

# Rule-following, expertise, and rationality: a new behavioral economics?

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[Richard N. Langlois](#)

Department of Economics  
The University of Connecticut  
U63 Storrs, CT 06269-1063 USA  
(860) 486-3472 (phone)  
(860) 486-4463 (fax)  
[Richard.Langlois@UConn.edu](mailto:Richard.Langlois@UConn.edu)

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## **Introduction.**

The mainstream conception of economic action as rational maximizing has been under attack at least since Veblen. What has been lacking, however, is an alternative -- or at least partly alternative -- account that remedies many of the faults to which critics point without at the same time obliterating the many tangible benefits of the mainstream approach. This essay argues that a new model of action may be emerging that qualifies as such a (partial) alternative. In what follows, I examine both the strong and weak forms of the rational-behavior model as well as several recent competitors. I then suggest that, taken together and understood in the right way, these competitors constitute a coherent alternative to the mainstream view that nonetheless retains many of that view's most appealing features.

## **The rationality principle.**

As a point of orientation, I will begin with Karl Popper's well-know rationality principle. This will provide a framework and a language with which to discuss both rationality and the methodology of economics. Popper's

principle will also prove useful in that, because of its roots in an older tradition of interpretive sociology, it will allow us to connect some intriguing new developments in behavior and cognition with a recognizable version of economic explanation. By thus walking both very old and very new ground, I hope to delimit a trail that others may find attractive.

As I have argued elsewhere, Popper's principle is ultimately part of a larger European tradition associated with names like Max Weber and Alfred Schütz (Langlois 1986b, 1990). In that tradition, one analyzes social processes by assuming that agents<sup>(1)</sup> act appropriately or reasonably in the situation in which they find themselves. Put his way, the method of situational analysis, as it is called, is a broad and widely applicable one.

Popper (1966, 1967) embraces a version of situational analysis as an antidote to what he calls psychologism, the view that one can explain all social processes solely by reference to the psychological states of individuals.<sup>(2)</sup> By contrast with psychologism, says Popper, situational analysis is able to explain "the unintended social repercussions of intentional human actions" (Popper 1966, p 95). Unlike psychology, economics and kindred social sciences are not about explaining the behavior of individuals; rather, they are about how individual behavior leads to larger social patterns and institutions, an idea that goes back at least to Smith and the Scottish Enlightenment. Understanding -- or predicting, if one really believes that possible -- the behavior of the agent is thus a means to an end rather than an end in itself. Moreover, for Popper, one benefit of situational analysis is that knowledge of the agent's situation can compensate in large measure for detailed knowledge of the agent's psychology: the "logic of the situation" may largely dictate behavior, and the psychology --or even the "rationality" -- needed to make sense of the agent's actions (as one element in the explanation of unintended social phenomena) may be "trivial" (Popper 1966, p. 97).

Notice, however, that, although both the situation and the theory of behavior needed to make sense of action in the situation may indeed be trivial, they also may well *not* be trivial. In the hands of Alfred Schütz and his followers (Schütz 1967; Schütz and Luckmann 1973), the approach from situational analysis often implies quite complex situations. In economics, however, it moved in a rather more narrow direction.

### Neoclassical rationality.

Popper contended (*e. g.*, 1966, p. 97) that situational analysis is in fact the method of economics. I return to this claim below. What is indisputable, however, is that there has long been in economics a tendency to see rationality as a logical rather than a psychological principle. Although we may trace this tendency to Menger (McCulloch 1977), it was probably Lionel Robbins's *Nature and Significance of Economic Science* (1932) that fully ensconced in the minds of economists the idea that their science is about the logic of means and ends rather than about the psychology of utility. Given a framework of means and ends, the agent's behavior reflects the solution to a logical problem of allocation. It was not a difficult leap to associate this logical problem with the mathematical problem of optimization, a leap that Walras and his followers had in fact already made.<sup>(3)</sup>

The neoclassical rationality assumptions are well known, and it may seem unnecessary even to repeat them. I propose, however, to recast my description in a rather idiosyncratic way that will help highlight certain criticisms on which I want to focus below. The basic neoclassical model, I argue, combines the following four elements.

- Self-interest.
- Omniscience ("complete information").
- Conscious deliberation (or an "as if" equivalent).
- The representative agent.

The first two of these are much discussed; the third and fourth elements are less often noticed.

**Self interest.** The assumption of self-interest has come under intense criticism, traditionally from outside economics, although increasingly from within as well. In my view, however, self interest is a red herring. By self-interested behavior one really means purposeful behavior. And, as Viktor Vanberg points out,

purposefulness is one of those appealing elements of the neoclassical model that a viable alternative would want to retain.

The classical rational choice paradigm seems to owe its appeal primarily to two facts: it provides a *unified theory* which applies to all human behaviour, independently of the particularities of time and place. And, second, its general thrust conforms to our common, every-day experience of *functionality* and *adaptiveness* in human behaviour. In order to be a viable competitor, an alternative approach should be an attractive substitute in both respects: it should, likewise, provide a unified theory of human behaviour, and it too should conform to our common experience of functionality and purposefulness in human behaviour. (Vanberg 1993, p. 183, emphasis original).

