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# Violent Non-State Actors: Countering Dynamic Systems

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### Introduction

Violent non-state actors (VNSAs) pose a pressing challenge to human and national security across the geo-political landscape. In the midst of a global war against terrorism, collective violent action thrives as a strategy of groups ranging from the al Qaeda network to the Maoist rebels of Nepal to the Revolutionary Armed Forces of Colombia (FARC). The dark dynamics of globalization enable VNSAs to prosper in a turbulent international environment marked by deepening roots of violence, failures in governance, and burgeoning illicit trade in guns, drugs and humans. With few exceptions, VNSAs play a prominent, often destabilizing role in nearly every humanitarian and political crisis faced by the international community. Successfully countering them is complicated by a host of factors, including the adaptive character of the threat and the difficulty of developing and implementing a coherent strategy that engenders measurable victories.

By applying systems analysis to this intensifying problem, we first proffer an actionable and universal analytical framework for diagnosing the non-state adversary. Building on previous research into the operational environment and VNSA properties, we now expose the internal workings of the organization in order to understand sources of strength and critical vulnerabilities. This sets up a counter-VNSA (C-VNSA) strategy that goes beyond coercion to the defeat of the enemy. At its core, our C-VNSA strategy defeats a VNSA by: 1) denying the negative entropy, or stores of energy, required to survive attack; and 2) disrupting congruence, or fit, among subsystems to achieve system failure. By also understanding the indicators of organizational change during its developmental life-cycle, preemptory defeat before the VNSA reaches maturity becomes feasible. Importantly, our approach allows for measuring campaign progress by assessing changes in VNSA effectiveness. Thus armed, prospects improve for inter- and intra-governmental collaboration, on-target intelligence collection and analysis, and successful execution of a multi-faceted, effects-based strategy.

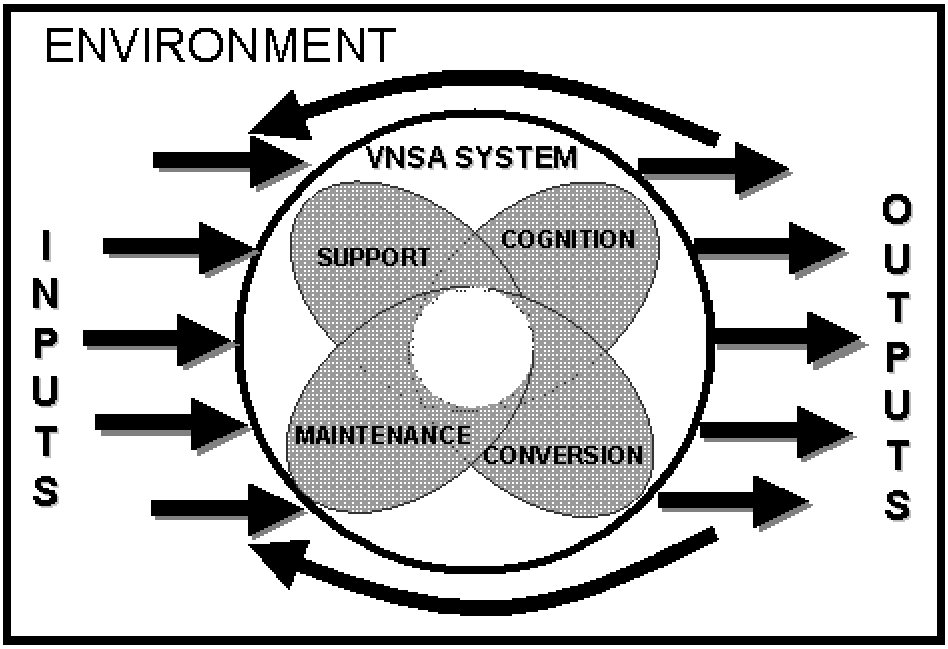
### Applied Systems Theory

The inter-disciplinary application of open systems theory serves as our diagnostic model for VNSA threat analysis and strategy development. Modern organizational theory views all social organizations as open systems, continually exchanging information and energy with the environment. This approach has already been applied to an understanding of the environment from which VNSAs are most likely to emerge. Thomas and Kiser developed a framework that provides insight to the inputs, energy conversions and outputs that produce groups employing collective violence to achieve a broad range of traditional and post-heroic goals.[1] This framework captures divergent factors too often examined in isolation, drawing attention to the key relationships that amplify the cycle of violent collective action. Progress has also been made in assessing the VNSA as an open system. Thomas and Casebeer illuminate the characteristics of

