Paradigms of Cognition in Security Sciences

Andrzej Glen
ORCID: 0000-0002-7443-2629
Siedlce University of Natural Sciences and Humanities, Poland

Abstract. *The article outlines difficulties related to the paradigm of cognition in security sciences, which have been generalised by asking about the paradigm that allows to study security of various entities and to obtain progress of knowledge about this fragment of reality. Then, a set of paradigms typical for the social sciences, disciplines: political and administrative sciences, international relations theory sub-discipline: security studies and management and quality sciences were analysed and evaluated using a system of hypothetical and assertion-deductive methods. The subject, time and spatial context of security of entities, the subject scope of security sciences and the ontological approach to the understanding of beings in the reality of security of entities were outlined. The usefulness of analysed and evaluated paradigms in cognition of security was assessed in this context. Finally, a complementary paradigm of cognition in security sciences was proposed and its usefulness in relation to multi-paradigmatic cognition was demonstrated.*

Introduction

The fact that the security sciences are in statu nascendi, due to their short, eight-year period of formal existence in the Polish classification of sciences does not require separate argumentation. However, following Thomas Khun, it should be emphasized that a scientific discipline at such an early stage of its development is characterized, among other things, by attributing equal importance to all facts that may contribute to its development. 'As a result, the collection of facts at this early stage is much more random than the research activities we know from a later period of the science development'[1].

The epistemological order of issues expected in the safety sciences, i.e. the sources of cognition, the truth and the methods of reaching it, should bring these sciences a paradigm which in this article is broadly understood as internalised beliefs of the academic community with regard to the vision of reality, the conceptual apparatus and methods, enabling the progress of knowledge about the examined fragment of reality, not returning to issues once established, and solving

---

[1] Kuhn T.S, Struktura rewolucji naukowych, Warsaw, 2009, pp. 39–40.

in its context successively emerging problems[2]. However, the achievement of this 'internalisation of beliefs' among scientists solving the security problems of its reference subjects is encountering numerous difficulties. These difficulties result mainly from different cultures, cognitive views and experiences of scientists exploring the subject matter. At present, we can see three main approaches, characteristic for the authors exploring security problems of entities and cognitively correlated to: theories of international relations: from realism, through liberalism, constructivism to international political sociology; humanities: personal and structural theories; national security theories: system and organisational approach. These approaches are accompanied by significant ontological, axiological and, consequently, methodological differences, which have a decisive influence on determining both the material and formal boundaries and the main objective of research into the security of entities.

The rationale for solving the outlined cognitive problem, consisting in obtaining the status of a mature, paradigmatic scientific discipline, can be seen in the inevitability of the process of integrating knowledge contained in scientific theories of many different scientific disciplines, including those located in different areas of knowledge. However, this process of integration is complicated by the fact that the abstract notion *security* has to be made concrete. The most frequently used entities to identify the notion of security are: a person, a nation, a social group, the state, an association of states, a global society[3], and then they are described with the following predicates: military, economic, political, public, common, social, cultural, ideological, ecological, informational[4]. However, when specifying the place and time of subjectively and objectively identified security, it is spatially positioned as: external, internal or local, regional, international, global[5] and in time as: past, present, future[6]. As a result, depending on the way of spatial definition of security, 360 to 1440 contexts of its understanding are possible.

Solving such a defined problem requires searching and finding, or formulating a paradigm (paradigms) allowing to achieve the prosperity of knowledge within the framework of the security sciences, characterized by: unity, measure and order, which has been recognized as the objective of this article. This aim resulted from the need to solve the scientific problem which generalises the mentioned and characterized cognitive difficulties and which was given the form of a question: what paradigms and why will allow to understand the essence of the security sciences,

---

[2] Krzyżanowski L.J, O podstawach kierowania organizacjami inaczej: paradygmaty, filozofia, dylematy, Warsaw, 1999, p. 57.

[3] Stańczyk J, Formułowanie kategorii pojęciowej bezpieczeństwa. Poznań, 2017, pp. 86–171; Williams P.D, Security Studies. An Introduction, Tajlor&Francis e-Library, 2008, pp. 2–10; Wróblewski R, Wprowadzenie do nauk o bezpieczeństwie. Siedlce, 2017, p. 89; Wróblewski R, Bezpieczeństwo narodowe zintegrowane i zrównoważone. Siedlce, 2019, pp. 55–60.