The main line of criticism of self-interested behavior tends to rest on a misidentification of self-interest with narrow selfishness.<sup>(4)</sup> In Smith's theory of the wealth of nations, individuals constantly strive to better their conditions. But those agents are not neoclassical optimizers, and indeed arguably follow a model of behavior closer to the one I will advocate below. Although Smith insisted that "it is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest" (Smith 1976, I.ii.2, p. 27), his was not a brief against unselfish motives. As the *Theory of Moral Sentiments* makes even more clear, Smith's agents even possess something very like a conscience. Smith's argument (in both works) is that, under the right institutional constraints, decentralized action leads to beneficial unintended social results -- namely economic growth -- *even when* such action is narrowly self-interested. In a complex world of dispersed and localized knowledge, it is difficult to anticipate the eventual effects of our behavior on others, which means that other-regarding behavior is far from sufficient to guarantee desirable outcomes, and may in some cases actually lead to undesirable outcomes.<sup>(5)</sup>

**Omniscience.** Obviously, the issue of unintended consequences is related to the second assumption above, namely omniscience. In neoclassical theory, this assumption usually goes by the title of "perfect information," a term that ought to suggest that it is a limited conception: information can be perfect only against some standard. In the end, neoclassical agents are perfectly informed not in general but in respect of a particular structure set out for them by the analyst. Arrow-Debreu general-equilibrium theory is the best known example of this, in which highly simplified agents are required to know all the utilities and production possibilities of all other agents. That's a lot to know -- an impossible amount, as many have pointed out -- but it is also a lot to know about a very little. These same agents are not required to know, for example, which new production possibilities might be invented in the future, at least unless these possibilities are already known to the analyst and laid out as contingencies. In general, then, the perfection of the information agents must possess is relative to the situations in which those agents find themselves.

As I have long argued ([Langlois 1984](#)), economics tends to forget that real people can be uncertain or ignorant not only about specific particular pieces of information within a known and given structure but also about the very nature of the problem situation they face. In neoclassical theory, agents are assumed to have perfect *structural knowledge*, that is, to know and be certain of the structure of the economic problem they face. When agents are ill-informed or uncertain in this theory, what they lack is *parametric knowledge* (or information<sup>(6)</sup>), that is, they lack perfect information about the value of some parameter (like the true willingness to pay of a transacting partner).

The theory of principals and agents, and much else besides in neoclassical theory, is based on a relaxation of the basic assumption of perfect information, but a relaxation that is invariably along parametric lines. In this sense, then, mainstream theory has not fully confronted the problem of omniscience in economics. If people really are "radically" or structurally uncertain, ignorant even of the nature of the problem they face, or possessed of pictures of the world different from the pictures possessed by those with whom they transact, then such a possibility will affect how people behave ([Langlois 1984](#)). Situational analysis does not in principle have a problem with divergent perceptions on the part of agents. The problem situation is always a reconstruction, a tentative appraisal by the analyst of the situation the agent thought himself or herself to have been in. What we

seldom consider, however, is that the problem situation agents sometimes face is precisely that they don't understand (rather than simply misunderstand) the nature of the situation they are in. I return to this point below.

**Conscious deliberation.** It is perhaps controversial to say that the agent in neoclassical theory is represented as consciously deliberating. As we saw, the method of situational analysis makes it possible to place most of the weight of explanation on the agent's situation, leaving little for deliberation. Nonetheless, it is certainly the case that, in "appreciative" theorizing<sup>(7)</sup> and undergraduate instruction, economists depict agents as consciously considering their options and choosing among them. Moreover, as economics has moved beyond simple situational logic into the realms of mathematical optimization, the problems that agents are represented as solving are no longer trivial or their solutions obviously implied in the situation. How do agents solve these problems if they do not deliberate? And if they do deliberate, then psychology is on the table as a necessary part of economics, and we should work harder to understand how agents "really" think.

The only alternative to is argue, with Milton Friedman (1953), that agents do not actually deliberate but nonetheless behave "as if" they did. Although embraced by practitioners as a justification of the *status quo*, Friedman's argument is typically scoffed at by students of economic methodology. And rightly so, perhaps. But the possibility of an "as if" justification does suggest that we might in the end call upon the structure of the agent's situation, in some manner yet unspecified, to substitute for explicit deliberation. I will take up this strand again below.

**Representative agent.** Since Marshall, most economists have taken for granted that the agent of theory is a "representative" one. But there has been comparatively little discussion of the nature and status of this assumption, which is in fact at crux of many recent evolutionary critiques of neoclassical theory.<sup>(8)</sup>

The idea of a representative agent fits in with the notion of the ideal type in the Weber-Schütz tradition. Because the object of our study is not agents for their own sakes but agents only as links in an explanatory chain, we need to abstract from real individuals to create artificial individuals that nonetheless retain some of the typical features of real individuals (Schütz 1943; Schütz and Luckmann 1973). But there are many ways to do this; and typification does not commit one to the assumption that all agents in the population are identical.

