The Explanatory Potential of Rational Choice Theory: A Critical Assessment*

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ABSTRACT

What are the explanatory values characteristic of concepts considering humans as entities aimed at maximizing expected utility by means of coherent and logical decisions? Do citizens who are active in politics behave according to the expectations of rational choice theorists? Reviews of premises constituting rational choice theory are found in the works of authors representing multiple disciplines. The vastness of these views will not be discussed within the limitations of the present article, though I have focused on the output of selected disciplines: evolutionary biology, neuroscience, and social and cognitive psychology. Among the phenomena that question the theory I have included: emotions and feelings, unconscious prejudices, heuristics, self-deception and the monological belief system.

INTRODUCTION

One of the most significant consequences of the 'behavioural revolution' initiated by Robert E. Park's Chicago School was the emergence of rational choice theory in American political science (*e.g.*, Arrow 1951; Downs 1957; Riker 1962; Olson 1965). The approach, corresponding to the autonomy and rationality of *Homo oeconomicus,* seemed to epitomize the dreams of political science for methodological precision, comparable to the one employed in economics (Green and Shapiro 1994: 1). In practice, it was an answer to the need for integration between economics and politics that had arisen after World War II in order to neutralize the undesired consequences of the capitalist production system with the state's interventions. The key assumptions of rational choice theory

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usually include: methodological individualism, the deductive method, maximizing rule, and the above-mentioned rationality of participating entities (Behnke 2009; von Beyme 2000).

These days in particular, in the light of the development of knowledge on brain functioning and exceptionally interesting research on the nature of perception, the last of the aforementioned assumptions may be controversial. The adjective *rational* is usually defined as based on logical thinking, that is it is mind- and logic-driven (for a review of definitions see Lupia, McCubbins, and Popkin 2000: 3–8). Is this the case indeed? Do we truly make decisions, not only in politics (even though this is the reference point in the present article), on the basis of reason only? Or are there other mechanisms that play a crucial role? Thus, how should we evaluate the usefulness of rational choice theory to explain the complex behaviours of the representatives of our species? This article attempts to address these questions.

THE PRINCIPLES OF RATIONAL CHOICE THEORY

In the literature of political science, rational choice theory is brought up in the context of election decisions, coalition building and entity behaviours in international politics. Let us focus on election participation in order to present its basic premises. Anthony Downs (1957: 6), one of the founding fathers of economic theory of democracy, believes that people are rational in their actions, which means they make decisions on the basis of the arithmetic balance of gains and losses. According to this American economist, the rational person 1) can make a decision when facing multiple alternatives, 2) ranks alternatives by preferring one above others, 3) displays preference ranking that is transitive (if A is better than B, and B is better than C, then A must be better than C),[1] 4) makes the choice of the top-ranked alternatives of preferences, and 5) ultimately, under constant conditions, always makes the same decision.

The above-mentioned ascertainment is usually presented in the form of a mathematical formula of net benefit for election participation: $R = B \cdot p - C + D$. Consequently, a rational voter considers the expected benefits attributed to a given result of elections (B) multiplied by the probability to cast a decisive vote (p) lessened by the cost of participation (C) and increased by the conviction that voting is a form of civil obedience which makes democra-

cy prevail (*D*) (Riker and Ordeshook 1968: 27–28; see also Schmidt 2010: 204).

The literature on the subject provides a number of typologies of costs and benefits involved in the participation. Let us recall the following works: *Mobilization, Participation, and Democracy in America* by Steven J. Rosenstone and John Mark Hansen (1993), and *The Logic of Collective Action* by Mancur Olson Jr. (1965). Among the participation costs, Rosenstone and Hansen enumerate money, time, knowledge, skills, and self-confidence. The benefits are grouped into the following: material, such as money, positions in state administration, lowering taxes; solidarity, for example, the sense of solidarity resulting from interactions with other individuals; and purposive, whose essence is acting for its own sake. On the other hand, Olson includes private and public goods in the benefits, with the latter being those which, if consumed by any person X_i from group $X_1,..., X_i,..., X_n$, cannot be made unavailable to others in the group. Thus, these are goods which are not subjected to being exempt from consumption.

