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Social Rationality as a Unified Model of Man (Including Bounded Rationality)

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Introduction

In 1957, Simon published a collection of his essays under the title of "Models of Man: Social and Rational". In the preface, he explains the choice for this title: All of the essays "are concerned with laying foundations for a science of man that will comfortably accommodate his dual nature as a social and as a rational animal." (p. vii) Observe that the title of the book refers to two models of man, one social and one rational. Throughout his life, Simon kept contributing to this science of man. The most well-known contributions directly relate to this duality. In a nutshell, his most outspoken propositions in this context were the following. Socially, man is *docile*; that is, most of his or her beliefs "are acquired, not by inde-

pendent verification of the facts in the real world, but from social sources regarded as legitimate.” (Simon, 1997, p. 202). With regard to rationality, Simon relaxed three central assumptions of SEU (subjectively expected utility) theory on empirical grounds. His three counter propositions are interrelated. First, alternatives are generally not fixed in advance but generated (or identified), and the process of generation or identification is not in any way comparable to an optimal search but rather a heuristic search, because the number of possibilities and combinations is so large that search costs are not known in advance. Second, we should not assume that probability distributions of outcomes are known. Instead, we should assume that people develop strategies for dealing with uncertainty that do not assume knowledge of probabilities. This is not just a matter of lacking specific information. It is also a limit of our scientific theories with regard to the prediction of phenomena relevant for choice. Third, we should not assume utility maximization but satisficing. The heuristic search for alternatives ends when a certain criterion is reached (stop rule) and the consequences of the found alternative(s) are estimated by simple heuristic strategies. Simon called these three propositions jointly *bounded rationality* in order to distinguish them from conceptions of unbounded rationality (such as SEU theory).

Viewed from another angle, the same propositions can also be contrasted with yet another aspect of standard SEU theory. Simon argued that “rational,” as it is conceived in microeconomics and SEU theory, is a term attributable to substantive outcomes of a decision. By contrast, the term may be applied not to substantive outcomes but to the process from which decisions have evolved. In this sense, Simon’s three rationality propositions also indicate *procedural* rationality (as opposed to substantive rationality). This distinction may create an unnecessary discontinuity between microeconomics and SEU theory on the one hand, and bounded rationality on the other. By this distinction, Simon may have made it difficult for himself and others to see the common core of both conceptions and to see that microeconomics and SEU are also linked to decision-making procedures, albeit procedures that are both very rudimentary and almost immune to subjective input. It might be better to interpret the distinction as one of emphasis. What Simon calls “procedural rationality” is a conception that puts much more emphasis on detail and on subjective input than the conception of “substantive rationality”. As we will see below, when we explicate the common core and interpret the difference between unbounded and bounded rationality as different specifications of this core, rationality is always procedural.

With both his contributions about the social and the rational side of man, Simon uncontestedly made a great contribution to the development of the social sciences. He applied both to a great number of important questions, and many authors used his suggestions, especially the one’s on bounded rationality. In organization studies, the use of some version of bounded rationality led to considerable advance.¹ However, even if one is very sympathetic to Simon’s suggestions, there are also important limitations and Simon himself observed that his ideas did not

have the impact they were intended to have.² For my purposes, I would like to focus on two such limitations.

First, Simon never came to a satisfactory integration of his two models of man. Because of this, many of his suggestions failed to have the impact they deserved. For example, for a long time, Simon had insisted on the importance of selective attention. Problems of lack of information are legitimate problems and have become prominent in agency theories, the New Institutional Economics and in theories of contracting. Yet, at all times, there are also problems of too much information, Simon would insist. "Human beings handle this difficulty by attending to only a small part of the complexity around them. They make in highly simplified model of the world, and they make their decisions in terms of that model and the subset of variables that enter into it" (Simon, 1997, p. 357). This insight was repeated time and again in Simon's work, yet it was never really worked out in more detail by him, nor was it really integrated into his theories on docility and/or satisficing. Similarly, Simon insisted on an important role for emotions and social processes in directing attention (Simon, 1983, p. 17ff, 1997, pp. 363, 368³). Again, these insights were not worked into his models of man in any systematic way, say, in terms of the influence of goals on selective attention. Maybe as a result of this, "social man" (who does not just learn socially-mediated knowledge, but for Simon also acts on the basis of learned conventions) and "rational man" (who pursues goals [which goals?]) within the limits of his or her bounded rationality) remain separate theories of action.