[4] Kitler W, Bezpieczeństwo narodowe RP. Podstawowe kategorie, uwarunkowania, system. Warsaw, 2011, pp. 127–190, Wróblewski R, Bezpieczeństwo …, *op. cit.*, pp. 77–132; Buzan B, New Patterns of Global Security. *International Affairs*, 1991, Vol. 67, No. 3.

[5] Stańczyk J, *op. cit.*, p. 167.

[6] Hills M.D, Kluckhohn and Strodtbeck's Values Orientation Theory. Online Readings in Psychology and Culture*, 4(4), *Electronic source:* https://doi.org/10.9707/2307–0919.1040, p. 5, *accessed:* 10.12.2019.

enabling the progress of knowledge about this fragment of reality? Such defined problem and research goal require basic research, so to solve the problem and achieve the aim the methods of the hypothetical and partly assertion-deductive system were used, including truth logical rules.

The paradigms of social sciences, its disciplines: the sciences of politics and administration, the sub-discipline of the theory of international relations: security studies and the sciences of management and quality were analysed and evaluated as conceptual forms of learning about the reality of the security of entity. Moreover, the author's own paradigm of cognition of the security in question has been proposed.

Main part

Results of the analysis of paradigms of social sciences, called cognitive viewpoints by John W. Creswell[7], allow to assess the possibility of their use as mental forms of cognition of the subject of security sciences. The subject of the research in question is the national and international security. Contemporary military and non-military security systems and their functioning on different organizational levels. These systems include activities of persons, institutions of international, state, governmental, non-governmental and local governmental character and any other of organised collective activity[8].

The above mentioned entities, being the subject of cognition of the security sciences, from the theoretical point of view are considered within the ontological realism of Leszek Jerzy Krzyżanowski. In this realism, the beings of the reality of the security sciences exist realistically and conceptually. The real sphere is formed not only by things, but also by interactions between them. Apart from artefacts and elements of nature, this sphere includes people understood as socio-psycho-bio-physical real objects. All real objects are concrete entities, i.e. completed in terms of physics, time and space. Moreover, all beings in the sphere of real security of the entity are characterized by derivation, dependence, subjection but also by the necessary self-containedness in this sphere. On the other hand, in the conceptual sphere there has been a reduction of subjective beings, functioning in human minds and inter-subjective, fixed creations of human minds to the category of conceptual existence. Beings in the conceptual sphere are characterized by derivation, dependence, subjection and non-self-containedness. They exist only in connection with the human mind..

Creswell distinguishes four main paradigms in social sciences: post-positivist, pragmatic, constructivist and activist. The post-positivist paradigm is most useful for scientific exploration of the real sphere of security, including social and technical security systems. It allows to describe cause-effect relationships, create evidence

---

[7] Creswell J.W, Projektowanie badań naukowych. Metody jakościowe, ilościowe i mieszane. Cracow, 2013, pp. 32–37.

[8] Such a subject of security research, proposed by Waldemar Kitler and the author of this article, was adopted by Centralna Komisja do spraw Stopni i Tytułów (Central Commission for the Degrees and Titles) in January 2011, deciding to abolish military science and to make security science a scientific discipline located in the field and area of social sciences.

using arguments gained from measurements and own observations. Moreover, this paradigm, similarly to functionalism according to G. Burrell and G. Morgan, gives a chance to fulfil the final function of reality in relation to the subject's security theory and create premises for practical solutions for the future. In this paradigm quantitative research strategies are applied.

Constructivism, on the other hand, as well as G. Burrell and G. Morgan's interpretiveism, allows to explore the conceptual sphere of the security sciences reality. This paradigm assumes the existence of society, one of the reference subjects of the sciences in question, only in the consciousness of researchers. On the other hand, Creswell's activism integrates in its content the features of paradigms of radical structuralism and humanism of G. Burrell and G. Morgan. This paradigm allows us to obtain a cognitive order for research on the individual and his release from the trap of the mind of a man locked in the unreal world, and to detect and reveal the mechanisms of man enslavement by power, as well as to propose ways of overcoming these mechanisms. Both constructivism and activism prefer qualitative research strategies.