Concluding, it is worth following Klaus von Beyme (2000), who emphasized the methodological consequences of the theoretical assumptions of the concept. First, social situations must be brought down to an individual's actions. Second, rational decisions are the foundations of actions. A rational individual is a resourceful, restricted, expecting, evaluating, and maximizing person. Third, rationality of decisions is concerned with balancing the benefits and losses which may become the outcome of a given action. The reference point in the calculations are the preferences of the participating entities. [2]

HOMINID ADAPTABILITY

In the few million years that have passed in hominid biological evolution one can distinguish processes which were crucial to their lives; for example, adopting an erect posture resulted in important qualitative changes for individuals, whose natural selection favoured this anatomical modification. Similarly, the development of a broad pelvis, which allowed giving birth to children with larger neurocrania, and the reduction of body hair were answers to the need for effective thermoregulation, or, finally, the development of a large forebrain. The last modification, partially determined by genes and in part by the environment, started developing the mind which, with time, was granted a conscience. Moreover, the devel-

opment of brain was accompanied by an uneven and non-linear development of adaptation mechanisms, out of which only a few are unique to our species, as we shall see below. Thus, let us enumerate the adaptations which are usually quoted in the literature on the topic. These include: emotions and feelings, memory, reason, recognition and concentration abilities, secondary thinking, the ability to learn and imitate, intuition, imagination, the ability to operate on symbols, creativity, planning, thinking about the future, inclination to manipulate and cheat, and consciousness and speech. Our ancestors' extraordinary adaptability increased their chances of surviving, raising offspring and allowed successful functioning in social groups, while at the same time being a trigger of cultural evolution (*e.g.*, Damásio 2010; Tattersall 2008; Hodder 1998; Smith and Szathmáry 1999; Steele and Shennan 1996; Frank 1998; Gibson and Ingold 1993; Dunbar 2003).

In view of our brains' limited cognitive skills today, which primarily developed in Pleistocene tribal structures, we are facing the fact of migrating computational powers of human cognition beyond our skulls. This concerns non-biological cognitive techniques, such as special notations, scientific tools and ever-developing information technologies facilitating the use of patterns and formulas. These considerably broaden our comprehension by modifying it at the same time.[3] Therefore, it is justifiable to ask why biological cognition systems have turned out to be insufficient. The answer seems very easy: fragmentation of our cognition extorts the development of higher efficiency computational systems in order to support the brain in an ever incompetent and bound for failure attempt to describe and explain the all-embracing reality.[4, 5] Then we see that rarely does the subject facing a decision, despite the help that is offered by non-biological cognition techniques, have all the necessary information predisposing it to maximize the expected utility.[6] More often subjects are driven by imaginations, illusions, feelings, faith or intuition. This is evolutionarily justified; and what I attempt to prove in the subsequent part of the article.

FREE WILL: TRUTH OR ILLUSION?

The concept of free will is an inseparable element of normative systems regulating the coexistence of individuals in social groups. It would be difficult for many people to imagine the functioning of contemporary societies without the feeling that their decisions are

made independently. For centuries the problem has mainly been addressed by philosophers. Today it is science that voices opinions on this issue.

As Franz M. Wuketits (2008: 108) noticed, it would be a lie to state that we do not have a will; nevertheless, it is not the same as free will. The failure to distinguish between the two causes a great deal of misunderstandings. Our will is not hanging in a vacuum, concludes the Austrian biologist, but it is influenced by a number of factors, most of which we are not aware of, thus we cannot willingly limit their impact. The American neurobiologist Sam Harris presented a similar view even more distinctly:

> Free will is an illusion. Our wills are simply not of our own making. Thoughts and intentions emerge from background causes of which we are unaware and over which we exert no conscious control. We do not have the freedom we think we have (Harris 2012: 5).

