

**RESEARCH METHODS  
IN SAFETY AND DEFENCE STUDIES,  
A PRAGMATIC APPROACH**

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**INTRODUCTION**

Globalisation and changes that have been made at the dawn of the twenty-first century led to some substantial transformations in economic, social, political and scientific spheres. A lot of new scientific areas have come into being and some modern (matching the 21<sup>st</sup> century) academic courses have been developed. What is more, a researchers' optics succumbed to a specific overestimation in many aspects. A crucial change has been made in a social studies area, with safety and defence studies among them.

Safety studies became quite a besieged course in universities. They are chosen by a notable number of students, for whom education in that field is a basis of their further existence and development. There is no doubt that safety studies appeared as a scientific discipline quite recently, replacing military studies. In this context, a reflection started: how to study the safety? What kind of searching optics to apply to certain objective aspects of safety? Should the internal and external safety be researched in a similar way? These sort of research questions and many more have become a challenge for potential researchers from a variety of scientific centers.

The aim of this article is to present certain research methods used in safety and defence studies. The author creates a hypothesis that the methodology in these relatively new studies is mostly adjusted from different scientific disciplines such as political science, sociology, pedagogy, psychology, etc. Unfortunately, it is often the case that when it comes to a research results' verification, it happens that the used research methods were inadequate to the obtained aim.

According to this reflection, new research techniques and tools are still looked for in a scientific discourse. New notional mechanisms are being created, hence the impression that the methodology of scientific researches in safety and defence studies stays a hardly explored issue considered by safety and defence researchers or certain scientific centers. It can be assumed that research methods used in safety and defence studies are still in a sowing phase, hence the usage of a variety of methodologies borrowed from different scientific disciplines.

### THE CONCEPT OF METHODOLOGY

In author's opinion, methodology is a very fascinating discipline of knowledge which shows the way in spheres of ignorance, conjecture, supposition and human's need of understanding.

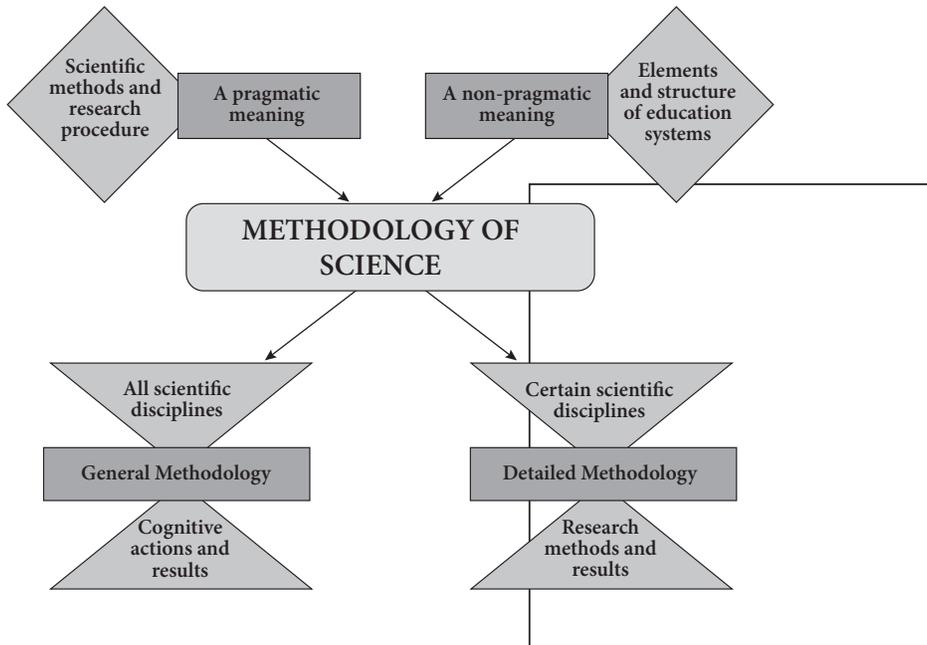
Studies of methods mostly fulfill roles of investigation in which all of the ways lead to one definite aim. Not all of them though do it directly, not all of them are clearly described and what is more, not all of them gain an appreciation among certain researchers<sup>1</sup>. A dictionary of Polish language defines methodology as a study of scientific researches' methods and effective ways of investigating their cognitive values<sup>2</sup>.

