

Complex Social Networks: The Case of Jihadi Global Networks & The Willingness To Use Terrorism After 9/11

MU MVZ 203 / 448
Spring 2010
Sonoma State University
Dave McCuan

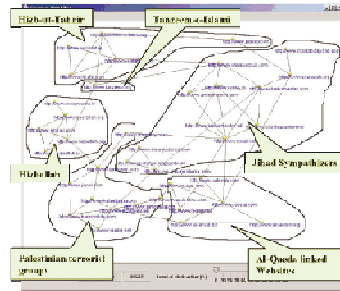


Fig. 1. The Arab Terrorist Network with associated Elements, Types of Relationships



SPECIFICATIONS FOR AN ATOMIC EXPLOSIVE DEVICE

In the easiest bomb to build, a plug of Uranium is shot through a tube into more Uranium, creating a critical mass capable of sustaining a fission reaction. This design requires a greater amount of fuel than more sophisticated designs and explodes less efficiently. Still, one bomb could destroy a medium-sized city.

Uranium Plug: The surface area of a sphere increases more slowly than does its volume, so in a sphere of fissile material, the ratio of surface (fission) area to volume (fission) decreases as volume increases. To start a sphere will be sure, a critical sphere will explode upon assembly. A critical sphere of U-235 weighs seven pounds and is smaller than a golf ball. In four millivolts of a second, eight generations of neutrons give temperatures as hot as the interior of the sun and pressure greater than that at the center of the earth before disintegrating (about steps for elastic modulus). Energy density there is the bomb is equivalent to that of several tons of dynamite.

Ratio of U-235 to U-238 in natural Uranium = 1:139. Absorption of any single neutron by U-235 (formation of U-236) releases some 1.8 MeV, more in MeV for fission, output 210 MeV.

The construction of plutonium: Plutonium's liquid thermal neutron cross section is smaller than that of uranium, so over 1000 cooling water through an outer casing U-235 to diffuse around and create plutonium. 1000 non-fissionable neutrons are lost with 2,000 fissions being the result; only neutrons from fission, because 200 per U-238 or plutonium.

Explosion Rating: 2 cut into hemisphere (instead over 1000) of cadmium alloy that is smaller of cadmium walls. Plutonium uranium oxide ratio together is the optimal ratio. The radius shrinks neutrons into this mass, and 100 U-235 completes the reaction.

Probability of pre-detonation in which energy release is less than 10,000 tons TNT equivalent is $P = 10^{-10}$ per gram, where n is the number of atoms per gram in the total amount.

Elemental Distribution by Weight:
 $U = 10^3$ $C = 2 \times 10^2$ $Na = 2 \times 10^1$ $S = 5 \times 10^0$
 $O = 5 \times 10^1$ $D = 10^1$ $Mg = 10^0$ $P = 10^0$
 $Si = 2 \times 10^2$ $F = 5 \times 10^1$ $N = 2 \times 10^0$
 $U^{235} = 10^3$ $U^{238} = 10^3$ $Be = 10^0$ $K = 10^0$

Neutrons from U-235 (fission) are moderated by hydrogen (water). With uranium fuel (C, observed at approximately 2.2 mm and occasional 35 mm holes (the μ K μ)).

This document is a work of the author and is not to be reproduced or distributed without the author's permission.
 Illustration in English from Arabic Jihad website. (Graphic as it appeared on website.)



Elements of the New Terrorism

BG Howard's model - "8 Ways Terrorism Has Changed After 9/11"

1. America is at risk on the homeland front
2. Terrorists are more violent – *different political aims*
3. Terrorists have global reach and are transnational non-state actors – *rise of Internet & enhanced communication networks*
4. Terrorists are better financed – *zakat, charity orgs., wealthy donors*
5. Terrorists are better trained *in tradecraft, AW, IW (info. warfare)*
6. Terrorist cells are more difficult to penetrate (*esp. AQ*)
7. Terrorists have access to more lethal weapons (*Soviets, bio/nukes*)
8. Success and/or failure are difficult to measure – *no clear outcome & no clear end or cessation of hostilities*

Elements of the New Terrorism

- Global in scope and strategic objectives
- Generational in scope; epic struggle, David vs. Goliath
– *Bin Laden as Robin Hood*
- “The number of the brothers is large . . . I do not know everyone who is with us in this base or this organization.”
– *Bin Laden as Pied Piper., with a constant call to jihad as the duty of every good Muslim*
- Educated members as martyrs in AQ; longer planning cycles (9/11 hijackers arriving in U.S. as early as 1994)
- Evolution into a political social movement, a global insurgency against Western-oriented globalization
- Afghanistan and Iraq offering new locations for Jihad, indoctrination, tactical training, network formation