all systems: 1) importation of energy and information; 2) through-put (energy conversion); 3) export of products to the environment; 4) cyclic pattern of activities; 5) negative entropy, or reserves; and 6) feedback (learning).[2] Each has implications for VNSA performance and a C-VNSA strategy. Of these, negative entropy is particularly important to long-term survival since it directs attention to the means by which the organization stores energy to survive crises induced by a turbulent environment and direct attack. Like organisms, VNSAs also pass through a series interrelated stages in form and function, transitioning between gestation, growth, maturity and death. Life-cycle transitions are not necessarily linear, as groups can go from maturity back to gestation or from growth to destruction. During its life-cycle, environmental dynamics vary in their impact on behaviors, internal functions shift in relevance to organizational performance, and decision-making results from varying affective and rational factors.

## Adversary Sub-Systems

Systems analysis allows us to approach geographically, and even temporally disparate groups within a common framework. Each operates within a structured environment, exhibits common system characteristics and progresses through comparable life-cycle phases. The diagnosis is completed by examining the internal workings of four common subsystems: support, maintenance, cognition and conversions. The three levels of analysis (environment, system, subsystems) provide the scaffolding on which we build the distinctive signature of each group. A VNSA's signature is a function of its unique interactions, or patterns of behavior, within and across the levels of the analysis. Signatures enable our C-VNSA strategy to retain its global consistency using a menu of transportable instruments and effects while still being tailored to the challenges of a particular region or group.




**Support Subsystem.** Religious students in Islamic schools — madrasas — are identified and recruited for jihad, money is collected and laundered through a front charity, small arms are purchased on the black market, and communiqués are faxed to media outlets around the world. These are just a few of the routine activities that constitute the dynamics of the support subsystem. The support subsystem works at the boundary of the VNSA, exchanging energy, monitoring and managing relations with the environment.[3] Five types of environmental transactions are most critical to the VNSA: recruiting, resource acquisition, stakeholder associations, intelligence gathering and product delivery (violence, services, ideology, etc.). Of

these, resource acquisition and stakeholder associations are the most critical to organizational start-up and crisis survival-they are forms of negative entropy. Reliable, and often excess critical and scare resources are needed for groups to survive sustained counter-insurgency, -terrorism and -narcotic operations. In all stakeholder associations, the ability of support to survive crises is a function of how the VNSA attends to the relationship over time.

**Maintenance Subsystem.** A jihadist is groomed through a madrassah, a Maoist insurgent is executed for collaboration with the state, and an assassin is promoted for successfully killing a justice minister. These activities are among the primary functions of the maintenance subsystem. This subsystem's over-aching goal is to protect the VNSA organism and its organs (subsystems) from incongruence and positive entropy-survival! Maintenance activities seek to preserve equilibrium, primarily through the socialization of personnel and a system of sanctions and rewards to maintain role performance.[4] Where the support subsystem focuses on accessing critical requirements, maintenance dynamics center on the "equipment for getting the work done," and in the case of VNSAs, the "work consists of patterned human behavior and the 'equipment' consists of the human beings."[5] The primary functions of the maintenance subsystem are socialization and rewarding and sanctioning. Socialization builds the culture, or system of values and norms, while rewards and sanctions maintain role behaviors. The interplay of these functions often results in a trend to a more mechanistic, or bureaucratic organization structure due to increased formalization and a corresponding decrease in adaptability. On the other hand, the institutionalization of role behaviors reduces uncertainty and serves as a form of negative entropy.

**Cognition Subsystem.** A spy gathers intelligence, key leaders meet to plan a series of urban bombings, a cell structure is implemented to ensure secrecy, and directions are issued for acquiring nuclear materials. These are sample activities of the cognition subsystem, whose primary functions are learning, strategy and control. Together, they comprise the decision-making style of the VNSA, which is responsible for "controlling, coordinating and directing" the other subsystems."[6] The dynamic of decision-making may be the most difficult to diagnose, but it is also the most important for a coercive C-VNSA strategy that requires the VNSA to retain cognitive capacity to question underlying values. Where defeat is the goal, undermining the cognition subsystem is certain to induce disorder and uncertainty, which are precursors to the goal of inducing total system failure.

