DECISION-MAKING UNDER PERSISTENT UNCERTAINTY. A NEW PARADIGM OF DECISION-MAKING AND ITS MULTIPLE EXPLANATORY CAPACITIES

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This paper was presented in the Conference of the European Sociological Association, Glasgow, 2007. These are conclusions drawn from the authors' research carried out during several decennia. The following topics are discussed: types of uncertainty in decision making, the relationship between objective uncertainty and subjective uncertainty, procedures of decision making under persistent uncertainty and the way the decision makers face problems like adopting a good enough decision, absorb uncertainty at an acceptable level and achieve a reasonable level of consensus.

***Key words**: decision making, objective and subjective uncertainty, neoclassic paradigm, consensus.*

This conference, focusing on concepts of risk and uncertainty, has the chance to reveal a view which, I am sure, will prove very fruitful.

Risk has become a favourite theme for the topic literature: Sociology, Psychology, Social Psychology, Economics, and Mathematics. But not the same was the case of **uncertainty**. I submitted this estimation under a test. I have searched in 12 Encyclopaedias, Dictionaries and social sciences treaties. The term **risk** is frequently invoked and largely debated: the theoretical context into which it has a central part. The term **uncertainty** was only found once in a short definition, in contrast with that of *risk*, not being properly treated in a specific context. One gets the feeling of embarrassment, though it seems to be deemed as important, it cannot be placed in a certain scientific context, like a possible scientific concept which generates theories in itself.

When I found out the theme of this conference, I was very glad from a personal point of view. It suggests that their initiators seem to advance the idea that it is high time to take in consideration, in an independent way, the thematic of *uncertainty*. And this theme must not be subordinated under the theme of *risk*, because it might be severely limited.

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The theme of this essay is the conclusions of one of my books (*Uncertainty. A Sociological and Psychological Perspective*) published in 1990 and republished in 2002, unfortunately only in Romanian. This book is not an essay but an attempt to build a new theory centred on the concept of *uncertainty.*

The main idea of this paper is that **uncertainty is a parameter of our individual and collective life, an explanatory factor of a large scale of psychological and social phenomena.** The uncertainty we are dealing with when we take decision is *persistent:* most of the times it is not reducible, but irreducible. We rarely succeed to completely reduce it and take *decisions under certainty.* Usually we must stop the search of new knowledge and evaluation of the fragile knowledge we dispose of, but take decision. We must live with an uncertainty which we cannot remove in the time pressure of decision-making.

The introduction of this theme of *uncertainty* opens up a new perspective over psychological and social processes of decision-making. The classical paradigm of decision-making is based on the considering certainty as granted. Classical logics and mathematics have developed the model of decision-making under certainty. But this kind of situation is rather an exception. The previous development of classical paradigm accepts uncertainty, but it "tames" it by the attribution of probabilities. I would be tempted to call this *neoclassic paradigm.* Attributing probabilities uncertainty is reduced to certainty and the classical logical-mathematical model is applied to it. It is always presumed that there are methods of certain attribution of probabilities in every situation. But such supposition is correct only in some situations, which are not the most frequent by far. It is high time to accept that the complex problems we are dealing with are generally characterized by a lack of relevant knowledge: there is lack of knowledge but as well, knowledge whose certainty is uncertain. In consequence, the reduction of decisional uncertainty presumes two conditions: to acquire new knowledge and to reduce the existent uncertain knowledge. In the useful time spans from the decision-making point of view, as a rule, we must stop the effort to acquire knowledge and accept the conditions of uncertainty. And even the probability we can attribute is uncertain.

It is strange though that there are no attempts (an exceptional attempt, but from reasons hard to understand, is rather ignored, is due to Herbert Simon) to develop a theory of *decision-making under persistent uncertainty.*

For such a perspective there are two concepts that I want to address in the following paragraphs.

