

INNOVATION, LEARNING AND RESILIENCY in COVERT ORGANIZATIONS

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1. ABSTRACT

We have become more adept at disrupting terrorist networks; nevertheless, adversaries continue to learn and adapt, posing an enduring threat to the security of America and its allies and partners.
 2010 US Defense Quadrennial Review

Organizing principles and mechanisms of learning and innovation in complex adaptive systems are applied to covert organizations to develop a theoretically grounded, system dynamics framework for understanding their capacity for adaptation and resilience, and implications for interrupting learning and diffusion of innovations. This framework suggests different learning and innovation mechanisms depending on organizational structure, resulting in different capacities for resilience. Empirical data on terrorist organizations corroborates the predictions of the conceptual framework.

2. INTEGRATIVE THEORETICAL FOUNDATIONS

SYSTEM DYNAMICS

State properties and governing equations for co-evolutionary resource utilization and production rates of interacting components

KEY CONCEPTS:
THRESHOLDS, TIME DELAYS, FEEDBACK LOOPS, CO-EVOLUTION

COMPLEXITY SCIENCE

Self-organizing mechanisms by which systems respond to internally driven goals in presence of exogenous forces and shocks: learning, innovation, adaptation, evolution, punctuated equilibrium

KEY CONCEPTS:
NETWORK STRUCTURES DETERMINE LEARNING AND THE EMERGENCE AND DIFFUSION OF INNOVATION

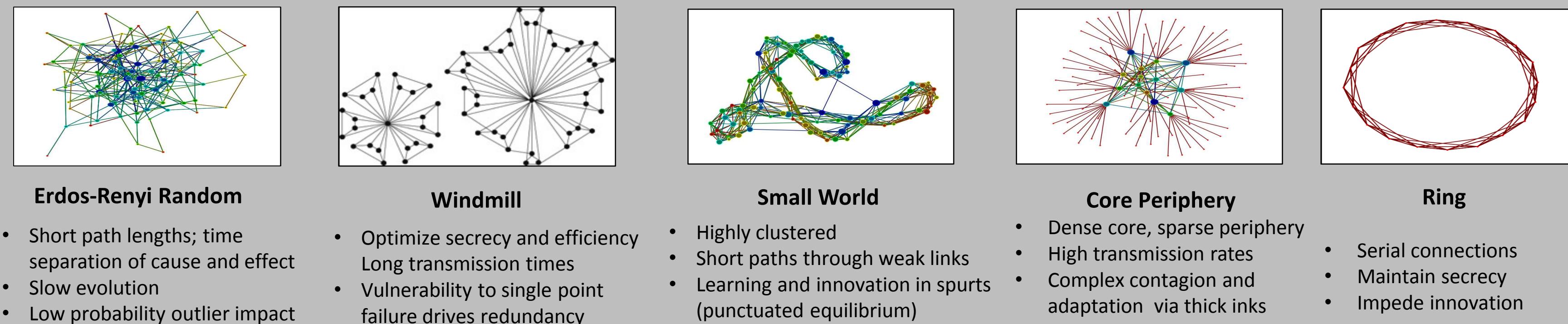
SOCIO-ECOLOGICAL RESILIENCE

The capacity of a system to absorb disturbance and re-organize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks

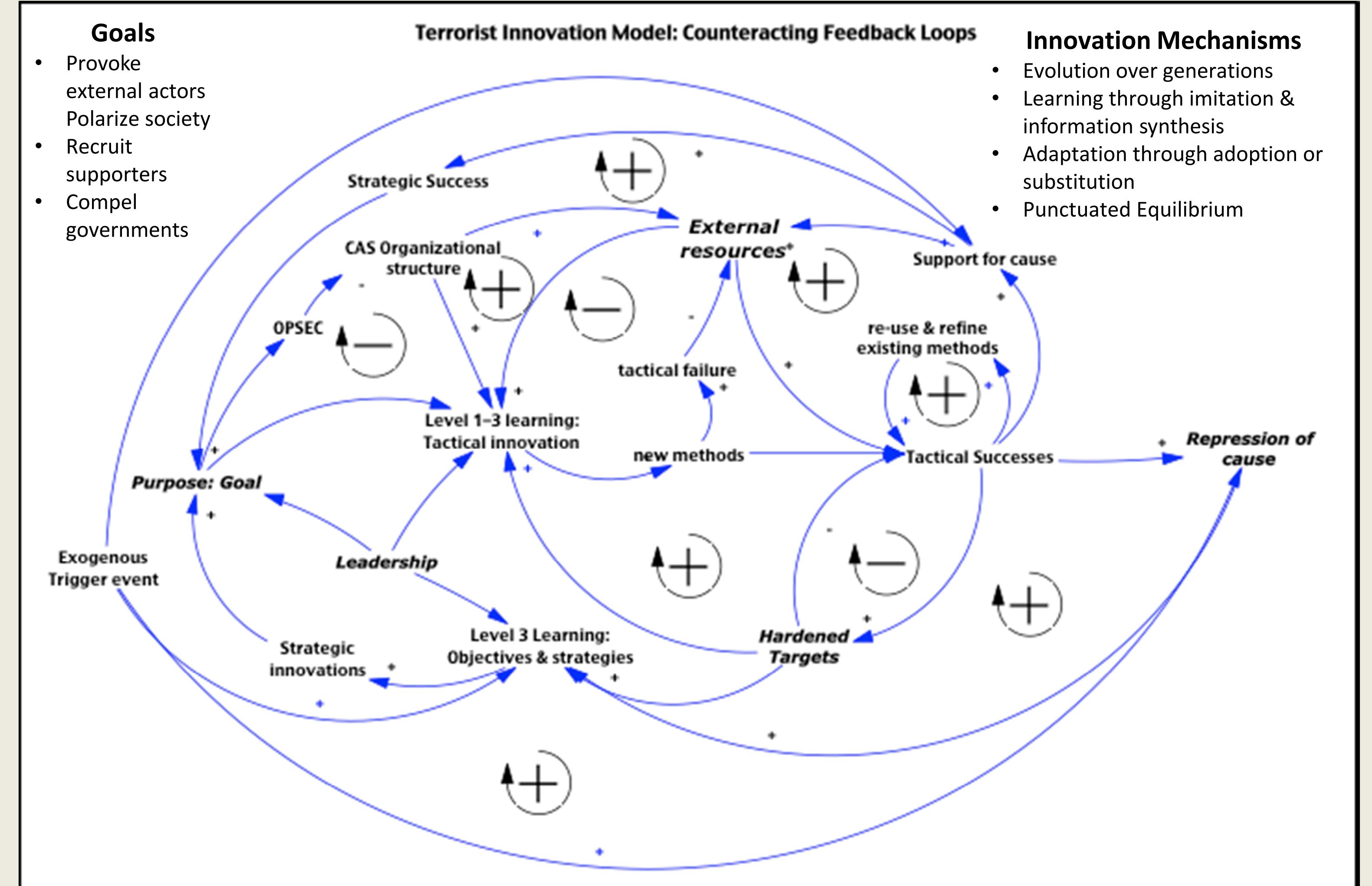
KEY CONCEPTS:
DYNAMIC CYCLES OF STASIS, GROWTH, ACCUMULATION, RESTRUCTURING, RENEWAL

3. HYPOTHESIS

Different innovation mechanisms and adaptive capacities of terrorist organizations, their operative timeframes, and resiliency can be explained by network structures and their influence on complex system dynamics.