Interestingly, it is the name of Alfred Marshall -- for whom evolutionary biology was the Mecca of economics (1961, p. xiv) and for whom "the tendency to variation is a chief cause of progress" (1961, V.iv.3, p. 355) -- that is most often associated with the representative agent in economics. But as Loasby (1976), Moss (1984) and others have pointed out, Marshall's notion of representativeness was quite different from later variants. In the case of the firm, Marshall understood the representative firm to reflect the typical properties not of any particular actual firms but of the population of firms as a whole. This "composite" firm was a way of accommodating some measure of population thinking into the non-evolutionary framework of comparative statics. Marshall's successors -- notably A. C. Pigou, who most often gets the blame -- took a different tack, building the industry up from identical atomistic firms rather than compressing a diverse industry down into a representative firm.

There is a third alternative: to retain an explicit population framework in which, although they are abstract constructions and may share many typical features, agents are allowed to vary along some dimensions. Such an approach would be essential for any explicitly evolutionary account.

### **Neoclassical rationality and the rationality principle.**

Many writers (*e. g.*, Latsis 1976, Caldwell 1994) have agreed with Popper that the method of situational analysis is the method of (neoclassical) economics. And there is no disputing that much of economics does in fact fit under this rubric. But it is also quite arguable that an equal or larger part of what goes on in economics is *not* situational analysis à la Popper.

As I have argued elsewhere (Langlois 1990; Langlois and Csontos 1993), the part of neoclassical economics that does not fit with situational analysis is that part of the canon to which most critics direct their attentions. An economic agent who is modeled as maximizing a foot-long Lagrangean is arguably not acting reasonably within

the logic of the situation. Indeed, an agent who, faced with a complex situation, follows rules or heuristics of some kind is clearly acting far more reasonably and far more plausibly.

This is not to say that all conceptions of rule-following behavior accord with situational analysis. Some approaches can indeed be seen as a version of what Popper called psychologism. This includes to some extent the original program of behavioralism put forward by Herbert Simon (1955, 1959). Like the neoclassicist, Simon implicitly sees it as an easy matter for the agent to understand the structure of the problem-situation he or she faces; the hard part is to find the correct solution. Interpreting the neoclassical model as one of conscious deliberation, Simon points out that agents cannot in fact solve such problems: agents are "boundedly rational." (Actually, of course, it is not their rationality at all but their computational ability that is bounded.) In analogy with the functioning of digital computers, he proposes as an alternative to see agents as following "heuristics" or rules with which they are effectively programmed *ab ovo*. For example, agents may "satisfice," which means abiding by a programmed rule very like the one followed by the thermostat on your wall.

Again, however, some conceptions of rule-following are quite consistent with situational analysis, as are some "maximizing" conceptions. These latter fall under the rubric of what we may call "soft" rational-choice models. What I have in mind here is the kind of rough-and-ready price theory captured in, say, Paul Heyne's *The Economic Way of Thinking* (1997). This is the neoclassical economics of simple partial-equilibrium analysis: of scarcity, of opportunity cost, of supply and demand. It is the neoclassical economics that reminds us there is no free lunch.

### "Soft" rational choice.

Recently, Michael Jensen and William Meckling (1994) have articulated in writing an account of rational choice they call the Resourceful, Evaluative, Maximizing Model (REMM). This model they contrast not only with non-economic (sociological, political) accounts of behavior but also with hard rational choice, what they call the economic (or money-maximizing) model. REMM has four postulates.

- The individual is an evaluator.
- The individual's wants are unlimited.
- The individual is a maximizer.
- The individual is resourceful.

Roughly speaking, the first three of these are familiar from any principles-of-economics textbook. When Jensen and Meckling say that the individual is an "evaluator," they mean to stress that behavior is purposeful rather than narrowly self interested. "The individual cares about almost everything: knowledge, independence, the plight of others, the environment, honor, interpersonal relationships, status, peer approval, group norms, culture, wealth, rules of conduct, the weather, music, art, and so on" (Jensen and Meckling 1994, p. ). When they say that the agent is a maximizer, they emphasize that he or she is a constrained maximizer, one who may be limited in knowledge and for whom the acquisition of information is costly.<sup>(9)</sup>

The REM model deviates most clearly from hard-core neoclassical rationality in its fourth assumption -- that individuals are resourceful. By resourceful Jensen and Meckling mean that individuals can act creatively, even perhaps to the extent of changing or adapting the situations in which they find themselves. They illustrate with the case of the imposition of the 55-mile-per-hour national speed limit, an example that plays to the strong suit of undergraduate microeconomics. People adapted creatively to this change in exogenous condition. Some drove more slowly, while others switched to forms of transport other than automobiles, both as the proponents of the measure no doubt hoped. But some people also clearly responded by disobeying the law and, moreover, by finding unexpected mechanisms -- like CB radios and ever-more-effective radar detectors -- to evade the law's strictures.<sup>(10)</sup> People did so because the value of their time lost at slower speeds was greater than the value to them of the savings in gasoline the law attempted to impose on them. This is the basic idea of substitution on the margin in response to a change in relative prices, but with an emphasis on innovation and creativity that, although sometimes creeping into Econ 101, is entirely absent from formal modeling.



