



Rationality in a Complex World: Pushing Back the Frontiers

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Abstract

Rational decisions should not only be reasoned, but also be optimal for achieving a goal or solving a problem. Often, rationality is treated stricto sensu independent of emotions, personal feelings or any kind of instincts. A rational decision-making process should be objective and logical. However, observing patients with brain damage which perturbs the emotional sphere, neurologists have concluded that reason alone is insufficient for problem-solving in everyday life. Consciousness is a late evolutionary development. It is not the brain that we have to focus on, but the body as a whole being, the “container” of feelings and emotions. Rationality as a strategy for successive reasoned problem solving by human societies creates with the advancement of time a more complex world containing all technical artifacts of civilization and the corresponding social institutions necessary for their usage. In parallel with making existence more comfortable, rationality gets self-trapped in the complexity of the artificial world! At the individual level there are epistemological (metaphysical illusions) and existential (escape from freedom, nostalgia for the absolute, etc.) impediments which can aggregate by mimetism to huge constraints at the societal level. Objectively, by a three-way trade-off between time, energy (physical and social) and information one can get rationality out from a trap. The political approach to achieving the goal could be the so-called directed incrementalism. Identifying the creative elements in various strata of the society and giving them the opportunity to participate in constructive negotiations at various levels (“mega diplomacy”), one could fuel directed incrementalism.

Introduction

What follows is a concise overview of the various aspects of human rationality, and specifically of its limits. If rationality is an exercise of reason, a means to derive conclusions when considering things deliberately, a rational decision should not only be reasoned, but also optimal for achieving a goal or solving a problem.

Based on such a definition, our first point will be to consider the cognitive mechanisms of decision-making both at the individual and societal levels. As a next step, we shall attract attention to the fact that the rational activities of humans and humanity in general make the world progressively more complex, which by a kind of negative feedback impedes further progress of rationality. This phenomenon we shall call *self-trapping* of rationality.

Having stressed that, we shall review the objective factors limiting rationality in the complex world and how — at their “nano” level — individuals respond to the constraints. Specific impediments of epistemological and psychological (existential) character can act not only at the individual level but create by accretion huge constraints to rationality in the society. The final part of the analysis will try to outline the possible policies for getting rationality out from the traps.

Outline of the Article

The concise outline of the article is as follows:

1. Complex Structure of Human Rationality
2. Self-trapping of Rationality in a Complex World
3. Objective Factors Limiting (trapping) Rationality in a Complex World
 - 3.1 Material (Physical) Bounds
 - 3.2 Institutional Inertia including Vested Interests
 - 3.3 Democratic-voting Impossibility
 - 3.4 Subjective Responses at the Individual Level
4. Epistemological and Psychological Impediments
 - 4.1 Metaphysical Illusions, Nostalgia for the Absolute
 - 4.2 Apprehensions (Lack of Confidence, Escape from Freedom)
5. Pushing Back the Boundaries
6. Conclusions

1. Complex Structure of Human Rationality

Even today, rationality is considered to be *strictu sensu* independent of emotions, personal feelings or any kind of instincts. A genuine rational decision-making process is expected to be objective and logical (*Cogito ergo sum*). If the cognitive agent is influenced by personal emotions, feelings, instincts or culturally specific moral codes and norms, the decision or more generally the reaction should be qualified as irrational.

Observing patients with brain damage that perturbs the emotional sphere, neurologists, among them Antonio Damasio, have concluded that reason alone is insufficient even for everyday-life problem-solving.¹ Damage to the *prefrontal cortex* can leave the patient apparently intellectually unimpaired, incapable of making even simple decisions. Paradoxically, cold, “robotic-like” decision-making is closer to the actions of brain-damaged individuals while the normal cognitive agents need their emotional biases in order to make the complicated human decision-making mechanism workable.

According to Damasio, Descartes’ famous dictum “*Cogito ergo sum*” (“*I think, therefore I am*”) is profoundly mistaken. Consciousness and thinking are late evolutionary developments. Long before their development there was feeling; so humans are still primarily feeling organisms! Damasio makes the important point that it is not only the brain that we need to focus on, but also the body as a whole being, the “container” of feelings and emotions. A

complete logical analysis needs time and supply of information, which usually are not available. The intuition and subconscious feeling of the situation compensate for this shortage. Humans take decisions not as robots but as feeling organisms with their capacity for subconscious assessment of the environment. As John Barrow puts it, “*The brain is a staging point in an ongoing evolutionary process. The mind was not evolved for the “purpose” of doing mathematics. Like most evolutionary products it does not need to be perfect, merely better, than previous editions, and sufficiently good to endow a selective advantage.*”²