A second limitation is Simon's selective attention to problems of simplification. He understands full well that human beings must use simplifications in their strategies to deal with complexity. He applies this insight with force to simulation and macroeconomic models (Simon, 1997, p. 105ff). For such models, he claims, we should not try to model complex mechanisms if we do not understand them well. Instead, we should use highly simplified approximations. For example, the lessons of the highly-complex World Dynamics Models of Meadows et al. could have easily been demonstrated "with the aid of much smaller models that are analytically tractable [sic!]" (ibid., p. 112). However, when it comes to microeconomic models, analytical tractability does not seem to him to be worth making strong simplifications, even in situations where they "work". Presumably, the highly simplified assumptions lead us to assume the wrong mechanisms behind the results. Be that as it may, when it comes to behavioral models, Simon did not explicitly deal with the trade-off between analytical tractability and realistic assumptions. There is something to say in favor of simplified assumptions, not just something in favor of realism. For ages, economists have used (to some degree) the method of decreasing abstraction⁴ in order to combine the advantages of tractability with those of greater realism. This method urges one to begin as simply as possible and only to introduce more complex assumptions when they are deemed absolutely necessary. Strong simplification can later be relaxed in favor of weaker simplifications (i.e. assumptions that abstract less from reality). The reason this

method is only used by economists in a half-hearted way cannot be attributed to the method per se, it seems to me. Rather, the problem lies in the fact that the tools for a forceful application of this method have never been well developed by economists. These tools consist minimally of (a) a core theory of rationality (such as RREEMM, see below) and (b) a menu of assumptions and theories, which increase in realism. These assumptions and theories can successively be plugged into the core theory as specifications of its various parts. By having two models of man, Simon did not have a core theory and so he could not possibly use the method of decreasing abstraction. Also, the distinction between "substantive" and "procedural" rationality stood in the way of using this method. By contrast, microeconomists did have such a core. However, so far, they have used only a very small menu of increasingly realistic assumptions, covering only restrictions and expectations (say, going from the assumption of no transaction costs to one with transaction costs, or from the assumption of complete information to one of incomplete information, etc.). Rarely, if ever, have they allowed more complex theories with regard to aspiration (maximization) and with regard to selective attention (i.e. of framing the action situation), the two areas where Simon's work would have been most relevant. The reason for this, it seems to me, is that the simplifications in microeconomics have been governed by what was necessary to give a clear meaning to "utility maximization". Maximization is seen as the heart of rationality. The simplification of all other assumptions is to be considered auxiliary to maximization (including assumptions on expectations, restrictions, ordered preferences, structured choice-set, etc.) These other assumptions may increase realism, but if they begin to muddy the clear and tractable meaning of maximization, they may not enter into the method of decreasing abstraction. The rationale behind it is that by giving maximization such a prominent place, the theory may be less realistic but it will be strong on tractability and the scope of application.

Had Simon been working with a core theory of rationality (one that included social man), he might have at least treated simplification in behavioral theories in the same way he treated it in other models: from both sides, tractability and realism. Attacking maximization might have taken another turn in his work. As it is, he approached the problem in terms of the realism of this assumption, leaving out the tractability issue. If he thought at all of simplification in this context, he thought of it in terms of the requirements imposed on the human decision-maker, not the modeling process. For example, satisficing is a way "of simplifying the choice problem to bring it within the powers of human computation" (Simon, 1957, p. 204). He does mention at times that the SEU model would be applicable under certain simple circumstances, but he does not pursue the issue and thus never comes to the point where he would say: For the sake of tractability, when we deal with problems of the class X, it is perfectly alright to assume perfect information or even optimization. Under condition of class Y, we need to give up some advantages of tractability in favor of realism, relax the assumption of perfect information and replace it with assumptions on subjective risk estimates. Under yet other conditions

of class Z, we have to go even a step further and introduce assumptions on heuristic search. Williamson has put it thus: "Rather than encourage economizing reasoning, to which economists could easily relate and usefully contribute, bounded rationality became identified with aspiration level mechanisms instead. . . . It is now generally agreed that the satisficing approach has not been broadly applicable" (Williamson, 1995, p. 179).