T. Kotarbiński claimed that methodology is often and can be understood insinuatingly. It is a study of reasoning building rules. It can also be a logistics section and finally through methodology one can understand

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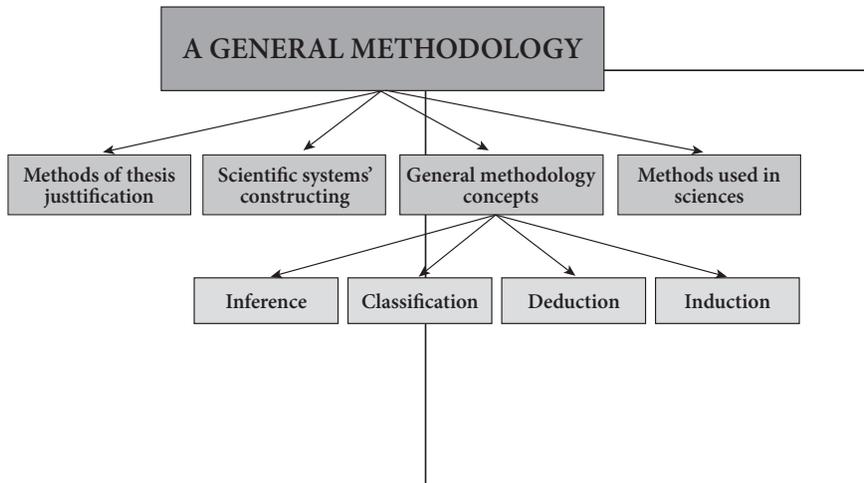
<sup>1</sup> J. Niemczyk, *Metodologia nauk o zarządzaniu*, [in:] *Podstawy metodologii badań w naukach o zarządzaniu*, W. Czakon (ed), Warszawa 2011, p. 19.

<sup>2</sup> *Słownik Języka Polskiego*, J. Dubisz (ed), Warszawa 2003, p. 1112.



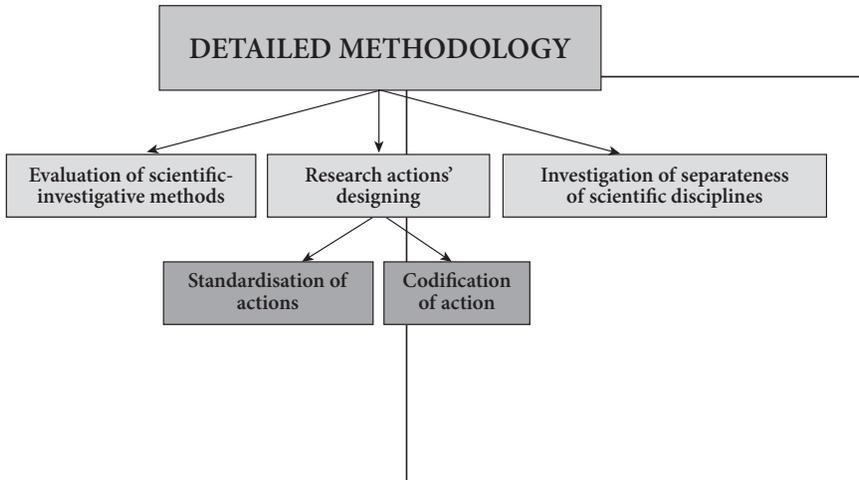
Schema 1. A division of science methodology.

Source: I. Ryguła, *Proces badawczy w naukach o sporcie*, Katowice 2004, pages 12–14.



Schema 2. A general methodology.

Source: I. Ryguła, *Proces badawczy w naukach o sporcie*, Katowice 2004



Schema 3. Detailed Methodology

Source: I. Ryguła, *Proces badawczy w naukach o sporcie*, Katowice 2004.

a theory of mental actions<sup>3</sup>. M. Sułek assumes that methodology is a study in which the matter of researches are scientific methods and a structure of a study<sup>4</sup>.

A. Stanuła thinks (following a track of thoughts of I. Ryguła) that methodology is a study of cognitive actions and cognitive products of these actions. In a particular interest of methodology are research methods and their products being presented as different facts- meaning gained information or data featured as qualitative or quantitative variables and their ratio<sup>5</sup>.

Methodology can be presented in pragmatic and non-pragmatic aspects. Methodology in the pragmatic aspect is a study of scientific activ-

<sup>3</sup> T. Kotarbiński, *Elementy teorii poznania, logiki formalnej i metodologii nauk*, Warszawa 1986, p. 207.

<sup>4</sup> M. Sułek, *Metody i techniki badania stosunków międzynarodowych*, Warszawa 2004, p. 14.