Elements of the New Terrorism

- Increasing number and lethality of attacks
- Attacks are carried out not by AQ or some other centralized group, but by affiliates and wanna-bes
- Use of children and female suicide bombers by terrorist organizations
- Info Ops – role of technology
 - From DVDs and web videos to *Al Jazeera*
 - Availability of info on government security, CT efforts
- EW / IW – another role of technology & potential for attacks
- Taking instruments from our daily life—the backpack, the car, the shoe, the cell phone—and turning them into weapons. Goal – damage the trust necessary for a successful open society
- Shifting from small groups to motivated and resourceful individuals (Madrid, London)

A “Protean Enemy”

Al Qaeda is an increasingly decentralized organization, constantly evolving, and employs a "virtual network" concept learned from American right-wing extremists, which makes it harder to detect and destroy.

Willingness to adapt its mission enables it to forge broad alliances with other terrorist organizations and attract new recruits (including women).

Ability to secure coordination with other like-minded groups (like Hezbollah) and its links with organized crime (a crime boss in India gave \$100,000 to Mohammad Atta, the 9/11 hijack leader) underscore the advanced stages of organization (professionals sharing ideas, cross-training, resources, joint planning, etc.) that al Qaeda has achieved.

Netwar: A Modern Form of Asymmetric Warfare

- Netwar: Information-related conflict at a grand level between nations or societies.
- It means trying to disrupt or damage what a target population knows or thinks it knows about itself and the world around it.
- A netwar may focus on public or elite opinion, or both.
- It may involve diplomacy, propaganda and psychological campaigns, political and cultural subversion, deception of or interference with local media, infiltration of computer networks and databases, and efforts to promote dissident or opposition movements across computer networks.

- John Arquilla and David Ronfeldt, 1993; 2001.

Networked Terrorism

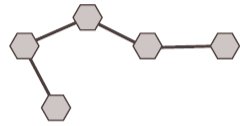
- Social interactions
- Affiliation networks
Ties developed at events or activities, like sporting events, clubs, or religious meetings
- Communities of Identity
 - Communities of locality
 - District or geographic region in which people live, interact, or under which they are governed
 - Examples: neighborhood, village, city, town or province
 - Communities of interest
 - Communities formed around a common interest or shared experience
 - Examples: prisoners or inmates, members of the military, scientists, sports enthusiasts, and hobbyists comprise communities of interest.

Networked Terrorism

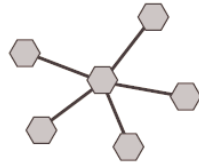
Three important concepts in social network analysis (SNA): diversity, redundancy, and adaptability

- **Diversity of identity** = individuals often have multiple identities: a familial identity, an employment identity, a religious identity, an academic identity, etc.
- **Redundancy** = individuals sharing multiple identities across networks (e.g., two individuals attending the same church, graduating from the same university, and working in the same office building).
 - Multiple shared identities (location, religion, education, and employment) means that some links between sets of individuals may be disproportionately strong.
- **Adaptability** = relationships change over time - a social network may evolve as a person's interests change, he moves to another community, or his position within that community shifts.

Terrorist Network Structures



Chain network



Star or hub network



All-channel network

Source: *Networks and Netwars: The Future of Terror, Crime, and Militancy*, John Arquilla and David Ronfeldt (eds.), November 2001

Terrorist Network Structures

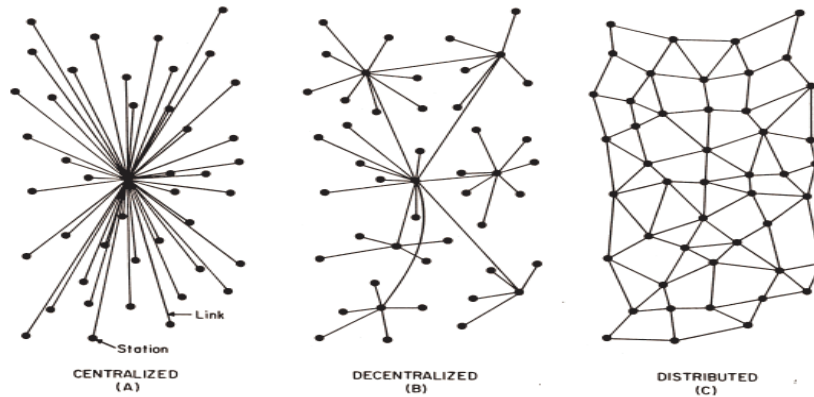


FIG. 1 — Centralized, Decentralized and Distributed Networks

Source: *On Distributed Communications: Introduction to Distributed Communications Networks*, Paul Baran, August 1964

Global Terrorism Networks

Interconnected terrorist groups, criminal organizations, individuals, etc. around the world.