The factors which limit and determine our decisions can be divided into two basic subgroups: evolutionary foundations of a developed *Homo sapiens*' nature and cultural provenience. In the former the prime positions are occupied by genes, which determine species-specific features that distinguish humans from other species[7] – a necessary condition for an organism's existence. 'Our genes are like a colony of viruses – socialized viruses, as opposed to anarchic viruses. They are socialized in the sense that they all work together to produce the body and make the body do what is good for all of them' (Dawkins 1995: 79). Obviously, one should not forget that the key here is the cooperation of thousands of genes, not the individual activity of replicators.[8] Moreover, the influence of genes on our behaviour is not direct, as was metaphorically put by Richard Dawkins (2006: 52–53), but indirect, like the work of a computer programmer. Genes make proteins which are the catalysts of chemical processes and influence the formation and functioning of cells. At a higher level cells interact with one another, resulting in a given colour of eyes or length of limbs; and in a broader perspective, in accordance with the concept of extended phenotype, in material and immaterial exemplifications of culture.

Then natural selection promotes genes whose phenotypical effects guarantee higher efficiency in accessing resources and in possibilities to transform them into energy, which is translated into increased chances for survival and conception of offspring. Im-

portantly, one should bear in mind the correct cause and effect order: genes – brain – behaviour. After all, the older, in terms of their evolutionary development, parts of the brain, such as the brainstem, amygdala, cingulum and hypothalamus, are genetically determined, whereas younger cortex structures are determined not only by genes but also by environmental factors. This is emphasized by António R. Damásio, who says that both our brain and mind are far from being blank cards when we are born. This, however, does not mean they are genetically predetermined in the broad sense. 'The genetic shadow looms large but is not complete. Genes provide for one brain component with precise structure and for another component in which the precise structure is to be determined' (1995: 111–112). An analogous opinion was expressed by Steven Pinker, who revealed the meanders of human nature: 'We know that there isn't nearly enough information in the genome to specify the brain down to the last synapse, and that the brain isn't completely shaped by incoming sensory information, either' (Pinker 2003: 47).

Our analyses should be, therefore, supplemented with the sources of environmental influences. As one of the social species of primates we pay particular attention to the social groups in which we function, and without which our chances of survival and reproduction would drastically be limited, both today and in the evolutionary past. These usually include structures consisting of family members, friends, neighbours, people sharing our interests or spending time in the same way, co-workers and also fellow believers. Accordingly, social groups differ in many respects, for example, by genesis, structure, level of formalization and functions. Nevertheless, they remain the basic sources of attitudes, opinions and beliefs transmitted by interactions between individuals.

On the one hand, social groups have such a strong influence that, under specific conditions, they balance and modify the behaviours which are the legacy of previous stages of evolution. This is recalled by Helen Cronin (2003: 55–56), who quotes the statistics of homicides committed in Chicago, England and Wales in the 1970s and 1980s. Most of the crimes were committed by young men (male universal inclination to compete), yet in Chicago there were 900 murders per 1 million inhabitants, whereas in England and Wales there were about 30. In other words, the structures as discussed above may facilitate the process of auto-domestication of our species (Hare and Tomasello 2005: 443). On the other hand,

we cannot ignore their destructive influence on individuals. This concerns the phenomena that challenge the findings of the representatives of rational choice theory on the factors that determine citizens' participation in elections. Let us at least mention: risky shift, the Abilene paradox, groupthink syndrome and coercive persuasion (Cooke 2001: 102–121).

EMOTIONS AND FEELINGS: INTEGRAL ELEMENTS OF PERCEPTION

The decisions we make are heavily determined by our genes and the environment. We do not have access to all options of choice because some of them are eliminated by means of early evolutionary biological conditioning and others by culture. Let us ask then if we truly choose from the pool of available alternatives by using arithmetic calculations of gains and losses?

If Downs is correct, everyone should be expected to take out a large piece of paper before casting a vote and write down all the arguments for and against individual political parties and candidates. We should add that this strategy would only be possible after having studied all the election programmes, which is extremely time-consuming and does not guarantee that the expected results will be obtained. In such situations what supports us are emotions and feelings. The former are defined by Damásio as a ‘collection of changes occurring in both brain and body, usually prompted by a particular mental content’ (Damásio 1995: 270). He classifies them as primary emotions, for example, happiness, sadness, and fear; secondary emotions, for example, envy, compassion, and contempt; and background emotions, for example, calmness, enthusiasm, and discouragement. In this Portuguese neurobiologist's opinion, a ‘feeling is the perception of those changes’ (Damásio 1995: 270) and includes: basic universal emotions, secondary emotions and background emotions. How do they work?