The assumptions of REMM suggest a psychology of conscious deliberation. Individuals consciously weigh alternatives and make tradeoffs. Is this reasonable? On the one hand, we surely do sometimes consciously weigh alternatives and make choices even if we equally clearly sometimes do not. *Consumer Reports* would sell few subscriptions if people never made choices like the REMM individual does. More importantly, in the uses to which one typically applies this kind of neoclassical economics, the Popperian principle of situational analysis arguably applies. In situations of partial-equilibrium comparative-static response to change in an exogenous condition (like the national speed limit), the agent may well be in a situation constrained enough that not much psychology -- or even conscious deliberation -- is necessary to understand behavior. Even if individuals do not actually calculate explicitly the opportunity cost of their time (as do Jensen and Meckling (1994, p.)), they may perhaps have a decent enough intuition about relative values. <sup>(11)</sup> Reading REMM in situational-analysis terms also connects with Popper's view that such analysis is crucial for understanding phenomena of unintended consequences. The creation of a CB-radio craze in the 1970s after the passage of the 55-mile-per-hour limit was not intended by the law's proponents nor even by any particular driver; it was the unintended result of the resourcefulness of economic agents in dealing with a change in their situation.

On the other hand, it is also clear that the REMM model is not well suited to all kinds of problems, notably to those involving what we might generically call non-marginal situations. <sup>(12)</sup> This is a point that Jensen (1994) himself emphasizes. REMM, he thinks, is not well suited to problems of understanding observed instances of apparently dysfunctional and self-defeating behavior. And he proposes an additional model -- what he calls the pain-avoidance model -- to supplement the limitation of REMM. Douglass North has made a similar point (North 1990; Denzau and North 1994) with respect to societies in the large. Neoclassical economics has not been very useful at explaining why some societies stay trapped in a low state of development and fail to adopt the kinds of institutions Smith long ago recommended. Societies as well as individuals can fail to seize what appear to outsiders to be obvious opportunities to better their conditions. If we are interested in the processes of economic growth -- and other dynamic processes, including perhaps technological and organizational innovation -- we need to understand not only how individuals respond to marginal incentives within given problem structures but also how those problem structures arise in the first place. We need a theory that allows us talk not only about agents acting within situations but also about the formation and change of situations themselves. Rather than adding epicycles to the model of soft rational choice, we need a more general theory of behavior of which REMM (and other) models would be special, albeit important, cases. <sup>(13)</sup>

### **Rule-following and choice.**

One significant development in economic theory that begins to address some of the concerns of critics is the New Institutional Economics (Langlois 1986b, 1992). Although this body of work does not obviously necessitate new behavioral foundations for economics, and in some minds is understood as a logical development of neoclassical theory (Eggertsson 1990), it nonetheless points to an important situational (and perhaps motivational) factor in economic explanation: the following of rules. At the most fundamental level, the notion of an institution itself refers to a rule-like regularity of behavior. <sup>(14)</sup> Such institutions can be simple, like a convention or norm of conduct (drive on the right, be honest in dealings with trading partners), or they can be complex systems of rules of conduct, like a culture or perhaps even a business firm.

One aspect of such institutions is that the rules that comprise them must enter into the situations in which agents find themselves. (Recall, for example, that the REMM agent cares about social norms and other institutions.) In this guise, institutions can enter into rational-choice models as side constraints that delimit what is otherwise deliberative choice. But the interaction between rules and individual behavior is actually a two-way street. Not only do rules constrain action, but economic action can in turn explain the origins of the rules: institutions emerge as the unintended results of individual action, and this is a process that we can explore theoretically. The most influential models in this area portray institutions like norms and conventions as emerging through a process of the repeated play of certain kinds of "games," such as the coordination game or the prisoners's dilemma (Sugden 1986; Rowe 1989). Over time, the agents will hit upon strategies that are "evolutionarily stable"; and these strategies, which are relatively simple bundles of rules, become institutionalized. <sup>(15)</sup>

This theory of the emergence of institutions raises two issues for the standard theory of rational choice -- issues that have to do with the postulates of conscious deliberation and representativeness I have highlighted. Obviously, the evolutionary aspect of the story speaks to the issue of the representative agent. More interestingly for the moment, however, the idea that institutions are rules that somehow coalesced out of the strategies of agents brings to the fore the possibility that rules may not be (only) constraints but may actually be principles of action alternative to conscious deliberation.<sup>(16)</sup>

