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DECISION ANALYSIS IN POLITICAL SCIENCE

THE PROBLEM WITH THE UNCERTAINTY PRINCIPLE

ABSTRACT Decision analysis is considered to be one of the most important research methods in political science. The problem, however, is to determine to what extent such analysis can be reliable. The application of classical decision theory, referring to statistical research and probability theory, to the assessment of the political decision-making process is usually inadequate. This results, among other things, from the inability to obtain reliable knowledge about the initial state of the decision and the state of nature, differences in the perspectives of the assessing entities, differences in short- and long-term priorities, and above all, the impossibility of achieving several goals at the same time due to their mutual exclusion. These difficulties are generalized by the 'uncertainty principle,' analogous to the Heisenberg equation: the more certain priorities are realized, the less it is possible to realize others. Similarly, the use of some paths of justification excludes others in the real decision-making process. What can serve as a useful procedure, however, is the 'expansion of time horizons,' i.e. the gradual distancing of the time perspective of benefits.

Keywords: decision, analysis, political, science, uncertainty, principle

INTRODUCTION

The purpose of this article is not to examine a complex political phenomenon, but rather to point out two opposing regularities concerning research in political science. One of them is the rather rarely used possibility of studying political phenomena from the point of view of decision theory with its complex and, worst of all, multifaceted conceptual apparatus. The second one, on the other hand, is of a negative nature and has not been emphasized so far in methodological research in political science; it is the problem of structural and inalienable cognitive and operational limitations, leading to the impossibility of developing prognostic recommendations, which are expected from political scientists.

However, let us emphasize from the outset that this is not about limitations in knowledge itself. The reasoning leading to the indication that failures in the decision-making process result from the impossibility of fully knowing the initial state is justified. The assumption of the inability of the political decision-maker to know all the facts of the initial state was exploited mainly by liberalism in its economic version. This includes the belief that success, both in business and politics, can only be verified by the market. Therefore, in the economic dimension, it is better to leave the flows to the free market, and knowledge about the needs will reveal itself. In the political dimension, it is best to entrust the creation of governments to democratic processes, because a free market of potential decision-makers will allow for the satisfaction of political demand. Such a view was clearly articulated by Anthony Downs in his 1957 book on the economic theory of democracy, where he developed the concept of rational choice among political actors.[1] However, even this kind of hope might be misleading, which was cleverly illustrated by Kenneth Arrow's impossibility theorem. It explained that no ranking-based rule is able to meet the seemingly reasonable requirements of rational choice theory such as non-dictatorship or citizen sovereignty. Moreover, the rules of rational choice in trade essentially differ from the ones in elections: *If consumers' values can be represented by a wide range of individual orderings, the doctrine of voters' sovereignty is incompatible with that of collective rationality*.[2]

Our main research question, or, to be more precise, rather a theoretical consideration boils down to the **possibility or impossibility of working out a useful scheme of political decision-making as a reliable method in political science**. In the set of contemporary research methods in our discipline, decision analysis usually appears as one of the most obvious. The problem, however, is that its essence has never been satisfactorily explained. When we discuss the main ideas of the method, we actually keep in mind several issues.

(i) One is a set of procedures that would make decision analysis a 'truly scientific' method. The expected method is considered, not without some naïveté, to comprise a kind of instruction, the application of which would guarantee reliable knowledge

[1] A. Downs, *An Economic Theory of Democracy*, New York 1957.

[2] K. Arrow, *Social Choice and Individual Values*, New Haven–London 2012, p. 60.

about the process being studied. In short, the point is to develop some formula that could then be applied in various cases. It should always be useful, although, of course, not always to the same extent; it should lead to rational conclusions according to its basic imperative to create a general principle, a formula, and then base any decision-making process on it: you can count on a sensible answer to any dilemmas.

(ii) Since we count on a reliable procedure, we must first rely on a basic set of concepts, analytical terms and believe that they can be applied in principle anywhere and at any time. Despite the obvious possibility of continuous expansion of the research apparatus, it should be generally assumed that the elementary terms/concepts are suitable for the useful and reliable study of every single problem that might be theoretically taken into consideration as an object of decision analysis, at least to a basic extent.

(iii) What seems to be an even more basic problem while defining the method is the question whether it is supposed to be applied only to the study of past events or serve as an instruction, a recipe for hypothetical or expected decision processes? In other words, do we expect decision analysis to be simply a useful device for historians, or, rather, a tool for political decision makers helping to create the most rational policies?

