Theoria, Vol. 16 (1): 41-48, 2007 ISSN 0717-196X

*Ensayo / Essay*

# BOUNDED RATIONALITY: A REALISTIC APPROACH TO THE DECISION PROCESS IN A SOCIAL ENVIRONMENT

## RACIONALIDAD ACOTADA: UNA APROXIMACIÓN REALISTA EN LA TOMA DE DECISIONES EN UN AMBIENTE SOCIAL

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ABSTRACT

In this paper the argument that the methodological tools offered by the Bounded Rationality Theory are better suited for the study of the decision-making by agents in social contexts than those offered by the Rational Choice Theory will be studied. Mainly the realistic characteristics of both theories will be established. It has been said, for instance, that the explanation of the individual decisions offered by the Rational Choice Theory is unrealistic in that, it does not reflect the way in which real agents take their decisions. It has also been said that the basic assumptions and premises behind this theory are fundamentally unrealistic. This criticism will specifically be the main objective of the first part of this paper. First, a brief outline of the basic assumptions and premises behind Rational Choice Theory will be provided, which is also the main aspect of the claim of unrealism. This latter criticism will be the main objective of research in order to show, in a second article, the virtues of Bounded Rationality Theory as a better methodological tool.

Keywords: Rational Choice Theory, Bounded Rationality Theory, Decision Theory and methodology.

RESUMEN

En este trabajo defenderé el argumento de que las herramientas metodológicas que ofrece la teoría de la Racionalidad acotada están mejor situada para el estudio de la decisión en entornos sociales que las herramientas de la teoría de la Elección Racional. Nos fijaremos principalmente en el carácter realista de ambas teorías. Se ha dicho que la explicación de la decisión individual que ofrece la Teoría de la Elección Racional es poco realista en el sentido de que no refleja la forma en la que los agentes reales toman sus decisiones. También se ha dicho que las premisas y supuestos de dicha teoría son poco reales. Aquí, nos centraremos en este último tipo de críticas al realismo de la Teoría de la Elección Racional para mostrar en un segundo apartado las virtudes de la Teoría de la Racionalidad Acotada como herramienta metodológica.

Palabras claves: Teoría de la elección racional, teoría de la racionalidad acotada, teoría de la decisión y metodología.

Recepción: 03/08/06. Revisión: 20/02/07. Aprobación: 26/04/07.

## INTRODUCTION

In this paper, the argument that methodological tools offered by Bounded Rationality Theory (Gigerenzer and Todd, 1999; Gigerenzer, 2000; Gigerenzer and Selten, 2002; Hayakawa, 2000; Jones, 2001; Rubestein, 1998; Selten, 1998a and 1998 b; Simon, 1955; 1983; 1986; 1987) are better suited for the study of decision-making

by agents in social contexts than those offered by Rational Choice Theory (Craven, 1992; Arrow, 1974) is presented. Rational Choice Theory has long been one of the dominant theories of individual action in many of the social sciences. However, the application of Rational Choice Theory in certain fields within the social sciences has not gone without criticism (Robles, 2005; Shapiro and Green, 1994). One of the most frequent criticisms to the theory accuses rational choice of legitimating the established order, by attributing to agents values such as individualism or egotism, and by explaining individual action from assumptions of complete personal self-determination or absolute freedom of action, very much like an agent in the market system (Zafirovski, 2000). However, in spite of being a critic of this theory, I do not consider this to be a fruitful approach. Rational Choice Theory fails on more fundamental fronts. Many other criticisms have been put forward. However, I am specifically interested in one point: the charge that Rational Choice Theory is an unrealistic theory. It has been said, for instance, that the explanations of individual decision-making offered by Rational Choice Theory are unrealistic in that they do not reflect real individual behaviour (Robles, 2005). It has also been said that the basic assumptions and premises behind the theory are fundamentally unrealistic. It is specifically this criticism that I am interested in, and which will be the main objective of the first part of this paper. First, I will provide a brief outline of the basic assumptions and premises behind Rational Choice Theory, which are also considered as the main topics of unrealism.