In some situations (like coordination games) there is no marginal incentive for agents to deviate from a convention. Thus one might argue that, once a convention is in place, agents consciously consider the convention as part of their problem situation and choose to follow it because it is, in each case, the best thing to do. (REMM certainly suggests this interpretation.) The alternative interpretation, what Vanberg (1994, p. 13) calls *genuine rule-following*, is for the agent to abide by the convention independently of the considerations at hand in a particular case. Although it is clearly in my case-by-case interest to drive on the right-hand side in the United States, I just as clearly do not consciously deliberate the matter each time an oncoming car appears. Rather, the convention has become internalized for me: it has become a routine (Nelson and Winter 1982). Even when it is not in my case-by-case interest to follow the rule, as when I pull out of a parking lot onto a street in Melbourne, Australia,<sup>(17)</sup> I may find myself driving on the right out of habit.

In other cases (like the prisoners' dilemma), agents may have a marginal incentive to deviate from a norm, and external sanctions are often necessary; but even in such cases, the very institutionalization of the strategy-as-rule arguably serves a kind of enforcement function. That is to say, the institutionalization of the norm serves an enforcement function in "routine" situations in which the payoffs to violating the norm are not large. Sanctions thus do not *create* the norm; they exist to police unusual cases in which particular individuals may have a greater incentive to violate (Berger and Luckmann 1966, p. 52). If the sanctions do become the prime enforcement mechanism, then the norm itself may be out of line with relative scarcities (remember the 55-mile-per-hour speed limit) and under pressure to change. (I return to the issue of institutional change below.)

From one point of view, of course, the explanatory overlap is quite large between "genuine" rule-following in this sense and a rational-choice view of rule-following. It is often hard to tell whether someone is behaving in a rule-like way because he or she is "programmed" to do so or because, upon careful consideration, the agent always found the same course of action to be optimal. Moreover, one need only invoke information costs in order to explain why people might continue to follow rules even when it might strictly pay to violate them in particular cases. This is especially true if we consider rules in the sense of Herbert Simon, that is, as second-best procedures in the face of "bounded rationality": satisficing really is optimal in a world of costly decision-making.

Nonetheless, I see two reasons to prefer the model of genuine rule following: plausibility and fruitfulness. Popper's principle of rationality makes the first point clear. If we want to represent the agent as acting reasonably within a situation, and if that situation is one of complexity and uncertainty, it may well be more plausible to see the agents as following some kinds of rules -- at least in preference to seeing the agent as consciously maximizing. Moreover, whenever a fully compelling explanation would require a relatively rich description of behavior, psychology is on the table. And a program that stresses rule following might be desirable not so much from the point of view of an alternative model of behavior as from the point of view of a research program seeking more plausible accounts of human cognition and motivation.<sup>(18)</sup> This is so not because rule following is always more compelling than conscious deliberation but because approaches from rule following (broadly construed) are blossoming nowadays in the literature of cognition, whereas the model of choice as conscious deliberation now appears to be a dead end rather than a starting point for further inquiry.

### **Rule-following, skill, and expertise.**

The traditional Simonian program of behavioralism suffers from two problems. One of these I have already mentioned, namely the tendency to psychologism. Put differently, the model of action as rule-following behavior programmed as in a computer can no more account for resourcefulness or creativity than can the model of the agent as a conscious optimizer over known and delimited variables. Indeed, the rule "maximize the specified

Langrangean" can well be interpreted as a behavioral heuristic, albeit not a particularly plausible one (Langlois 1990). It is the possibility of creativity and resourcefulness on the part of agents that permits the method of situational analysis to explain phenomena of unintended consequences.

The second (and perhaps related) problem with the simple behaviorist program, however, is that it is also arguably not even a very rich or fruitful account of rule-following behavior. The reason has to do with the formative metaphor of the digital computer, which led to a picture of behavior as programmed and mechanical. The alternative is to see rule following as related to a more open-ended picture of cognition in which it is impossible (or at least not useful) to reduce behavior to a set of rules with which the agent is programmed from the beginning. In this alternative, rule-following behavior is more the matter of executing a skill than executing a program. The distinction I have in mind has been well aired (albeit controversially) in the literature on the branch of computer science called artificial intelligence (Dreyfus 1979; Dreyfus and Dreyfus 1986). Set against an optimistic vision of computerized intelligence (typified, interestingly, by Herbert Simon), these critics assert that human cognitive processes are quite different from those of computers and, for many tasks at least, far superior. They do not deny that humans follow rules; but they do deny that, like computers, humans follow *explicit* rules. What makes human behavior effective is the inexplicit or tacit character of human rule following: people follow rules unconsciously, in a skillful or expert fashion; and people actually perform less well when they deliberately try to follow explicit rules (let alone when they try consciously to optimize).

Let me call this critical view the *expertise* model of behavior. One way to see the difference between this model and simple behaviorism is the following. In the behaviorist account, abiding by rules is a second-best option in the face of "bounded rationality." Implicitly, then, one is always performing less than ideally well when satisficing or following a heuristic, where the ideal is set in terms of what could have been accomplished by explicit calculation or optimization given adequate resources. In the expertise account, (tacit) rule following can be inherently superior to deliberate action even in the ideal.