The list of problems presented above, whose solution is an obvious imperative for methodologists, does not, however, touch on the most important thing, namely the extent to which the desired decision analysis could be able to reflect the decision-making processes that actually take place, and not only imagined intellectual structures. In principle, however, it is about something more; one can always indicate certain cases in which a procedure leads to a convincing analysis of real processes from the past or serves as a useful tool in creating both domestic and foreign policies. The point is **whether such a method can lead to optimal solutions**, i.e. unquestionably the best ones for the communities for which such policies are created, at least in a basic and theoretical way. This principle applies both to retrospection, to a critical look at decisions made in the past, the consequences of which can be assessed from today's perspective, as well as to the tasks decision-makers are facing right now, from which we expect optimization of solutions without certainty concerning the actual state of affairs in the future.

Decision analysis as such has of course a certain literature. Today, we can speak of various useful studies on this subject, which include, for example, an inspiring 1996 collection edited by Rios[3], the classic 2007 book by Hansson,[4] or a comprehensive study by Katie Steele and H. Orri Stefánsson placed in the priceless Stanford Encyclopedia of Philosophy in 2015 and then revised in 2020[5]. Obviously, decision theory was in a creative way structured and creatively revitalized by Martin Peterson in his continuously reedited *Introduction...*, where we find his considerations about utility in decision processes as well as his reflections concerning the problem of probability to

[3] S. Ríos S. (ed.), *Decision Theory and Decision Analysis. Trends and Challenges*, Dordrecht 1994.

[4] S.O. Hansson, *Decision Theory. A Brief Introduction*, Stockholm 2005.

[5] K. Steele, H.O. Stefánsson, "Decision Theory," in *Stanford Encyclopedia of Philosophy*, Stanford–Palo Alto, at https://plato.stanford.edu/entries/decision-theory/, 12 May 2025.

be especially interesting.[6] Not all classic studies on decision theory are suitable for our purposes. Many, such as Parmigiani's 2009 monumental analytical work concentrate firmly on the purely statistical aspect of the matter,[7] which satisfies sales managers and bookmakers but not necessarily political scientists. The general impression is that the lion's share of interest was taken by business and management research, and that is why it makes sense to open a slightly different perspective on the matter.

Decision analysis, similarly to all the other methods, has been undergoing some development for decades. Many new approaches have enriched the range of DA in various ways. One of the most interesting moments in this process was the 'invasion' of Q (Q sort) methodology. It was probably Durning and Brown in 2007 who were the first to introduce this kind of reasoning and procedures in the area of decision analysis.[8] From our point of view, the most interesting issue with this innovation was in opening the door to subjectivity as an aspect no less important in decision making than a mathematical compilation of data. It is actually crucial in analyzing political decisions, which have not so often been taken up as an object for DA. In our times it was Heinelt who gave an interesting and reflexive study of decision-making process in politics as a consequence of broadly defined 'knowledge.' Heinelt correctly points to two basic notions referring to knowledge in the process of decision-making in politics. One of them is the 'knowledge order,' a dominant form of selecting and integrating knowledge by means of socially recognized institutional principles. The other consists in 'cognitive-constitutive rules,' which go beyond the knowledge order and are unavoidable in the process of cognitive discovery of the world and for sense-making as such.[9]

In 1996 Gallhofer and Saris in their *Foreign Policy Decision-Making* gave an innovative study in the field of decision-making in international politics with a strong emphasis placed on argumentative narratives. Their major discovery was that only six principal models of persuasion were in use as comprehended by politicians and their followers, and, moreover, that the same approaches are applied nearly irrespective of the current political circumstances.[10]

An alternative current in decision theory, which uses a conceptual apparatus peculiar to its specificity, is game theory. It is particularly useful in the analysis of world order and the behavior of actors in international relations.[11]

6 M. Peterson, *An Introduction to Decision Theory*, Cambridge 2022.

7 G. Parmigiani, L.Y. Inoue, H.F. Lopes, *Decision Theory. Principles and Approaches*, Newark 2009.

8 D.W. Durning; S.R. Brown, "Q Methodology and Decision Making," in G. Morçöl (ed.), *Handbook of Decision Making*, New York 2007, pp. 537-563.