1. Procedural Rationality as a Basis for Unifying the Model of Man

What are the features of human behavior that make up human rationality? Generally, the more or less intelligent pursuit of goals under the consideration of constraints captures the heart of what is considered to be human rationality. Calculation itself is no necessary part of what is meant by "intelligent pursuit" (see Grandori, 2001). As Simon puts it: "the decision-maker wishes to attain goals and uses his or her mind as well as possible to that end" (1997, p. 293). The disadvantage of putting it this way, is that in such a formulation the picture is not fine-grained enough to accommodate different specifications of this general consensus. It is therefore useful to split this into a number of components. First of all, the goals that are being pursued should be split into *substantive* and *operational* goals. "Operational," according to the dictionary, refers to "being in action" and "the way in which something works". For example, the assumption of self-interest is an assumption about certain goals human beings pursue (a matter of their evaluations), whereas "maximization" is an assumption about the process of choosing alternatives that pertain to these goals (a matter of aspiration or, more generally, motivation). The maximization assumption states that human beings want their goals realized in such a way that in every situation, the best alternative is chosen. The term "operational" refers, in this context, to the dynamic side of preferences (or substantive goals). Second, it is useful to split what is meant by "more or less intelligent pursuit" of goals. To begin with, there is the assumption that individuals are *resourceful* in their goal-pursuit. They are inventive; i.e. they can think of new ways of achieving a goal and can adapt to changing environments. Human beings also form *expectations* about past, present and future events and are able to learn from experience or example, or instruction. In addition, human beings are able to structure (i.e. define) situations in such a way that elements relevant to the pursuit of certain goals become salient. In other words, situations are made *meaningful* in terms of goal-pursuit. Third, it is useful to bring in scarcity explicitly: human beings are restricted in their resources and they pursue their goals under the consideration of these restrictions. Jointly, these elements make up human rationality. A handy way to remember these elements is to fit them into an acronym: RREEMM.⁵ A human being, irrespective of time and place, is endowed with rationality, which means that he/she is. . . .

Resourceful (meaning: inventive, creative, problem solving): a human being will search for and often find possibilities to realize a state he/she evaluates

more positively than the one he/she is in; he/she can be inventive and adapt to changing environments.

Restricted: a human being is confronted with scarcity and chooses (consciously or not) among exclusive options; choice implies costs in terms of forgone opportunities.

Expecting: a human being forms expectations about past, present and future events and adjusts these expectations by learning from experience, example or instruction.

Evaluating: a human being attaches value to past, present and future states of the world; this leads to the formation of preferences (i.e. substantive goals).

Motivated: a human being is motivated to achieve a higher level for those conditions for which he or she has ordered preferences. This can be seen as an *operational goal* that expresses a general striving across different situational-goals. It implies possible substitution of one option for another when restrictions, expectations and/or evaluations change.

Meaning: a human being, when confronted with an unstructured situation, will try to improve the structure of this situation by making it meaningful in terms of the other elements of RREEMM. For example, when he/she experiences an unexpected event, he/she will try to fit the event into the knowledge that generates his/her expectations or else search for appropriate changes in the knowledge, i.e. he/she will search for reasons for the occurrence of the unexpected event.

As it stands, RREEMM needs to be filled with more specific assumption in order to become a model of man. For example, we can fill in RREEMM in such a way that we generate *homo oeconomicus* of microeconomics and also the theory of rational egoists (SEU theory):

Resourceful: for both *homo oeconomicus* and *the theory of rational egoists*, individuals are assumed to think of efficient solutions to their problems (this includes, in some versions, even actively changing the given set of alternatives) and to learn efficiently from experience (see Expectations).

Restricted: for *homo oeconomicus*, it is assumed that one's own income (in terms of money) and scarcity of consumer goods (reflected in monetary prices) jointly form the relevant restriction. In some versions, time and effort are explicitly admitted as restrictions (yet their price is to be expressed in terms of money, as "shallow prices"). For *the theory of rational egoists*, restrictions consist of a given set of behavioral alternatives with associated outcomes and rules. The set is generally selected by the researcher to represent a particular choice-situation (say, "vote or not vote").

Expecting: for *homo oeconomicus*, expectations are trivial due to the assumption of complete information on alternatives and prices, or due (in case uncertainty is assumed) to the assumption that expectations are correct in the aggregate (so-called "rational expectations"). *The theory of rational egoists* admits risk and asymmetric information explicitly. Yet, individuals are assumed

to estimate objective probabilities and to do so, by and large, correctly, given the evidence available to them, at prices they are willing to pay for this evidence. Since individuals in both theories are assumed to look into the future and (in the aggregate) anticipate the relevant contingencies fairly objectively (i.e. they are assumed to be "farsighted"), time has no influence on the way in which expectations are formed.

