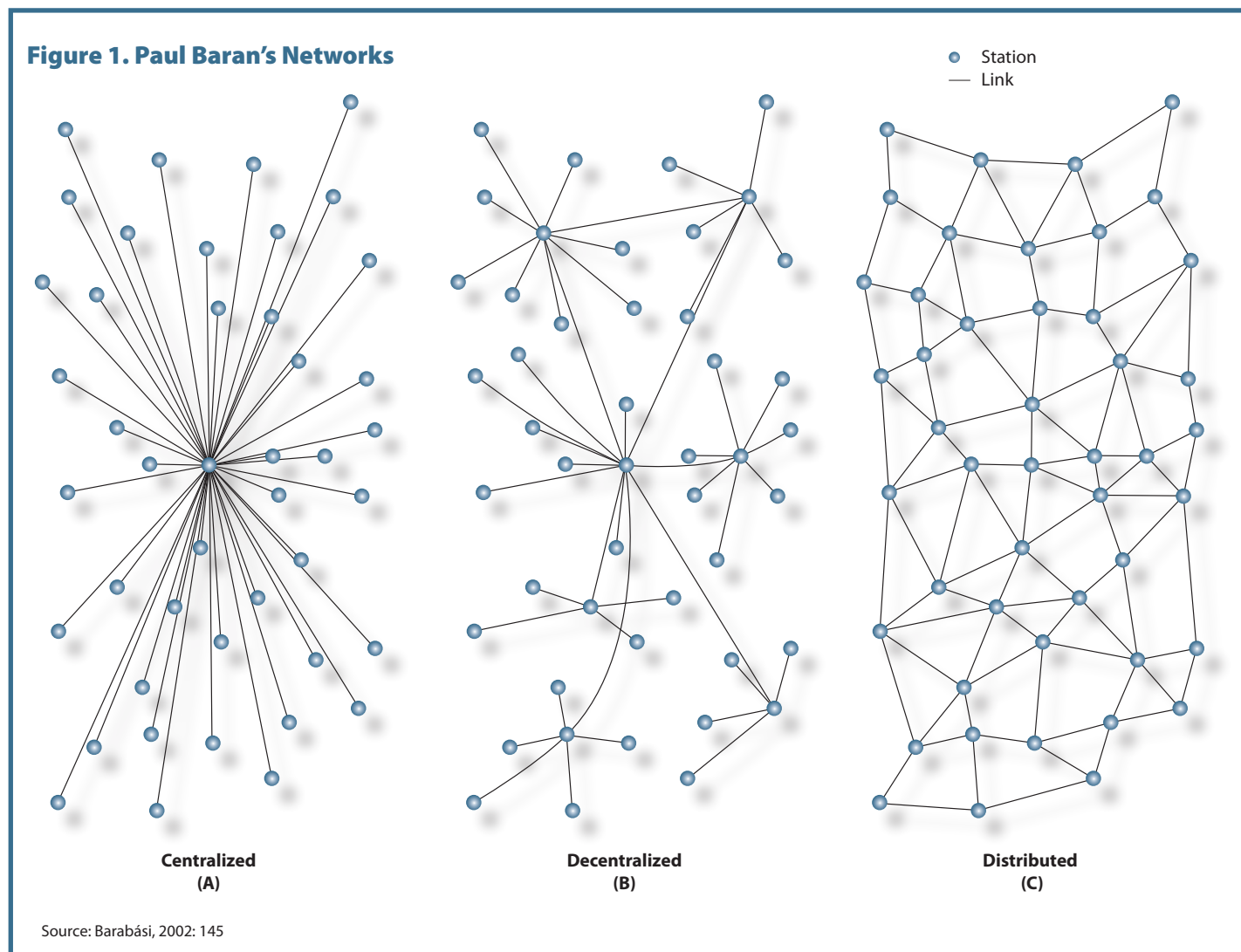
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3. <http://www.census.gov/main/www/popclock.html> (November 2010)

Working at the RAND Corporation in the early sixties, the Internet's inspirer, Paul Baran, was asked to develop a communicator system which would secure command in the event of a nuclear strike. Looking for the optimal structure of a computer communication network, he described three possible architectures, as shown in Figure 1. Both centralized and decentralized networks were far too vulnerable, whereas the distributed one was flexible enough to resist some of its nodes going down, as alternative paths will keep the rest of the nodes in the system connected. If one of the nodes is disconnected, the network reconfigures itself showing incredible robustness and resilience. This characteristic had a key influence on the way in which the Internet grew and became the dominant communication system of our time, a system which is shaping the way

Recent studies have confirmed the complexity of understanding such networks<sup>4</sup>. They can easily evolve into small-world networks, they are very efficient in handling information and can become very difficult to tackle, while their topology, following Marc Sageman's findings, is "able to adapt to changing circumstances and solve unforeseen obstacles in the execution of general plans". Sageman argues that:

"the self-organizing hubs and nodes topology of a small-world network or the dense topology of a clique performs this function (of handling information) very well. Communications are possible horizontally among multiple nodes, allowing them to solve their problem locally without having to refer them upward to Central Staff and overwhelming the



human networks are functioning today. That is one of the reasons why it is so difficult to tackle a criminal or terrorist network that has a distributed architecture, as it is not enough to hold down a few key nodes, however important they may be. When tackling a small-world type network, where real impact is required, it is necessary to attack the existing hub or hubs, where the large number of connections or links are concentrated. If you miss the principal hubs, the network is liable to be very resilient and reconfigures itself very quickly, as with the al-Qaeda network, which reconfigures itself at various levels and in different regions.

vertical links of communication. This flexibility and local initiative of small-world networks and cliques contrast with the rigidity of hierarchies, which do not adapt well to ambiguity but are excellent at exerting control" (Sageman, 2004).