As an example of our analysis for all eleven functions, learning deserves additional emphasis. VNSAs are cybernetic systems; they have a feedback capability that enables correction and in most cases, self-awareness. VNSAs, like organisms, develop regulatory mechanisms early in development (gestation). The most basic form of learning, which dominates the gestation and early growth period, is known as single-loop learning, or simply as cognition. Single-loop learning involves learning from the consequences of previous behavior, resulting in changes in "strategies of action or assumptions underlying strategies in ways that leave the values of a theory of action unchanged."[7] Single-loop learning is sufficient when changes in strategies and tactics can satisfactorily correct errors in performance or improve effectiveness. It is not always sufficient, however, when the environment is highly dynamic, or when the organization must change the values and norms that girder culture. The ability to adapt, to not only correct behavior, but to determine what behavior is correct, is essential for surviving crises.[8] It is a form of negative entropy known as double-loop learning. The double-loop refers to two feedback interfaces that link the intelligence about performance or the environment to strategies as well as to the values served by those strategies.[9] The strongest VNSAs, like al Qaeda, learn to learn. Therefore, our C-VNSA strategy must seek to drive groups to single-loop learning if defeat is the goal. If coercion is the goal, strategy should seek to enhance double-loop learning so the cognitive subsystem can effect changes in underlying values and norms.

**Conversion Subsystem.** Child soldiers learn to shoot an AK-47, health services are delivered to a community, a suicide bomber records a martyr's video, guerilla forces ambush a convoy, a politician is kidnapped, or aircraft are used as missiles to attack landmarks. These activities are

carried out by conversion functions which include operations, training, production and others. This subsystem's primary function is task accomplishment, converting energy within the system and outputting a product to the environment. In the case of VNSAs, the product of most concern is collective violence; however, our C-VNSA is also be concerned with other products that reinforce the system of violence, such as training and illegal goods, or outputs that strengthen their position, such as social services. Conversion activities and associated facilities are often the main focus: destroying cocaine production facilities in the jungles of South American, raining cruise missiles on terrorist camps in Afghanistan, protecting facilities against guerrilla attacks in Baghdad, or fighting Islamic militants in the Pankisi Gorge of Georgia. Our C-VNSA also encourages disrupting training and operations and destroying facilities and operatives; however, the most effective strategy targets all subsystems, recognizing that conversions do not have to occur for the VNSA to survive. Conversions do contribute to survival by providing a surplus of trained members and products, and successful operations can produce internal and external support; however, the VNSA *can* survive an extended period of dormancy by this subsystem if the others remain active.

### Life-cycle Vulnerabilities

In a mature VNSA, the subsystems and associated functions outlined here are each generally well-developed, inter-related and of relatively equal in importance to system functioning. When mapped against life-cycle phases of a specific VNSA; however, the extent of their development and their relative value will vary substantially, presenting a unique VNSA signature and opportunities for preventive policy. Specific subsystems tend to "lead," or be the most critical to survival and organizational efficiency during each life-cycle phase. In order for a group to form in the gestation phase, an identity entrepreneur and nucleus of founders must be linked to resources, stakeholders and potential recruits. Embedding the primitive VNSA in the environment through a network of critical relationships is the responsibility of the support subsystem. Until the support subsystem does its work, maintenance and conversion subsystems will lack the people and tools required for socialization, sanctioning, training, production and operations. Although the support subsystem is most critical during gestation, it is guided by a basic cognitive subsystem. Decision-making and control are not the result of an elaborated, participatory process at this point. Rather, the identity entrepreneur can easily set the agenda and control functions without the need of other subsystems due to his familiarity with all other group members.

The growth phase is entered when all subsystems initiate activity. In early growth, the support subsystem continues to lead, but is increasingly interlaced with the development of specific maintenance and conversion functions. Maintenance functions are likely to dominate in VNSAs that stress a transcendental, or more value-based agenda, such as the Islamic Jihad in Palestine or the Kahane Chai in Israel. These groups and others place a greater premium on loyalty and commitment to the religious or ideological goals of the group. Conversion functions will dominate in VNSAs that pursue a more pragmatic agenda, such as the Chinese Triads or the warlords of Afghanistan, where the accumulation of wealth or consolidation of power requires the production of drugs or the training of guerrillas to hold territory and extract resources.