Finally, pragmatism allows us to see the existence of security of entities both in the real and conceptual sphere. Researchers using this paradigm select mixed, quantitative-qualitative research strategies for the purpose of research. Pragmatism is characterized by a multi-paradigm shift in cognition.

Generalising this part of paradigms analysis, it should be stated that the researchers of entity's security use mental forms of cognition proposed by all described paradigms of social sciences. The choice of a paradigm and the related cognitive strategy depends primarily on the ontological characteristics of the subject of cognition, resulting in its assignment to the real or conceptual reality of entity's security.

Paradigms of the sciences of politics are characterized due to their usefulness in the sciences of security by Ryszard Zięba[9]. He distinguishes three paradigms of the cognition of security: traditional (theory of political realism), liberal (idealistic) and constructivist. In the traditional paradigm R. Zięba emphasizes a forcible, militarized understanding of security, which focuses on protecting the state against external threats while ensuring the welfare of the society. In turn, in the liberalist paradigm, he notes the idealization of peaceful cooperation, involving non-state actors in international relations and preferring non-military methods of creating security. In the constructivist paradigm, R. Zięba claims the assumption of the non-existence of an objective social reality and treating it as a subjective human production. He also perceives the understanding of such categories as identity, danger, protection, security, because of the communication experience of constructivists. R. Zięba classifies realism and liberalism as positivist approaches, and constructivism as post-positivist one. He considers the path from interpretation and understanding to explaining the phenomenon of security of various entities as the most fruitful security methodology..

---

[9] Zięba R, O tożsamości nauk o bezpieczeństwie. *Zeszyty Naukowe AON*, 2012, Vol. 1, pp. 7–22.

This position is modified by R. Zięba[10], perceiving the multi-paradigmentary nature of the knowledge of security of entities in the international dimension. He proposes to use liberal and constructivist paradigms in the analysis of the internal dimension of the Ukrainian crisis, claiming that the former allows to grasp the current relations between the state and society of Ukraine and the nature of the political regime, while the latter facilitates the definition of the identity of contemporary Ukraine as a state and nation. In turn, in the further part of the article R. Zięba notices the greatest explanatory usefulness of the paradigm of political realism for the analysis of the international crisis Russia — Ukraine.

The arguments of R. Zięba create premise and imply that a conclusion is drawn about the necessity of multi-paradigmatic knowledge of the reality of entity's security. However, one should stress the limited usefulness of political realism, liberalism and constructivism in examining the operational systems of the entity's security in a systemic-organizational perspective. These paradigms narrow the understanding of the security of the entity to the state and its military and power sphere (realism), or allow the exploration of the conceptual sphere of the existence of entity's security (liberalism, constructivism).

The multi-paradigm shift in understanding the reality of international security is confirmed by the work Security Studies edited by Paul D. Williams[11]. In this work Colin Elman describes classical realism, neorealism, defensive structural realism, realism of growth and decline and neoclassical realism[12]. The common characteristic of all the cognitive trends mentioned by Elman is to accept the state as the only reference subject for security, in the context of its power in the system of other states. However, beyond this feature, numerous differences can be identified, especially in terms of the causes and effects of conflicts between these countries.

In classical realism, there was a permanent clash of states in an attempt to expand their own power, and a lack of international institutions capable of opposing such actions. In this field of international security research, aggressive politicians, supported by the political systems of states, are able to make any decision based on an account of potential costs and possible benefits. So they make decisions that are dangerous but rational. In turn, neo-realists treat the behaviour of politicians of countries that simply try to survive as irrelevant variables. In the international system, neorealism distinguishes three levels: the ordering principle, the constituent elements and the distribution of forces. In this movement, only the distribution of forces changes, anarchy is the constant organizing principle of the system, and the constituent elements — states — function similarly. The anarchic international system leads states to unintended consequences, and multipolar systems are less stable than bipolar systems, but even in the latter system the hegemony of a single state is not possible. Even a cursory analysis and evaluation of classical realism and neorealism allows us to see a contradiction of sentences describing both cognitive currents.

---

[10] Zięba R, Międzynarodowe implikacje kryzysu ukraińskiego. *Stosunki międzynarodowe — International Relations*, 2014, Vol. 2, t. 50.

[11] Williams P.D (Ed.), Studia bezpieczeństwa. Cracow, 2012.