4. "In fact, complex networks are the natural setting for the most mysterious forms of group behaviour facing science today. If the day should ever come that we understand how life emerges from a dance of lifeless chemicals, or how consciousness arises from billions of unconscious neurons, that understanding will surely rest on a deep theory of complex networks. At the moment, such theory is almost inconceivable". Strogatz, 232

This sort of anarchic, random character of network-building and performance is a major difficulty that has to be addressed in a multidisciplinary way. Experience shows that it is possible to recognize and even scrutinize a network but cannot control or degrade it from the outside.

If we take a closer look into this difficulty we can observe how network building has both a spontaneous growth and a structured dynamic: the presence of mixed geographical and socioeconomic origins, going from highly educated wealthy individuals leading the cause to petty criminals or graduated middle class medical doctors acting independently, adds complexity to the system and obliges us to include a multi-level vision of the phenomenon in our thinking. John Ar-

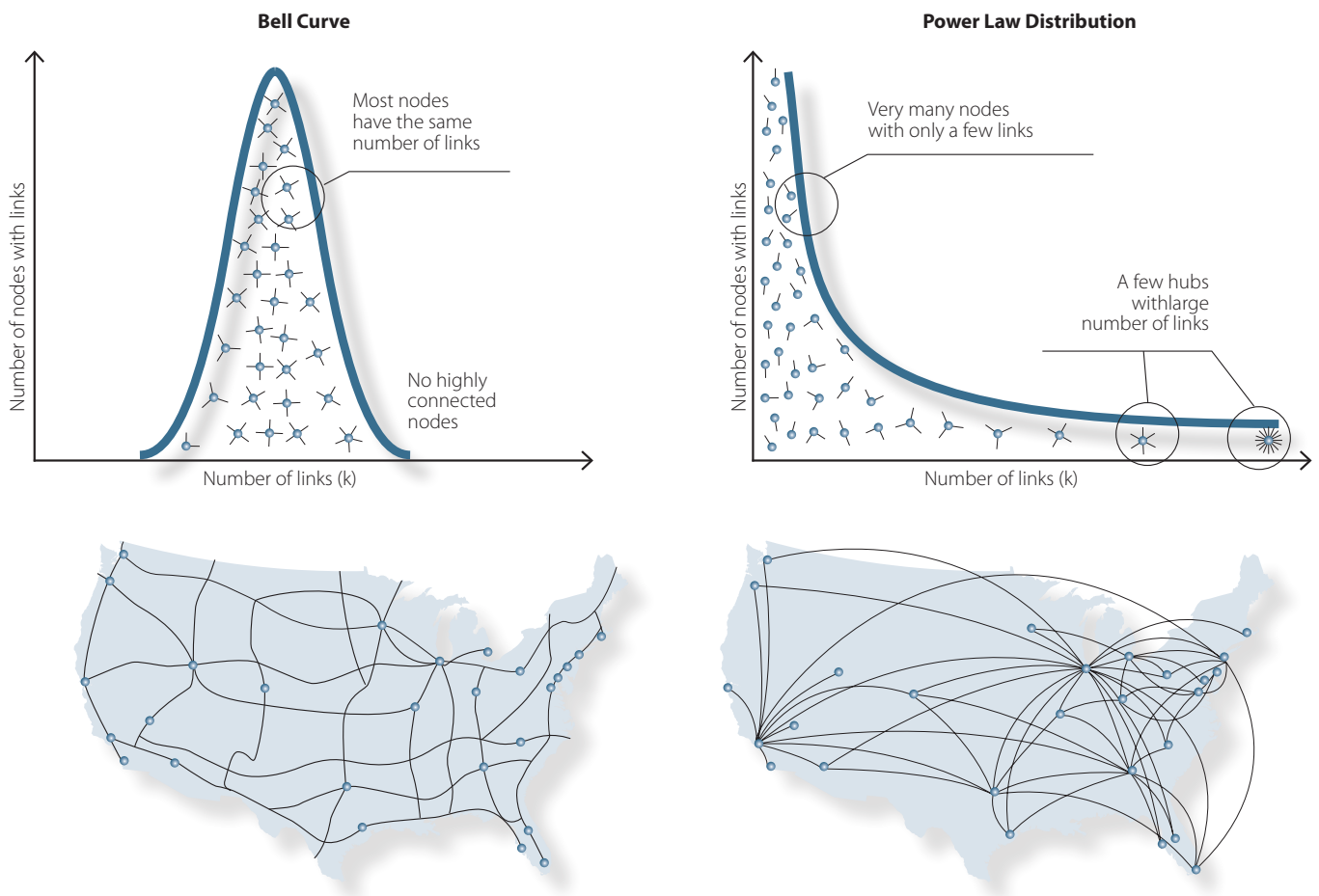
- Technological level - the information systems in use
- Social level - the personal ties that assure loyalty and trust

The strength of a network (...) depends on its functioning well at those five levels. The strongest networks will be those in which the organizational design is sustained by a winning story and a well-defined doctrine, in which all this is layered atop advanced communications systems and rests on strong personal and social ties at the base.”<sup>5</sup>

All of these characteristics can be discerned in the networks discussed in this essay.