The growth phase is characterized by high levels of uncertainty related to the idiosyncratic behaviors by group members, doubt about reliability of resources and stakeholders, and the evolving character of the organization. In an effort to increase stability and survivability, the growth phase will increasingly reflect efforts to differentiate and enforce roles and responsibilities. Therefore, the maintenance and cognitive subsystems will assert themselves during late growth by clarifying goals and structures. Differentiation generates pressure to integrate functions, which is carried out by the control function. Additionally, the VNSA leadership will recognize the importance of continued environmental scanning through intelligence collection activities as a means to reduce uncertainty and harmonize the fit of its subsystems to the opportunities and constraints of the environment. In the most adept VNSAs, learning will gain prominence — the earlier it does in the life-cycle, the more successful the VNSA is likely to be in a turbulent

environment. Finally, sporadic violent acts can be expected during the growth stage; however, these are more likely for the purpose of establishing legitimacy, enhancing recruiting, collecting intelligence and testing tactics than they are for achieving over-arching VNSA goals.

For the fully mature VNSAs of the world, all subsystems perform in concert; congruence is achieved, uncertainty is managed, and negative entropy is built. Based on this ideal system type, each function is fully articulated in terms of sustainable, adaptable patterns of activity, the culture is strong, the decision making process is based on double-loop learning, control is efficient, training has efficacy, and operations achieve goals. We are fortunate this ideal rarely exists. Yet, even growing VNSAs trapped in single-loop learning, or lacking sanctuary for training, or failing to attract new recruits, or running short of funds, are tough to defeat.

## Counter-VNSA Strategy

Equipped with increased insight to the structure and function of VNSA afforded by an open systems analysis of how VNSAs mature, we can formulate a comprehensive, effects-based C-VNSA strategy. Our strategy addresses VNSA vulnerabilities across their life-cycle, both in terms of system/environment interfaces and subsystem functions; in other words, some parts of our C-VNSA strategy will focus on the environment/system interface, while other aspects of it will focus on the "internal physiology," or functions, of a prototypical VNSA and how we can disrupt that physiology to maximum effect (e.g., can we identify the "recruitment organ" in a VNSA, and if so, how do we best attack it and the inputs it needs to accomplish its function of inducting people into the organization?).

The desired effects depend on whether our goal is coercion or defeat. For coercion, the measure of merit would be the actual change in behavior. For defeat, the measure of merit is the total failure of the VNSA system. In reality, behavioral changes will not be clear and defeat a distant and sometimes elusive goal. Nonetheless, we can measure progress in our C-VNSA campaign as a function of VNSA system characteristics and performance. At the system-level, we should be pursuing effects of increased uncertainty and disorder, which will contribute to organizational inefficiencies and force the organization away from its pre-determined roles — all essential to crippling a system. In terms of performance, systems theory helps as well by directing attention to an input metric of resource utilization, an output metric of goal attainment, and a conversion metric of process efficiency. Thus, we can think about input effects broadly as inefficient resource utilization, which can be further broken down into effects such as dysfunctional stakeholder associations, reduced recruitment, and resource disruption. Conversion effects relate to subsystem performance, such as poor decision-making, misperception, disrupted communications, or importantly to incongruence, a break down in role behaviors. Output effects, where assessment traditionally focuses, include failed operations, reduced quality products, and a general failure to achieve desired changes in policy or defeat of an enemy.

Strategy formulation is guided by principles. In war, these are general principles that have withstood the test of time and serve as a guide for operational implementation. Traditionally, there are nine principles, ranging from mass to offensive to surprise. Some of these traditional principles will have analogues in our systems-tutored view of VNSAs, while others will not; the list of principles on offer is not necessarily intended to transcend the traditional principles of war, but rather works in concert with them to produce maximum disruption and ultimately, system failure:[10]

*1. Leverage indirect "diachronic" effects.*
Military strategy often focuses on direct (synchronic) effects: effects that manifest themselves simultaneously, or nearly simultaneously, when action is taken. Open systems, however, present opportunities for indirect interventions; these are interventions whose impact is often not felt until far later in the developmental cycle (hence the term "diachronic", meaning across time). The value of indirect effects is that, owing to the feedback loops present in the system, they can offer

a significant ratio between the cost of the intervention and its impact upon the system. In chaotic systems, such as the weather, indirect interventions may have generally unpredictable consequences; in an open system, however, regularities in causal relations between subsystem functions means we can often predict what impact a diachronic intervention may have on the end-state of the system.