9 H. Heinelt, *Challenges to Political Decision-Making. Dealing with Information Overload, Ignorance and Contested Knowledge*, Routledge 2020.

10 I.M. Gallhofer, W. Saris, *Foreign Policy Decision-Making. A Qualitative and Quantitative Analysis of Political Argumentation*, Westward 1996.

11 Cf. Z.J. Pietraś, *Teoria gier jako sposób analizy procesów podejmowania decyzji politycznych*, Lublin 1997.

THE PROBLEM OF CONCEPTUAL STRUCTURE

As we noted in the introduction, decision analysis in political science does not have a clearly defined conceptual apparatus. In general, we are rather dealing with an attempt to apply concepts from the scope of 'general' decision theory, but in this case the matter is not obvious either. The authors use different concepts, but one cannot speak of uniformity in this respect. Since politics is about decisions on such things as the benefits of establishing diplomatic relations with country X, applying the most favored nation clause to country Y, entering into coalitions with parties P and Q in order to form a stable majority, changes in school programs so that teaching encourages the adoption of patriotic attitudes, etc., and not about choosing the target group for a newly produced candy bar (from the point of view of the number of potential buyers), we will focus on concepts that can be applied in a broad spectrum of political science research, at least in an elementary way.

The list below presents some relatively frequently used terms, which might be applicable in analyses of political decisions:

(i) A 'decision-making situation' – refers to all factors that could theoretically have an impact on the decision;

(ii) A 'decision-making problem' – in terms of logic is a yes-or-no question concerning an infinite set of inputs; in decision theory it generally denotes a difficulty with choosing the 'correct' option, a dilemma resulting from the experience of various mental shortcuts in past decision-making processes;

(iii) The 'decision-making process' – is a set of subsequent stages of decision-making, which sometimes passes through the lines drawn by a 'decision-making model' – an abstract of the decision-making problem in a decision-making situation, a pattern;

(iv) The 'decision-maker' – is a person or a collective body making the decision; in politics – a dictator, a monarch, a legal head of state, the head of a government, a charismatic leader of a rebellion, etc.;

(v) The 'decision-making space' – is the 'room for maneuver,' the complete set of possible decisions that can be made; the term is most often used in medical management and generally refers to *the range of choice, or authority and responsibility, which decentralized organizations have been granted by central authorities to make decisions about or influence a range of functions and resources*;[12]

(vi) The 'decision' itself – denotes the resolution influencing the future course of events;

When the decision is a fait accompli its quality undergoes an analysis, which needs (vii) the 'decision-assessment criterion' – a principle or system of principles allowing the reviewer to give arguments supporting or negating the decision;

The framework of classifying decisions may be very complicated. However, three concepts are worth mentioning:

[12] T.E. Roman; S. Cleary; D. McIntyre, "Exploring the Functioning of Decision Space. A Review of the Available Health Systems Literature," *International Journal of Health Policy Management*, vol. 6, no. 7 (2017), pp. 365-376.

(viii) An 'admissible decision' – is a broad category denoting a decision that is acceptable, fulfilling all conditions limiting the decision; the concept is most often used in statistics and stands for a decision made such that there is no other decision that is always better than the one in question; an interesting aspect of this category of decisions was defined in 1957 by Herbert Simon, who introduced the notion of 'bounded rationality' denoting *the behavior of human beings who satisfice because they have not the wits to maximize*;[13]

(ix) An 'optimal decision' – is the most favorable decision option in specific circumstances in the light of the decision-assessment criteria. The popular formula for an optimal decision is:

$$\mathrm{dopt} = \arg\max_{d \subset D} UD(d)$$

where D is a set of available decision options, d the decision made and U the expected utility;

(x) A 'decision-limiting condition' – is one of the 'red lines,' (e.g. an existential threat to state security) ruling out the possibility of making a specific type of decision;

(xi) 'Certainty' – theoretical lack of doubts about the consequences of the decision

(xii) 'Risk' – a less obvious notion, which refers to a situation in which the choice of a given decision option entails the possibility of various negative and positive consequences with a known probability of each possibility occurring;

(xiii) 'Uncertainty' – a situation of doubt about the possible consequences of a decision due to the lack of full knowledge about the probability of certain states/circumstances that are supposed to be taken into account while making the decision.