Network theory has evolved since 1990 going from describ-

**Figure 2. Random and Scale-Free Networks**



Source: Barabási, 2002: 71

quilla and David Rondfeldt in their studies of “netwar” have established that besides the organizational aspects:

“theoretical arguments and the practice among *netwar* actors indicate that the design and performance of such networks depend on what happens across five levels of analysis (which are also levels of practice):

- Organizational level - its organizational design
- Narrative level - the story being told
- Doctrinal level - the collaborative strategies and methods

ing networks as static features to seeing them as growing systems, from random performance to scale-free behaviour. It might be helpful to shift from describing their structure and topology to, as the network theorist at University of Notre Dame, Laszlo Barabási (2002) puts it, “understanding the mechanisms that shape network evolution”.

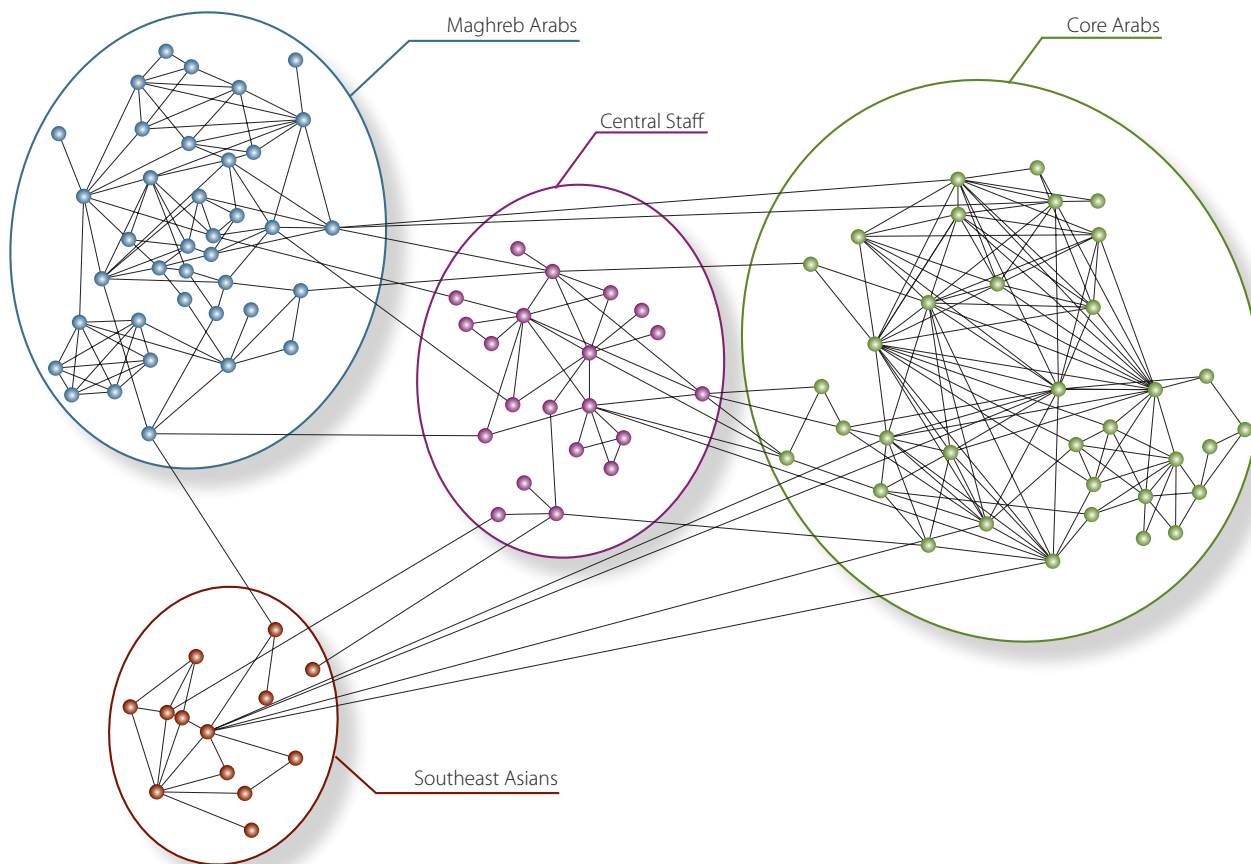
5. John Arquilla and David Rondfeldt (1999) “Networks, Netwar and the Fight for the Future”, [http://firstmonday.org/issues/issue6\\_10/ronfeldt/index.html](http://firstmonday.org/issues/issue6_10/ronfeldt/index.html)

As Figure 2 shows, the distribution of a random network follows a bell curve which demonstrates that most nodes have the same number of links, and nodes with a very large number of links do not exist (top left). Thus it is similar to a national highway network, in which the nodes are cities, and the links are the major highways directly connecting them. Indeed, most cities are served by roughly the same number of highways (bottom left). In contrast, the power law degree distribution of a scale-free network predicts that most have only a few links, held together by a few highly connected hubs (top right). Visually this is very similar to the air traffic system, in which a large number of small airports are connected to each other via a few major hubs (bottom right) (Barabási, 2002: 71). One of the problems increasingly cited as a perverse tendency of global capitalism, known as the *long tail* problem, is that the

man's portrayal of the global Salafi jihad network shape, the jihad is described as "not a specific organization, but a social movement consisting of a set of more or less formal organizations", before he proceeds to refine social network analysis concluding that the "more connected nodes, called hubs, are important component of a terrorist network. A few highly connected hubs dominate the architecture of the global Salafi jihad" (Sageman, 2004: 137-138).