[12] *Ibid.*, pp. 15–28.

Neorealism has developed into forms of defensive and offensive structural realism. Unlike neorealism, defensive structural realism assumes rational choices of states on the international stage, a balance of the rationale of defence and attack, distorted in favour of defence by modern technologies and favourable geographical conditions for defence rather than attack. States strive for the status quo and avoid revisionist actions. On the other hand, in the concept of offensive structural realism, states aim at achieving the maximum possible power, and in striving for the position of a hegemon they make carefully thought-out decisions. In this concept, the state may hold the position of an island (Great Britain), continental (Russia) or regional hegemon (USA). Offensive structural realism assumes that the international system can take a structure from an unbalanced multi-polarity conducive to war, through balanced multi-polarity, to bipolarity conducive to peace. As in the case of classical realism and neorealism, the currents of defensive and offensive structural realism should be considered contradictory and thus rendering their complementary application impossible in the cognition of national security in the international system.

Classical realism has developed two more cognitive concepts of international security of states: the realism of growth and decline and neoclassical realism. The realism of growth and decline sees the formation of the international order in wars between world powers. In this concept, a hegemon occupying a leading position that brings him tangible benefits, retains its position only if aggressive actions are taken against the state claiming to be a hegemon. If such an action is not taken, the claimant state will declare war and take the position of the hegemon. The cycle of growth and decline of the hegemon state has not changed for millennia, and states in this cycle are constantly fighting for wealth and power. Only the unwavering status quo of the hegemon does not lead to war. On the other hand, the neoclassical realism sees the instability of the international security system in a significant number of revisionist actions. Among them, apart from the aggressive characteristics of state leaders (classical realism), the motive for aggressive action is the properties of the state's institutions and internal structures, which with the support of ideology and ambition lead to revisionist actions. The lack of cohesion and consensus of the state elite and the lack of social cohesion and the government's susceptibility to pressure cause inaccurate reactions of states to externally enforced strategic needs.

Extremely different approaches to the cognition of international security of states take the currents of liberalism: traditional, economic, theory of democratic peace and neoliberal institutionalism, as described by Cornelia Navari[13].

The founder of the traditional liberalism Immanuel Kant based the stability of the international security system on the republican system of a state in which the universality of 'good law' to which the monarch and ordinary citizen were equally subject became the guarantor of peace. The republican states, in turn, should strive for international relations governed by law. He assumed, however, that every state and its ruler strive for lasting peace by conquest, and to avoid this situation all states should have a republican system, international law should be based on the federalism of free states, and global civil law should be limited to conditions of universal

---

[13] *Ibid.*, pp. 29–43.

hospitality. He also advocated a ban on maintaining regular armies, ruled out interference in the internal affairs of other states, espionage, incitement to treason and assassination and renunciation of imperial conquests. Kant's concept, although certainly serving the cause of peace, should be considered a slightly utopian and of little use in explaining the security of the entity in the international space.

In turn, economic liberalism derived from the theory of *douce commerce* assumed that there was a close relationship between free trade and peace. Thus, a market economy builds civil society and peace, and an economy based on government policies is conducive to conflict and war. Therefore, the countries must separate politics and the economy as far as possible, and within the economy itself, barriers to the movement of goods, services and people between countries must be removed. As a result, powerful transnational economic actors will aim at predictable interactions in the international system, which are conducive to peace. Economic liberalism sees the main threats to world peace in the unpredictability of non-state actors, easy access to weapons and technology and, as a result, the potential to cause disorder in a globalised world.

The theory of democratic peace, on the other hand, assumes that liberal states do not wage wars with each other. The monadic current of this theory assumes the natural peace of a liberal democracy, but the dyadic current already allows the use of force against undemocratic states. Thus, in the long run, liberal states spread this idea while taking care of their security. The problem with achieving the popularity of the theory of democratic peace lies mainly in the large number of countries in the international system, which do not acknowledge liberal democracy and are hostile towards liberal countries.

Finally, the last trend of liberalism, institutional neoliberalism assumes that international institutions have an overwhelming influence on conflict mitigation, and treats international stability as the realization of common interest of states. In the opinion of liberals, these institutions serve precisely the common interests of states, and in the opinion of realists the states ensure themselves supremacy through institutions.