Evaluating: for *homo oeconomicus*, preferences are pragmatically restricted to (material) consumer goods, assumed to be ordered and governed by subjective rates of substitution between goods (which, in turn, are governed by decreasing marginal value). "Utility" is not a measure of subjective well-being but the evaluation of goods relative to each other (i.e. the substitution value measured by the slope of the indifference-curve). The actual preference ordering is exogenous to the theory and filled-in through the assumption that these orderings are revealed through action. In principle, there are no *a priori* restrictions on what might be revealed. In *the theory of rational egoists*, it is assumed that people have ordered preferences on goods that serve self-interest, governed by subjective rates of substitution between goods (which, in turn, are governed by decreasing marginal utility). Evaluations are assumed not to be relative (with ordinal preferences) but absolute, so that expectations can influence evaluations in a systematic way (*expected utility* formed by weighting the utility of a good with the subjective probability of its occurrence).

Motivated: for *homo oeconomicus*, the operational goal of individuals is to maximize their utility and to do so simply by ranking the available options according to the ordered preferences and choosing according to this ranking. Technically, this is sometimes expressed in terms of ratios: individuals will, for any pair of goods, choose quantities such that the ratio of marginal utilities of these goods is equal to their relative prices (i.e. to the ratio of prices of these goods). For *the theory of rational egoists*, the operational goal of individuals is to maximize their expected utility across outcomes (which also presupposes ordered preferences and certain consistency requirements: so-called Von Neuman-Morgenstern utility functions, see Harsanyi, 1977).

Meaning: for both theories, "meaning" does not have to be explicitly dealt with, because, by assumption, actors are at all times confronted with well-structured (i.e. meaningful) situations. Thus, both theories are not incompatible with problems of meaning (i.e. of the definition of the situation), but these problems fall outside the intended range of these theories. Questions about the sources of clearly structured choice-situations in real life thereby also fall outside the range. For example, to the degree that well-structured choice-situations indeed govern many market transactions, there is no way one can then ask questions – within the theory – about how they come about, say, by institutional influences on framing or by interaction (see White, 1993).

2. Social Rationality

There are many other ways in which RREEMM can be specified into a full-blown model of man. One that would be close to Simon's suggestions and yet also integrate the social and rational side of human beings is what I call "social rationality". Particularly, the introduction of an evolutionary perspective has encouraged an integration of these two aspects because it sees the development of "adaptive rationality" as governed by reproductive success, which, for humans, means a *social* success in generally uncertain environments. Rationality itself can be seen as pertaining both to social tendencies (such as having particular goals, assigning meaning to situations) and to dealing with uncertainty and restrictions (such as heuristics). Conversely, social influences can be seen in the way individuals deal with uncertainty and restrictions. The social and rational sides of human beings are thoroughly intertwined. Therefore, it is useful to speak of "social rationality" in terms of a unified model of man. Its specification in terms of RREEMM could look like this:

Resourceful: Even though this list begins with resourcefulness, we need to first anticipate the specification of the operational goal (under "motivated") in order to obtain a good understanding of the importance of resourcefulness. To maximize or optimize within given constraints needs no specific attention to resourcefulness. The frontiers of possibilities are given and maximization remains within them. However, below, the operational goal will be identified as, "to improve one's condition". This goal gives resourcefulness a central role in the conception of rationality, including learning in the sense of an active improvement of one's knowledge. For Simon, "the greater part of the decision-maker's time and effort is devoted to generating or identifying alternatives." (1997, p. 321) The social side of this is that reference points for improvement are socially induced in most cases, via social standards, normative reference groups, and social comparison processes. Simon had pointed to the fact that learning is mainly "social learning" (Simon, 1997, p. 209). Limitations with regard to resourcefulness that stem from framing effects will be discussed in more detail under "meaning".

Restricted: In the light of an improvement goal and resourcefulness, restrictions take on a meaning quite different from the one in neoclassical economics and SEU theory. Rather than point to the feasible set of consumer goods or discrete alternatives, the theory of social rationality draws attention to possibilities of improvement by changing the seemingly given restrictions. Simon would say that a heuristic search will generate alternatives. Resourcefulness is required because in most cases, the expected marginal return from an "optimal search" cannot be known in advance. The social side consists of the fact that most restrictions are socially produced (such as money, social and cultural capital) and socially conditioned (such as time, energy). Some restrictions (for example, the involuntary display of emotions) may be rational from an evolutionary point of view.