Perhaps the most interesting point about al-Qaeda's architecture shown in Figure 3 is that it was not planned and executed from the top, but rather it was the bottom-up product of the changing circumstances of the national and international environment that globalization brought about. This bottom-up quality is now increasingly seen in the new generation of

**Figure 3. The Global Salafi Network as described by Mark Sageman**



Source: Sageman, 2004: 138

topology of the small-world networks of corporations operating in a particular sector is less and less "democratic", in the sense that very few nodes concentrate the majority of connections, that is to say, very few corporations concentrate a large number of customers. This is leading to marginalization in the sense that marginal nodes tend to become more and more marginal, and eventually disappear from our focus (for instance in Google, which organizes its information by connectivity) and can easily fade away or simply hide.

Accordingly the argument here is that networks are being increasingly described as small-world networks. In Sage-

jihadist networks that seem to be scattered internationally. Nevertheless, the preceding paragraphs seem to lead to the tentative conclusion that, in network theory, there seems to be an overemphasis on structure, on nodes and key hubs and clusters, but there is little thought on the *nature* of the social relationships that establish the links. Here is where research effort should be invested. Even virtual links, like face-to-face relations, vary in quality (i.e. formal-informal, hierarchical-horizontal, kinship, gender, class, race, interest-oriented, identity-oriented and so on). This variety defines different networks even though they may share the same small-world structure.



## Globalization, violence and identity

Two concepts are crucial to understanding the nature of transformations and challenges emerging when studying contemporary networks in the light of the connection between violence and identity issues. On the one hand there is the increasing speed of interconnections and interactions that, in the realm of individual psychological perceptions, are “shortening” our time. On the other hand, this speed has an important impact in “shrinking” our space: distances matter less and less. Portable communication devices also have a very important role, as we are only recently beginning to discern. The classical psychological space-time patterns that were used to grasp this reality have obviously become obsolete. This has major consequences for identity building of particularly vulnerable individuals or groups that might resort to radicalisation and eventually violence as a reaction to uncertainty. In order to offset this danger, it is very important that new tools for understanding and developing adaptive codes for interpreting different realities are constructed.

All kinds of networks are growing every day. Powered by the Internet, collecting in “chat rooms”, fuelled by web sites and other virtual spaces, all kinds of networks are growing every day, incrementally, node by node, even “face by face” as we have seen with the accelerated expansion of Facebook. Earlier we saw how it takes just a few nodes and, provided at least one of them is linked to a connector (or a hub), there is already a functioning web, a seminal small-world network with a great deal of potential, spontaneous growth. Yet, social networks of individuals have existed throughout human history, conditioned by time and space. Simultaneity and proximity (personal face-to-face contact) were a must. What is different now, what is new, is the varied scope and scale of interconnectedness that can develop and function in asynchrony and at long distance.

We know that communities develop patterns of social interaction defined as “networks of interpersonal ties that provide sociability, support information, a sense of belonging and social identity”.<sup>6</sup> The most active members of the network are the ones who shape its structure and control its dynamics and orientation. So the network will be shaped by their users, and the users will be shaped by their network. Understanding the structure and function of social networks thus helps us to understand certain rules regarding their connection and contagion. Christakis and Fowler have defined five rules in this regard: 1. We shape our network; 2. Our network shapes us; 3. Our friends affect us; 4. Our friends’ friends’ friends affect us; and 5. The network

has a life of its own (Christakis & Fowler, 2009: 17-25). Networks of individuals are, in a way, blown up by the use of the Internet and proliferate through virtual forums and web sites. The findings of sociologist Manuel Castells’ research tell us that “users of the Internet tend to have larger social networks than non-users. People of higher status tend to have more friends, who are more diverse and live at a greater distance, so e-mail is a good instrument to keep in touch with this wider network of personal contacts and use them, eventually, for a purpose” (Castells, 2001: 120). “The medium is the message”, said Marshall McLuhan in 1964. “The network is the message”, argued Manuel Castells in 2001 (Castells, 2001: 1-8).

The rise of the network society in the late twentieth century constituted a change of paradigm. Interconnectedness has become the obsession of the contemporary era, if only because a volatile environment is making individuals conscious of the ever present danger of redundancy. Becoming redundant means becoming underconnected, poorly attached, thus becoming marginalized, disconnected and finally turned into waste. Increasing our interconnectedness means increasing our chances of surviving and progressing through complexity. In the context of an overwhelming performance of post-modern capitalism, we were continuously producing “human waste”.<sup>7</sup> Broadening this analysis to our study of societies, we might be tempted to conclude that the long period of economic growth in the West-

ern world (1993-2008), facilitated by the processes we refer to collectively as globalization, have produced much waste in the less developed areas of both our neighbourhoods and the world at large. While Africa seemed redundant to the Western economies, parts of the Arab-Muslim world faced difficulties to adapt their social systems to the new global scenario where emerging economies like China, India or Brazil,

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modernizing themselves very quickly, are playing their cards. Closed, traditional societies, even if they are relatively well-off, experience a sense of *décalage* with the speed of changes fostered by the global world and go through identity crises that can result in what might be called “regressive utopias”. Even if it is too a dichotomist analysis - since open societies have a number of closed corners, while closed societies allow more open spots than commonly anticipated - we can argue that open societies are creative, can face crisis and manage political changes that will better adapt to fluid situations than closed ones. Closed societies will struggle to survive by tightening social control mechanisms and political repression. And yet this reaction is contrary to the global dynamics set in place by open markets and free circulation of capital, goods, services and information, pushing these societies into the periphery of the system, where they become more vulnerable to corruption and violence.