The brain keeps imitating surrounding objects by presenting them as emotion-attributed images. What reaches the brain through the senses, such as sight, hearing, smell or touch, is selected according to a precisely determined criterion: biological value. Images which are more significant for maintaining a functional balance are attributed with high-intensity emotions in order to make us react accordingly to the situation. In one of the hypotheses, what plays the leading role are the special types of feelings generated by secondary emotions, for example, somatic markers. They devel-

oped in our brains through the processes of socialization and education, which gives the organism an opportunity to juxtapose specific stimuli with corresponding bodily reactions. In other words, the mechanism significantly increases the precision and efficiency of the decision-making process because it triggers changes in our bodies (*e.g.,* excessive sweating, increased heartbeat, enterospasm, muscular contraction or breathing pace changes, *etc*.), which inform us about the possible effects of the choices (Damásio 1995).

We are driven in our actions by emotions and feelings not only because the basic function of the brain is to care for the body that carries it, but also because the need to extend the time of the body's being in good shape is pursued (Damásio 2004: 194). This existentially functional state ensures a sense of pleasure. Therefore, we focus our attention on activities providing pleasures, such as food, sex and social relationships. Along with pain it is a basic mechanism of homeostatic regulation that increases the organism's chances of survival (Leknes and Tracey 2008: 314). A similar function is performed by feelings of positive illusions, as analysed by Shelley E. Taylor and Jonathon D. Brown (1988). It turns out that realism perception disorders, which push people to do actions that are not desired by either individual or society, are not necessarily destructive to the organism. The selectiveness of our cognition results in a process in which the brain fills in the gaps in the image of the world, which is far from the real image of the world. Consequently, with the shortage of data we make decisions on the basis of unrealistic opinions about ourselves, we indulge in optimism towards other people, objects or phenomena, or we exaggerate our influence on the course of actions. Within certain limits the process has adaptive values.

Analogical features can be attributed to feelings of faith and hope. A metaphysical illusion of belief in the supernatural, along with the hope for eternal life, significantly limits existential fears. They also have their historical significance as they have played an important role in the evolution of political phenomena. What I have in mind is the process of transforming chiefdoms into states, and then the latter into imperia in the area of the Fertile Crescent. The accompanying institutionalization of religion – one of the driving powers of early stages of cultural evolution – let sovereigns mobilize subjects with commonly shared ideas and values (*e.g.*, Service 1971; Adams 1979; Alcorta and Sosis 2005; Kirkpatrick 1999; Boyer and Bergstrom 2008; Bulbulia *et al*. 2008). As Scott

Atran and Ara Norenzayan (2004: 717) showed, the key to developing complex societies and to start conquests, in the longer perspective, was based on building group identification and encouraging participation in religious celebrations. This was the basis for the evolution of the sense of common fate, which was additionally strengthened by a collective moral consciousness (*e.g.*, Casebeer and Churchland 2003; Churchland 2011; de Waal 2006; Haidt 2003; Hauser 2005; Wright 1994). From that moment on people did not give their lives up only to protect their families, as had been the case before in clans or tribes, but rather for god/gods, the ruler, or at the altar of the mother land, nation, class or race (Skarzyński 2011).

UNCONSCIOUS FOUNDATIONS OF INTELLIGENCE

Several times I have referred to the phenomenon of selective perception and to the consequences involved. I have noticed that it is the nature of a cultural animal to accept unconscious premises rather than to process correct data about reality, as advocates of the classical approach to rationality think. This fact even results from the anatomy of the human eye. From a basic course in anatomy we know that light beams pass through the lens, hit the retina and generate an image of what we are seeing at a given moment. However, the problem is that there is a blind spot on the retina, which is a place where the sight nerves escape the eye to transmit data to the brain. Thus, a part of reality that could be perceived in this spot is unavailable for use due to a lack of photoreceptor cells. How does the brain deal with this obstacle? It fills the blanks with conjectures to save us from the discomforts of seeing, on the one hand, and drawing conclusions and building an image of the world on the other (Gigerenzer 2007: 41–42).