Last but not least, it is important to consider the concept of (xiv) the 'state of nature' i.e. all possible outcomes of a decision, independent of the decision-maker(s), but resulting in (political) consequences.[14]

There is much to be said about the doubts raised by the above conceptual structure. First of all, it shows that in decision theory – and thus in reliable decision analysis – we are essentially dealing with vague concepts that can only seemingly be captured in mathematical frameworks. For example, how is it possible to mathematically express risk or uncertainty in political processes? It is somewhat easier to use this type of reasoning in the case of strictly economic decisions, but here the useful concept of the 'state of nature' cools down initial ambitions and makes us realize that the

[13] For further study see: J. Inglis, "Admissible Decision Rules for the Compound Decision Problem: The Two-Action Two-State Case," *The Annals of Statistics*, vol. 7, no. 5 (1979), pp. 1127-1135; H. Simon, *Administrative Behavior. A Study of Decision-Making Processes in Administrative Organization*, New York 1957, p. XXIV.

[14] For an interesting consideration about 'generalized' decision theory applied to explain such partially predictable phenomena as the crowding-out effect, irrational educational investment decisions or persistent social inequalities see: I.P. Embrey, "States of Nature and States of Mind. A Generalized Theory of Decision-Making," *Theory and Decision*, vol. 88 (2020), pp. 5-35.

consequences of a decision depend not only on the decision-makers, although they will bear full responsibility for it.

THE COMPLEXITY OF POLITICAL DECISION-MAKING

Decision-making in politics is almost always a structurally complex process, and therefore difficult to describe unambiguously, although considerable effort has been made to illustrate it mathematically. The first question is about the nature of governance as such. For the purposes of our study, we can apply the model suggested by Kooiman and Jentoft, who distinguish three components: images, instruments, and action. Images actually comprise the base of meta-governance and are described as the 'guiding lights' of the process, such as metaphors, goals, hypotheses or convictions. Instruments, as the authors note, *contrary to what the instrumental toolkit metaphor suggests, (...) are not a neutral medium – in fact, their design, choice and application frequently elicit strife. It is clear that the choice of instruments is not free; one's position in society determines the type and range available*. As far as actions are concerned, they generally boil down to the implementation of objectives by policy-makers, but *may also consist of mobilizing other actors in a new and uncharted direction*.[15]

Kooiman and Jentoft list three governance modes: hierarchical governance, self-governance, and co-governance, where the first is obviously characteristic of unitary states, whereas in self-governance, the parts of the entity take care of themselves without a previously issued instruction from the top, and co-governance accounts for partnership. What is more important, however, is the classification of governing orders, an important element in Kooiman's theory. 'First-order governing' is the one that is oriented towards concrete choices of action in the reality of implementation. On this level, problems are identified (as they do not belong to objective reality and become problems only in the minds of 'societal actors'). Then attention is given to practical solutions. 'Second-order governing' is focused on the institutional sphere of decision-making, including norms, laws and procedures. The core of the problem, however, lies in the 'third-order or meta-governance.' Kooiman and Jentoft are fully aware that this concept was formerly in use in various ways[16] but they generally understand it as an *order where values, norms and principles are advanced according to which governance practices can be formed and evaluated*.[17]

The literature on decision-making is generally dominated by the focus on 'first-order governing.' This is primarily due to the fact that decision theory is overwhelmed by the sphere of management in the broad sense, which receives its legal and institutional

[15] J. Kooiman, S. Jentoft, "Meta-Governance. Values, Norms and Principles, and the Making of Hard Choices," *Public Administration*, vol. 87, no. 4 (2009), pp. 820-821.

[16] Kooiman and Jentoft tend to follow the old school of meta-theorists. Cf. L. Sklair, "Transcending the Impasse. Metatheory, Theory and Empirical Research in the Sociology of Development and Underdevelopment," *World Development*, vol. 16, no. 6 (1988), pp. 697-709.

[17] Ibid., pp. 822-823.

framework as a ready product from politicians. The issue of meta-governance is even more ignored, because the general assumptions regarding values are reduced from the outset to the maximization of corporate profits, beyond which the masters of management do not dare to move. Therefore, the fundamental task of such studies is to optimize agenda-setting. This syndrome can be detected as well in other areas such as strategies and tactics used by the armed forces of states, where the pragmatic aspect is all-encompassing for obvious reasons.