6. Barry Wellman, quoted by Manuel Castells (2001), *The Internet galaxy. Reflections on the Internet, Business and Society*; Oxford: Oxford University Press.

7. Baumann (2004): “The production of ‘human waste or’ more correctly wasted humans (the excessive and redundant ...) is an inevitable outcome of modernisation and an inseparable accompaniment of modernity”.

The changing nature of our times is very demanding and confronts individuals with the need to cope with the liquidity, instability, and volatility of our interconnected social environment, be it in our private sphere or our professional career. As the German sociologist Ulrich Beck put it, in a world of fast changing references, our society almost continuously tells us to seek “biographical solutions to systemic contradictions” (Beck, 2002: 39-55). These solutions can go from deepening individuality and egotism through status and economic success to putting the accent in identity building and political or religious radicalism. The relationship between identity building and violence that was at the origin of modern nation-state construction, has been at the core of the conflicts that emerged after the post-Cold War world. The recent violence occasioned by the identity crises in Bosnia, Kosovo, Rwanda, Sudan or Kyrgyzstan are self-explanatory. Harvard professor and Nobel prize winner, Amartya Sen (2007:23), argued that:

“many of the conflicts and barbarities in the world are sustained through the illusion of a unique and choiceless identity. The art of constructing hatred takes the form of invoking the magical power of some predominant identity that drowns other affiliations (...). The result can be homespun elemental violence, or globally artful violence and terrorism”.

In today’s complex world of multiple identity,<sup>8</sup> many contextually-alienated young men would find joining a network of a violent nature an effective way of finding trustworthy peers with whom to share a purpose and simply make sense of everyday life. This can be the answer to insecurity, uncertainty, poor social integration in foreign countries, joblessness or hopelessness at home. As individualism is a feature of modern societies, the difficulties of semi-closed impoverished or alienated groups that fail to cope with success based in economic or professional achievement and social integration might explain why more or less alienated youngsters seek an alternative narrative. Once you find enough external motivation - through jihadi web-sites, satellite TV propaganda, or through the words of a fundamentalist preacher in your nearby mosque - taking actions to increase your fanatical feelings through chat rooms on the Internet and to establish a cell of self-organizing activist friends might turn to be a quite straightforward process. A very different issue though is to manage to link up

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with the real al-Qaeda network members, as Marc Sageman has shown in his description of the organization’s behaviour during the 1990s and early 2000s. “The critical and specific element to joining the jihad”, Sageman wrote, “is the accessibility of a link to the jihad. Without it, the group of friends, kin, pupils and worshippers will undergo a process of progressive isolation” (Sageman, 2004: 120). However, since the American campaign against Osama bin Laden’s sanctuary in Afghanistan failed to hunt him down but managed instead to disperse al-Qaeda’s alleged high commanders, thus failing to remove the principal hubs of the network effectively, the problem has become even more complex. The intensive use of internet communication tools, and the vanishing need to get in touch with some al-Qaeda veteran or travel to a training camp, makes organizing a plot and declaring al-Qaeda’s paternity much more easy than in the past. Therefore this “deterritorialization” has fostered bigger uncertainty on who is and who is not directly linked to bin Laden’s matrix, on what and what is not an al-Qaeda franchise.

In consequence, an added difficulty to the looseness of real relations with original jihadi leaders is the diversity of networks that can decide autonomously to act in their name to bury their real goals, as we have seen in the case of a number of bombings in Algeria, where some experts from inside the country pointed out that blaming al-Qaeda could be a tactic

to cover internal political struggle. Recent kidnappings in the Sahel region, allegedly carried out by al-Qaeda in the Islamic Maghreb (AQIM), have showed the goal to be more profitable than political, the group being a flawed mixture of radicals, desert smugglers, drug dealers and criminals, ambiguously fuelled by unnamed services. The variety of motivations and contexts adds to the variety of socio-economic origins and social dynamics of terrorists making it difficult if not impossible to identify a *typical*

*background* of a potential terrorist individual or network that can range from “lone wolfs” to “home-grown” wannabes, following Sageman’s recent characterization. “The present threat”, he writes, “has evolved from a structured group of al Qaeda masterminds, controlling vast resources and issuing commands, to a multitude of informal local groups trying to emulate their predecessors by conceiving and executing operations from the bottom up. These “home-grown” wannabes form a scattered global network, a leaderless jihad” (Sageman, 2008: vii). Of course some patterns can be described, such as being an expatriated student or immigrant young Muslim going through a crisis of identity and/or integration in a Western European country, but little more can be said. The process of radicalisation and recruitment is highly complex and takes different forms in different environments, while social networks theorists argue that the best predictor for joining in a network is knowing somebody who already is

8. There is a wide bibliography discussing “multiple identities” in recent modernity. In his article *Cultural Identity and Cinematic Representation*, Stuart Hall (1993) argued that “identity” is not as transparent or unproblematic as we think. Perhaps instead of thinking of identity as an already accomplished fact (...) we should think of identity as a ‘production’ which is never complete, always in process, and always constituted within, not outside, representation”.

involved. Anyhow, as Peter Neumann argues, “No researcher has yet been able to construct a single profile based on simple socioeconomic indicators that would accurately describe the typical jihadist... The pattern is that there is no pattern” (Neuman, 2007).

