THE USE OF COMPLEXITY IN SOCIETAL SECURITY STUDIES

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Societal security, as developed by the Copenhagen School of Security, is an extremely important area of the broader contemporary security concept which, in addition to military issues, also takes into account a number of other threats coming from the fields such as political, economic, societal or environmental ones. In the study of contemporary societal security, a number of concepts specific to the theory of complex systems, such as complexity, self-organization, the threshold of chaos, etc., have been borrowed, substantially enriching the hermeneutics of security discourse on the basis of non-mechanistic interpretations of social systems. This article aims to show that in the study of societal security the use of tools specific to the study of modern complex systems has produced quite interesting results, which could give a new meaning to the research in this field. At the same time, the paper presents some conclusions regarding the methodology of analysis specific to the science of complexity applicable to the field of societal security.

Keywords: societal security; complexity science; systemic thinking; security in a systemic context.

Introduction

Systemic thinking has had a significant impact in many fields of study and research, among which the field of international relations and, in particular, that of Security studies, has occupied an important place. Thus, the concepts of complexity have been used in the study of military conflict and war by a number of analysts such as Quincy Wright or Pitrim Sorokin, and other analysts such as Lewis F. Richardson or Frederick Lanchester have applied these concepts, especially game theory elements, in the study of national / military security. In the study of international relations, elements of complexity theory were used by Morton A. Kaplan and Karl W. Deutsch[1] and, later, Barry Buzan, together with other specialists of the Copenhagen School, applied such elements in contemporary Security studies. Thus, they developed the *extended security concept* proposed by this school, based on five distinct areas of analysis (political, economic, military, social and environmental) and introduced the *theory of securitization*[2] as the basis of a new post-Cold War security paradigm.

Over time, elements of complexity theory

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have become extremely important in the study and research of new military threats, and especially non-military threats to contemporary security. In this context, the main purpose of this article is to show that in the study of contemporary conflicts, terrorism, transnational crime, migration or uncontrolled degradation of the environment, the use of tools specific to the study of complex modern systems has produced quite interesting results, which could give new meaning to research in this field. However, there are also situations in which the use of methodologies derived from the research of complex systems for security studies has been questioned by the insufficient understanding of the concepts of the social sciences or of the theories specific to the complex systems. Given these difficulties, in this article, we aim to identify some of the possible answers regarding how we should understand and overcome the conceptual barriers in applying the concepts of complex systems theory in contemporary security studies.

Using complexity in the social sciences

In sociology, social complexity is a conceptual framework used for the analysis of society and the current use of the term *complexity* refers specifically to social theories that treat society as a complex adaptive system. This aspect motivates the fact that both the social complexity and its emergent properties are central recurring themes

not only for the study of the historic evolution of social thinking, but also for the study of social changes[3]. In addition, social complexity theory offers a medium-level theoretical platform for setting working hypotheses[4] in the study of social phenomena at micro and macro level, the concept of social complexity being methodologically neutral.

The first uses of the concept of complexity in the social and behavioral sciences having as theoretical basis the theory of the complex systems was found in the studies regarding the modern organizations and in those regarding the management studies[5]. However, in management studies, especially, complexity has often been used in a metaphorical manner rather than in a qualitatively or quantitatively theoretical way[6]. However, by the mid-1990s, complexity was incorporated in the field of social sciences, concomitantly with the adoption of study and research tools similar to those generally used in complexity science. In 1998, the first specialized online publication called the *Journal of Artificial Societies and Social Simulation* was created, followed by numerous other high-profile publications that contributed to the promotion of complexity theory in the social field. On the other hand, these concerns have been connected with other theoretical traditions specific to the social domain such as constructivist epistemology and the philosophical positions of phenomenology, postmodernism and critical realism.

As we have already shown, social complexity is a neutral theoretical notion, which means that it can be used in both local and global approaches to sociological research. In this context, the research methodologies are determined according to the level of analysis established by each researcher or according to the level of description or explanation required by the research hypotheses[7].

At the micro level, methods as content analysis, ethnographic observations or other qualitative research methods may be appropriate. More recently, highly sophisticated quantitative research methodologies have been developed that can be used in sociological researches both at the micro and macro level. Such methods include, but are not limited to, bifurcation diagrams, network analysis, nonlinear and computational modeling, including cellular, socio-cyber-type programming and other social simulation methods.

Theoretically, social complexity can be applied to any research that deals with social interaction or the results of such interactions, especially when these interactions can be measured and expressed as continuous or discrete data. A common criticism often cited about the usefulness of complexity science in sociology is the difficulty of obtaining adequate data[8]. However, the application of the concept of social complexity and the analysis of such complexity has begun and continues to be a continuous field of research in sociology.

Can complexity be used in security studies?