In the constructivist approach to *security studies* characterized by Matt McDonald[14], the Copenhagen School and its leading representative Barry Buzan deserve special attention from the entity's security point of view. He introduced the concept of sectors, regional security complexes and securitisation to the process of learning about the security of the entity. The author distinguishes five security sectors: military, political, economic, social and ecological. The reference subject of security and the form of relations between entities creating this security depend on the specificity of the sector. Regional security complex, on the other hand, is represented by not overlapping geographical regions: Europe, the Americas, Asia, the Middle East and Africa, where the interests of individual actors are so intertwined that it makes no sense to consider them separately. Securitisation practices are implemented in sectors and regional security complexes create the conditions for their success. Securitisation is, in general, about acts of speech by an entity that seeks to create from a particular issue or another entity an existential threat to a certain group. This act takes place in a specific context: the form of a speech act,

---

[14] *Ibid.*, pp. 67–71.

the position of the speaker and the historical conditions of the threat. Successful securitisation takes place when the recipients accept the stated existential threat as true, and desecuritisation occurs when the securitised threats return to the sphere of regular politics. However, the reference subject of security at the Copenhagen School remains the state in the regional international scheme.

The perception of security issues other than the state of the entities is made within the framework of the critical theory of *security studies* characterized by Pinar Bilgin. The Welsh school of critical research for security proposes going above and below state level in this research. It draws attention to the existential dangers for people, and sees the security of the entity in politicising security issues rather than in their desecuritizations. The school aims to address the security issues also of non-state actors, e.g. environmental non-governmental organisations, and addresses the non-military, health, social and environmental contexts of the entity's security, also in the global dimension.

However, all the characterised paradigms of *strategic studies* and *security studies*, apart from the Welsh School, focus on the state in the international security system. They do not provide rules, methods and cognitive tools to explore, for example, operational security systems.

A paradigm that is sufficient to study the security of an entity in a system-organisational perspective, and that is adequate for the needs of cognition of operational security systems of an entity can be sought and found among the paradigms of management science: fundamentalist, pluralist, eclectic and anarchist. Their analysis was conducted by Łukasz Sułkowski, whose conclusions[15] have created an important premise for assessing the usefulness of these paradigms in exploring the subject of security sciences.

Ł. Sułkowski points out that methodological fundamentalism assumes the use of a single, universal scientific method in the process of cognition, and only allows for differentiation of research techniques. Such an approach does not allow to use a set of different methods to solve a research problem and verify hypotheses. The assessment of the probability of achieving the research goal in the fundamentalist paradigm can be carried out indirectly, by positive or negative confirmation (falsification) of the results obtained. On the other hand, methodological pluralism recommends the use of a set of many research methods and techniques, selected according to the scientific discipline in question. At the same time, this selection is also possible from sets of methods relevant to different methodological approaches. The effectiveness of a method is assessed in terms of its cognitive efficiency. On the other hand, methodological eclecticism, as opposed to pluralism, recommends using a set of research methods and techniques within one scientific discipline in the process of research. It allows to combine methods and approaches representative of different scientific paradigms. In eclecticism, the criterion of effectiveness of methods is their cognitive and pragmatic efficiency. Finally, the most controversial of the described anarchist approach assumes the total lack of scientific methods, the lack of scientific development, and allows only pragmatic acquisition of knowledge.

---

[15] Sułkowski Ł, Epistemologia w naukach o zarządzaniu. Warsaw, 2005, pp. 106–108.

Assuming that the dialectic concept of scientific knowledge development and the need to use significantly diversified methodologies of various scientific disciplines are applied in the security sciences, the fundamentalist and anarchist paradigms should be considered useless when studying the issue of security. On the other hand, methodological pluralism, in view of the interdisciplinary nature of cognition in the security sciences, too closely binds a set of research methods and techniques to one scientific discipline. Methodological eclecticism, in turn, allows the use of methods of approach and action appropriate to different cognitive viewpoints. In creating the cognitive basis of the subject of research, eclecticism uses both inductive and deductive methods, it also allows to algorithmise the research activity in designing within the framework of physical research of operating systems. It allows for metaphorical interpretations and combining of methods. Thus, despite the fact that this paradigm may lead to contradictory research results obtained by different methods, it becomes efficient in the simultaneous exploration of the real and conceptual spheres of security of entity.