Expecting: Human beings are forward-looking but not farsighted. A good term to describe their powers of anticipation is "savvyness". On this point, too, Simon's influence has been great. He stressed that individual's expectations are not generally governed by rational Bayesian updates (in the sense of "rational expectations" in economics), that expectations of an individual are strongly influenced by the expectations of others through processes that influence the focus of attention (emotions, social processes). The heuristics individuals use to generate expectations are adapted to the structure of the environment. The research into heuristics used by individuals to generate expectations have recently taken a strong social turn along the lines suggested by Simon. For example, Gigerenzer and Todd (1999) study "fast and frugal" heuristics with simple stopping-rules. A striking feature of these heuristics is that using only a subset of the available information will often lead to more realistic expectations. One can assume that people recognize the social nature of the generation of expectations and figure this into their interaction. With regard to contracting, this insight led Favereau (1997) to argue that "the incompleteness of contracts is not the problem but (its acceptance is) the solution." The generation of expectations is often also socially orchestrated through joint categories and institutionalized rules (see Stinchcombe, 1986), creating "co-orientation" (Scheff, 1967). This means that the expectations are locked-in by the fact that they mesh. For example, the rule to drive on the right side of the road creates expectations about the other's behavior, but also about the other's knowledge of the rule and about the other's expectations concerning me.

Evaluating: In the neo-classical consumer theory, human goals are not theoretically specified and only pragmatically restricted to material consumer goods. Clearly, this is a very unsatisfactory solution for the analysis of social contexts and interaction. In the theory of rational egoists, human goals are specified by the vague concept of "self-interest", by many taken to mean "material gain". Yet, in most real-life contexts, it is not so evident what "self-interest" is, since the concept covers very heterogeneous goals and empirically defies the assumption of ordered preferences. Simon has treated this aspect in his discussions on satisficing and on altruism (for example, Simon, 1997, pp. 197ff and 295ff). Yet, even though he introduced evolutionary arguments in this context, he did not go more deeply into an analysis of human goals to solve some of the puzzles surrounding the concept of self-interest. In this way, both his conception of self-interest and of "altruism" remain vague. "Self-interest" is left unanalyzed and "altruism" refers, at times, to processes of identification with the group or the organization, and at times to the ignorance about one's own sacrifice that is socially extracted. Another general problem in dealing with human goals is that no clear distinction is made between *operational goals* (such as maximization or improvement) and *substantive goals* (such as physical and social well-being). I will turn to operational goals under the heading of "motivated". Here, the question is what substantive goals are there, if any,

that can be assumed to be universal? There is no room to go into much detail about the answer I could give to these questions (see Lindenberg and Frey, 1993; Lindenberg, 2001). Suffice it to say that in my view, a theory of goals as part of a theory of social rationality would have to put two universal goals at the top of the hierarchy: physical well-being and social well-being. *Physical well-being* covers mainly comfort (to be free of pain, hunger, etc.) and stimulation (to maintain a certain level of activation). Thus, contrary to a standard assumption in economics, effort (reduction in comfort) is not always a net cost if it helps achieve an improvement in terms of stimulation. The other major goal has been stressed over and over again by sociologists as the most important universal goal: *social well-being*, produced by some form of social approval. The direct instruments for doing so also have a long pedigree within sociology and are also corroborated by evolutionary arguments: *Status, behavioral confirmation, and affection*. The study of the interaction of the realization of these two blocks of goals reveals that the openness to social influence makes evolutionary sense⁶ in the context of individual goal-pursuit that is sensitive to cost. In this sense, the social and the rational sides are solidly intertwined, also on this point. This point is reinforced by the hierarchical structure of means-end relations (or "social production functions"). There are many layers of instruments that can be used to achieve higher-level goals. Some resources (such as money or "having a partner") are even multifunctional and can be used to reach a number of higher-level goals. Simon also realized this hierarchical nature of goals. For him, the ability to reason about conduct stems from this very structure, because "most of the *ought's* we profess are not ultimate standards of conduct but only subgoals, adopted as means to other goals" (Simon, 1983). From such a hierarchy, it also follows that preferences in the future are uncertain (as uncertain as any contingent relations) and will be subject to people's own efforts in influencing them. March (1978) has made this point very clear. He has also pointed out how different this conception is from the neoclassical view of stable preferences.

Motivated: A strong candidate for an operational goal that is compatible with bounded rationality and the impact of social standards on behavior is the *general desire to improve one's condition*. It implies that relative gain is more important than absolute gain and that reference points and social comparisons are therefore crucial for the utility an individual derives from goal achievement. Thus, improvement may also be the prevention of deterioration of the present condition, or limiting the loss that would materialize if you did nothing. The goal to improve one's condition has been recognized as a major operational goal by classical authors (Adam Smith, Emile Durkheim). More recent contributions have moved in the same direction, arguing for relative, rather than absolute, conceptions of utility (for example, Scitovsky, 1976; Kahneman and Tversky, 1979; Frank, 1992). I would like to argue that satisficing can be seen as a specific version of the operational goal "to improve one's condition".