Objective uncertainty and subjective uncertainty. We must accept that the decision-making process includes two phenomena which apparently overlap, but are structurally different, in fact. *Objective Uncertainty* (O.U.) is a cognitive phenomenon. It refers at the difference between **existent** and the **relevant** quantity and quality of knowledge which are needed for a certain decision. This "distance" between what "should be" and "what is" is a measure of objective uncertainty. But the problem is the following: Who can measure the decider's objective degree of

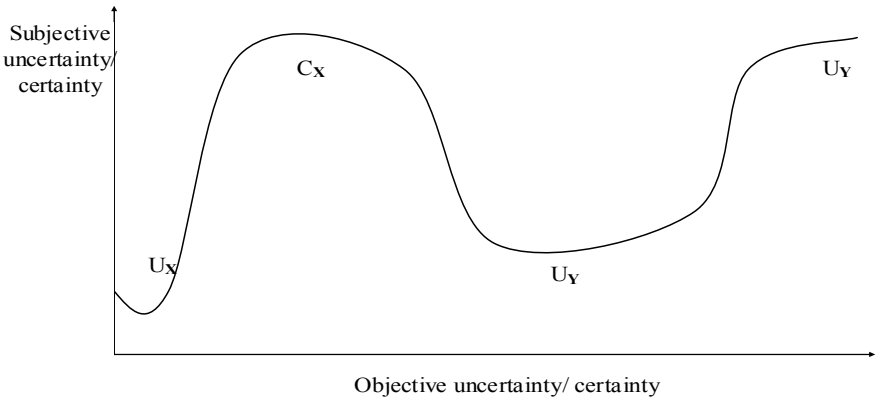
uncertainty? Clearly, the decider himself cannot accomplish such a measure, precisely due to the uncertainty that he is shrouded in. There arises the need for an external decider who has a complete knowledge to place against the actual knowledge that the decider disposes of. But who is such an external observer? It is God, of course. In simple situations, might be the professor who is presumed to know everything, in comparison with the student who knows less. It is clear that in current situations, the decider does not have a measure of objective uncertainty and so, of his degree of cognitive uncertainty. Therefore objective uncertainty is a rather purely theoretically imaginable state, but it is not the decider's real state. *Subjective Uncertainty* (S.U.) is the perception the deciders have over their uncertainty. S.U. is the individual and collective deciders' **real** subjective state. It is a fundamental parameter of human life, with distinct effects.

The relationship between objective uncertainty and subjective uncertainty.

Of course, subjective uncertainty is determined by objective uncertainty, but the relation is not a linear one. How does the decider know if he is in a situation of certainty or uncertainty and how does he estimate the degree of uncertainty ? He cannot have a measure of uncertainty, but only the perception of some *qualitative states*, function of the degree of knowledge. What the decider perceives is the *structure of the cognitive image and its stability*. The action orientation of actors prompts his cognitive image to become structured, in order to find a solution, when faced with certain problems.

Graphic

The relation between objective and subjective uncertainty/ certainty



The deciders do not perceive the quantity level of knowledge, but only distinct **states** as against the **thresholds of knowledge.** The decisional cognitive structuring that the decider can estimate has several distinct states. I believe we can identify four such distinct states:

Uncertainty X(Ux): Facing the problem to which he must find a solution, the decider does not posses sufficient knowledge. Knowledge he own is not crystallized around a possible solution. The cognitive image is not structured.

Certainty X (Cx): Knowledge is structured around a solution that "appears" to be good. The structuring of the cognitive image is for the decider the indication of certainty.

Uncertainty Y (Uy): Yet, the cognitive structure that supports Certainty X is fragile. A solution that appears to be satisfactory is vulnerable, it usually tends to be surrounded by another type of uncertainty, with several sources:

1. New knowledge can question the solution that appears to be satisfactory, un-structuring the fragile image that it sustains.

2. The accumulation of new knowledge makes possible the identification of alternative solutions. The emergence of alternatives (alternative structures) questions the first structuring/ first identified solution.

3. Have all the possible alternatives been formulated? Maybe the best solution has not yet been included among the identified alternative solutions. Should the search for alternatives be stopped, and, thus, the process of acquiring knowledge?