The analysis and evaluation of the paradigms of the sciences of politics and administration, the sub-discipline of the theory of international relations: *security studies* and the sciences of management and quality, allows us to see that none of the paradigms provides a set of rules that is fully sufficient for understanding the security of the entity in all possible subject, time and spatial contexts. Thus, only a multi-paradigm shift in cognition, assuming that the choice of paradigm is thoughtful, adequate to the properties of security of the entity in conceptual and real spheres, gives a chance for a relatively complete cognition. On the other hand, in the search for the most efficient mental form of cognition of entity security, an attempt was made to create a complementary paradigm of security sciences, drawing creative inspiration from the complementarity of research methods recommended by L. J. Krzyżanowski[16].

Fig. 1. Complementary paradigm for cognition of the security of an entity
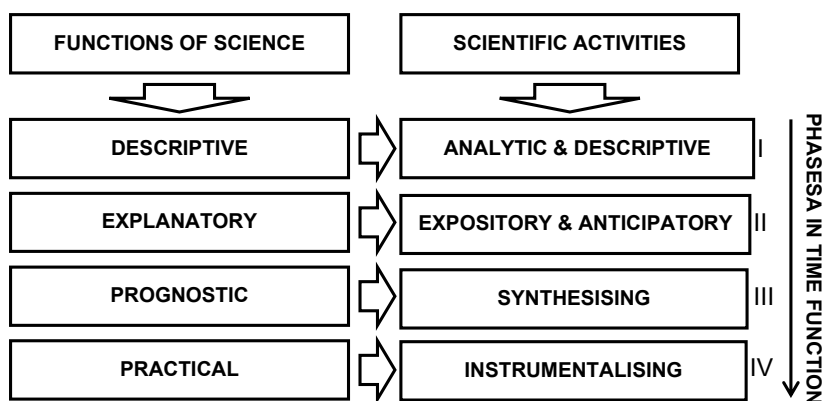
Source: own elaboration

---

[16] Krzyżanowski L.J, pp. 284–290.

The complementary paradigm of cognition illustrated in fig. 1 proposes a four-phase process of cognition of the entity security. In the first phase — analytical and describing — there is a conceptualisation of the cognitive part of reality. In this phase, the researcher receives information from the set of true sentences of the theory of the entity security in all contexts of its functioning. The knowledge in phase one is created in two ways. First, as a result of describing and explaining facts using the language of the theories created so far: armed struggle, non-armed actions, international relations, a state and the law, systems, organization management, history, sociology, psychology, and others. Secondly, as a result of the deductive creation of new scientific facts. As a result in the first phase it is possible to select the conventions of the language of description of these facts adequate to the identified characteristics of the raw facts.

On the other hand, in the second explanatory and predictive phase, the characteristics of the subject of research are described with the use of scientific facts that inform about the reality of raw facts, which motivate the process of cognition. This characteristic, in which knowledge is used to describe the lack of knowledge about the examined fragment of the security reality of the entity, according to the chosen convention of the language of description may be speculative, empirical or systemic. This phase ends with a generalisation of the described difficulties to be overcome in the cognitive process. This generalisation should take the form of a general scientific problem expressed by a question. Further structuring of cognition should be done by dividing the general problem into specific problems, determining the main problem and parallel ones. The overriding problem should take the same form as the general problem but should relate to an object of cognition of the same kind but of a directly higher order. The parallel problem, on the other hand, should be identical in form to the general problem but should concern an object of cognition of the same order but of a different kind. The basic criterion for dividing the general problem in the proposed paradigm is the function of science. According to the level of complexity and scope of reality covered by the problem, it is possible, and often necessary, to further divide it, for example, according to the criterion of the adopted model of cognition: speculative-metaphorical, empirical or systemic. This phase ends with the process of creating initial working hypotheses that allow to direct cognition, to understand its purpose, to select facts for observation and data for analysis, as well as methods of verification of the mentioned hypotheses.