The above rule has an automatic character which makes it activate each time a given stimulus appears. Similar rules apply to affective priming, that is the process of classifying stimuli as negative or positive. Michael S. Gazzaniga (2009: 121–124) noticed that we are beings which manifest negative inclinations more often. What does this result from? Paying attention to phenomena generating unpleasant feelings has an enormous evolutionary significance. Species that were faster and more efficient in reacting to dangers in the wilderness of the African savannah or the mountain areas in New Guinea had higher chances of survival. It turns out that the unconscious prejudice we see in another sex, different age, height, weight, ethnic background, accent, dressing or face can in-

fluence the results of elections. Such was the lesson that Richard Nixon's electoral committee learnt in 1960 when the Democrats used a photo of the tight-lipped Republican candidate with a two-day beard and bags under his eyes (Damásio 2010; Gigerenzer 2007).

Moreover, it should be emphasized that the brain uses much more complex elasticity rules which, unlike the automatic rules, are subject to individual evaluation. This concerns the following heuristics: recognition, string, Take the Best and imitation.[9] According to the director of the Max Planck Institute for Human Development in Berlin, Gerd Gigerenzer (2007), the key that significantly increases the precision of decisions is one's being driven by information and ignoring all other pieces of information. This may be connected with recognizing specific names or faces. Those who are well aware of this fact are not only the producers promoting a given brand but also politicians who, in the age of media democracy, exert themselves to be present in the media and at the same time in voters' minds.

Analogous rules give bases to the string heuristic and Take the Best heuristic. The former facilitates decision-making if there is shortage of data. It is based on a classical division into left and right wings reducing *eo ipso* the multidimensional political landscape to one dimension only. The closer a given party is to the desired point in the left-right axis, the higher the probability that it will win a voter's support in the next election (Gigerenzer 1982, 2007). The latter, though, is useful in attributing an appropriate value to the one, most important opinion, a variable. The process consists of three stages: 1) searching the memory in order to determine the most important variable differentiating objects; 2) determining the key variable and attributing it with a value of 0 or 1; and 3) making a decision according to the rule that the object with a positive value is most preferable. The choice of the best indicator is based on the less-is-more pattern. It has an intuitive character and relies on life experience. The strategy is very useful when we make decisions about problems whose outcomes are difficult to predict (Gigerenzer and Brighton 2009: 13).

Another general rule that drives our minds is imitation.

> Most children abhor difference. They want to look, talk, dress and act exactly like all of the others. If the style of dress is an absurdity, it is pain and sorrow to a child not to wear that absurdity. If necklaces of pork chops were ac-

> cepted, it would be a sad child who could not wear pork chops. And this slavishness to the group normally extends into every game, every practice, social or otherwise. It is a protective coloration children utilize for their safety (Steinbeck 1979: 60).

The observation made by one of the most renowned American novelists does not concern children's socialization process but can be directly translated into the behaviour of each and every one of us, regardless of age, sex or social status.[10] Steinbeck's literary impression reveals the adaptation values of imitation (see, *e.g.*, Meltzoff 2002; Williamson, Jaswal, and Meltzoff 2010; Rizzolatti, Fogassi, and Gallese 2001; Gallese 2005; Donald 2005; Iacobini 2005; Tomasello 1999). Learning behaviours and acquiring attitudes is done by transmission and internalization of cultural patterns which, at the same time, facilitate orientation in an ever-changing and unpredictable world. The population geneticist Luigi Luca Cavalli-Sforza (2001: 179–191) distinguishes two routes of cultural transmission: vertical and horizontal. The former illustrates inter-generation transmission within families or groups linked with strong social bonds, whereas the latter is focused on relationships between unrelated individuals who get involved in interpersonal relations, yet these relationships are not at such a strong level of intensity and relevance.