The philosophers felt this a long time ago, surely in different terms. Pierre Hassner, the French political scientist, recently wrote on the role of passions in social and political life.³ Passions combine the intensity of emotions and the sustenance of sentiments. For that reason, they are driving forces influencing the decision-making process, hence the evolution of societies and the interactions among them. He recalls the classification of Thucydides, dealt with later on by Hobbes and many others, which distinguished three main passions: fear or the search for security, greed or the desire for material possession, and last but not the least, honor or vanity (Plato’s *thymos*). According to Plato, the latter is the choleric part of the soul, which is between reason and instinct. Today, one would call as passion the need to define our identity against other individuals and other social or cultural groups. All these passions or emotions are working together with reason when the societies as well as the individuals are forging their opinions and decisions.

2. Rationality Self-trapped in a Complex World

Rationality as a strategy for successive reasoned problem solving by active political units (nation-states, empires-civilizations or other politically-organized groupings of states) creates with the advancement of time a more complex world.* Let’s call it WORLD 3, borrowing the metaphor of Popper.⁴ In this context we consider World 3 as containing not only the products of science like theories, models and formulae (the objective knowledge in general), but also all technical artifacts of civilization and the corresponding social institutions created for their usage and management.⁵ This World 3 created by human rationality as a product of the cultural evolution of *Homo sapiens* is getting more and more complex with the advancement of time. In parallel with making existence more comfortable, it generates problems that are more and more difficult to solve rationally. We propose to call this effect *self-trapping* of rationality in the complexity of WORLD 3.

Examples: (i) After the Fukushima 2011 disaster the energy dilemma *to develop or not develop further nuclear power plants in Japan and also elsewhere* (ii) “Merkel’s” dilemma: decreasing the budget deficits and/or striving for further growth but risking the public’s next debt increase.

Following Pierre Hassner, we shall recall the possibility to interpret human history as a succession of fears where every “medicine” healing a fear opens the door to a new one. As Lucretius already pointed out, the fear of death, of big natural catastrophes, of big wild beasts created the Gods. In their turn, they became threats: directly, as administrating punishments, and indirectly, as reasons for religious wars. The secular state was devised to avoid these fears, but ironically pronounced death sentences, involved the citizens in external wars,

* For a definition of political unit see Thierry de Montbrial, *L’Action et le système du monde*, PUF, Paris.

imposed despotic governments etc. In order to escape from fears related to such threats, the liberal state substituted the system. Softening of manners and customs contributed to the attenuation of fears from inter-individual violence and of severe punishments, while the progress of science attenuated the fear from epidemics and natural disasters. However, the fears never disappear, and those of technologies getting out of control have become overwhelming. It is easy to see the equivalence of the succession of fears and general problems getting more complex in the complex world. At a given degree of complexity, rational solutions appear critically hindered.

3. Objective Factors Limiting Rationality in a Complex World

3.1. Material (Physical) Bounds

As John Barrow pointed out, *“There is a three way trade-off between time, energy and information that is controlled by the limits on the amount of information that can be obtained with a given energy budget, the energy-time uncertainty principle and the Wigner clock limit.”*⁶

This means that a short timeframe available for or imposed on a given decision-making process could be compensated at least partly by considerable energy and/or information inputs. Low energy resources (physical and also social) impose usage of longer timeframes, which need a lot of supplementary information to be shortened. Limits to the information available (uncertainties) or the limits to computational capacity will need more energy and longer time for achieving the goal. Eric Drexler said it another way: *“People who confuse science and technology tend to be confused about limits...they imagine that new knowledge always means new know-how; some even imagine that knowing everything would let us do anything.”*⁷

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3.2. Institutional Inertia and Vested Interests

A large part of the social reality around us is created by humans.⁸ This is also true of the economy and the mechanisms of production and distribution of goods and services. We have all the reasons not to be happy with the economic situation, especially after the big financial catastrophe in 2008.⁹ However, can we easily change the institutions created by us? Obviously not. And this is not only due to the vested interests and the corruption of the political class related to them. Simply speaking, there is quite an objective difficulty related to institutional inertia, which resembles the inertia of a big battleship or tanker trying to change its position in troubled waters. We need a lot of physical and social energy directed and managed rationally in order to change the structure of economy or any other social institution which has deep roots in the society.