In the third synthesising phase, in the inductive-deductive process of learning there is the transformation of the initial working hypotheses into working hypotheses, and then into explanatory scientific hypotheses — the theory of security of the studied entity. The hypotheses must reflect the subject of cognition defined in the scientific problem. The essence of the synthesising phase consists in the use of inductive methods until the result obtained by these methods can be treated as axiom. This moment is reached frequently, when the probability of the hypothesis being tested is the limit of relative frequency of events, when their number increases to infinity, or logically, when the degree to which the hypothesis being tested can be considered according to the logic of induction is taken into account. However, the decision on the choice of this moment will always be made subjectively and personally by the researcher. The axioms created in the described mode

may serve as a basis for deduction and in the process of hypothetical-deductive proving may result in the creation of new scientific facts — productive, creative knowledge about the security of an entity. In the third phase one should also take into account the lack of positive confirmation or hypothesis falsification, which lead, depending on the defects of the hypothesis, to a return even to the first phase and which require a change in the convention of the description language.

An important role in the proposed paradigm is played by the fourth phase instrumentalising research results. In this phase, the classical functions of reality in relation to the generated theory are fulfilled: the criteria and the final one. As a result, according to the characteristics of research in social sciences, the researcher influences and changes the explored reality. These changes may take place in real and conceptual spheres, also enriching, for the needs of the next cycle of cognition, the set of true sentences of the entity security theory created in the phase of the first proposed paradigm of cognition. In the fourth phase, due to the frequent lack of access to the real reality of the object of research, it should be expected that, for the purposes of fulfilling the criteria of the entity's security reality, social practice will be replaced by scientific practice, i.e. models (analogues) of reality created for the purposes of research. In the case of the final function in which reality fulfils in relation to scientific theory, such replacement is not possible.

In a complementary paradigm, all three strategies, conceptual, empirical and systemic, combine the relationship of complementarity. The speculative-metaphorical generalizations created in the conceptual strategy can be verified empirically and used as a basis for models created in the system strategy. In turn, in the system strategy, numerical models can process more empirically acquired data and replace the reality of security in the verification of speculative generalizations. As a result, the verifiability of the solutions developed in the conceptual strategy is increased, while its high informativeness and predictability are maintained. The system strategy retains high applicability of the developed solutions, and the empirical strategy keeps the empirical verifiability, reliability of information with simultaneous acceleration of obtaining reliable research results.

Conclusions

In security sciences, scientists have grown up in different cognitive cultures, the truth and sources of cognition and its boundaries are seen in different, often contradictory paradigms of cognition. The conceptualisation of the world of security of an entity changing over time influences the choice of paradigms and limits their cognitive performance. Cognition in the security sciences may be characterized by: mono-paradigmativity, or multi-paradigmativity or cognitive complementarity. Cognitive complementarity in the security sciences is enabled by the common axiological and ontological basis of the security of an entity. The transition from multi-paradigmativity to complementarity of cognition of the content matter of the security sciences is supported by the phenomenon of synergy obtained by eliminating disadvantages and exploiting the conceptual, empirical and systemic advantages of cognitive strategies integrated in the complementary paradigm.

References

1. Buzan B, New Patterns of Global Security. *International Affairs*, 1991, Vol. 67, No. 3.
2. Creswell J.W, Projektowanie badań naukowych. Metody jakościowe, ilościowe i mieszane. Cracow, 2013.
3. Hills M.D, Kluckhohn and Strodtbeck's Values Orientation Theory. Online Readings in Psychology and Culture, 4(4), *Electronic source:* https://doi.org/10.9707/2307–0919.1040.
4. Kitler W, Bezpieczeństwo narodowe RP. Podstawowe kategorie, uwarunkowania, system. Warsaw, 2011.
5. Krzyżanowski L.J, O podstawach kierowania organizacjami inaczej: paradygmaty, filozofia, dylematy. Warsaw, 1999.
6. Kuhn T.S, Struktura rewolucji naukowych. Warsaw, 2009.
7. Stańczyk J, Formułowanie kategorii pojęciowej bezpieczeństwa. Poznań, 2017.
8. Sułkowski Ł, Epistemologia w naukach o zarządzaniu. Warsaw, 2005.
9. Williams P.D (Ed.), Studia bezpieczeństwa. Cracow, 2012.
10. Williams P.D, Security Studies. An Introduction. Tajlor&Francis e-Library, 2008.
11. Wróblewski R, Bezpieczeństwo narodowe zintegrowane i zrównoważone. Siedlce, 2019.
12. Wróblewski R, Wprowadzenie do nauk o bezpieczeństwie. Siedlce, 2017.
13. Zięba R, Międzynarodowe implikacje kryzysu ukraińskiego. *Stosunki międzynarodowe — International Relations*, 2014, No 2, t. 50.
14. Zięba R, O tożsamości nauk o bezpieczeństwie. *Zeszyty Naukowe AON*, 2012, Vol. 1.