<sup>5</sup> I. Ryguła, *Proces badawczy w naukach o sporcie*, Katowice 2004, pp. 12–14.

ity methods and research procedures used in science; in the non-pragmatic aspect however, it is a study of elements and structure of scientific systems<sup>6</sup>.

K. Ajdukiewicz divided methodology of science on a general and detailed one. General methodology develops some regularities which control a common for all sciences process<sup>7</sup>.

Going on, detailed methodology develops general methodological concepts related to a specific scientific discipline and working on cognitive processes which are distinctive for this scientific discipline.<sup>8</sup>

## RESEARCH METHODS OF SAFETY AND DEFENCE STUDIES

As it was mentioned before, methodology of safety and defence studies derives from many different scientific disciplines, particularly from widely understood social sciences. These methods can be easily divided on two sections: empirical and theoretical.

The aim of empirical methods is to deliver some scientific facts to potential researchers. The project of theoretical methods is to logically organise gathered empirical material.

A fundamental research method used in promotional work is an analogy. The analogy is a type of inference based on similarity<sup>9</sup>. A corollary gained through the analogy shows a possession of some feature by a certain object based on its similarity to other objects possessing this particular feature<sup>10</sup>. In scientific essays and researches the analogy is one of the research methods used by their authors. In their investigations they look for some common nominatives between given subjects or concepts, they also try to illustrate, plastificate and accurately depict certain phenomena.

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<sup>6</sup> M. Sułek, *Metody i techniki badania stosunków międzynarodowych*, Warszawa 2004, p. 15.

<sup>7</sup> They include concepts of inference, deduction, induction, classification and many more.

<sup>8</sup> K. Ajdukiewicz, *Logika pragmatyczna*, Warszawa 1974, p. 174.

<sup>9</sup> A conventional example of analogy is the hypothesis that there is life on Mars.

<sup>10</sup> *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 38.

The analogy has one important defect- nothing can be specifically proved by it, which shows a negative aspect of the analogy. Another research method is an enumerative and eliminative induction. Within the enumerative induction, two variants can be distinguished: an exhaustive and non-exhaustive induction.

The enumerative induction is related to inference, in which a thesis stating some general regularity is regarded (by a researcher) as a corollary based on a recognition of theses stating specific cases of this regularity<sup>11</sup>. A complete induction differs from an incomplete one. The enumerative incomplete induction is discovery, it possesses a heuristic power. Premises which the inference is based on are the same as with the enumerative complete induction. The inference based on the enumerative incomplete induction is actually an incorrect inference, and this type of inference takes a bottom-up approach. A probability of an inductive corollary depends on a number of examined elements, their differentiation and a randomness of their selection<sup>12</sup>.

The another type of induction is eliminative induction. Researches on the subject were introduced by F. Bacon, who formulated a rule of a limited diversity of the World. It assumes that a given subject can be thoroughly formulated and a completed list can be presented. J.S. Mill tried to improve this method. In his researches he looked for causal connectives between phenomena, so basically between causes of a phenomenon or its effects. That is how unfailing Mills Methods came into existence.

They are used for exploring casual connections that have an impact on a process of a certain phenomenon. With some assumptions, this method allows to take out a real corollary<sup>13</sup>.

An inverse of the induction is a deduction, which is a correct inference. It consists of taking out logical corollaries from theses with an axiomatic nature. Therefore, it contains a nature of some logical necessity. A starting point of the deduction are axioms and theses that have already been

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<sup>11</sup> See J.M. Bocheński: *Współczesne metody myślenia*, Poznań 1992, p. 103.

<sup>12</sup> *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 41.

<sup>13</sup> *Ibidem*.

proved. The deduction is a way from a cause to effects and also going from general relations to a certain case – as a confirmation of a specific regularity. In deduction the inference goes with a top-down approach. In safety and defence studies some of the researchers use a reduction method. It is characterised by the fact that in a reduction inference a direction of reasoning is actually opposed to a logical resulting direction. The notion of the reduction inference is presented in the illustration below:

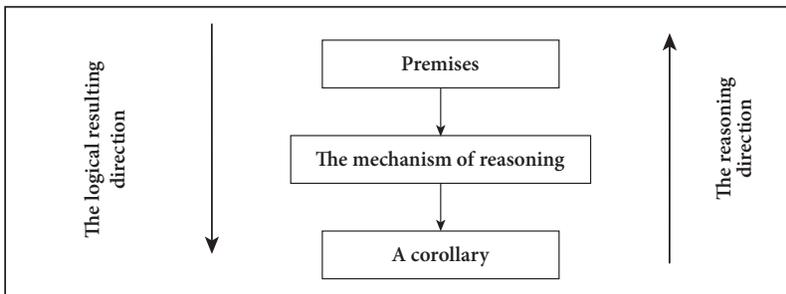


Illustration 1. The notion of reducing inference.