## BASIC ASSUMPTIONS BEHIND RATIONAL CHOICE THEORY

In Rational Choice Theory, social agents are somewhat similar to the famous Star Trek character, Mr. Spock. Rational Choice Theory's agents are not affected by emotions (they decide with equal ease what they will have for dinner and what to do to save the Enterprise from a critical attack). They are infallible calculators (no matter how much information they have to process), and they are not affected by any external events (whether it is a sudden drop of temperature or a sudden attack by the Klingons). In any decision context, Mr. Spocks efficiently handles all available alternatives by comparing them all, and predicting the result of each of them. They then order their priorities and choose the one that provides them with the maximum benefit possible. However, the great virtue of Mr. Spock is that he is able to carry out this entire, long, complicated process in the time it takes to press a button.

Now, Rational Choice Theory agents are even less human than the Star Trek character. Mr. Spock was capable of sacrificing himself for his fellow-enterprisers and friends. But these spocks have only one motivation: their own interest.

Much more seriously, Rational Choice Theory is based on the following assumptions (Craven, 1992):

1. The agent has defined preferences concerning the available alternatives in a given decision to be made.
2. Motivation for action is maximum utility/benefit.
3. The agent's preferences are complete.
4. The agent's preferences are transitive.
5. The agent's preferences are extensional. If an agent claims to prefer *a* to *b* in a given situation, for any sufficiently similar situation, the same agent will also prefer *a* to *b*.

Although some of the other assumptions associated with Rational Choice Theory, such as the assumption of agents' egotism or selfishness, have been softened in recent

decades, the assumptions outlined above remain fundamental tenets of Rational Choice Theory.

## THE LACK OF REALISM OF RATIONAL CHOICE THEORY

Any description of real agents in these terms is open to charges of lack of realism. Along these lines, the main criticism regarding Rational Choice Theory has been that, often, it does not seem to reflect real experiences of real social agents, nor does it reflect the complexity of human decision-making (Shapiro and Green, 1994).

These criticisms have been answered by Rational Choice Theorists. Friedman's *Essays in Positive Economics* (1953), already a classic, is still very much present in this controversy today.

> A theory or its "assumptions" cannot possibly be thoroughly "realistic" in the immediate descriptive sense so often assigned to this term. A completely "realistic" theory of the wheat market would have to include not only the conditions directly underlying the supply and demand for wheat but also the kind of currency or credit instruments used to make the exchanges; the personal characteristics of wheat-traders such as the colour of each trader's hair and eyes, his personal and educational background, the number of members of his family, their characteristics, personal and educational background etc.; [….] Any attempt to move very far in achieving this kind of "realism" is certain to render a theory utterly useless (Friedman, 1953: 32).

Humour aside, Friedman's point of view reflects one of the methodological positionings of Rational Choice Theory concerning realism. The main point is that decision-making is immersed in a set of variables too diverse and complex for all of them to be included and controlled within a single explanatory model. Given this premise, any theory should attempt to simplify its assumptions with two aims: 1) to better control the mechanisms of the basic characteristics of the decision, and 2) to put forward, as Lindenberg (1998) suggests, a more theory-driven model. This is the debate between proponents of fundamentally analytical theories and proponents of fundamentally explanatory theories.

I shall not go into assessing the advantages of one over the other. I will focus on criticisms regarding Rational Choice Theory's lack of realism from a different point of view. Is the analysis provided by Rational Choice Theory a valid representation of reality? As Moe (1979) says, "the proper question is not whether theoretical statements exhaustibly account for everything but whether they are true o false assertions about only those aspects of the world that are singled out for especial attention" (Moe, 1979, 268). That is, are the basic tenets of Rational Choice Theory good explanations of those aspects of reality that it attempts to explain? This sense of "realism" depends on the relations of correspondence between the assumptions of the theory and the reality it tries to explain. Here, the criticism is deeper. What does Rational Choice Theory have to answer to this "lack of correspondence" criticism? Once again, I quote Friedman:

> All scientific theories are linked to the empirical world through the application of rules of correspondence to their non-logical norms. But this means of ascribing empirical content to non-logical terms is incomplete for many theories; there remain certain terms, which may be called "theoretical" terms, that cannot be directly connected with observable phenomena and thereby cannot be ascribed unambiguous empirical content. Ratio-

> nal models contain terms of this sort, as do theories from the natural sciences. In this sense they share a common characteristic: some of their theoretical statements are unrealistic –strictly speaking, they do not make testable assertions about discernible phenomena. It can be argued then that, in respect to this unrealistic aspect, rational models are no less acceptable than corresponding theories from the natural sciences. If they are to be denied theoretical status on the basis of unrealism, then so must the latter, and conversely" (Friedman, 1953: 45).