EZZEDEEN ALQASSAM BRIGADES

الجنود العسكريين لحركة المقاومة الإسلامية في العراق
 English | الملتقى العالمي | بيانات | من نحن | الصفحة الرئيسية
 عروب فوريه | صوريات | كتب ومذكرات | ملفات خاصة | حوارات | مقالات وآراء | تقارير | سجل المعتقلين | شهداء القتلى

Global Terrorism Networks

Interconnected terrorist groups, criminal organizations, individuals, etc. around the world.

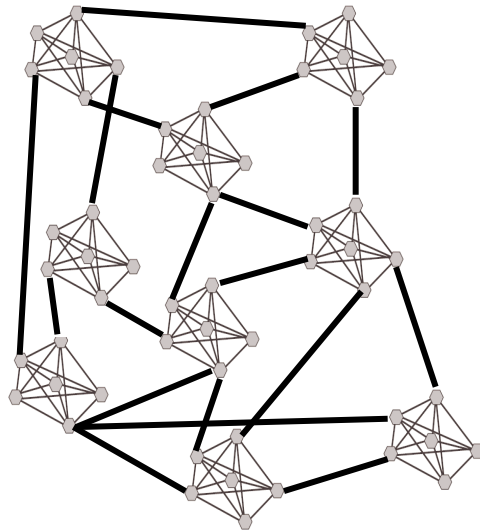
- Shared strategies
- Sharing tactics, training
- Cross-fertilization, inter-organizational learning
- Shared profits from trafficking in drugs, arms, other contraband
- Increasingly connected via technologies/Internet

Shared Similarities of Strategy, Training, & Tactics

Establish training camps – *Developing the will to kill and the skill to kill*

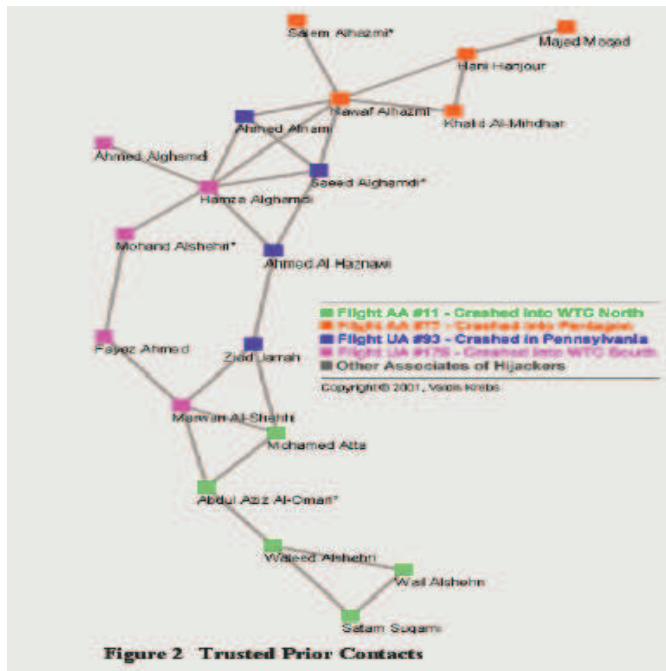
- Operational space: Geographic isolation
- Teachers: Experts in relevant knowledge, e.g., military combat experience
- Committed learners: Careful recruitment, cultivation
- Time, money, & basic necessities: Handled for individuals

- | | |
|---------------|--------------------|
| • Afghanistan | • Northern Ireland |
| • Algeria | • Peru |
| • Bosnia | • The Philippines |
| • Chechnya | • Somalia |
| • Colombia | • Spain |
| • Egypt | • Sri Lanka |
| • Indonesia | • Sudan |
| • Japan | • Syria |
| • Kashmir | • Turkey |
| • Lebanon | • United States |
| • Libya | • Uzbekistan |