These procedures usually focus on studying such facts and processes as events, i.e. single facts occurring in social reality; issues/problems – the totality of aspects concerning a topic; any objects forming a given issue; attributes of valued objects, etc. However, what seems even more important is the presence of an agenda as such: a set of issues arranged hierarchically. Other frequently studied aspects are 'issue salience' – the position of an issue on a given agenda resulting from the co-occurrence of two indicators: 'media coverage' and 'issue exposure'; transfer of salience or 'issue transfer' – the postponed, directional destabilization of an agenda caused by the impact of an opposing agenda on it; and 'framing' – giving certain aspects of reality greater importance than others in order to spread a certain attitude toward a considered issue.[18] Such a scheme has, of course, undeniable advantages. These include, for example, a holistic approach to the subject of decisions, ordering the description, and rationally outlining the cause-and-effect chain.

In the concept presented here, which is dominant in decision-making theory and which can be briefly summarized as a triad: (i) the meta-principle of 'everything to maximize benefits', (ii) the agenda as a path of inference, (iii) statistics as the basis for fulfilling the agenda. Over time, certain 'imperfections' making such an approach inadequate to several possible applications have been noticed. In 2018, Bradley realized that only if the matrix mentioned above is in use does reasoning proceed according to the model described. In reality, however, nothing excludes the possibility that the same decision situation can or must be formulated in different ways. First, it may happen that the problem is not naturally represented by a state-consequence matrix. This occurs above all when we are dealing with the attractiveness of short-term and long-term consequences. Second, the problem may not be representable by any decision matrix at all, because we are unable to identify its different elements. Third, sometimes actually no structure is required; for example, when certain actions are morally or legally obligatory, or when habit dictates a course of action.[19]

Bradley also emphasizes the necessity of considering the aspect of standpoint, the 'perspectives on benefit,' which are not identical with the 'locations of benefit.' The difference in standpoints may lead to different evidence or reasoning skills. Moreover, according to Bradley, our standpoints vary with time; as we get older we undergo a change

[18] E. Nowak, "Metodologiczne problemy badania zależności pomiędzy agendą medialną, publiczną i polityczną," *Annales Universitatis Marie Curie-Skłodowska*, sectio K, vol. 20, no. 2 (2013), p. 198. Cf. R. Bäcker et al., *Metodologia badań politologicznych*, Toruń 2016, pp. 203 ff.

[19] R. Bradley, "Decision Theory. A Formal Philosophical Introduction," in S.O. Hansson, V.F. Hendricks (eds), *Introduction to Formal Philosophy*, Cham 2018, pp. 4-5.

in standards. However, *the way in which benefit varies with perspective need not be the same as the way it varies with location*.[20]

In a traditional decision-making scheme (based on assumptions rooted in business management) the motivations of particular decisions strictly depend on the decision-making situation, which involves several steps leading to the improvement of the company's condition. One such classic set of premises conditioning the decision-making process was presented by Holska (2016). As she claims, a manager is faced with the need to make decisions when current or anticipated problems and threats force the decision-makers to change the existing unfavorable state; when the choice is inevitable; in situations requiring the division of resources; when the company is forced to make a selection in a situation of excess; or, when it is necessary to establish an order of implemented solutions. The reasons initiating the decision-making process can therefore be divided into 'reactive' – relating to events that have occurred – and 'proactive,' i.e., anticipating or even creating future events. However, Holska also admits something crucially important: the fact that the decision maker may have to deal with goals that cannot be achieved simultaneously.[21]

We notice, therefore, that as time passes, classical decision theory reveals flaws in the schemes it most often uses. One of the most fundamental is the issue of access to reliable and, above all, complete knowledge about the potential effects of decisions, i.e. the lack of possibility of integral knowledge about the 'state of nature.' The theoreticians of decision-making process sometimes try to overcome this difficulty by distinguishing between 'deterministic' data assimilation (evidently not applicable in the description of political decision-making and evaluation of decisions) and 'stochastic' summaries,[22] where random variables are defined on some 'probabilistic space' with values in some 'measurable space.' In other words, a stochastic process is a time-dependent function whose values at each time instant are random variables.