3.3. Democratic Voting Impossibility

Very often, a collective impossibility results from the addition of a number of perfectly rational individual choices.¹⁰ Democratic voting on issues like “pursue the nuclear electric-

ity production or close all nuclear power plants” creates contradictions! As we pass from individual choices to some form of collective choice, a paradox arises, as demonstrated by Kenneth Arrow (1972 Nobel Prize Laureate in Economics). It seems that more often, negotiations are a better means for solving dilemmas facing rationality than democratic voting procedures.

3.4. Subjective Responses at the Individual Level

The optimization of interplay between the components of rationality permits in certain limits adaptation to objective bounds: (i) the time frame imposed, (ii) the limited information and material resources available, (iii) the degree of preparedness to face the unforeseen, (iv) the overall confidence of social institutions including the state (their reliability) etc. This is especially clearly visible on the battle field. Clausewitz in *On the War* says the following to a capable commander: *“Intellect which, even in the midst of intense obscurity, is not without some traces of inner light, which lead to the truth, and then the resolution and courage to follow this faint light”*, *“The mind must first awaken the feeling of courage, and then be guided and supported by it...in momentary emergencies the man is swayed more by his feelings than his thoughts.”*¹¹

The view of Clausewitz corresponds perfectly to Spinoza’s understanding. The latter suggested that the intensities of the effects are usually so strong that the only hope to overcome a harmful effect — an irrational passion — is to struggle with a stronger positive effect generated by reason. In other words, Spinoza recommends struggling with a negative emotion with a stronger but positive emotion provided by reason.

One can argue that both at the individual and the societal levels, with the increasing complexity of the world and the shorter timeframes available, the emotional component of rationality could become the leading one in the binomial. Passing above a critical threshold, the behaviour of the agent(s) becomes overtly irrational, i.e. overwhelmed by emotions.

4. Epistemological and Psychological Impediments to Rationality Pushing to Irrationalism

4.1. Metaphysical Illusions

The desire to link all things together is a deep human inclination. The symptomatic dichotomy is, the greatest scientific achievements spring from the most insightful and elegant reductions of the superficial complexities of Nature revealing their underlying simplicities, while the greatest blunders (including harmful and misleading ideologies) usually arise from the oversimplification of aspects of reality that subsequently prove to be far more complex than initially supposed.¹²

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4.2. Psychological (Existential) Impediments

Those who do not have the courage to be responsible for their destiny escape from freedom, hence submitting to an authoritarian system.¹³ Very often, the latter replaces an old

order under a different external appearance but identical function for the faint-hearted: *to eliminate the apprehension and the lack of confidence by prescribing what to think and how to act.*¹⁴ This escape from freedom serving as mass support to the totalitarian Governments was underlined by Hanna Arendt: *“There is no doubt that in spite of the evidence of its crimes the totalitarian Government has the support of the masses. This is very troublesome. For that reason, it is not astonishing that very often experts and politicians are denying the fact. The first ones believe in the magic effects of the propaganda and the brain washing, while the others as Adenauer simply refused to recognize it.”*¹⁵

Nostalgia for the Absolute due to the decline of formal religious systems has left a moral and emotional emptiness in Western culture. As a consequence, alternative “mythologies” like Marxism, Freudian psychology, Levy-Straussian anthropology and/or fads of irrationalism introduced themselves.¹⁶

5. Pushing Back the Boundaries

5.1. Has the Irrational been explained Rationally?

Referring to the intuitions of Spinoza, Schopenhauer, and Clausewitz, stressing the contribution of Freud and the last scientific discoveries of neurobiology, the answer seems to be *yes, to a great extent.* This pushes back to *some extent* the boundaries surrounding rationality.

5.2. Directed Incrementalism

Against such a background, how can we push back further the limits to rationality? A possible issue is outlined in pointing at the so-called *directed incrementalism.*¹⁷ It consists of purposeful decision-making guided by clear goals, articulated visions and guiding principles. At first glance, it generates only minor changes in the form of small-scale adaptations to policies, which may appear as merely incremental short-term policy changes, but in the long run emerge as policies clearly leading to stated goals relying mostly on negotiations than on voting.

5.3. Looking for Creative Minorities

The question is, who has the strong word in decision-making? Who participates in formulating the concrete realizations of directed incrementalism? National sovereign governments, groups of governments, bankers and other financial and business lobbies? Trade unions? Scientific societies and academies? Non-governmental organizations? Or a complex blend of them?