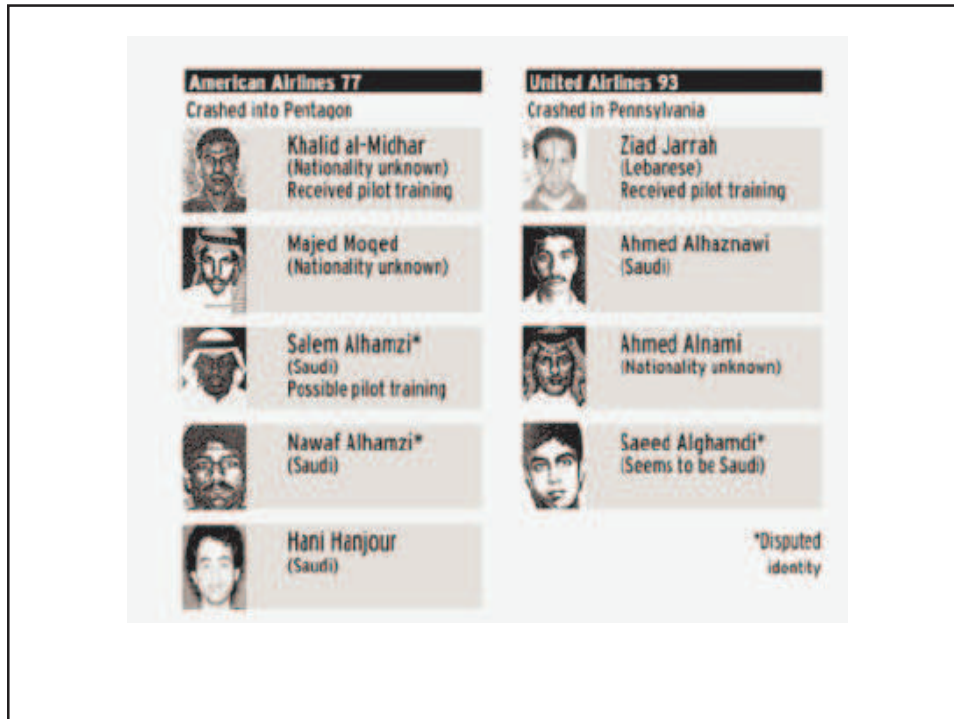
Global Salafi Network

Interconnected by common ideology (Militant Islam revivalist movement), with strong bonds formed through fighting together, family, etc.



THE HIJACKERS ...

American Airlines 11 Crashed into WTC (north)	United Airlines 175 Crashed into WTC (south)
 Mohamed Atta (Egyptian) Received pilot training	 Marwan al-Shehhi (United Arab Emirates) Received pilot training
 Waleed M. Alshehri (Saudi) Commercial pilot	No picture available Fayez Ahmed (Believed to be Saudi)
 Wail Alshahri (Saudi) Possible pilot training	 Ahmed Alghamdi (Possibly Saudi)
 Satam al-Suqami (Nationality unknown)	 Hamza Alghamdi (Believed to be Saudi) Possible pilot training
No picture available Abdulaziz Alomari* (Saudi) Possible pilot training	 Mohaid Alshehri (Nationality unknown) Possible pilot training



Terrorist Networks

Even though it's a decentralized network, there are still critical functions that enable the network to operate

- Critical functionary roles – can become a hub of multiple networks
 - Weapons procurement; logisticians
 - Financier (funder or banker) (particularly in *Halawa* system)
 - Document forgerer
 - Human traffickers
- Support individuals (trusted contacts) can and sometimes do support multiple networks; can provide supplies/facilitate trafficking of weapons & funds to multiple networks
- Example: 60% of day spent moving legitimate charity money around; 20% of day on Hamas transactions, other activity on side
- Some may get profit for doing these support/function roles