The neurally grounded ability to transmit cultural patterns (*e.g.*, skills, behavioural patterns, inventions and stories) was a milestone in the evolution of *H. sapiens*. Suffice it to say that the global expansion of our species, which started *ca.* 60 thousand years ago in Africa, would be impossible without a rapid spread of knowledge, tools and social devices. If not for the short yet efficient and intuitive instructions: 1) do what the majority in your group does, and 2) imitate successful individuals (Gigerenzer 2007: 217), we would have failed to adapt to the harsh climate of northern Eurasia and the equally demanding geographical and ecological conditions of Alaska, the Sahel, equatorial Africa, Australia and the islands of Polynesia and Indonesia. In spite of extremely unfavourable climatic conditions, small populations of hunter-gatherers were able to explore previously inaccessible areas thanks to transmittable and internalizable skills of sewing clothing, heat and light generation, construction of safe shelters and boats, hunting large mammals and preparing hot food (Boyd, Richerson, and Henrich 2011). In much more recent times, that is around 11–10 thousand years ago, it was their ability

to domesticate high-calorie species of fauna and flora that played an analogous role in accelerating cultural evolution to a large extent (Diamond 1997).

SELF-DECEPTION IN THE SERVICE OF CHEATING OTHERS

Continuing in evolutionary terms, one should notice that human behaviour is aimed at adapting to both the natural and social environment. The key role in this process is played by the environment, which forces using specific strategies in response to the conditions that arise. In interpersonal relations a common adaptation, used not only by *H. sapiens*, is deceiving others but also oneself. According to the American evolutionary biologist Robert Trivers (2010), the phenomenon of deceiving others by means of instrumental manipulation of facts, which is aimed at obtaining certain benefits, such as better access to resources and opportunities to transform them into energy, and hence relatively higher chances for reproduction, evolved with the ability to expose deceptions. In the animal world, including cultural animals, the above-mentioned 'arms race' concerns relationships at almost every level. A child deceives its parents to secure more food, attention and love than its siblings. Males try to hide accurate information on their health status from females in hope of having the opportunity to submit their genes for future generations; and for the same reason they simulate fidelity. Priests manipulate the faithful to maintain a privileged position in society. Politicians' efforts to manipulate the electorate are not necessarily guided by a concern for the state but by the desire to govern, make laws, change rules and get even with political opponents (*e.g.*, Dawkins 2006; Buss 1999; Rosenstone and Mark Hansen 1993; Byrne and Whiten 1988; Byrne and Corp 2004; Dunbar 1998).

This is not the end yet. Due to the fact that in an uncertain world interactions with organisms, in particular of the same species, can provide necessary resources for proper functioning, natural selection favoured those individuals who mastered the art of deception at the top-most level. The mechanism that increases the effectiveness of the process is self-deception. When we try to deceive others we can be given away by a number of details, for example, a look, a grim, a smile on our face, the nervous moves of our hands, non-rhythmic breathing, excessively fast articulation of thoughts or voice trembling (Ekman 2002). In the face of difficult to control physiological responses the probability of detection

proves to be too high. In such a case the adaptation that allows us to realize our goals is faith in our own goals that distorts the realism of perception. However, it is worth remembering that reality distortion disorders can turn counter-effective for both the individual and the society. Suffice it to mention John F. Kennedy's decision to invade Cuba in April 1961, or Lyndon B. Johnson's order to escalate US military activities in Vietnam in 1964–1967 (Cooke 2001: 112). Other didactic data on self-deception can also be found in Trivers' (2002: 262–271) analyses of black boxes from the Boeing 737 which fell into the Potomac River on 13 January 1982 and the results of numerous economists' deceitful faith in self-regulation of the free market, on the one hand, and excessive protectionism on the other (Hall and Klitgaard 2012).

MONOLOGICAL BELIEF SYSTEM

Therefore, we can see that one of our minds' constitutive features is the constant conception of false images of reality. This fact is proved in a phenomenon that is defined by psychologists as the monological belief system. Falsification-proof conspiracy theories can be its one exemplification. Believing in them does not lead to a situation when all information questioning our beliefs is treated selectively. Moreover, with time they become the starting point to explaining virtually every case. According to research done by Michael J. Wood, Karen M. Douglas and Robby M. Sutton (2012), people who believed in one conspiracy theory were more vulnerable to believe in others without caring for the most rudimental rules of logic. Thus, those who believe that it was the American government that organized the September 11 terrorist attacks state more often that princess Diana was murdered. A similar relationship is found between blaming MI6 for Diana's death and the intentional creation of HIV in laboratories.

