Philip Vos Fellman, Yaneer Bar-Yam, Ali A. Minai (Eds.), *Conflict and Complexity: Countering Terrorism, Insurgency, Ethnic and Regional Violence*, New York Heidelberg Dordrecht London: Springer, 2015, 292 p.

Monica Meruțiu[*]

The foundations of this complex and comprehensive volume were laid back in 2006 by the three editors, Philip Vos Fellman, Yaneer Bar-Yam, Ali A. Minai and it was built with contributions of experts in a wide variety of disciplines, such as political science, economics, history, sociology, geography, psychology, mathematics, computer science, and physics, to name just a few. This diversity of their ellaborated perspectives stands from the beginning as a distinctive characteristic, distinguishing this volume from other approaches on similar topics, and consequently transforming it in a unique contribution.

The analyses encompassed in this edited volume focus on stringent problematics of our time, from terrorism and battlefield warfare, to ethnic and regional violence; while at the same time they stand and illustrate an effort to make a significant contribution in combating terrorism, as well as ethnic and regional violence.

The dense volume is structured in three main parts; the first part comprises six chapters, and the next two parts encompass five chapters each.

Part I of the book offers a theoretical background and tackles rather theoretical ideas.

The first chapter, "Modeling Terrorist Networks: The Second Decade" written by Philis Vos Fellman, one of the three editors of this collective work, has its origins in a previous work prepared for a NATO conference in 2003 and its major goal consisted in elucidating how the techniques of nonlinear dynamical systems modeling, combined with first

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[*] Monica Meruțiu is Lecturer in International Relations within the Department of International Relations and German Studies, Faculty of European Studies, Babeș-Bolyai University.
 Contact: monica.merutiu@mail.ubbcluj.ro.

principles of counter- intelligence, could provide solutions to the various problems of the structure of terrorist networks. The present study written a decade later benefits from an updated perspective and while many of the former principles remain the same, there have been major improvements in modeling terrorist networks, while the development of computational power has made possible a better understanding of the complexity of terrorist networks.

Chapter two, "Complex Systems Studies and Terrorism", authored by Czeslaw Mesjasz, is an insight into the systems methods that are relevant to the study of terrorism and the particular modalities in which they can be applied. It is argued that analyses resulted from Complex Adaptive Systems, consisting of various models for identifying and predicting terrorist activities, could bring significant contributions both to the research on how to deal with terrorism as a form of warfare, as well as for studying terrorism as a sociopolitical phenomenon.

The next chapter, "The Psychology of Terrorism", by Elena Mastors provides, as the title suggests, a significant study on the psychological dimension of the terrorist phenomenon, focusing on the motivations and characteristics of terrorists, and the specific stages of their radicalization and recruitment processes. The conclusions underline the idea of the imperativness of interviewing terrorists, as well as conducting research on terrorism, and making appeal to the interdisciplinary approaches in order to cover to a wider extent this complex area of study.

In chapter four, "A Framework for Agent-Based Social Simulations of Social Identity Dynamics", M. Afzal Upal approaches the agent-based model to the social identity dynamics, considered to be imperative for of our understanding of the terrorists' actions and our potential to countering their recruitment methods.

The next chapter, "DIME/PMESII Models", by Dean S. Hartley III, focuses on the complex model DIME/PMESII in order to provide an analysis of counter-terrorism strategies. The acronym PMESII refers to the Political, Military, Economic, Social, Information, and Infrastructure variables that describe the status of a situation, while the acronym DIME refers to the levels of power that a (nation) state has to influence the PMESII state.

In the last chapter of the first part, "Net-Centric Logistics: Complex Systems Science Aims at Moving Targets", Thomas Ray illustrates how a complex systems-based logistics could help prevent terrorists in a more pragmatic manner compared to the traditional centralized model. One of the most important conclusions is that "whereas in the past, preemptive battle tactics meant destruction of the enemy's will to fight, we find today that violent suppression only makes stronger the roots of future conflict. When utter destruction is impossible, victory can be realized only by sustained cooperation" (p. 146).

In Part II of the volume the chapters are dedicated to applications and case studies based on complex systems approaches.

Thus Maurice Passman in chapter seven, "A Fractal Concept of War", moves beyond the traditional model of war to one based on fractals, considered to better reflect and assume the complex dimensions of warfare in our contemporary world.

In the next chapter, "Disrupting Terrorist Networks: A Dynamic Fitness Landscape Approach", authors Philip Vos Fellman, Jonathan P. Clemens, Roxana Wright, Jonathan Vos Post, and Matthew Dadmun claim that one of the most fruitful scientific approaches to the study of terrorism has been network analysis; especially if applied for disrupting the flow of communications. Their arguments illustrate the ways in which "optimal decision-making for terrorist networks might be constrained" and apply the fitness landscape approach to the formal mechanics of decision theory.

Chapter nine, "Comparison of Approaches for Adversary Modeling Decision Support for Counterterrorism" by Barry Ezell and Gregory S. Parnell, summarizes several methods used for risk analysis, stressing the need to integrate terrorism risk analysis into the intelligence cycle. It reviews some of the most common techniques: logic trees, influence diagrams, Bayesian networks, systems dynamics, and game theory, providing technical descriptions, references, as well as the benefits and limitations of each technique. It is underlined that intelligent adversaries remain a fundamental component of terrorism risk analysis and that the modeling of potential adversary attacks on homeland security is an essential opportunity to support national decision makers responsible for homeland security decisions.