### A dark age ahead?

We have discussed so far different characteristics of the networks and their behaviour, the social and psychological nature of their potential members, but we found little that could guide us to building a solid strategy to prevent their emergence and proliferation. Far from solving the problem, President Bush’s administration policies in Afghanistan and Iraq failed to achieve their objective of “making the world a safer place”. The Indian-American author Fareed Zakaria (2008: 223) has synthesized Bush’s foreign policy in a very eloquent formula:

Unipolarity + 9/11 + Afghanistan = Unilateralism + Iraq

By 2004, the International Institute for Strategic Studies was reporting that “the Iraq conflict has arguably focused the energies and resources of al-Qa’ida and (bin Laden’s) followers, while diluting those of the global counter-terrorism coalition”. The report states that: “in the wake of the war on Iraq, al-Qaeda now has more than eighteen thousand potential terrorist scattered around the globe” (The International Institute for Strategic Studies, 2004). Iraq became a second Afghanistan for international jihad fighters. They did not need training camps anymore, as they could road-side bomb American Humvees, killing real enemies, and use the tactics of suicide car bombings against servicemen or civilians alike. In the last few years, all that horror –including repulsive televised beheadings– has been systematically broadcast by Arab television stations throughout the Middle East and the Maghreb, resulting in daily propaganda and potential recruits for the jihad, now that the “far enemy” has come close. A report from the Combating Terrorism Center at West Point analyzing al-Qaeda documents captured in Iraq, containing about nearly 700 records of foreign nationals that entered Iraq between August 2006 and August 2007, shows that they were usually young –average age of 24-25 years– and came from a wide range of Arab countries –mainly from Saudi Arabia, Libya, Morocco, Algeria, Syria, Yemen and Tunisia:

“The fighters’ overall youth suggests that most of these individuals are first time volunteers rather than veterans of previous jihadi struggles. If there was a major influx of veteran jihadists into Iraq, it may have come earlier in the war. The incitement of a new generation of jihadists to join the fight in Iraq, or plan operations elsewhere, is one of the most worrisome aspects of the ongoing fight in Iraq. (...) So long as al-Qa’ida is able to attract hundreds of young men to join its ranks, it will remain a serious threat to global security” (Felter & Fishman, 2008).

What is happening to the young people who survived the Iraq conflict and were left behind after Allied withdrawal as veterans of that war? Will they resume their home networks

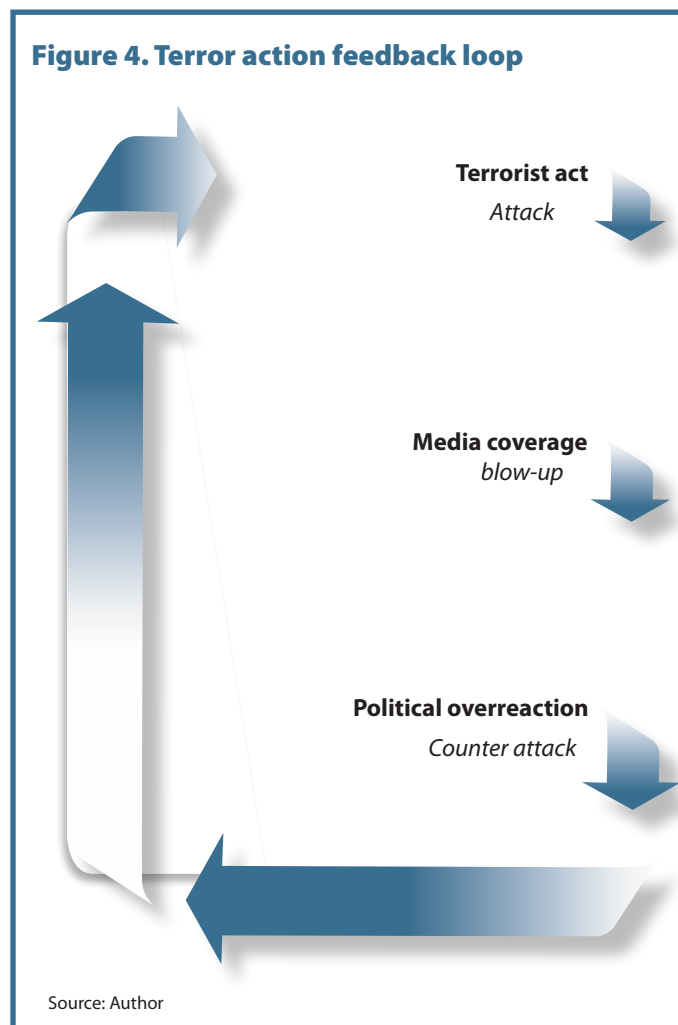
and attempt to use their lethal experiences against new targets? While describing al-Qaeda’s first public appearance, the French historian Jean-Pierre Filiu argues that al-Qaeda or “The Base” eponym can be also interpreted within a double meaning: that of a territorial “base” whence to anchor the jihad for a better diffusion, and that of an electronic “data base” (*qâ’ida alma ‘lûmât*) of Afghanistan veterans constituting the jihad’s avant-garde (Filiu, 2006: 31). As strategy professor Audrey Kurth puts it:

“Al-Qaeda began in the 1980s as a computer database with the names of foreign fighters in Afghanistan is that a wealthy Saudi dilettante would have a way to inform their next of kin if they were killed, and over the course of the next two decades it became a global entity capable of bloodying a superpower on its own soil and frightening millions of people into supporting a ‘war on terror’” (Kurth Cronin, 2009: 166).