In support of this last assertion one often hears invoked the work of Ronald Heiner (1983, 1986). Heiner argues that, in the face of uncertainty -- that is, in a highly volatile and unpredictable environment -- those agents will do better who do not try to respond optimally to the environment but who are willing instead to limit themselves to a smaller set of possible responses. The reason for this is that, because of limited competencies, agents become unreliable in using their full repertoire of actions, and sometimes take the wrong action. The behavior of agents who limit their repertoires in the face of uncertainty will appear to be rule-like, since their actions will vary less than those of agents who attempt to wield a full repertoire and try to choose the best action on a case-by-case basis. Heiner's theory accords with the well-known findings of Robert Axelrod (1984), who discovered that, in a computerized round-robin tournament, those programs did better in surviving a repeated prisoners'-dilemma situation that followed relatively simple solution rules rather than attempting to optimize or to behave in a complex way.

Although this is a very nice way to understand the value of rules in situations of uncertainty, it does not, however, capture the essence of the expertise view. For one thing, Heiner's analysis is vulnerable to the criticism that it reduces to costly computation. Agents make mistakes and thus cleave to simple repertoires because of the limits of their computational capacities. If their competencies were greater, they would behave in a less rule-like way, *and* they would do better.

Moreover, and more importantly, the (tacit) rule-following that experts engage in typically does not take place in novel or uncertain situations but rather in *routine* ones.<sup>(19)</sup> As Michael Polanyi (1958) has emphasized, tacit skill-like knowledge is acquired through imitation and repeated trial-and-error learning. "Knowledge how," to use the famous phrase of Gilbert Ryle (1949), is acquired in and for predictable recurrent situations. Using a model based on Heiner's, I have tried to show (Langlois 1986a) that agents are likely to follow rules *both* in situations of uncertainty *and* in situations of routine. In the former, they follow rules for the reasons Heiner articulates: because case-by-case choice becomes unreliable. In routine situations, however, agents also follow rules, but for the kinds of reasons Adam Smith long ago articulated: because case-by-case choice becomes unnecessary and inefficient. As in Smith's account of the division of labor, agents are made expert by repetitious action. This is because, with practice, they act with less and less deliberation, thereby narrowing their choices



and freeing up conscious attention for other uses, including innovation (Berger and Luckmann 1966, p. 51). In other words, this kind of narrowing of the repertoire economizes on costly computational resources, which are not limited but in fact become surplus. It will also be the case that the kinds of rules followed in routine situations will be different from those followed under uncertainty. In routine situations, the agent's actions will be highly specialized and concrete, whereas under uncertainty the rules will be more general and abstract in order to be more likely to be appropriate in a wide range of possible future states.

Recently, David Lane and his coauthors (1996) have mounted a major attack on rational-choice models from the perspective of expertise. They conceive of rational choice as adhering to the following three postulates.

**RC1 Universality:** Every significant economic action is the result of a *choice*.

**RC2 Context representation:** To choose what course of action to take, the agent must construe the context in which the action is to take place in terms of a *choice situation*. A choice situation consists of a specification of a set of *available acts* and, associated with each available act, a set of *consequences* that describe what might happen should the agent choose to act.

**RC3 Rationality:** The agent must select an act on the basis of a calculation of the *value* of the consequences associated with it. The algorithm guiding the calculation must be such that the agent obtains some pre-specified measure of value from the chosen act. The value may be specified in absolute terms, or relative to what can be attained from the other available acts. (Lane *et al.* 1996, p. 44, emphasis original.)

Although the foregoing discussion of "soft" rational choice may suggest that this is a rather strict conception, the authors rightly see it as broad along one critical dimension: it includes not only traditional rational-choice models but also large parts of the behaviorist literature, since these postulates are consistent also with following heuristics under situations of bounded rationality -- at least so long as we think of those heuristics as consciously chosen.<sup>(20)</sup> Following a rule can be one of the "acts" among which the agent chooses. What Lane *et al.* object to in their postulates of rational choice is the very notion of choice -- or, rather, "the primacy of choice over action itself" (p. 45). Drawing on the literature of cognitive psychology, they argue that conceiving of situations as choices leads to an implausible model of behavior, except perhaps in special situations.<sup>(21)</sup> In most circumstances, action is governed by expertise, with conscious deliberation and planning entering as secondary considerations that are, however, themselves predicated on expertise.

Examples of expertise are familiar: catching a ball, flying a plane, or-- to use Milton Friedman's famous example -- playing billiards. These are activities we perform without conscious deliberation, and indeed paying attention to what one is doing often degrades performance: thinking consciously about one's performance is the mark of a novice. Skilled performers, moreover, cannot and need not translate what they are doing into explicit terms. All of this will be familiar to readers of Michael Polanyi on tacit knowledge. Lane and his coauthors direct the issue of expertise to the arena of decision-making. If action based on expertise is more effective than conscious deliberation in most situations, then we ought to see *economic* action as a matter of skilled performance rather than deliberation.

