Chapter 1
Decision-Making Theoretical Models and Cognitive Biases

ABSTRACT

Decision making is a cognitive evaluation and selection process on a set of options in order to get to a series of objectives, so the decision-making process is complex. For that, this chapter will talk about the most important decision-making models found in the scientific literature. On the one hand, it will explain the computational models of decision making: connectionist, probabilistic, and qualitative. On the other hand, it will describe the somatic marker model of Damasio and the model of decision making based on heuristics of Kanheman and Tversky. Note that all decision-making models are valid and will depend on the decision in particular that a model will be explanatory of or not. Moreover, some of the models can also act in a complementary way.

INTRODUCTION

Decision making is a cognitive evaluation and selection process on a set of options, in order to get to a series of objectives like economic, moral, political, religious, sexual, and so on. According to Ernst and Paulus (2005) in decision making process there are three independent processes whose combination may carry out a decision. These three processes would be: evaluation of stimuli or options; selection or implementation of an action; and evaluation of experience or impact assessment of selected elections.

DOI: 10.4018/978-1-5225-2978-1.ch001

Each of these processes may be differentially affected by several physiological factors. For example, most of the alternatives which we choose would be explicitly or implicitly linked to beneficial and / or negative consequences which could become in a reality in short or long term. Decision making would result from an emotional appraisal of future consequences of possible options of behavior, through a cost- benefit analysis (Bechara, Damasio & Damasio, 2000).

Moreover, through years the decision making process has been widely studied in different populations, as clinical as non-clinical. For instance, it has been examined studied in patients with brain damage (Bechara, Damasio, Damasio, & Anderson, 1994; Bechara, Damasio & Damasio, 1997), addicted patients to the drug (Bolla, Eldreth, London, Kiehl, Mouratidis, Contoreggi… Ernst, 2003), patients with psychological disorders (Moritz, Woodward & Lambert, 2007; Fear & Healy, 1997), adolescents (Lejuez, Aklin, Zvolensky, & Pedulla, 2003), elderly (Denburg, Tranel, & Bechara, 2005), men and women (Bolla, Eldreth, Matochik, & Cadet, 2004), people with different political ideology (Shook & Fazio, 2009; Jost, Glaser, Kruglanski, & Sulloway, 2003), with different religious beliefs (Harris, Kaplan, Curiel, Bookheimer, Iacoboni, & Cohen, 2009), examining possible associations between personality traits and decision making (Davids, Patte, Tweed, & Curis, 2007)… etcetera. Therefore, the decision making affects to all areas of our life and world and therefore, its study is essential and it has been investigated in all known areas.

For all them. for the study of decision-making has been designed several tasks depending on what individuals want to study. For example, for the study of impulsivity, it is used the famous Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994). In this task, participants should try to make as much money as it is possible. The task is made up of four decks which two decks are conservative and two are risky. The instructions explain to the participant that when he takes cards he can gain or lose. Conservative decks would give less money, but when he loses, the punishment is lower. The risky decks would give him more money, but when he loses, the punishment is greater. The task is designed to examine the underlying mechanisms which govern individual choices in the contexts of reward and punishment.

Following the line of this task, the decision making process has generally been dominated by economic theories. Proof of this are the different models where a person weighs the costs and benefits of different choices. In this line it is found the Computational models of decision making which can be classified into three main types: a) connectionist models (decision-making is based on "the accumulation of emotional evaluation produced for each