An Iraq veterans’ Qaeda or “data base” is a very detrimental inheritance of the occupation and may leave a grim legacy for the years to come.

While it is clearly important to develop an understanding of the development of small-world connectivity for future counterterrorism action planning, this is to deal with abstractions. The lack of understanding of local societies and cultural dynamics has led to huge mistakes, especially when we let arrogance, and the abuses of over-sophisticated technology

**Figure 4. Terror action feedback loop**



Source: Author

condition our perceptions while fuelling hatred and anger both in the Arab Islamic world and in migrant communities of that origin abroad, resulting in new recruits of brave mujahedeen ready for action. It might be useful to refer to what professor Werner Heisenberg (1958), famous for his groundbreaking Uncertainty Principle, wrote: “What we observe is not nature itself, but nature exposed to our method of questioning”. It is clearly necessary to examine the quality of our perceptions, distorted as they are by our ideology, our hegemonic views and our alleged superiority based on Cartesian thinking and hyper technology. The obsession of measuring and rationalizing everything precludes us from understanding the system as a whole. Confusing the screen with the landscape, the hard with the soft, is a common disease in our technological times. Thus, when analyzing the new reality of distributed network-based global terrorism, it is necessary to be very cautious. We must shift into nonlinear systemic thinking and bring in the social, political and cultural context if we are to grasp something about their logic and evolution. As we have seen, bringing in the highly sophisticated complexity theory or small networks theory –the realm of mathematicians and physics– is not enough. We will need some psychology as well, some sociology and simple examples of everyday life. Terrorists are not essentially evil people from the outside world, but usually lay people from our neighbourhoods, often belonging to an alienated Diaspora that undergo a radicalization process fuelled by complex and multiple reasons. We need “cultural translators” who can open our eyes to the realm of social dynamics on the ground. And yet, all that knowledge will become useless if we do not integrate into the algorithm the role of the media and the reaction of the politicians, in a devious and unpredictable but very basic feedback effect, as illustrated in Figure 4.

**Finding a way out would not be straightforward. Maybe a smart use of public diplomacy and soft power might overturn the situation, even if it is done by adding democratic networks of policy-making, committed individuals and institutions to the already existing long tail of initiatives.**

This change of perspective brings us back to the idea that an apparently commonplace, simple event as K’s *rentrée* party described above can become a growing system, a potent power distributed network that can work as a connector. The whole idea revolves around the key role hubs may play. A regular gathering of forty something people can become a small-world network if kept alive for a number of years, potentially linking hundreds of thousands. Its power can be large if appropriately used. Imagine if somebody participating in the network tried to convince a core group of its participants –maybe those going through some turning point in their private or professional lives– to use it for a wicked goal. Even if its small-world architecture makes it vulnerable, we have to abandon the idea that identifying and eventually removing some nodes will help us to destroy the network. Some very marginal, difficult to identify nodes are likely to survive and easily reconstitute the network and become the substitute of the original hub. The key person to remove will be K himself –or Osama bin Laden, if you wish– being the principle hub around which the network is formed. But do-

ing so would be clearly insufficient in the case of al-Qaeda as, following Kurth’s analysis, “this movement has gone well beyond where decapitation might have led to its end” (Kurth Cronin, 2009: 178). A quick overlook back at *9/11 Commission Report*<sup>9</sup>, issued in September 2004, shows us how the efforts made to track down al-Qaeda’s leader through some nodes of the Afghan tribe’s networks were vain and ultimately unsuccessful. Not even massive bombing of Tora Bora caves was the right answer to that failure of intelligence. Additionally, poor understanding of cultural codes and refined social links has led to poor performance in disturbing their networks. If indeed we are entering a “leaderless jihad” era, where networks of all sorts might proliferate with a general objective of causing distress but lacking any central command and control component, that may complicate an already intricate situation.

Finding a way out would not be straightforward. Maybe a smart use of public diplomacy and soft power might overturn the situation, even if it is done by adding democratic networks of policy-making, committed individuals and institutions to the already existing long tail of initiatives. Finding appropriate solutions will be difficult as they are likely to entail some radical reform of our way of thinking. Therefore, if action is not taken, devoured by its own contradictions and harassed by seldom but devastatingly violent cells, American

and European culture might be facing what the urban sociologist Jane Jacobs once called a “dark age ahead” (Jacobs, 2004).

