Cognitive Process Elements of People Decision-Making

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INTRODUCTION

With computers and the interest in information processing, a new image of man begins to emerge. In the 1950s, studies of Broadbent (1954), continuing the Cherry (1953) model, culminate in the model of human thought processes. A model that began with the information received by the senses, but concentrated on a new and important feature: the individual has a limited capacity for receiving and storing information (Gardner, 2003).

These results were related to the work of George Miller. Miller (1956) in "The magical number seven, plus or minus two: some limits on our capacity for processing information", when referring to classification and coding, indicates that there are limitations to the ability to process sensory signals on the order of about seven. At the same time, Bruner led the "Cognition Project" at Harvard. Faced with the observations of human performance in tasks of formation and acquisition of concepts, Bruner, Goodnow and Austin (1956) suggest that individuals suffered a state of "cognitive strain" and tried to reduce it through strategies of simplification.

In the study of decision-making, the classical view of behavioral appropriateness or rationality was also challenged by psychological reasons. One major example was Simon's theory (1957) of "bounded rationality", in which it is proposed that cognitive limitations lead decision-makers to construct simplified models for dealing with the world. In the same study, Simon (1957) suggests several cognitive strategies, the average, the sum and subtraction, to explain the behavior of different economic agents. The best known example is the

"satisfaction" one, which explains the behavior of consumers looking for a "good enough" option in an uncertain environment, where the search for alternatives is costly. To satisfy is a heuristic decision which involves choosing the first alternative that meets its minimum requirements. To satisfy is simple in terms of cognitive operators; therefore it makes smaller demands to the scarce mental resources. However, it can lead to sub-optimal behavior, given that finding an acceptable option, the search and evaluation of other alternatives, possibly better ones, ceases.

When asked by Gigerenzer about why bounded rationality is not the same as irrationality, Simon responded with an analogy. "Bounded rationality is like scissors: the mind is a blade and the structure of the environment is the other blade. To understand the behavior, we have to look at both and in how they fit." (Simon, 1990:7 *apud* Gigerenzer, 2004:397). In other words, in order to assess the cognitive strategies as rational or irrational, one must also consider the environment because a strategy is rational or irrational only with respect to a physical or social environment (Simon, 1990). Thus, models of bounded rationality bring the reality and consider how human with little time and knowledge behave. This term, coined by Simon (1955) is associated with three distinct programs: the study of optimization under constraints, the study of cognitive illusions and the study of fast and frugal heuristics.

In the search for descriptions that adhere more closely to the human decision-making process, this text briefly contextualizes the human perspective in the study of decision-making. It then proceeds, on the basis of a review of the literature

on cognition during decision-making, to propose the formulation of a model that identifies the roles of aspects of cognition, and their inter-relations, during the decision-making process.

BACKGROUND

Some models of decision-making involved in descriptive approaches, approximating to how decisions are really taken. In the heuristics and biases program, the focus is on the individual's process to reach a conclusion, i.e. in the judgment that leads to the decision. It can be said that the central input is to indicate the existence of particular types of processing, covering certain areas in greater or lesser extent, and that in their function there is a set of trends in decisions made. It is relevant to point out that people do not decide rationally. It refers to a set of evidences of bounded rationality and systematic deviation from the optimal model, the expected decisions. However, it fails to explain why the heuristics manifest, how they operate in cognitive terms.

The program of fast and frugal heuristics is particularly interesting as it locates individuals in the context, and considers the rooted empirical knowledge that they have. With the ecological rationality reinforces the kinds of decision-making process before which the heuristic, of specific domain, change. This direction to the context is done without losing the object of analysis - the decision-maker. It goes on, however, without explaining how the cognitive process works. Explanations relating the types of environments with cognitive functions are not formulated, for example.

The dual processing models advance in attempts to explain the processing operation "within" the individual's head. They contribute, fundamentally, to mark the existence of non-rational processes, guided by intuition. It is also important to strengthen processes under which people have no control and awareness. It features a large contribution, which goes toward closer

cognitive processes. It remains, however, without explanation as to the correlation between the actual functioning of processes and the types of problems that are presented to individuals.

With cognitive models, the advance continues, recognizing structures formed by individuals that make up their understanding, assessment, and access or not to certain information and previous experiences. Particular aspects of each individual are emphasized as attention focuses on the formation of "schemes", which carry the history of the decision-maker.

The ramifications of this study lead to sense-making, through which one has contact with the attribution of meaning, and reinforces the unconscious processes. The concept of the production of retrospective explanations is of great contribution to the Decision Theory. The existence of the framing phenomenon commands researchers' attention to variations that cause information to be better or worse perceived and evaluated. The existence of a coding process in information processing that shapes the perception of the value of information is evidenced in this theoretical framework.

However, advances in the understanding of the cognitive process have been partly incorporated into organizational applications. Although cognition figures among the earliest focuses for research (Thagard et al., 2007), it is still a subject with many open questions in all the fields where it is considered. Very recently (as compared with other fields) organization-related inquiries entered this group of interested parties (Spiegel, 2013).

In order to understand decision-making "completely", and improve it, the underlying decision-making processes and the variables that affect the process must be examined (Roberts, 2002). Ola Svenson writes: "Human decision making cannot be understood simply by studying final decisions. The perceptual, emotional, and *cognitive* process which ultimately lead to the choice of a decision alternative must also be studied if we want to gain an adequate understanding of human decision making." (Svenson, 1979 apud Roberts, 2002, p.6)

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