The model of cognition these authors use is what they call a categorization-action system, "which manages the feedback between past experiences and present action that is the essence of expertise" (Lane *et al.* 1996, p. 53). Drawing on some recent work in cognitive theory<sup>(22)</sup> (Holland *et al.* 1986; Edelman 1992), they see the human mind as having built up a structure of categories from past experience. Cognition is a process of sorting new experiences into existing categories, sometimes adding to or modifying the structure as a result. The environment provides constant feedback about the suitability of the categories to which new experiences are consigned.

When confronted with a new situation requiring action, the system categorizes the situation according to patterns motivated by previously experienced situations. The categories are associated with particular actions: the association depends upon the valuations of the effects of the actions taken in past situations that were characterized similarly to the present situation. The

categorization-action system then generates an action on the basis of this association. Roughly speaking, if previous actions in situations similar to the present situation led to good results, the new action is modeled on them, while actions that led to bad results are avoided. (Lane *et al.* 1996, p. 53.)

The authors emphasize that the sorting process takes place at the "subcognitive" level, and it operates faster and more efficiently than if explicit calculation were involved. Sometimes agents do consciously consider alternatives; but they do so not as in the rational-choice model but in terms of precedents: they consciously search for past situations (that they or others have experienced) as appropriate guides to action. And even when agents plan -- consciously lay out a sequence of possible future acts -- they do so in a way controlled by the categorization-action system, at least in the sense that such planning is itself an expert skill (Lane *et al.* 1996, p. 55).

### Recurring problems, paradigms, and mental models.

Although Lane and his coauthors are perhaps the most strident in pushing the expertise view of behavior, they are by no means alone. Several other recent contributions have put forward models of behavior that draw on many of the same sources and paint a strikingly similar picture.<sup>(23)</sup> For example, Vanberg (1993, 1994) argues for a behavioralism based on genuine rule following and on the sort of trial-and-error feedback emphasized in Popper's evolutionary epistemology. He points out that both rule following and learning from experience call for a model of cognition as classification.

In order for trial-and-error learning to work, the behaving organism must somehow, explicitly or tacitly, *classify* problem-situations into categories of situations which are, in some relevant sense, "similar." Such classification embodies, in essence, a *conjecture* about what makes situations, in a behaviourally relevant sense, similar or different. [S]uch classifications are at the roots of all rule-following behaviour, whether we are dealing with instincts, unreflected habits or deliberately adopted rules. They determine what are, to the classifying agent, recurring situations, that is, situations which are responded to in certain ways. Behavioural rules are, in this sense, standard recipes for how to deal with certain types of situations. They are conjectural solutions for certain types of recurring problems. (Vanberg 1993, pp. 186-7, emphasis original.)

Similarly, Denzau and North use a classification theory of cognition as the basis for their analysis of what they call "shared mental models." Learning, they argue,

entails developing a structure by which to make sense out of the varied signals received by the senses. The initial architecture of the structure is genetic but its subsequent development is a result of the experiences of the individual. This architecture can be thought of as generating an event space which gets used to interpret the data provided by the world. The event space structure consists of categories -- classifications that gradually evolve from earliest childhood on in order to organize our perceptions, and keep track of our memory of analytic results and experiences. Building on these categories we form mental models to explain and interpret the environment, typically in ways relevant to some goal(s) (Holland *et al.* [1986], p. 22). Both the categories and mental models will evolve to reflect the feedback derived from new experiences -- feedback that may strengthen and confirm our initial categories and models or that may lead to modifications -- in short, learning. Thus, the event space may be continually redefined with experience, including contact with other's ideas. (Denzau and North 1994, p. 13.)

The work of Holland *et al.* (1986) seems to be a unifying thread here, as it is cited enthusiastically by Lane *et al.*, Vanberg (1994), and Denzau and North.

In what may be the best-developed account of all, Young Back Choi (1993) puts forward a model of behavior based on what, following Kuhn (1970), he calls paradigms. As in Kuhn, the notion is a vague one, but it appears to refer to an exemplar as well as to a "way of thinking" more broadly (Choi 1993, p. 34). Paradigms are examples, borrowed from the past or from the experience of others, that serve to guide behavior. They are thus

precedents (as in Lane *et al.*), standardized recipes for recurrent action (as in Vanberg), and mental models (as in Denzau and North). Moreover, action based on a paradigm is *expert* behavior: it is based on rules, but not on explicit rules (Choi 1993, p. 34).