4. Has the evaluation of alternatives led to a certain hierarchical ordering? Here, uncertainty takes the form of an oscillation between alternative structuring: if some provisions are taken into account, a hierarchical ordering may appear to be adequate; viewed from another perspective another hierarchical order appears. The oscillation between various hierarchies has a specific subjective effect:

Theorem[1]: *Under persistent uncertainty, for the decider, the alternatives tend to appear to be equal.*

Here the equality does not mean that they have the same value by themselves, but that there is an oscillation of preferences and the subject cannot choose between alternative solutions.

This effect of accumulating knowledge we can find in the troubling assertion "knowledge produces pain". Pain is the uncertainty generated by the process of knowledge accumulation.

Especially in the case of problems with high degree of complexity, the persistent uncertainty is the standard situation. But what happens with the uncertainty that surrounds the decision-making process which could not be eliminated?

It is useful to also take into consideration two types of uncertainty, specific to the various stages of the decision-making/ action process: *pre-decisional uncertainty (precedes the decision-making) and residual (the uncertainty that lingers after the decision was made).* These two types of uncertainty have distinct effects.

[1] I have used the term "theorem" because they are deducted from the theoretical context. Of course, they are hypotheses.

Certainty Y (Cy) characterizes the state of a complete decisional knowledge: all the possible solutions have supposedly been identified and, on the basis of their complete evaluation, the best, optimal solution was chosen. It is obvious that such a state is attained only in limit cases. Frequently, the decisional process oscillates between Certainty X and Uncertainty Y.

The effects of subjective uncertainty

Subjective uncertainty can be considered to be an ***independent causal variable*** that generates multiple effects on human behaviour, be it individual or collective.

Subjective uncertainty has a set of positive effects (functions). The pre-decisional uncertainty: it postpones the decision, motivating the continuation of the search of new knowledge. The residual uncertainty: in parallel with action, it motivates the continuation of the search of new knowledge; it maintains the already taken decision under productive doubt; it motivates the review of the decision.

But uncertainty has some negative effect as well. On these effects the attention of the specialists has systematically failed to focus. A short overview of the main negative effects continues below.

In this context, we can formulate some important "theorems".

1. The paralyzing of the decisional process and of the action. The cases of excessive postponement of the decision-making: hesitation, oscillation between alternatives. Bahavadgita says: "Action is better".

In a social context, the effects are even more accentuated.

2. **Theorem:** *Uncertainty creates dissension; consensus is less probable.* Dissension is, on its turn, a factor of blocking decision, an independent source of conflict/ social tensions. At this point, we can formulate another "theorem" with powerful explicative consequences.

3. **Theorem:** *Persistent uncertainty is an independent source of social tensions and conflict.*

4. **Persistent uncertainty lowers the motivation of performance.** Directly: the motivation for the mobilization of resources in view of a specific action, about which the decider still has some reservations, lowers. Indirectly: the **dissension produces an accentuated social differentiation in performance motivation**; those that have doubts regarding the taken decision will have a lower motivation.

5. I have brought arguments in the support of a hypothesis that might appear surprising but with multiple effects on the understanding of how the **authoritarian pattern** of social organization is produced:

Theorem: *Persistent uncertainty, which has dominated the history of human society, represents an independent factor (along with other factors) for the generation of the authoritarian pattern of social organization.*

In short, this hypothesis consists in the following causal chain:

→ Persistent/ irreducible uncertainty independently generates a packet of social effects: dissension, resistance to the adoption of the decision, tensions and conflicts, social differences in the motivation of the performance.

→ Authority represents the most efficient means, of course, with important "collateral" costs, to diminish/ control the negative effects of dissension.

→ It can be assumed that the exertion of social power, alongside the competition for rare resources, has the persistent uncertainty as one of its distinct sources.

6. **Theorem:** *Persistent uncertainty, through the use of authority, which implies inevitable the exertion of power for control and the use of resources as an instrument of motivation, is an independent determining factor of social stratification/ differentiation.*

Three problems of decision in persistent uncertainty and decision-making procedures

In this point of analysis we can return to the two initially formulated questions:

How do (individual and collective) actors come to adopt decisions in conditions of an irreducible, persistent uncertainty. When the computational rational strategy is not possible, namely the "calculation" of the correct decision, the following question arises: which is the rational strategy in order to take „the best possible decision", in the condition of limited knowledge?