Obviously, conspiracy theories are not the only examples of monological thinking. Valuable information is also provided by works on internalization, religious and political doctrines that destroy reality and works of pseudo-science. The latter are exceptionally informative because they show impostors posing as scientists and researchers with established positions whose ability to have a critical look at reality failed at a certain point in their careers. The former may include Immanuel Velikovsky, with his controversial cosmological concepts, the creationist George McCready Price and Robert Faurisson, who has negated the Holocaust. Among the latter is Johann Beringer, a pro-

fessor at the University in Würzburg, who was ruthlessly mocked by his colleague, Thomas Gold with his bold astrophysical and geological concepts, and, finally, Josepha B. Rhine who believes in extrasensory powers (Gardner 1957, 1991; Shermer 1997).

ATTEMPTS TO 'REANIMATE' RATIONALITY

Everything I have written so far proves the limited use of the maximum expected utility rule in daily life. The observation also questions the classical understanding of rationality, which then influences the philosophical concepts of human nature. This is so because not all researchers want to accept the worldview implications of neuroscientific research and the accomplishments of social and cognitive psychologists. Therefore, they think how to resolve the impasse and how to restore faith in the Enlightenment idea of the world operating in accordance with reason.

Some of them have invested their hopes in rapidly developing research in the field of quantum information theory, and specifically quantum game theory (QG), as established in its framework. They have focused on the fact that in quantum states of matter there might be a phenomenon referred to by physicists as the entanglement of particles. In their opinion this could solve the prisoner's dilemma by affecting the coordination of decisions made by parties so as to minimize the possibility of denunciation (see, *e.g.*, Eisert, Wilkens, and Lewenstein 1999; Du *et al*. 2002). Even further-reaching interpretations (*e.g.*, Segre 2008) discuss the entanglement of votes as well as quantum electoral laws, which would rule out the inconsistency of social judgments and, in the long term, would become a remedy for the degeneration processes of representative democracies.[11]

Another method of solving the above-discussed problem was proposed by Goldstein and Gigerenzer (2002). These psychologists started with the assumption that classical concepts of rationality do not have much in common with the challenges posed by the ecological niche we inhabit. This observation led them to create a model of ecological rationality in opposition to the postulate of optimal performance in any situation. In the sheer volume of daily activities we do not have time to pursue maximizing the expected utility by coherent and logical operations. What helps us at this point are general rules of conduct – heuristics – which have evolved with other psychological mechanisms. Their efficiency depends, to a large extent, on an appropriate use of the information structure in the natural

environment. Then we can see that an efficient and rapid reaction to an ever-changing and quantifiable reality appears to be impossible without conscious data processing by the brain that is specific for each type of our life space. All of this significantly modifies the traditional concept of rationality.

CONCLUSIONS

In this article I tried to question the constitutive rules of rational choice theory. For this purpose I recalled the achievements of evolutionary biology, the neurosciences as well as social and cognitive psychology. Let us recall that, in accordance with the guiding principle of rational choice theory, people evaluate the costs and benefits associated with each option and make the best choice among these. In politics, according to Downs, this strategy applies, *inter alia*, in the act of election. The rational voter will, therefore, be a person who can make a decision in the face of a multitude of alternatives; builds a transitive ranking, elects from those who are marked the highest, always makes the same decision under constant conditions. What then is the explanatory value of the above suppositions? Here are the most important conclusions of the analyses provided herein:

1) The impact of evolutionary adaptations together with the fact of involvement in complex networks of social relations provides a researcher with knowledge on the mechanisms governing the species-specific behaviours of *H. sapiens*;

2) In a constantly changing world we make decisions based on emotions and feelings, allowing our minds to alleviate inconveniences resulting from the fragmentation of perception;

3) The same functions are realized by unconscious prejudices and heuristics which facilitate and boost the decision-making process;

4) The adaptation that is common in nature is the art of deceiving others. With the ability to use language, man acquired a special predilection to manipulate while being simultaneously manipulated by others. This process is reinforced by the tendency for self-deception that disturbs the realism of perception as well as the state of mind known as a monological belief system;

5) The inability to scientifically defend the classical understanding of rationality in the context of decision-making in uncertain conditions makes researchers seek intellectual foundations for the world operating in accordance with reason in such areas as quantum physics and Neo-Darwinian ecology;

6) Due to the development of evolutionary biology, the neurosciences as well as social and cognitive psychology, we obtain data that significantly limit the explanatory value of rational choice theory on the one hand, and on the other, scholars tend to revise the concept of 'rationality' in accordance with the basic findings of the modern theory of evolution. From this point of view the reason is supported by all possible cognitive mechanisms affecting the efficiency of decision-making in the ecological niche we inhabit.