Friedman's "theoretical" terms here, are what we know as idealisations. Idealisations are non-logical terms frequently used in scientific theories that do not refer to reality but that are useful for the theories. Concepts such as Galileo's "perfect vacuum" or Boyle's "ideal gas" are examples of this kind of concept. The social sciences also use idealisations. Examples of this are Rawls' "veil of ignorance" or the notion of "perfect market" in economics. Generally, this type of concept is used to make the model simpler. One cannot talk of their "truth" or "falsity", as they do not pretend to fit reality but rather to serve as analytically convenient tools for the explanatory aims of the theory (Moe, 1979). Friedman's point is that the issue of correspondence between the assumptions of the theory and reality is not pertinent, nor is it fair. Many natural sciences take idealisations and apply them usefully as explanatory tools. Social sciences can do the same. Table 1 outlines this argument.

Table 1.

- ARGUMENT 1: The basic assumptions of the theory portray an individual agent with qualities that are very different from those observed in real agents and that do not reflect the complexity of human decision-making.
- COUNTER-ARGUMENT 1: The basic assumptions of the theory do not attempt to be realistic in the sense of reflecting reality. A theory in the strict sense of the word should be able to accommodate a practically infinite set of variables. Thus, the assumptions of the theory are simplifications that aim to better control the fundamental aspects of decision-making and to put forward a more theory-driven model.
- ARGUMENT 2: The stereotyped character of the basic principles makes it very difficult to establish any type of logical correspondence between those assumptions and any real aspect of the decision.
- COUNTER-ARGUMENT 2: The basic assumptions of Rational Choice Theory are theoretical terms known as idealisations. These terms, also used in the natural sciences, are, strictly speaking, unreal terms, as they do not refer to testable realities. However, they are very useful from an analytical point of view.

Thus, it seems that these two criticisms regarding the lack of realism of Rational Choice Theory are refuted by the counter-arguments put forward by its proponents. However, let us introduce the criticism that is the main focus of this paper: the lack of realism in Rational Choice Theory does not lie in its use of idealisations, but rather in the illegitimate use of these idealisations. I will now develop this idea by comparing, as Friedman does, idealisations in Rational Choice Theory with idealisations in the natural sciences.

Idealisations in the natural sciences normally specify certain conditions under which an event will take place (Díez and Moulines, 1997). Thus, for instance, we can say that under conditions of total absence of friction –which is an idealisation- a ball that has entered into movement will not stop moving unless it is stopped by some other circumstance. The conditions implied in the idealisation and the event itself are independent circumstances, normally linked by an empirical or logical law. In the above example, there is evidence that the lesser the friction, the longer the continuation of the motion. Thus, the guarantee of the event or phenomenon is not the idealisation but rather the empirical law. The idealisation merely stipulates, here, as in many other cases, one extreme case of the empirical law, that is, the total, absolute and unreal absence of friction.

However, unlike idealisations in the natural sciences, idealisations in Rational Choice Theory do not only refer to ideal conditions, such as perfect vacuum or certain physical qualities such as infinite motion. Idealisations in Rational Choice Theory also refer to the phenomenon itself. The problem with the use of idealisations in Rational Choice Theory is that the idealisations themselves are the logical guarantee for the occurrence of the phenomenon, without the support of an empirical law. The idealised bases of Rational Choice Theory prescribe how behaviour ought to be (Moe, 1979). Proponents of Rational Choice Theory define an action as rational if the real action fits the idealisations stipulated by the theory's assumptions. Therefore, this use of idealisations strays from the use given to them in natural sciences. Here, the idealisations are not connected with the event by means of any logical, empirical or natural law. Here, the phenomenon is made to depend on the idealisations. It is this sense of lack of realism of Rational Choice Theory that I believe is important. Let us look now at the way in which Bounded Rationality Theory deals with individual decision-making.

## BOUNDED RATIONALITY THEORY AS A REALISTIC APPROACH TO DECISION-MAKING

Bounded Rationality Theory is a realistic theory in two ways. Firstly, it is psychologically plausible. As Todd and Gigerenzer (2003) put it, "The goal of the program is to understand how actual humans make decisions as opposed to heavenly beings equipped with practically unlimited time, knowledge, memory and other infinite resources. The challenge is to base models of bounded rationality on the cognitive, emotional, social and behavioural repertory that a species actually has" (Todd and Gigerenzer, 2003). Secondly, it is a realistic theory in that it takes into account the way in which the social environment affects individual decision-making.