4. INNOVATION AND LEARNING IN TERRORIST ORGANIZATIONS

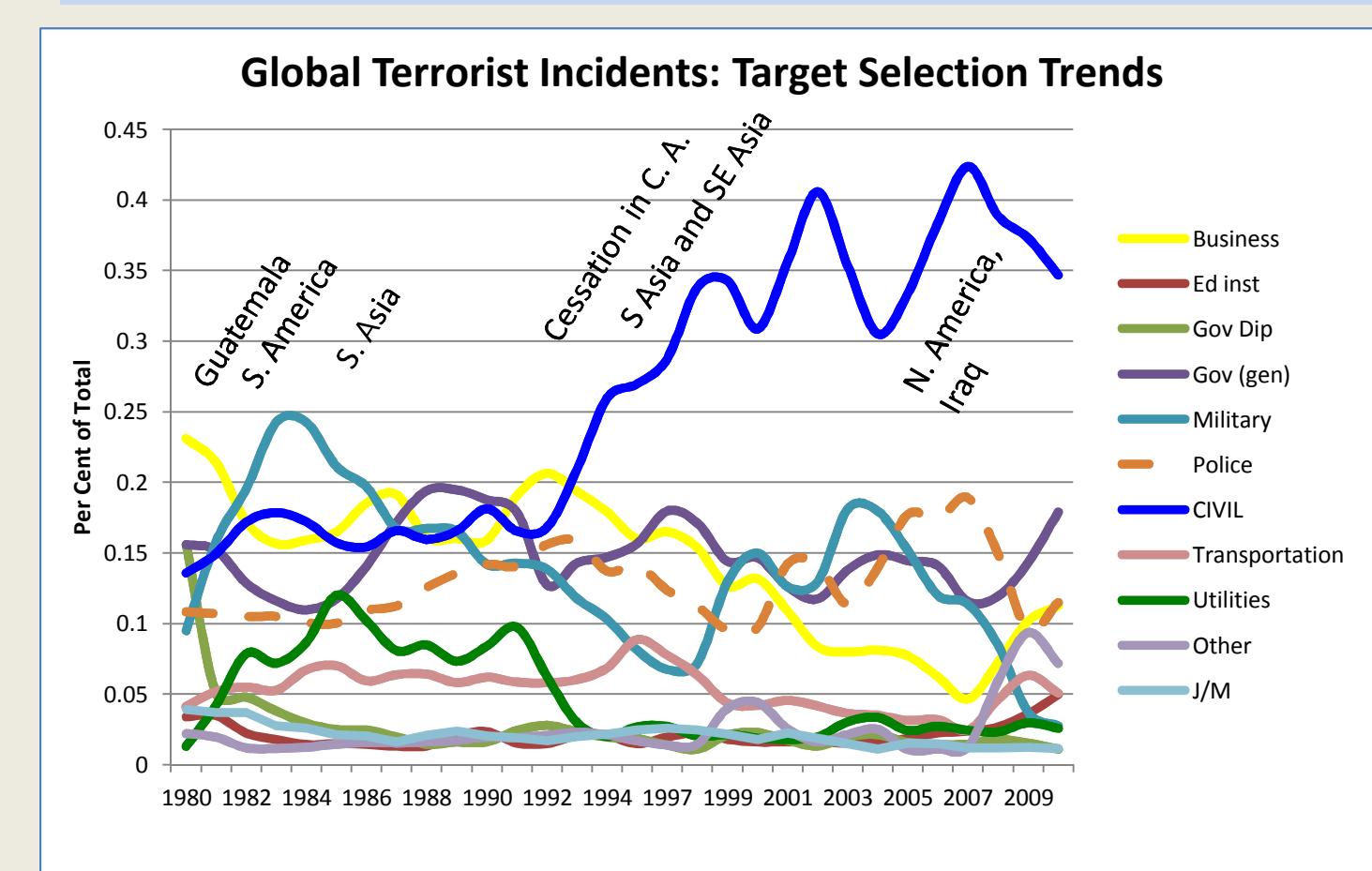


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Resiliency Attributes Depend on Structure
 RESILIENCE = Capacity to absorb disturbance and reorganize under change and retain same function, structure, and feedbacks
 ADAPTABILITY = capacity to influence resilience

TRANSFORMABILITY = capacity to create new system when conditions are untenable
 BASIN OF ATTRACTION = Region in state space in which the system tends to remain



Trends of successful groups show different patterns of innovation traceable to organizational structures shaped by culture, goals, resources, and environment.

5. Conclusions

Success by covert organizations breeds countermeasures. Resiliency requires innovation in the face of countermeasures. Two counteracting feedback loops compete with innovation drivers to strongly influence basins of attraction for terrorist organizations: (1) Need for secrecy and (2) Need for recognized successes (failure intolerant). Data trends affirm the conceptual model for structural influence on innovation mechanisms. Effective countermeasures must decrease, not lead to an increase in, network resiliency. Next steps: Process tracing in longitudinal, comparative case studies.

Network Structure	Terrorist Organization	Degree	Est. size	Age	State Sponsor	Innovation	Innovation mode	AOO	Cause
Erdo-Renyi	Entrepreneurial	1	<100	~5	0	2	all	global	mixed
Windmill	AQ - Two Rivers	9	5000	9	0	2	imitation, evolution	Iraq	regional
Small World	LeT (ISL)	8	300	14	1	2	imitation, evolution	Kashmir	local
Core Periphery	Ansar al-Sunnah	6	700	10	0	3	adaptive, punctuated equilibrium	Iraq	regional
Ring	Hizbollah	4	10-100K	32	1	4	learning, evolution	Lebanon	regional
Hierarchy	IRA	3	700	95	0	2	learning, evolution	UK	local
ELN	LTTE	0	8000	38	1	1	learning, evolution	Sri Lanka	local
		8	3000	50	1	1	evolution	Columbia	local