Source: *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 44.

In the reduction inference, researchers know the result of an action and wonder what kind of reasons caused it. It means that they know the corollary and they have to think about the premises. Therefore, it can be assumed that the correct inference consists of: enumerative and eliminative induction and deduction; and the incorrect inference consists of analogy, incomplete induction and reduction<sup>14</sup>.

The another method used in safety and defence studies is (acquired from political science) systems analysis. A systems' approach is understood as an entirety of scientific thinking rules and also methods and ways of analysis that allow to examine a certain object as a relative totality. Therefore, it can be assumed that system thinking is some kind of aggregation of methods and ways of researching, describing and constructing systems.

<sup>14</sup> Ibidem, p. 45.

The analysis includes: demands and approval of changes, intrasystemic conversation, system's creations, a feedback between enter and exit and remedies serving a maintenance of the system in the face of forthcoming changes from the outside world<sup>15</sup>. This type of analysis can be successfully used in researches of typical problems related to national security. Safety and defence researches can not be missing a decision-making method or a decision-making approach, of course. This method focuses around a composite treatment of political and military phenomena. Thanks to usage of this method it is possible to deformalise researches and allow the analysis of real mechanisms of actions in certain decision-making center. A disadvantage of this method is some tendency to an absolutisation of decisions which are identified with phenomena and processes that constantly happen in surrounding everything and everyone reality<sup>16</sup>.

As it was mentioned before, in safety and defence studies researches borrow some aspects from different scientific disciplines. Some of the researches use nomothetic and idiographic methods to explain some problems. W. Allport is their creator. He assumed that these methods are not only used in natural sciences, but also in studying the safety<sup>17</sup>. They are particularly used in situations when population is the matter of research.

Nomothetic methods formulate some general, universal laws controlling a social functioning of entities. Going on, idiographic methods are directed to getting to know a uniqueness of an entity as well as a whole of their personality, they should be able to give a deep and complete picture of it. These unique characteristics of a human being can be something important, however if they were not, there would only be left as defects of the idiographic approach<sup>18</sup>.

The researchers also relate to structural approach which came into existence in 1970<sup>s</sup>. In these type of methods a top-down process of analysis is used. What is more, a fundamental way of an approach is a decomposi-

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<sup>15</sup> M. Żmigrodzki, *Wprowadzenie do teorii polityki*, Lublin 1996, p. 23.

<sup>16</sup> A. Chodubski, *Wstęp do badań politologicznych*, Gdańsk 1996, p. 14.

<sup>17</sup> Compare: T. Malim, A. Birch, A. Wadeley, *Wprowadzenie do psychologii*, Warszawa 1994.

<sup>18</sup> *Ibidem*, p. 14.

tively-functional analysis through which functions of security systems are examined. A prominent place in safety researches also belongs to institutional methods- particularly institutionalism and new institutionalism.

G. Wallas was a precursor of a traditional institutionalism. The matter of its researches are basically states' institutions, including institutions responsible for a safety maintenance. Thanks to this method it is possible to analyse institutional system responsible for the safety and defence. Particularly, some aspects need to be worked with in a descriptive way. New institutionalism assumes that safety institutions are more alternating, they develop, but all in all they do not cause a slowdown of a changes' pace. It means that institutions responsible for safety are more rational in their actions.

In safety and defence studies there are also used statistical methods through which one can present some data in a graphic view<sup>19</sup>. In advanced researches in a safety field, to measure some phenomena there have to be used specific mathematic models<sup>20</sup>. Aspects particularly modeled are: military conflicts, fighting models, direct fire striking and studies on guerrilla warfare models. Therefore, these models can be used for stimulation of any levels of military actions to support solving different decision-making problems within a military sphere<sup>21</sup>.

One of the research methods used in safety and defence studies is a grounded theory method. It is used in qualitative researches and it consists of building a middle range theory based on systematically gathered empirical data. This method is some kind of endeavour of opposition to traditional academic methods of theories' building<sup>22</sup>. Unfortunately, this method is not easy to operationalize. It is because of the fact that its concepts derives from observations and narrowly separated for researches of empirical area descriptions.