The new realities since the end of the Cold War led to an extension of the unrealistic concept of security due to the wider range of potential threats that the world had to face. Deepening the agenda of security studies has required the use of different security references that the state, both at lower levels, up to the individual, transposed into the concept of *human security*, and at higher levels, up to the global level, transposed into the concept of *international* or *global security*, regional and societal security being intermediate references of this interpretation. This parallel extension and deepening of the concept of security was proposed by the constructivist approach associated with the researches of the Copenhagen School[9]. These features make up the core of the security concept and can be used as a starting point for identifying systemic attributes of contemporary security[10].

In order to preserve and develop the analytical properties of the concept of security in a systemic sense, we propose a compromise approach, which we call eclectic. It combines, at least at the declarative level, the objective value of the extended neorealist security concept with the in-depth constructive idea of security viewed as compelling discourse[11]. In this eclectic approach, following the interpretation of Buzan and his collaborators in Copenhagen School, security refers to the following sectors: military, economic, political, environmental and societal, and the basic concepts used are those of existential threat and securitization. Any public problem, presented as an existential threat, can be securitized, as it requires emergency measures and justifies actions outside the normal procedural limits. Security is a self-referential practice, because a certain problem becomes a *security matter*, not necessarily because there is a real existential threat, but because the

problem is described as a threat[12]. Opposite to the concept of securitization is *desecuritization* which can be defined as a process in which a factor, called a threat, is perceived/described as one that is out of date and, therefore, no longer requires extraordinary measures after a persuasive discourse which had previously been presented with the need to impose such measures[13].

The proposed approach helps to identify a stratagem of compromise between the unrealistic approach of predictability of objective threats and the constructivist approach of denying any possibilities for predicting security. Solving this dilemma can be found by abandoning the mechanistic and linear visions of social processes and adopting visions based on complex systems theory. Instead of refining extrapolations, computer models, scenarios and forecasts, emphasis is placed on learning mechanisms that lead to prediction-making, as happens in management[14] or to refinement methods applied in forecasts as is the case with studies about the future[15].

These assessments allow us to conclude that this scientific corpus called complexity can be successfully applied in the security studies which we intend to further explore.

Applying complexity in security theory and practice

Security specialists along with policy makers in this area have high expectations for complexity research. Specialists and decision-makers in the military field are placed in the same margin of expectations. For this reason, it has often been attempted to adapt complexity-specific methods to all levels and situations of a military nature and not only, that is, in post-conflict situations or in so-called emergency situations.

Expanding and deepening the concept of security contributes to increasing the real or perceived complexity of the world we live in today. Therefore, traditional state-centric security studies, oriented on the cause-effect linear approach, even if they were based on scientific models (including those borrowed from early systemic thinking such as: stability, polarity or hegemonic stability), had to be replaced with new approaches based on systemic thinking in which security studies use complex systems concepts such as analogies, metaphors or mathematical models. Thus, nowadays, there

are more and more analysts who think that only in a limited number of cases can the mechanistic concepts of the functioning of social systems be applied. Therefore, a number of concepts specific to the theory of complex systems, such as: complexity, self-organization, chaos threshold has been taken up in security analyzes. In most of these approaches it is not clearly specified, for example, what is really chaotic but, of course, such metaphors are valuable heuristic tools. Therefore, as we have already stated, the notions taken from the study of complex systems have substantially enriched the hermeneutics of security discourse on the basis of non-mechanistic interpretations of social systems.

Thus, the reality indicates that between the research of the complex systems and the contemporary security policy, there have been increasingly close links. On the other hand, the scientific community offers analyzes/works that fall within the same coordinates. We support this claim with a few examples: Holland, J. D., *Hidden Order. How Adaptation Builds Complexity*, Basic Books (New York), 1995, Kauffman, S. A., *The Origins of Order: Self-Organization and Selection in Evolution*, Oxford University Press (New York/ Oxford), 1993, Prigogine, I., *End of Certainty*, The Free Press (New York), 1997, and so on.

The need to understand these concepts has determined the evolution and development of research in the field. Thus, the specific debates have undergone a constant expansion and have concentrated on explaining the extent to which these new terms allow the correct / exact description of the specific social phenomena. In this context, many opinions have emerged, to which we also rally, which support the validity of these concepts, as well as many criticisms of them. On whose side the truth remains, it remains to be proven, but what is certain is that such terms significantly enrich the language of social discourse regarding contemporary security policies and strategies.

Therefore, research in the context of complex systems has offered a new approach to contemporary security analysis. Thus, new possibilities for explaining/predicting the security phenomena at the macro level have emerged, starting from the behavior of the elements at the micro-system level. A good example of this strategy is the *Sugarscape*[16] project, part of a larger project, the

2050 Project, developed by the Santa Fe Institute, in collaboration with the World Resources Institute, and the Brookings Institution. The project involves identifying the conditions for a sustainable global system in the next century and for developing policies to help achieve such a system[17].