Simon often refers to the link between satisficing and improvement, especially by bringing in the mechanism of adaptive aspiration levels (see Simon, 1997, p. 323). It remains to be seen whether satisficing or some other version of this operational goal proves to be the most useful conception. In any case, it is already clear, that to assume an improvement goal instead of a maximization goal has large consequences for virtually all other elements of RREEMM.

Meaning: Individuals must make sense of situations, before they can act. They must "define" situations. In certain situations, the structure is so simple, obvious and unambiguous that we can neglect this very process. However, in many, if not most cases in the social world, situations are not well-structured, they can be "framed" in multiple ways and we must know how they will be framed. This is Simon's point about selective attention. The way he has worked out this insight, as stated above, is linked to influences on attention. He mentions emotions but also information and communication flows in society. One might also add institutional prescriptions concerning appropriate frames. Of all the elements of RREEMM, processes of selective-attention are likely to be the most important links for the integration of the social and rational side of human beings, and therefore need to be worked out in much more detail. Frames do not just govern what we attend to, but also what bits of knowledge and beliefs become more easily accessible in memory, and what criteria we will use for the selection and ordering of alternatives. Aspects that fall outside the frame are thereby not gone, but will influence the effectiveness of the frame. Here, the distinction between automatic and controlled processes is important. Again, there is no room for detail in this short paper, but a lot has already been done in this direction, in addition to the work by Kahneman and Tversky (see Lindenberg, 1993, 2001). An important point is that the selection of frames seems to be mediated by goals, so that emotional and societal influences on frames work via their influence on goals. If this is true, then it become even more important to have a theory of substantive goals, and it makes even more difference whether the operational goal assumed is maximization or 'improving one's condition'. An important point connected to framing effects is the preponderance of short-term aspects above long-term aspects, or myopia (see Loewenstein and Elster, 1992). Simon did not go into this problem much, but it is clear that the way incentives work is heavily influenced by the question whether they are short-term or long-term. For models of governance in organization, this distinction may be so important that it is likely to frustrate all efforts to construct valid models of governance that ignore it.

Conclusion

Simon's seminal work and his many important insights on the social and rational side of human being can be brought into better relief when the two models of man (social and rational) are actually integrated into one unified model of man, of which

bounded rationality is a part. The obvious name for such a unified model is “social rationality”. By carefully isolating the most relevant elements of any model of man linked to a notion of rationality (RREEMM), one can present the model in such a way that its relation to the neoclassical model and to the theory of rational egoists becomes more transparent. The various theories of rational choice can thus be seen as different specifications of a common core.

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Notes

¹ Particularly, the earlier work of Williamson made great strides using of bounded rationality. In his later works, an increasing emphasis on the powers of farsightedness has virtually replaced the consideration of bounded rationality, even though the terms have been retained (see Lindenberg, 1998).

² Simon, 1997, p. 269. Wherever possible, for the ease of locating his work, I will refer to the 1957 and 1997 collections of papers relevant to our topic rather than to the original publications.

³ The role of emotions as attentional markers has recently been researched by Damasio (1995).

⁴ See Lindenberg, 1992.

⁵ See Lindenberg, 1990, where I follow and expand a suggestion by Meckling, 1976. Here I replace “maximizing” with “motivated” because ‘maximizing’ is seemingly too much identified with its specific operationalization in microeconomics. I also add “meaning” (the last M0 to the set rather than to keep it a separate assumption. The reason for this is that I believe that between 1990 and now this assumption on meaning (the definition of the situation) has become widespread enough to include it in the consensual set, even though many rational-choice scholars make no explicit use of it.

⁶ Within the environment of evolutionary adaptation, inclusive fitness is likely to have been essentially served by (a) resource-holding potential (leading to status-striving, see Gilbert, 1990), (b) reciprocal altruism (leading to a striving for behavioral confirmation from relevant others, see Cosmides and Tooby, 1992), and (c) kin altruism (leading to a striving for affection from people to whom one is closely tied, see Daly, Salmon, and Wilson, 1997). Gilbert (1990) argues, very much in line with a Simonian argument, that human beings have also developed *social attention-holding potential*.

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