Objectively speaking, however, even the stochastic procedure seems not to be particularly useful in the case of political decision-making processes. This results from the infinite number of factors influencing the effects of decisions, which means that it is impossible to determine the value of probabilities at any stage of reasoning. Similarly, there is no possibility of numerical evaluation of decisions. In other words, in the world of politics there is a lack of the desired 'certainty' about the initial state – i.e. all the parameters of the decision-making situation – as well as about the effects of the decision; important political decisions are actually always accompanied by uncertainty. A political decision is always burdened with risk, and under conditions of risk the consequences of each decision are determined by probability distributions, which is why for non-deterministic cases (and in the case of politics all cases are non-deterministic) the methods of probability theory and statistics are applied.

[20] Ibid.

[21] A. Holska, "Teorie podejmowania decyzji," in K. Klincewicz (ed.), *Zarządzanie, organizacje i organizowanie – przegląd perspektyw teoretycznych*, Warszawa 2016, p. 139.

[22] C.L.Farmer, "Uncertainty Quantification and Optimal Decisions," *The Royal Society Publishing*, vol. 473, no. 2200 (2017).

If the most important pragmatic imperative of decision theory is to determine paths leading to optimal decisions, then it must be admitted that it copes well with this task only in very specific cases, primarily those that are closely related to the broadly understood sphere of economics. In business and logistics, the optimal decision is the one in which the income (the difference between revenues and costs) has the highest positive value for a given decision-making situation. In politics, however, this issue is usually much more complicated, primarily due to the impossibility of mathematically determining the optimal decision. This is always the case if one is expected to compare benefits in situations where choices are motivated by immeasurable values – e.g., territorial gains as opposed to the imperative of ethnic coherence of the state.

INALIENABILITY OF UNCERTAINTY

Some of the basic political dilemmas in the context of the impossibility of determining the optimal decision have been described in valuable studies and are treated as 'taken-for-granted paradoxes.' For example, within the category of meta-governing indicated by Kooiman, one can refer to the old dilemma of the relationship between the free market and democracy. As it was described by Rose in 2018, social success requires high levels of overall well-being, which come from a free market system and require freedom guaranteed by democratic institutions. But here the controversy begins. A democratic system makes it easier to favor redistribution and regulation, which weakens trust in the system, in its institutions which form the foundations of a free market system and democracy. The paradox is that democracy is necessary for freedom, but it can also induce changes that might be destructive to it.[23]

In the decision-making process, as we already know, we have to deal not only with the risk of contradiction, but also with cases in which the impossibility of simultaneously achieving more goals is a logical premise of the decision-making process. Typical examples of such a decision-making situation can take place in the realistic logic of the zero-option game, where the principle of relative advantage dominates in the relations between states. This is conditioned by the fundamental realist assumption that it is not about maximizing the financial benefits of the state (explicitly expressed in a specific currency), but about increasing security by achieving an advantage over other players. In this type of game, country A may decide to give up financially advantageous decisions if the potential partner, country B, gains greater benefits: strengthening the partner increases the risk of being attacked/dominated by a stronger actor. Therefore, country A may opt for a decision that is financially disadvantageous, but safer in terms of the balance of 'power.' In other words, in the Hobbesian situation of war of all against all, you can't have your cake and eat it too.

The presented example illustrates a situation in which any mathematical calculation of the 'optimal decision' is fundamentally impossible, because such a profit and loss calculation would have to take into account two genetically and axiologically different selection criteria at the same time, which would constitute a fundamental methodological

[23] M. Rose, *Why Culture Matters Most*, Oxford 2018, pp. 97-114.

error. It is not possible to calculate to what extent the increase in the level of security outweighs in the calculation the possibility of increasing income by value X (compared to the state of finances before any possible contracts with country B). Moreover, the numerical definition of the state of security itself poses certain difficulties. This state can be measured by the number of warheads, tanks, multi-role aircraft or submarines, but the training of commanders and the determination of the staff and society are values that are difficult to quantify.

What seems crucially important here is the issue of assessing the probable consequences of a decision (which consequently affects the evaluation of its accuracy). In the case described above, it is not possible to calculate the probability of an attack by partner B in the event that it increases in financial potential (as a result of the decision of state A to conclude a contract beneficial to both parties but unquestionably more to country B). Therefore, what even physicists admit, it is impossible to avoid situations where probability is viewed as 'reasonable expectation.'[24] Therefore, in decision analysis used in political science we sometimes use statistics, but the probability of decision effects is determined largely intuitively.