Arnold Toynbee considered history as an evolution of civilizations. Civilizations arose *in response* to some set of challenges, when “creative minorities” devised appropriate solutions. By *responding to challenges*, civilizations grow. They decline when they are not able to respond creatively further: *“Civilizations die from suicide, not by murder.”*¹⁸ An example is the empire of Angkor which lasted six centuries in the territory of contemporary Cambodia, thanks to the very efficient system of managing and distributing waters.¹⁹ According to Georges Coedes, the weakening of Angkor’s royal government by on-going war and the erosion of the cult of the *devaraja* (*God-king*) undermined the government’s ability to engage

in important public works, such as the maintenance of the waterways essential for irrigation of the rice fields. As a result, Angkorian civilization decomposed due to shrinking economic base.

5.4. Role of Negotiations

Substituting *civilization* with any relatively stable *active political unit*, (civilizations are not such units, but empires or other political groupings corresponding to certain civilizations are) we may agree with Toynbee on the important role of *creative minorities*. Identifying such minorities in various strata of the society and giving them the opportunity to participate in constructive negotiations at various levels (“mega diplomacy”), we may reasonably fuel directed incrementalism.²⁰ This, probably, is the means we are looking for to liberate rationality from the self-created traps. What we may really need is less applied science increasing the density of technological “gadgets” in World 3, but what we need much more is applied humanities serving directed incrementalism aiming at the liberation of the society from the traps, actual consumerism being one among them.

Conclusions

A rational decision “*should not only be reasoned, but also optimal for achieving a goal or solving a problem.*” Having outlined the emotional or passion component in the mechanism of human decision making, we should accept that optimal decisions, sometimes or even very often, are not apparently the most logical ones. This should not disqualify them as being irrational. The appropriate attitude is to look for rational explanation of the respective “irrationality.”

“Human rationality solving problems inevitably creates more complex ones.”

At the level of political units (nation-states, empires-civilizations, grouping of states etc.), rational application of the natural sciences (technologies and technical artifacts) complicated the world. Thus, human rationality solving problems inevitably creates more complex ones. In a way, the complex world resulting from the activities of rational humans is catching rationality in self-created traps: the phenomenon of self-trapped rationality.

The liberation of rationality from self-trapping may need negotiations with the participation of creative minorities in various strata of the society with the view to fueling policies of directed incrementalism.

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Notes

1. Antonio Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York: Putnam, 1994).
2. John Barrow, *Impossibility: The Limits of Science and the Science of Limits* (Oxford: Oxford University Press, 1998), 232.
3. Pierre Hassner, *La revanche des passions, Commentaire*, No 110/Ete 2005.
4. Karl Popper, *Unended Quest: An Intellectual Autobiography* (London: Routledge, 1992), 180.
5. John R. Searle, *The Construction of Social Reality* (New York: Free Press, 1995).

6. Barrow, *Impossibility: The Limits of Science and the Science of Limits*, 146.
7. E. Drexler, *Engines of Creation* (London: Fourth Estate, 1990), 148.
8. Searle, *The Construction of Social Reality*.
9. Orio Giarini, Garry Jacobs and Ivo Šlaus, "The Great Divorce: Finance and Economy," *Cadmus* 1, no. 4 (2012): 12-14.
10. Barrow, *Impossibility: The Limits of Science and the Science of Limits*, 239-246.
11. Carl von Clausewitz, *On War* (Oxford: Oxford University Press, 2007).
12. Barrow, *Impossibility: The Limits of Science and the Science of Limits*.
13. Erich Fromm, *Escape from Freedom* (New York: Farrar & Rinehart, 1941).
14. Alain Peyrefitte, *La société de confiance* (Paris: Editions Odile Jacob, 1995).
15. Hannah Arendt, *Totalitarianism* (New York : St. Martin's Press, 1979).
16. Georg Steiner, *Nostalgie de l'absolu* (Paris: Bibliotheque10/18 dirige par Jean-Claude Zilberstein, 1974).
17. Gerhard Barse, Imre Hronszky and Gordon Nelson, *Rationality in an Uncertain World* (Berlin: Edition Sigma, 2005).
18. Arnold Toynbee, *A Study of History* (New York : Oxford University Press, 1947-1957).
19. Georges Coedès, *Pour mieux comprendre Angkor* (Hanoi: Impr. d'Extrême-Orient, 1943).
20. Parag Khanna, *How to Run the World: Charting the Course to the Next Renaissance* (New York: Random House, 2011).