About the Author

Andrzej Glen, *Prof. PhD, Eng., interests: philosophy of science, including the process of cognition, axiology, ontology, epistemology, methodology in security sciences, widely understood air safety of the state, including: air defence, airspace control, air traffic management, terrorism, including air terrorism. E-mail: andrzej.glen@uph.edu.pl.*

Streszczenie. *W artykule zarysowano trudności związane z paradygmatycznością poznania w naukach o bezpieczeństwie, które uogólniono pytaniem o paradygmat pozwalający poznać bezpieczeństwo różnorakich podmiotów i uzyskać postęp wiedzy o tym fragmencie rzeczywistości. Następnie stosując system metod hipotetyczno i asertoryczno-dedukcyjnych poddano analizie i ocenie zbiór paradygmatów właściwych dziedzinie nauk społecznych, dyscyplinom: nauk o polityce i administracji, subdyscyplinie teorii stosunków międzynarodowych: security studies oraz nauk o zarządzaniu i jakości. Zarysowano kontekst przedmiotowy, czasowy i przestrzenny bezpieczeństwa podmiotów, zakres przedmiotowy nauk o bezpieczeństwie i stanowisko ontologiczne pojmowania bytów w rzeczywistości bezpieczeństwa podmiotów. Na tym tle oceniono przydatność analizowanych i ocenianych paradygmatów w poznaniu przedmiotowego bezpieczeństwa. Wreszcie zaproponowano komplementarny paradygmat poznania w naukach o bezpieczeństwie i wykazano jego użyteczność w relacji do poznania wieloparadygmatycznego.*

Zusammenfassung. *Der Artikel beschreibt die Schwierigkeiten, die mit dem Wissensparadigma in den Sicherheitswissenschaften verbunden sind und die verallgemeinert wurden, indem nach dem Paradigma gefragt wurde, das die Untersuchung der Sicherheit verschiedener Entitäten und die Entwicklung von Wissen über dieses Fragment der Realität ermöglicht. Anschließend wurde eine*

Reihe sozial- und disziplintypischer Paradigmen analysiert und bewertet: Politik- und Verwaltungswissenschaften, subdisziplinäre Theorie der internationalen Beziehungen: Sicherheitsforschung und -management sowie Qualitätswissenschaften unter Verwendung eines Systems hypothetischer und durchsetzungsfähiger Methoden. Das Thema, der zeitliche und räumliche Kontext des Seins von Sicherheit, der technische Umfang der Sicherheitswissenschaften und der ontologische Ansatz zum Verständnis von Wesen in der Realität des Seins von Sicherheit wurden vorgestellt. In diesem Zusammenhang wurden die Vorteile der analysierten und bewerteten Sicherheitserkennungsparadigmen bewertet. Schließlich wurde ein komplementäres Paradigma der Kognition in den Sicherheitswissenschaften vorgeschlagen und seine Nützlichkeit in Bezug auf die multiparadigmatische Kognition demonstriert.

Резюме. *В статье представлены некоторые трудности, связанные с парадигмой познания в науках о безопасности, которые обобщаются вопросом о парадигме, позволяющей познавать безопасность различных субъектов и добиться прогресса в познании данного фрагмента реальности. Затем, используя систему гипотетических и дедуктивных методов, проанализирован и оценен набор парадигм дисциплин, характерных для социальных наук: политические и административные науки, субдисциплина по теории международных отношений — исследования в области безопасности, а также наук по менеджменту и качеству. Были определены предметный, временный и пространственный контекст субъектов наук о безопасности, а также предметная сфера наук о безопасности и онтологический подход к пониманию бытия в реальности безопасности субъектов. На этой основе была проведена оценка полезности анализируемых и оцениваемых парадигм в изучении предмета безопасности. Наконец, автором предлагается дополнительная парадигма познания в науках о безопасности и доказывается ее полезность по сравнению с много-парадигматическим познанием.*