Chapter ten, "The Landscape of Maritime Piracy and the Limits of Statistical Prediction" by Philip Vos Fellman, Dinorah Frutos, Thanarerk Thanakijsombat, Pard Teekasap, and Britten Schearuses is a quantitative study that explores whether there is a "learning curve" in the activity of maritime piracy. As the authors confess in the Introduction, they were able "to draw a variety of useful conclusions about maritime piracy and to draw a series of useful conclusions about the nature of this activity" and consequently they have also been able "to place the quantitative results in context, thus hopefully contributing to the successful diminution of Somali piracy" (p. 200).

In "Identities, Anonymity and Information Warfare" Stuart Jacobs , Lou Chitkushev, and Tanya Zlateva approach an interesting and poignant topic, that is identity and anonymity in cyber-warfare, as „modern information warfare embodies many different forms and types, using various computer devices and applications as weapons" (p. 221). The authors conclude that modern electronic societies can no longer allow anonymity to be generally accepted and that industries and societies need to insist that electronic infrastructures and services require authentication of network access and network-based activities. They make the claim that "removing the cover of anonymity will increase the difficulty of perpetrating attacks (including spam, phishing etc.) by cyber-criminals, terrorists, and those involved in information warfare" (p. 230).

Finally, the five chapters in Part III, titled "Broader Horizons", provide deep analyses to conflict in its diverse forms of manifestation and with its many sources: environmental factors, consequences of the climate change, socioeconomic issues, overpopulation, ethnic violence, religious and political turmoils.

In chapter twelve, "The Geography of Ethnic Violence", Alex Rutherford, May Lim, Richard Metzler, Dion Harmon, Justin Werfel, Shlomiya Bar-Yam, Alexander Gard-Murray, Andreas Gros, and Yaneer Bar-Yam We are considering the conditions of peace and violence among ethnic groups, in order to test a theory designed to predict the locations of violence and interventions that can promote peace, taking the former Yugoslavia, India, and Switzerland as main examples. Their analysis illustrate that peace "does not depend on integrated coexistence", but rather on "well-defined topographical and political boundaries separating

linguistic and religious groups", and it supports the hypothesis that "violence between groups can be inhibited by both physical and political boundaries"; e.g. the area of the former Yugoslavia "where during widespread ethnic violence existing political boundaries did not coincide with the boundaries of distinct groups, but peace prevailed in specific areas where they did coincide" (p. 235).

Marco Lagi, Karla Z. Bertrand, and Yaneer Bar-Yam discuss in chapter thirteenth, "Food Security and Political Instability: From Ethanol and Speculation to Riots and Revolutions", the role of food prices in producing political instability, taking as illustrative examples the violent protests in North Africa and the Middle East in 2011 as well as earlier riots in 2008 that coincided with higher rates in global food prices. The arguments claim that protests not only reflect the political failings of governments, but also "the sudden desperate straits of vulnerable populations", and consequently that "if food prices remain high, there is likely to be persistent and increasing global social disruption" (p. 249).

This topic is addressed in the next chapter as well, "South African Riots: Repercussion of the Global Food Crisis and US Drought", authored by Yavni Bar-Yam, Marco Lagi, and Yaneer Bar-Yam that analyze the impact of food prices in South Africa, argumenting on the importance of food prices in social unrest worldwide and the suffering of poor populations, relating to the example of food prices in South Africa that have doubled since 2006, increases that are directly associated with the periods of extreme violence.

This theme is continued in the next chapter, "Conflict in Yemen: From Ethnic Fighting to Food Riots", in which authors Andreas Gros, Alexander S. Gard-Murray, and Yaneer Bar-Yam examine the rioting triggered by food prices in Yemen, an area considered a global terrorist base for Al-Qaeda, where manifestations of violence are threatening the social order, and overall a country with an active terrorist presence. The authors show that the socioeconomic origins of violence have changed in the sense that if prior to 2008 violence can be attributed to inter-group conflict between ethnically and religiously distinct groups, from 2008 on "the increasing global food prices triggered a new wave of violence that spread to the endemically poor southern region with demands for government change and economic concessions" (p. 269).

The last chapter, "Complexity and the Limits of Revolution: What Will Happen to the Arab Spring?" by Alexander S. Gard-Murray and Yaneer Bar-Yam reviews the case of the Arab Spring, by relating to analysis on the Middle East and North Africa, providing a complex systems framework, and infering that "in the absence of stable institutions or external assistance, new governments are in danger of facing increasingly insurmountable challenges and reverting to autocracy" (p. 281). The premises the authors hold are that revolutions have the potential to disrupt societies, they emphasize the complex challenge of forming a functional government and consequently underline the need to identify patterns across all revolutions and past unrest that may enrich our understanding of present crises. Therefore they construct and propose a theory of governmental change from the perspective of complex systems, which can be used not only to explain but perhaps even anticipate the consequences of revolutions.

Conflict and Complexity: Countering Terrorism, Insurgency, Ethnic and Regional Violence is a volume that embodies a complex approach to emphasize the need to add to the classical methods of analyzing, understanding, and combating terrorism and conflict (such as intelligence, statistical and gametheoretic modeling, and military operations) of new methods that has become evident in recent years.

Consequently, the current volume analyses such efforts- the application of network modeling and analysis to terrorism and conflict, as well as many other complex systems concepts, chaotic dynamics, self-organization, emergent patterns, and fractals that have also been applied, generating important results.