Conclusions

All the aspects shown so far demonstrate that complexity studies have become an indispensable part of the epistemology of contemporary security theory and even a useful tool for security policy. The use in security studies of mathematical models, analogies and metaphors related to complexity has broadened the epistemological foundations of research in this field. This does not mean, however, that complexity studies have directly responded to all expectations of security studies in terms of prediction, explanation of causal effects, normative approach, resilience and (always limited) improvement in the ability to influence social phenomena.

The applications of complexity in security discourse demonstrate two essential shortcomings. First, there are too high expectations from security theory and policy and, on the other hand, we notice incorrect use of concepts and abuses. Security specialists, analysts and politicians often treat complexity-related approaches as a new, modern element and with some sense of the magic of contemporary security language. Similarly, researchers familiar with the methodology of complexity reduce social phenomena to very simple models, irrelevant to the reality we live in. In our opinion, references to non-linearity, self-organization and chaos allow for a deeper understanding of all social phenomena. However, in security oriented research they have a special significance because they offer an answer regarding the need for prediction and normative, action-oriented studies.

Therefore, we must pay greater attention to both the efficiency and the legitimacy of the applications of complexity in the theory and practice of contemporary security. Due to the ideas associated with the diversified complexity, the epistemology of security studies has been enriched with tools useful in analysis and research. The new social phenomena specific to the information society have received names that facilitate their understanding, as well as the processes of social communication that target them. The employment of terms such as stability, turbulence, non-linearity, self-organization, chaos, etc. used in security studies reinforce the argument of using complexity theories to explain and model contemporary security phenomena. Although the complexity studies offer the final argument of the impossibility of elaborating in-depth forecasts in security research, they nevertheless offer concrete methods for improving the predictive capabilities either by using mathematical models, or by using analog and metaphorical applications or heuristic stimulation.

NOTES:

1 C. Mesjasz, *Applications of Systems Modelling in Peace Research*, Journal of Peace Research, 25/1988, p. 3, available on Internet at: http://journals.sagepub.com/doi/10.1177/002234338802500319, accessed at 14.05.2018.

2 B. Buzan, O. Wver, J. de Wilde, *Security. A New Framework for Analysis*, Lynne Rienner Publishers (Boulder-London), 1998.

3 Eve Raymond, Sara Horsfall, Mary E. Lee (eds.), *Chaos, Complexity and Sociology: Myths, Models, and Theories*. Thousand Oaks, CA: Sage Publications, 1997.

4 Lee Freese, *Formal Theorizing*, în Annual Review of Sociology, 6/1980, pp. 187-212.

5 Douglas L. Kiel, *Managing Chaos and Complexity in Government: A New Paradigm for Managing Change, Innovation and Organizational Renewal*. Jossey-Bass: San Francisco, 1994, available on Internet at: http://infra-eu.cinecardz.com/l8u3t4q5dhyf/04-santina-waelchi-iv/read-9780787900236-managing-chaos-and-complexity-in-government-a-ne.pdf, accessed at 12.05.2018.

6 Eve Raymond & co., *op.cit.*

7 Niklas Luhmann, *The Differentiation of Society,* New York, NY: Columbia University Press, 1982.

8 Stewart, Peter, *Complexity Theories, Social Theory, and the Question of Social Complexity*, in Philosophy of the Social Sciences, 31(3), 2001, pp. 323-360, available on Internet at: http://journals.sagepub.com/doi/abs/10.1177/004839310103100303, accessed at 12.05.2018.

9 B. Buzzan, et comp., *op. cit.*

10 C. Mesjasz, *Complex Systems Studies and the Concepts of Security*, în Kybernetes, 35/2006, pp. 3-4, available on Internet at: https://www.emeraldinsight.com/doi/full/10.1108/03684920610653755, accessed at 15.05.2018.

11 B. Buzzan, et comp., *op. cit.*

12 *Ibidem.*

13 O. Wver, *Securitization and Desecuritization*, in Lipschutz, R. D., (ed.), On Security, Columbia University Press (New York), 1995, available on Internet at: https://www.scribd.com/doc/95165611/Securitization-and-Desecuritization, accessed at 14.05.2016.

14 K. van der Heijden, *Scenarios. The Art of Strategic Conversation*, John Wiley & Sons (New York), 1996.

15 J. C. Glenn, T. J. Gordon, *2006 State of the Future*,

The Millennium Project, American Council for the United Nations University: Washington, D.C., 2006.

16 This project attempts/intends to apply computer-based modeling techniques to study complex social phenomena (breeding, seasonal migration, interaction with the environment, trade, disease spread, population dynamics and more). The overall goal is to develop a computerized solution that allows the study of different types of human activities from an evolutionary perspective.

17 J. M. Epstein, R. L. Axtell, *Growing Artificial Societies. Social Science from the Bottom Up*, MIT Press (Cambridge, MA), 1996, p.177. available on Internet at:https:// mitpress.mit.edu/books/growing-artificial-societies, accessed at 19.08.2019.

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