Does this mean that in the part of the analysis that is beyond mathematical determination (i.e. in the vast majority) there are no specific signposts? It seems that what constitutes a key to estimating the consequences of a decision and its subsequent evaluation is the fundamental principle of the time perspective, which would take into account the comparison of benefits predicted in the 'short term' and those predicted in the 'long term.' In general, benefits in the short term seem more predictable, it is easier to track risk factors on an ongoing basis and current statistics are known. Benefits and threats in the long term are much more difficult to estimate, because it is possible that factors that are not yet known will occur. However, the long-term outcomes of the decision-making process might be more important for the entity represented by the decision-maker than the benefits perceived in the present moment.

In reality, however, it is about something else, very important, yet conceptually uncomplicated. The inspiration for this principle can be found, for example, in the dilemma of the 'practice of injustice' once put forward by Jean-François Lyotard. In this postmodernist philosophy, it is nominally about the 'violence' caused by imposing a narrative as the only truth. At least this is how this reasoning is presented in its ideologized form. Basically, however, it is about the fact that choosing one narrative/decision makes it impossible to choose another. In other words, by achieving certain benefits, we simultaneously renounce a whole set of other benefits, not because of ideological pressure, but by the very nature of things. As Cartlidge points out, *Lyotard's work calls for us to conceptualize deep disagreements as problems of politics, not epistemology, and to find new ways of dealing with disagreements that do not force a solution on them*.[25]

[24] R.T. Cox, "Probability, Frequency, and Reasonable Expectation," *American Journal of Physics*, vol 14, no. 1 (1946), pp. 1-10.

[25] J. Cartlidge, "Lyotard, The Differend, and the Philosophy of Deep Disagreement," penultimate draft, at https://philpapers.org/archive/CARLTD-22.pdf. Ultimate publication: *Synthese*, vol. 200, art. no. 359 (2022).

Miranda Fricker describes Lyotardian 'injustice' as *consisting, most fundamentally, in a wrong done to someone specifically in their capacity as a knower*.[26] So, if according to Heinelt and other leading decision-making theorists, the essence of the problem lies in the imperfection of knowledge, then we arrive at the argument that in the world of politics, objective knowledge can never be delivered. Therefore, if we add together several key arguments gathered above, it is hard to avoid conclusions that are somewhat pessimistic, or perhaps rather bring theoreticians of decision analysis down to earth. Firstly, we are dealing with a lack of knowledge that would be desirable for the decision-maker and could form the basis of decision assessment. Secondly, it is known that the decision-maker is most often placed in a situation in which a number of goals greater than 1 cannot be achieved simultaneously. Thirdly, short-term gains may be in conflict with long-term acquisitions.

These statements are encompassed by a broader principle, which we can consider as a kind of 'uncertainty principle.' However, not in the sense typical of classical decision theory based on statistics, which considers the lack of full knowledge of the initial state and the 'state of nature.' We use this concept in the sense suggested by Heisenberg's quantum mechanics. Generally, the idea is that the more we enter into one decision sequence, the more we deprive ourselves of the possibility of entering another – in a way analogous to the famous formula concerning the possibility of registering the momentum and position of elementary particles:

$$\Delta x \cdot \Delta p \geq \frac{h}{4\pi}$$

Heisenberg's equation gave the world of physicists and cosmologists something to think about. By stating that it is impossible to know the momentum and position of a particle at the same time, it destroyed the current image of the world, and thus the reasoning about it in terms of classical mechanics. Incidentally, it was just another slap in the face, after the breakthrough caused by the special and then general theory of relativity, which questioned, for example, the possibility of velocity reaching values from zero to infinity. The announcement of these revelations stimulated speculation among interpreters. In the most popular and quite commonly accepted Copenhagen interpretation it is not the measurement uncertainties due to imperfections in measurement equipment or methods, but the scatter of results (variance) resulting from the nature of the measurement itself or the nature of quantum mechanics itself that makes perfect knowledge about the parameters of particles (i.e. both their momentum and position at the same time) inherently impossible. This means that the consequences of the principle are significant: it is not so much about inaccuracy or uncertainty as such, but rather about a challenging relationship: the more defined the momentum of a particle is, the less its position can be determined (and vice versa).

[26] M. Fricker, *Epistemic Injustice. Power and the Ethics of Knowing*, Oxford 2007, p. 1. Cf. T.J. Lagewaard, "Epistemic Injustice and Deepened Disagreement," *Philosophical Studies*, vol. 178 (2021), pp. 1571-1592.