1. How does the decider handle the persistent uncertainty that could not be absorbed in the decision-making process and with which he has to live?

For the first question, I want to invoke only three assertions (I would say theorems), out of which two are formulated by H. Simon.

1. *Usually the decider stops at the first satisfactory solution that he has managed to formulate, and only in exceptional cases does he succeed in identifying the optimal solution.* The optimal solution is, naturally, the result of a logical-mathematical process, which is operational only in conditions of certainty (H. Simon).

2. *The "step by step" construction of the solution whose complexity greatly surpasses the capacity of the decider.* Complex problems are divided into simpler problems and the latter into an array of simpler and simpler problems until they can be solved in a satisfactory manner. From the "step by step" assembly of partial solutions, in a process, the global solution is built. In this sense, H. Simon estimated that an organization is not only a *system of action*, but also a system of *constructing complex decisions.*

3. I would add yet another strategy that becomes a standard in the practice of nowadays actors: the accumulation of knowledge with various degrees of uncertainty pertaining to the "experts" through various procedures: the Delphi method in an example. The system of democracy, founded on communication and vote, is another procedure.

A second question is how, in order to lower the negative effects of persistent subjective uncertainty, the decider must find other non-cognitive ways to reduce subjective uncertainty.

In practice, a large variety of mechanisms of artificial absorption of uncertainty can be identified. All these mechanisms have something in common: the investment with an extra-value of the decision/ author of decision or mechanisms of decision-making, from oracles to charismatic leaders; but also the investment extra-value in *experts* or in the *procedures* of decision-making. Social norms, including common patterns of perception of reality/ thought/ feeling/action are mechanisms of extra-value investment of the collectively chosen solutions. Tradition is a very clear case from this point of view.

The procedures of decision-making used in individual and collective actions are, thus, conceived in order to solve both problems: to arrive at reasonably good decisions and to reduce or control at an acceptable non-destructive level of subjective uncertainty.

Secondarily, a third problem arises: **how to accomplish an acceptable degree of consensus, avoiding the destructive effects of dissension.**

The rational strategies of decision-making, developed in current practices, must thus have three components:

a. To produce satisfactory decisions.

b. To reduce destructive subjective uncertainty or to cope constructively with it.

c. To increase the consensus.

Starting from these three functions, a few practically used strategies will be shortly mentioned.

Procedures of decision-making	Quality of decision	Subjective Uncertainty	Consensus
H. Simon: 'The first satisfactory solution'	Satisfactory. Continuous research and the identification of alternatives, does not necessarily lead to a better choice. Under subjective uncertainty, the alternatives are 'equal' and "the first satisfactory solution" is probably as good as any.	Low: It is avoided Uncertainty Y	Relatively high
Tradition	Satisfactory. Possible the first solution might be satisfactory. To add: verified by practice	Very low: Social norm and past experience offers certainty	Very high
H. Simon: 'step by step' construction of complex solutions	By the end, "the first satisfactory solution". Accumulation of partial solutions. Exceptional it is an optimum solution.	Relatively low Certainty X At the group, oscillation between Uncertainty X, Certainty X and Uncertainty Y	Relatively high

(*continuare*)

Authority	Satisfactory Possible better due to competence	Average At the group level, passive attitude and oscillation between Uncertainty X, Certainty X, and Uncertainty Y	Average. Possible passive dissension. Consensus based on authority
Charisma	Satisfactory	High Certainty X	High
Communication	Possible better: increased qualitative and quantity knowledge	Decreasing/ increasing, depending on conditions	Decreasing/ increasing depending on conditions
Techniques of democratic decision-making	High chances of being better	Decreasing: procedural certainty	Increasing: procedural consensus

Conclusion. As it can clearly be seen, the decision-making techniques combines three interrelated distinct functions: getting satisfactory decision; reducing uncertainty by cognitive (communicative) means but especially non-cognitive, artificial ones, to built as much as possible consensus.

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***Cuvinte cheie**: proces de decizie, incertitudine obiectivă şi subiectivă, „paradigma neoclasică", consens.*