Originally, the concept of bounded rationality was used to refer to individual behaviour patterns that strayed from the patterns predicted by Rational Choice Theory. There are many empirical studies that show patterns of behaviour that are significantly different from those predicted by Rational Choice Theory. For instance, Tversky and Khaneman's studies (Tversky and Khaneman, 1981; 2000) show how social agents use certain cognitive short-cuts in dealing with decision tasks. Thus, bounded rationality was, and is still in some circles today, identified with biased decision-making. However, as early as in the 1950s, Simon (1955; 1983; 1986; 1987) insisted that, far from dealing with "biased" patterns of behaviour, bounded rationality reflects the actual way in which real agents make decisions.

The idea of constraint is key to understanding this idea of Simon's (1983). Agents

in social decision-making environments face a considerable number of constraints, both cognitive and contextual. These constraints are, according to Simon, the reason why agents' behaviour departs from the patterns of rational behaviour predicted by Rational Choice Theory. The logical question here is: Is the actual behaviour of constraint-bound real agents irrational? If our answer is no, how do we define this form of rationality shown by actual agents subject to constraints? It must be pointed out that some Rational Choice Theory proponents, such as Craven (1992), have acknowledged the importance of constraints, mainly as an obstacle for maximisation of benefit. However, Bounded Rationality Theory is not interested in analysing how agents overcome these constraints. It is interested in taking these constraints into account as an integral part of the decision-making process. According to bounded rationality theorists Todd and Gigerenzer (2003), "humans exhibit rationality making good decisions with mental mechanisms whose internal structure can exploit the external information structures available in the environment" (Todd and Gigerenzer, 2003), that is, including the constraints.

Bounded Rationality Theory defines these mental mechanisms used by actual agents as heuristics. The advantage of using heuristics lies in the structure of the environment, that is, in the fact that they take into account the characteristics of the social environment, to obtain from it a satisfactory result in a simple way. In other words, heuristics are cognitive short-cuts that make it possible for individuals to evaluate alternatives according to one or several basic rules or structures, thereby avoiding the cost involved in performing a thorough exploration of a large and complex set of possibilities, and adapting to the characteristics of the context. In this sense, the agents described by Bounded Rationality Theory are not, as Rational Choice Theory would have it, utility-maximising agents, but rather, they are agents that try to achieve satisfactory results. The premises of bounded rationality are:

– *Psychological Plausibility:* The goal of the program is to understand how actual humans make decisions as opposed to heavenly beings equipped with practically unlimited time, knowledge, memory and other infinite resources. The challenge is to base models of bounded rationality on the cognitive, emotional, social and behavioural repertory that a species actually has.
– *Domain specificity:* The adaptative toolbox offers a collection of heuristics that are specialised rather than domain-general [...]. These heuristics are composed of cognitive and emotional building blocks that can be part of more than one heuristic and allow the composition of new heuristics. The building blocks are more general than the heuristics.
– *Ecological Rationality:* The rationality of domain-specific heuristics is not in optimisation, omniscience or consistency. Their success is in their degree of adaptation to the structure of the environment, both physical and social. The study of the match between heuristics and environmental structures is the study of ecological rationality.

The basic assumptions of Bounded Rationality Theory such as constraints and heuristics are concepts that can be defined as idealisations in the sense of not being real in themselves. However, these concepts are different from the basic assumptions of Rational Choice Theory in two important senses. Firstly, they are methodological, and not ontological, concepts. Secondly, their definition is the result of the experience of agents' real behaviour. In this sense, the behaviour of agents and the assumptions of

Bounded Rationality Theory are independent and they are connected by means of a set of empirical tests, much like the ball's infinite motion and the frictionless surface. The rationality of the subjects is not defined by the assumptions made, but rather, the assumptions serve as tools to explain their behaviour. Bounded Rationality Theory claims are, therefore, subject to verification.

## CONCLUSION

The use of idealisations in the way proposed by Rational Choice Theory can be useful in theories with a high speculative component, but are far less useful in fields like sociology or politics, where empirical reference is essential. I would like to conclude with two last comments. First, I would like to have included practical cases in this paper, but time constraints have made it impossible. Secondly, it has not been my aim to suggest that Bounded Rationality Theory is capable of explaining social behaviour in general. Nor has it been my aim to suggest that it is better than other theories. I have simply wanted to put forward the idea that Bounded Rationality Theory offers methodological tools that are better suited to the study of real agents in social contexts than those offered by Rational Choice Theory.

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