We are entirely aware that in this case we assign the uncertainty principle a purely metaphorical meaning (after all, it does not refer to the probability of the occurrence of a premise in decision theory, but in quantum physics). However, the core of reasoning remains the same and contradicts the commonly accepted concept (and imperative) in decision theory which is the 'optimal decision,' i.e. the one, where the quotient of benefits and costs gives the highest number among all acceptable options.

The utility of Heisenberg's reasoning in social sciences is not a completely new suggestion In 2014 Kashyap put forward the idea of using the scheme of Heisenberg's uncertainty principle to refer to the relation between generalizations and predictions in social sciences. He even formulated his own uncertainty principle claiming that *any generalization in the social sciences cannot be both popular and continue to yield accurate predictions, or in other words, the more popular a particular generalization in the social sciences, the less accurate will be the predictions it yields*.[27]

The question remains whether, in light of inherent uncertainty, it is at all possible to formulate any decision analysis procedures in political science. One can tentatively venture to assume that in such a case, the estimation of benefits may take the form of **horizon expansion** – a further extension of the time perspective – towards benefits anticipated in the long term. Farmer correctly noted that *the length of the time horizon enables the decision-maker to balance short-term with long-term costs in a principled manner and that the choice of time horizon is an important factor in decision-making*.[28]

Example

Country A is considering the prospects of an investment into an electric car factory, What matters most is time (due to the costs, which continuously increase) and the reliability of the partner. The cheapest offer meeting the 'decision-limiting condition' comes from company Z, an entity registered in Great Eastern Power; the company has already managed to take over several key brands in the immediate vicinity.

1. The optimal decision in the short term is to accept the offer of company Z due to lower costs and fast deliveries. In this way, country A can find its place on the market in the immediate vicinity, competing with much more expensive partners registered in allied countries.
2. The optimal decision in the long term is to reject company Z's proposal and decide to cooperate with a more expensive and perhaps less efficient partner from the neighborhood. This option is obviously less profitable in the global market, but it allows one to avoid strengthening the influence of Z's mother country, achieved through attractive investments. These influences can be dangerous for the entire region in the long run, and thus for the target country of the investment.

[27] R. Kashyap, *The Uncertainty Principle of the Social Sciences*, 2 January 2014, p. 4.

[28] C.L. Farmer, "Uncertainty Quantification...".

CONCLUSIONS

The review presented above does not provide a positive answer to the question of the possibility of constructing a useful and at the same time reliable decision analysis in political science. There are too many reservations about the application of decision theory in relation to political practice. These include such issues as the inability to obtain full and reliable knowledge allowing for a responsible choice, the impossibility of achieving more goals at the same time, the difference in the short- and long-term perspective when assessing the accuracy of decisions, the need to take into account different standpoints, which is considered as well in classical theories based on statistics, etc.

What brings all these arguments together is the proposal of the 'uncertainty principle' based on the Heisenberg equation. It is applied **only by analogy**, but still retains the main message: the more certain priorities prevail in the political decision-making process, the less the alternative goals can be realized. In this case, some kind of 'priority comparator' would be useful, therefore, what might become an imperfect but still helpful procedure is the expansion of time horizons, showing benefits in increasingly distant perspectives. There has been some research on the problem of indeterminacy in decision theory and the role of time perspective, i.e. the 'discount rate' problem. One of the most important studies on this topic was published in 2003 by Richard Newell and William Pizer.[29] Since then, other argumentation models have been proposed, e.g. the ones that suggest a different way of accounting for uncertainty when discounting the benefits and costs of policies and projects that occur in the distant future – using discount rates that decline over time. However, all of these works addressed the problem of indeterminacy (also as a factor causing certain tendencies in decision-making in the here and now) as a state of lack of knowledge, whereas the essence of the analogy we use is not ignorance, but the inherent impossibility of reconciling desired political goals.

Last but not least, further research on this topic may also consider the significance of certain 'commandments' – principles useful in every decision-making process. They are specific regulatory ideas, allowing one to evaluate political decisions from the most distant perspective of the general good of societies and meta-legal principles, i.e. the foundations underlying the functioning of states and the international community, if such a community truly exists.

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[29] R. Newell, W. Pizer, "Discounting the Distant Future. How Much Do Uncertain Rates Increase Valuations?," *Journal of Environmental Economics and Management*, vol. 46, no. 1 (2003), pp. 52-71.

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