## Conclusion

A small-world shaped network is easy to establish and shows a rather spontaneous and self-organized behaviour, as seen in both the Madrid

plotters and K’s party examples. If we are to mention only some aspects of the complex social nature of their durable links, we will cite the need of a narrative, a sense of belonging, a common purpose and trust among their members. Provided the Internet and some modest “seed money” is in place, directing the network towards hyper violence is just a matter of determination and resolve. As I have discussed extensively through this essay, a central commander or a precise instruction to act is not compulsory anymore. This devaluation of order and hierarchy is a side product of “globalization”, a concept that was coined, according to Zigmund Bauman’s analysis, “to replace the long-established concept of “universalization” once it had become apparent that the emergence of global links and networks had nothing of the international and controlled nature implied by the old concept”. He argues that:

9. <http://www.9-11commission.gov/report/911Report.pdf>

“Globalization’ stands for processes seen as self-propelling, spontaneous and erratic, with no one sitting at the control desk and no one taking on planning, let alone taking charge of the overall results. We may say with little exaggeration that the term ‘globalization’ stands for the disorderly nature of the processes which take place above the ‘principally coordinated’ territory administrated by the ‘highest level’ of institutionalized power, that is, sovereign states” (Bauman, 2001: 34).

In contrast with classical modern terrorist organizations, al-Qaeda has evolved into a fluid post-modern association as a distinctive globalization outcome. Even though a refurbished leadership might try to re-emerge in the mountains bordering Afghanistan and Pakistan, this global network (and its parasites) has no headquarters and it is not coupled with this or that state or region. The trouble is that, in a technology and communication-driven highly unstable global environment, our traditional “industrial”, “modern” and “sovereign” way of thinking and acting has become obsolete. Yet major changes at the macro level of policy making are urgently needed, and a quick and “honourable” end of the Afghanistan war as well as to the Israeli-Palestine conflict are only preconditions for scaling down the potentialities of global terrorism. A better-informed and broader strategy is needed. In the meantime, understanding network dynamics and reinforcing highly specialized “hub hunting” task forces might be of some help in disturbing a number of terror cells. In addition, actions like building multilateral democratic platforms of trust and common understanding, integrating smart, influential, committed to action people from both sides (as the Alliance of Civilizations’ UN initiative is trying to do<sup>10</sup>) might be of some use. However, in the light of what I have been discussing, it is likely to be insufficient.

Declaring perennial “war on terror” turned out to be an error of major consequences. At this stage, the accurate response must come from truthful community policing and fine police work rather than from harsh military campaigns. The answer must come from “intelligence” multidisciplinary teams (incorporating social scientists willing to test their hypothesis), rather than from political opinionated cabinets ready to overreact or from overexcited journalists seeking bleeding bad news to increase their “share”. To my understanding, the remaining core question will be nevertheless how to handle the key role of traditional and new media, and create a healthful narrative, both in the West and in the Arab Muslim world. And yet, as a reaction to weak post-crisis economy, anti-immigration is becoming mainstream in Europe and increasingly yielding votes to the populist right. The good news are that, after years of mistrust fuelled by violent extremism and violent response, in Cairo in June 2009 the

10. <http://unaoc.org/>

newly elected Barack Obama told the audience: “I have come here to seek a new beginning between the United States and Muslims around the world, one based upon mutual interest and mutual respect”. The path indicated by this speech, reinforced by his Jakarta speech in November 2010, reveals a major change of trend and opens a window of opportunity for mutual understanding that should not be frustrated.

We can conclude that global terrorism is a side effect of globalization, as it exploits its technology, its looseness and flexibility, and its impact in reshaping the global power struggle from the bottom up. In consequence, the critical social and psychological tensions that globalization has added to individuals is shaping people’s identities, and some are solving their conflict by canalizing violence in an odd way. The “war on terror” was a wrong move and clearly added oil to the fire. Thus, Islamist terror networks are here to stay, unless they fade away, if they are no longer able to attract new adherents, as Sageman (maybe too optimistically) suggests<sup>11</sup>. The implosion of al-Qaeda, while plausible, is not yet certified. Al-Qaeda “brand” is too useful for a large number of different actors –from security services to international criminals- that it is unlikely to fade away even though we know, following professor Kurth, that “we do ourselves no favours in glossing over these differences and simply referring to all this groups as “al-Qaeda” or for that matter implying that all groups that

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use terrorism are al-Qaeda. There is a strong argument to be made for avoiding the name in many circumstances” (Kurth Cronin, 2009: 188).

In the meantime, moving on the edges of chaos, some “sleeping cell” might be planning to obtain hazardous biological or nuclear material in

Pakistan or elsewhere else in the world, while new threats, like cyber-terrorism, are waiting on the sidelines. Tough –and silent– security is necessary to tackle that, but possibly the present counterterrorism coalition of “vertebrate” nation-states should be more sensitive to the new environment and foster, in addition, a “cellular” network of responsible media and insightful policies. The political response (as it seems to be understood by the Obama administration) should be based on careful listening, not only to the usual intelligence units and customary terror experts, but to a wider range of fresher views with a better social and anthropological understanding; that is, if we are to avoid the disastrous overreactions and policy errors we witnessed in recent times, in the event of another shocking attack. Analysts and policy-makers should thus concentrate on setting up the building blocks for a post-al-Qaeda world.

11. “The leaderless jihad will probably fade away for (different) internal reasons. The danger is that too vigorous an eradication campaign might be counterproductive and actually prolong the life of the social movement. The eradication efforts may be seen as unjust and therefore attract new recruits to the movement, just when it was dying out on its own. A measure of restraint is necessary to prevent new member from joining. The leaderless jihad should be allowed to expire on its own”. Marc Sageman (2008: 146).

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