NOTES

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[1] It should be noticed that the order determined by rational preferences can be intransitive. The case is illustrated by the case of cat which ensures food resources for itself (see experiments by Walter H. Pitts, Jr.). This is in opposition to views based on common sense, according to which intransitivity of preferences is illogical and paradoxical (Piotrowski 2004).

[2] With time the shortly presented foundations of rational choice theory were interpreted in multiple ways; for example, the followers of Arrow, Downs, Riker and Ordeshook refrained from a dogmatic interpretation of the term 'rationality', seeing only the premises of heuristic values in it. This procedure brought further difficulties for this concept. The 'fuzzy' approach to rationality was blamed for the strong presence of the post-modernistic component, disloyalty to the postulate of economizing theory as well as the necessity to reconstruct rationality of actions *ex post* (the activity is rational if the acting individual can give reasons for it). The strategy of giving additional – not very fortunate – assumptions or an auxiliary hypothesis must be considered as typical attempts to save a collapsing theory. In the present text the initial, 'tough' approach to rationality is criticized.

[3] Let the examples be the perception differences resulting from a traditional recording the thoughts with a piece of paper versus using a computer text editor.

[4] The words are written from the perspective of a representative of the Western civilization, thus they do not aspire to be an objective description of reality.

[5] Studies on the history of science provide valuable information about broadening the functioning of human brains by scientific instruments. Astronomers realized how important instruments are in the process of changing paradigms after Galileo used a telescope to observe astronomical objects (Kuhn 1985: 224–225).

[6] I refer to John von Neumann and Oskar Morgenstern's (1947) axiomatized theory of expected utility, which significantly influenced the concepts of the representatives of rational choice theory. The decision-making process differs from von Neumann's and Morgenstern's views. This does not mean that people are not driven by usefulness in the evolutionary sense (I mean the resultant of genetic and memetic pressures primarily at the subconscious level). This ascertainment also concerns other species; for instance, if one wants to determine the measure of the usefulness of a peacock's tail, one should define how its length influences the

number of copies of genes that were passed on to its grandchildren throughout its life. A researcher should expect the evolution of such length of tail that will lead to maximization of expected utility (the optimal number of male genes transferred to future generations in conditions that are appropriate to a given ecological niche).

[7] Contrary to unfixed genes distinguishing specimens from one another.

[8] Considering the above, looking for correlations among the variants of individual genes with even more sophisticated behavioural aspects of *H. sapiens* generates a significant deal of scepticism. Recently, the representatives of so-called genopolitical studies are leading in this practice. One example is the attempt to correlate the dopamine receptors DRD2 with party identification and membership in political parties (see Dawes and Fowler 2009).

[9] Due to the limitations of the present text I had to limit the discussion to selected heuristics from Gigerenzer's catalogue (2007). It is worth learning more about heuristics discussed by Daniel Kahneman (2012), for example, affect, availability, representativeness or judgment. Under specific conditions the rules simplify and accelerate the decision-making process. Let us add that according to Kahneman's concept, heuristics are the constituents of 'System 1' – a faster and automatic mode of thinking which is not subjected to conscious control of the cognizing subject, contrary to a much more intellectually demanding source of rational actions – 'System 2'.

[10] Naturally, some individuals will be driven by a strong desire to be distinguished within the group.

[11] Concepts of this type are frequently speculative. Thus, it is an unjustified extrapolation of physical terminology onto other disciplines to talk about quantum election laws or quantum democracy. In extreme cases the practice reaches the magnitude as described by Alan Sokal and Jean Bricmont (1998).

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