*2. Seek "synergy minus one" interventions.*
Complex systems usually manifest synergy; they produce effects that one would not have otherwise expected from a mere additive summation of the parts of the complex system. Well-constructed VNSAs are often able to leverage synergy to have impacts disproportionate to their size. Synergetic systems are troublesome to deal with; however, this synergetic strength is also an Achilles' heel: generally, the removal of even one component of the synergetic complex disables the complex entirely. The mere conjunction of Shoko Ashara (the leader of Aum Shinrikyo) and intelligent disaffected Japanese youth does not produce a nerve gas attack in the Tokyo subway system — the relevant chemical weapons technologies must also be available; all three components of the system must be in place. Disabling synergetic subsystems by removing or neutralizing just one of the causal factors is called a "synergy minus one strategy."[11] Those wishing to combat complex systems would do well to seek out the subsystems that leverage synergetic effects and focus on disabling just one of the causal factors contributing to the production of the synergy.

*3. Disrupt well-connected nodes.*
As discussed, subsystems are alternately critical for organizational effectiveness depending in part on the life-cycle; others will not. Generally, critical subsystems lie at the nexus of multiple inputs and outputs. Attacking these well-connected nodes can have a dramatic effect on group performance. Attacking a person's brain will be much more likely to paralyze them than by attacking their hand; indeed, even a semi-successful assault upon a human's frontal lobe will impact their functioning much more than an entirely successful assault on both their arms. The cognitive subsystem in a terrorist organization will almost certainly consist of multiple well-connected nodes.

*4. Leverage feedback loops.*
Some subsystems will be recurrently connected to other subsystems; others will not. For a subsystem to be recurrently connected, its components must provide causal input into another subsystem, and that subsystem must, in turn, provide causal input back into the previous subsystem; for a homely example, consider time management — a failure to manage your time well makes it difficult to meet writing deadlines; this, in turn, makes it difficult to manage your time well as you will always be working in "crisis mode." Interventions that affect the status of these subsystems will have cascading effects on the system as a whole; small time management failures can quickly magnify. Overstressing the authority subsystem of a VNSA can have a similar effect. Put a terrorist organization in a difficult position by feeding noise into its intelligence and counter-intelligence functions; being in this difficult position, in turn, makes good intelligence all the more important, which (again, in turn) magnifies the impact that the noise will have on the system. Leveraging feedback loops also undermines system congruence, making it difficult for subsystems to interact.

*5. Create positive entropy.*
One way in which organizations attempt to isolate themselves from rapid environmental change and disorder is by accumulating negative entropy; a stock of order within the organization used to "ride out hard times" when the inputs the organization would normally use to continue functioning are unavailable. Critically, a knockout blow can only be delivered to an organization if its reserves of negative entropy are already disrupted. Analysis to determine whether these reserves are in the form of cash surpluses, redundant communications, rigid socialization, etc., must be conducted to determine which is most critical to group survival. Attacking stocks may not directly impact the short-term ability of the VNSA to export its product (terrorist bombers, active cells,

etc.), but it will set up the necessary conditions needed for a VNSA to die when it is attacked directly.

*6. Disrupt environment/organism interfaces.*
Organizations need input to survive. Disrupting critical inputs, especially at developmentally important phases of the organization's life-cycle, can stunt the organizations growth or possibly even shift it into an entirely different developmental pathway. In much the same way that vitamin D deficiencies cause rickets in young children that in turn affect the overall development of their muscular-skeletal system, so can critical deficiencies create brittleness in a VNSA (for example, cognitively backwards terrorist organizations — perhaps those stuck in single-loop learning — will be less effective groups on the whole). While VNSA are made more robust by certain environments, they are also made weaker by certain environments. For example, a VNSA that can draw upon a well-educated population for recruits will better be able to engage in sophisticated planning for attacks, or will be more effective at coordinating a comprehensive financial effort. Shaping the environment by disrupting inputs (be they material or information-oriented) or by increasing turbulence can have debilitating effects on system performance.