Different members of the network play support and action roles

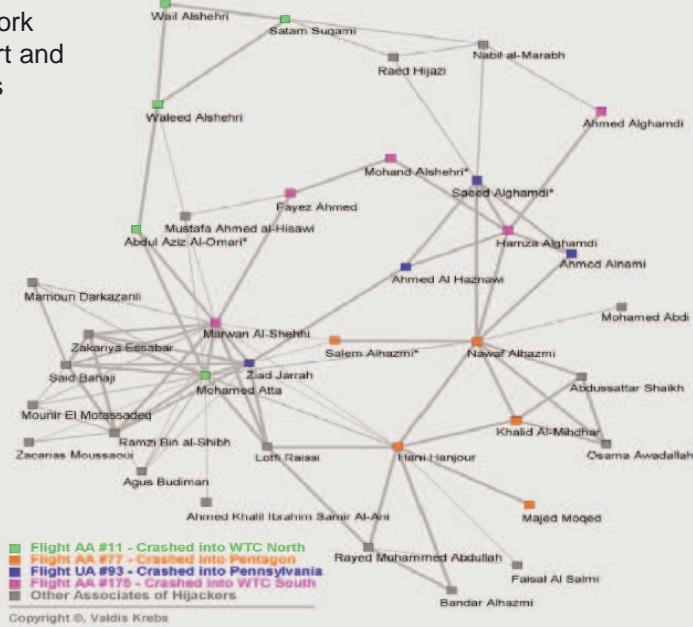
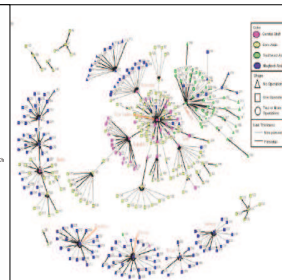
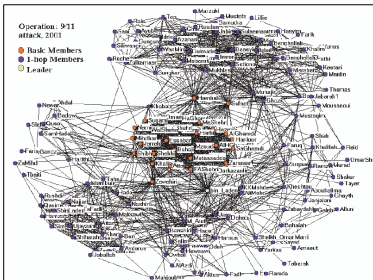


Figure 4. Hijacker's Network Neighborhood

Network Analysis & Jihadists

- Qin. et al, 2005:
 - Information collected on social relations between members of Global Salafi Jihad (GSJ) network from multiple sources (e.g. reports of court proceedings, mainstream media publications)
 - Applied social network analysis as well as Web Structural Data Mining to this network
 - Authority Derivation Graph (ADG) captures (directed) lines of authority in the network

Ranking	Leader	Gatekeeper	Outlier
Central Member			
1.	Zawahiri	bin Laden	Khalifah
2.	Nakawati	Zawahiri	bin Laden
3.	Ismaili	Khadr	Qutayb
4.	bin Laden	Siri	M Ataf
5.	Jafar	Zuhaydah	Sheikh Omar
Core Arab			
1.	Khalid	Harith	Elhaneh
2.	Shihb	Nasim	Khalid
3.	Barah	Khalid	Janjani
4.	Atta	Johani	Dahab
5.	Mindhar	Zakaria	Mehdi
Middle Arab			
1.	Hanbali	Basayr	Silwanji
2.	Basayr	Hanbali	Fatih
3.	Nahhas	Geagan	Nahardin
4.	Iqbal	Muhajir	Yunes2
5.	Azahari	Serono	Maidin
Southeast Asian			
1.	Doha	Yarkas	Mujati
2.	Bayasich2	Zawi	Parin
3.	Fatih	Chaib	Mashayab
4.	Chaib	Dusik	Zinidine
5.	Bayasich1	Maaroni	Ziyad



Terrorists with top centrality ranks in each clump

1-hop network of 9/11 attack

ADG of GSJ network

Networked Terrorism

Implications:

- We tend to target operational (attack/combat) cells and **overlook support cells** that disseminate propaganda, recruit members, procure supplies, maintain transport, forge false and adapted identities, facilitate travel, and organize safe houses.
- For example, operating through front, cover, and sympathetic organizations, Al Qaeda and its associate groups established charities, human rights groups, humanitarian organizations, community centers, and religious associations to raise funds and recruit youth. (Gunaratna)

Networks to Map

Relationship/ Network	Data Sources
1. Trust	Prior contacts in family, neighborhood, school, military, club or organization. Public and court records. Data may only be available in suspect's native country.
2. Task	Logs and records of phone calls, electronic mail, chat rooms, instant messages, Web site visits. Travel records. Human intelligence: observation of meetings and attendance at common events.
3. Money & Resources	Bank account and money transfer records. Pattern and location of credit card use. Prior court records. Human intelligence: observation of visits to alternate banking resources such as Hawala.
4. Strategy & Goals	Web sites. Videos and encrypted disks delivered by courier. Travel records. Human intelligence: observation of meetings and attendance at common events.