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<sup>19</sup> D. Przybysz, H. Domański, *Analiza zmiennych porządkowych. Modele logarytmiczno-liniowe*, [in:] J. Brzeziński (ed), *Metodologia badań społecznych. Wybór tekstów*, Warszawa 2011, p. 155–160.

<sup>20</sup> J. Gutenbaum, *Modelowanie matematyczne systemów*, Warszawa 1987, p. 34.

<sup>21</sup> *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 95–96.

<sup>22</sup> It is a so called „armchair theorising”.

A researcher using this method should be aware of some paradigmatic entanglements which can define their ways of perceiving reality. What is interesting, a way of exploring the reality reveals some ontological assumptions, for example a processual nature of a social reality<sup>23</sup>. A variety of researchers undertaking the challenge of investigating the issues of safety and defence studies try to draw from a comparative analysis. It is based on moving theses related to one phenomenon to another one. All of it happens according to some similarities, hence this method is also called a method of analogy.

In general, while conducting studies on security systems of certain countries researchers thoroughly search for a common nominative between occurring systems<sup>24</sup>. This way they try to illustrate, plastificate and accurately depict some of the aspects. At the same time, what is worth mentioning, this method can not prove occurring phenomena in security systems, hence it is obvious to assume that it also contains some defects.

Thanks to a development of IT methods and techniques, new specific methods of researching complex objects called simulation methods have been created. In safety and defence studies, computer simulations have become a very commonly used research method. Thanks to them one has a possibility to develop, improve and use computer models to study already existing or postulated dynamic systems. By means of computer simulations it is also possible to imitate effects of a specific system functioning and to reconstruct systems<sup>25</sup>.

Simulation models are used in an inductive way. Especially by means of the computer simulation method, simulation of a war games can be conducted. Thanks to them the efficiency of military systems, problems of military systems and made decision can be thoroughly researched<sup>26</sup>.

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<sup>23</sup> K. Konecki, *Studia z metodologii badań jakościowych. Teoria ugruntowana*, Warszawa 2000, p. 23–25.

<sup>24</sup> Ibidem.

<sup>25</sup> More in: W. Radzikowski, *Badania operacyjne w organizacji i zarządzaniu*, Warszawa 1985

<sup>26</sup> *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 129–157.

The last type of methods used in safety and defence studies is a scenario analysis method.

These methods are based on an assumption that future can not be predicted for sure and this is why it should be designed in advance. Hence it can be assumed that a scenario is a description of a future, possible and probable situation characteristic for a phenomena which is the matter of the research.

It shows the possibilities of existence of some states and a growth of events which condition future states of an object and its possible behaviour in the environment. There is a lot of scenario methods, so a researcher conducting a specific study will have to choose the one they want to use<sup>27</sup>. Scenario methods are used as prediction evaluation by institutions such as the RAND Corporations, the Club of Rome and the Prognosis' Committee PAN (The Polish Academy of Sciences)<sup>28</sup>.

### SUMMARY

Safety and defence studies have a very short history, as they were created quite recently. Hence the possible assumption that research methods that are used in them are in a sowing stage. In spite of it, there are researchers that decided to undertake a variety of explorative challenges and they try to use different research method, very often choosing them in reference to investigated reality. Therefore, it can be assumed that the methodology of safety and defence studies has not completely developed (yet). Borrowing methods from different sciences is a very difficult venture which causes situations when research results are false or they do not support any of the stated hypotheses.

In the objective article, a review of research methods used for now in safety studies has been made. Of course, it can not be suggested that they are the only and the best ones. Actually, scarcely the quantity of conducted researches and investigated issues can let researchers make an observation which method is a leading one. For now, researchers try to look for accurate solutions for them and the investigated matter at the same time. It is very similar to a promotional work (such as essays, researches). In universities, where degree dissertations and Masters' theses are being created, different research methods are

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<sup>27</sup> Scenarios can be: descriptive, normative, forecasting, back-casting, possible events, simulation, environments' states and environments' processes.

<sup>28</sup> *Metody badań nad bezpieczeństwem i obronnością*, P. Sienkiewicz (ed), Warszawa 2010, p. 216.

used to apply to them. It happens quite often that the used methodology derives from pedagogical sciences. Some of the universities use research methods borrowed from political sciences. Another ones use methods that are quite sophisticated and very often draw from a variety of scientific disciplines.

To recapitulate, one can hope that it is only the matter of time until together with maturing of the new discipline which is safety and defence studies, some methodological patterns will also be created.

**Keywords:** Safety and defence studies, Methodological analysis, Scientific research