*7. Attend to life history analysis.*[12]
The fact that VNSA have an ontogeny (a developmental history) is important, as it opens the door for VNSA to adopt different "life history strategies" (either rationally or through the accidental combination of luck and appropriate environmental exigencies). In population ecology, life history traits affect basic reproductive and survival schedules of organisms (such as size at birth, number of offspring, longevity, stage-specific growth rate, etc.). There are tradeoffs among these components of life history (otherwise organisms would be produced large at birth and keep producing many large offspring in perpetuity). For example, producing large offspring most often means that fewer offspring can be produced. Attending to life-history enables understanding and impacting how and what the VNSA spawns, as some VNSA will adopt a life history strategy reproducing slowly and only when they can produce an offspring organization that is fairly large and self sufficient, while others will adopt a life history strategy that involves reproducing quickly into very small cells only a small number of which will survive. Understanding life history will help shape strategy, as organizations that reproduce using the latter approach can be most effectively combated by shaping the environment so as to preclude fission, while groups that pursue the former approach can be effectively confronted directly…think of the difference between preventing the spread of a disease and hunting bears.

*8. Increase uncertainty.*
If organizations are to adapt to their environment, especially in the mature phase of their life-cycle, they must bring to bear some cognitive capacity. Environmental scanning as an activity of the learning function is a hallmark of the mature organization. In turbulent environments, the VNSA spends valuable time trying to make sense of and look for resources in its environment. If such resources are unpredictable, the organization will "forage" more and spend less time actually producing a product. We want terrorist organizations to spend more time worrying about where they will obtain the inputs they need to sustain their operations and less time actually producing output (suicide bombers, fielded forces, etc.).

*9. Implement across the system.*
The proximity of the threat often drives strategies toward an output focus: harden targets, capture or kill terrorists, disrupt operations. To confront outputs directly is to engage in a force-on-force confrontation with VNSA; this is effective in some circumstances but not in others, and can play into the hands of an enemy that is planning on leveraging force asymmetries in its favor. A more effective application of principles would be to implement a strategy that is balanced against inputs, conversions and outputs. Specific inputs strategies include, but are not limited to environmental shaping, financial interdiction, Diaspora disruption, counter-narratives, fostering stakeholder distrust and identity gerrymandering. Conversion strategies involve intervening into any of the four subsystems. Even if interventions into a particular subsystem are not successful, disruption can be achieved by boosting incongruity between successfully functioning subsystems.

If the support subsystem cannot successfully feed into the production subsystem, this is functionally equivalent to entirely disabling the support subsystem itself. Authority related disruptions, for example, include targeting key VNSA leadership or decreasing the span of control such leaders have within the organization, manipulating intelligence units to drop an organization back to single-loop learning, and interdicting flows of information. Maintenance related disruptions, however, would involve sabotaging the ability of a VNSA to socialize its members, or interfering with the rewards and sanctions system (possibly by beating the VNSA at its own game: cultivate an alternate attractive identity replete with even greater rewards). Output strategies include traditional direct engagements with the guerrillas or terrorists, effective intelligence, surveillance and reconnaissance operations to detect impending attacks, capture of drug shipments, or even more creatively, alternative social services.

## Conclusion

Our work is not a panacea, but it should add multiple dimensions to a strategy that sometimes focuses too much on the product of the system and not enough on the system itself. To disrupt the importation of energy, shape the environment and attack the environment/organization boundary. To destroy through-put, have a process-oriented attack plan. To attack export, meet the product head-on before it has been fully deployed. To interfere with the cyclic pattern of activities, interfere with internal activities that are critical, well-connected, or consist of exponential feedback loops. Attack negative entropy by disrupting or destroying critical stores. Disrupt the feedback and coding process by engaging in counter-intelligence and influence operations designed to increase uncertainty and disrupt communication. Destroy homeostasis by attacking critical nodes and disrupting system congruity. While doing these things, keep in mind our newly formulated principles of war for countering VNSAs, as they should inform all actions whether directed at input, conversions, or output. Our inter-disciplinary application of open systems theory provides a powerful framework for diagnosing adversaries, shaping their development and structuring an effects-based strategy for coercion and conquering. It is a global approach to a global challenge.



## About the Authors

Major Troy S. Thomas is an Air Force officer with professional leadership experience in intelligence operations, defense policy and academia. In addition to leading airmen during combat operations in the Middle East, he has served as a war planner in South Korea, a staff officer in the Pentagon and an Assistant Professor of Political Science at the US Air Force Academy. A distinguished graduate from the Air Force Academy, he holds a MA in Government from the University of Texas, Austin, and a MA in Organizational Management from George Washington University. Major Thomas is currently a Fellow with the Center for Strategic Intelligence Research at the Defense Intelligence Agency. His award-winning research focuses on leadership, warfare, intelligence, Islam and air power.

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