Knowledge Transfer & Terrorist Networks

- Learning Organizations = committed to capturing knowledge, analyzing it, forming new doctrine and tactics which are informed by lessons from the past
 - Learn from each other
 - Learn from trial and error (IRA example)
 - Media showcasing 'best practices' to others
 - Managing public image (PR)
(becoming more sophisticated)
- Emerging professional networks in the terrorist world

Knowledge Transfer & Terrorist Networks, cont'd

The network challenge

- “As far back as 1968 the PLO . . . had welcomed terrorists from around the world to their guerilla camps in Jordan for training, indoctrination, and the general building of transnational revolutionary bridges. In this respect, the Palestinians pioneered the ‘networking’ dimension of international terrorism still in evidence among many groups today.”

Bruce Hoffman, 1997, p. 82

Knowledge Transfer & Terrorist Networks, cont'd

The network challenge

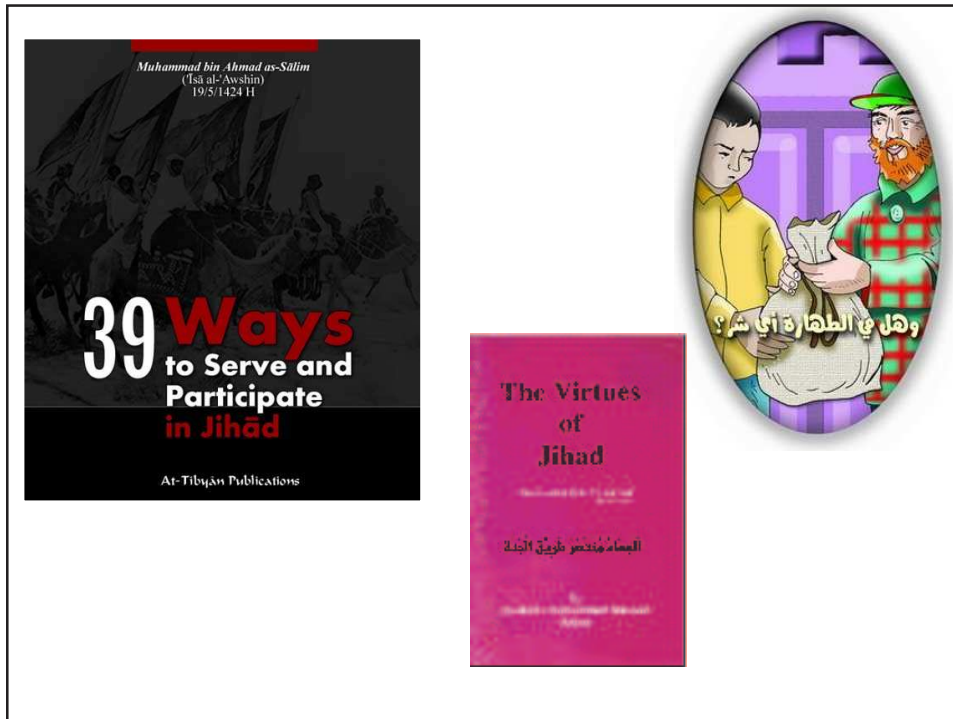
- “Strategic partnerships” between Al Qaeda and groups like Hezbollah, Jemaah Islamiya, HT, IMU, and MILF, as well as drug cartels in Latin America and other criminal organizations
- For example, “Hezbollah . . . trained Al Qaeda fighters in Sudan, Lebanon, Iran . . .” (Gunaratna, 2002, p. 196)
(why would Shiite Muslims work so closely with Sunni Muslims?)

Challenges of Terror Networks

Overall CT challenge: How to fight a network of networks

Specific challenges include:

- Identifying network members, especially when membership is hidden until demonstrated by overt behavior
- Determining network structure, leadership/decision-making cells
- Intelligence gathering/Infiltrating the network
- Defending against an attack from unknown network members



Recall the Twelve Mechanisms of Radicalization Among Terrorists

- Ind'l Level:
 - Personal Grievance;
 - Group Grievance;
 - Personal Ties;
 - Slippery Slope;
- Group Level:
 - Extreme shift in like-minded group;
 - Dynamic shifts of isolation and/or threat;
- Group Level, cont;d:
 - Intra-group competition;
 - Inter-group competition;
 - Condensation / consolidation from a larger movement;
- Mass Level:
 - Hate movement(s);
 - Martyrdom movment(s);
 - Jujitsu politics shift (management of perception & strategies of violence / non-violence, & includes suicide bombing rise)