Choi's starting point is the problem of structural uncertainty discussed earlier. In situations of uncertainty, agents do not find the structure of their problem-situations given to them. The world is vastly underspecified, and there are many possible interpretations of one's situation. Choosing a paradigm is for Choi the only real act of choice in anything like a conventional sense; and once a paradigm has been chosen, structural (but not necessarily parametric) uncertainty disappears, and the agent's course of action becomes clear<sup>(24)</sup> (Choi 1993, pp. 45-46). As I will suggest again below, this idea fits well with the approach from situational analysis. We can understand an agent's action by reconstructing the paradigm (or mental model) the agent thought himself or herself to be following.

### **Cognition and situational analysis.**

I now want to return to where I started, namely Popper's principle of rationality or, more generally, the method of situational analysis. It may seem odd to suggest that an approach designed, in Popper's view at least, to eliminate psychology should be compatible with a renewed emphasis on cognition in economic theory. The paradox evaporates, however, once we take the principle of situational analysis back past Popper to its origins and then follow its development forward along a track different from that of neoclassical economics.

The notion of situational analysis almost certainly originates with Max Weber (Lachmann 1971, pp. p. 25-26). For Weber, however, this and related concepts (like the ideal type) were tools of historical analysis not of theory. The distinction between history and theory was an important one in Europe in the wake of the *Methodenstreit*, the nineteenth-century debate between the Austrian economist Menger, who upheld the possibility of universally valid laws, and the German Historical School, which denied that possibility. Led by Ludwig von Mises, the Austrian School of the 1920s staunchly upheld a version of Menger's position from an epistemological base that was increasingly under attack -- from the Vienna Circle of logical positivism and elsewhere. As Christopher Prendergast (1986) has cogently argued, into this breach stepped the philosopher Alfred Schütz, who worked to buttress the Austrian position by remaking its foundations. To this effect, he turned to Weber's concepts of situational analysis and the ideal type, which he modified with a large admixture of the phenomenology of Edmund Husserl and a bit of Henri Bergson. The Austrians knew and respected Weber's work; indeed, Weber and Mises became friends during Weber's brief stay at the University of Vienna in 1918. But Mises categorized Weber's approach as "historical," that is, as lying on the wrong side of the divide. Schütz's innovation was to transform Weber's methodology for use in the "nomothetic" or law-making social sciences.

The Austrian approach to economics was "subjective," in the sense that it used as building blocks the subjective knowledge, preferences, and expectations of the economic agent rather than strictly observable, and thus supposedly "objective," facts. One major problem in the interwar years, however, was that the Austrians lacked a convincing account of intersubjective understanding, that is, of how agents know the motives of other agents and form expectations about their behavior (Prendergast 1986, p. 11). Using Husserl, Schütz was able to build on the Weberian notions of typification and of the situation to create a systematic account of how agents see and learn about the social world.<sup>(25)</sup> Because of this, Schütz provides material for a rich understanding of situational analysis, one that, as Popper recognized,<sup>(26)</sup> is particularly useful for coming to terms with the coordination problem (Foss 1996): the problem of tracing out the unintended consequences of individual action. My argument here is that Schütz's work is in fact strikingly in the spirit of Lane, *et al.* and the other authors canvassed above.

For what thing, Schütz's approach does not depend on conceptualizing the agent's situation as one of choice; and it certainly doesn't place choice ahead of action. Following Weber, Schütz distinguishes action from behavior. The former is conscious, whereas the latter is not. Unlike Weber, however, he insists that behavior is just as meaningful as action (Schütz 1967, p. 19). Action is the execution of an imagined or projected act, which act is the meaning of the action. But this does not imply the metaphor of choice. Indeed, following Bergson, Schütz sees the choice metaphor as essentially an attempt improperly to apply "spatial" modes of thought to what is actually a continuous process of duration.<sup>(27)</sup> "[T]he real way in which choice occurs is the following," writes

Schütz in discussing Bergson: "the Ego imaginatively runs through a series of psychic states in each of which it expands, grows richer, and changes (*grossit, s'enrichit et change*), until 'the free act detaches itself from it like an overripe fruit'" (Schütz 1967, p. 67). The error of the choice metaphor, whether in the determinist or the indeterminist version, "is to suppose that the conscious state (*état psychique*), which only exists after the deed is done, lies back at some 'point of duration' before the actual choice" (Schütz 1967, p. 69). In other words, "we are *conscious* of an action only if we contemplate it as already over and done with, in short, as an *act*. This is true even of projects, for we project the intended action as an act in the future perfect tense" (Schütz 1967, p. 64, emphasis original). All of this is quite consistent with the role of consciousness suggested by Lane, *et al.* (1996, pp. 54-55), for whom deliberation consists in running imaginatively over precedents until an appropriate model of action drops from the tree, and for whom planning consists in an orientation to a context -- what Schütz (1967, p. 63) calls "map-consulting" -- rather than in an explicit algorithm.

Both precedent and context are in fact crucial to Schütz's system. All experience, all action, necessarily occurs in a context -- in a situation. On the one hand, the agent's situation is informed by what Schütz and Luckmann (1973, p. 99) call the "stock of knowledge." On the other hand, this stock of knowledge is itself built up from -- is the "sedimentation" of -- past situations. The stock of knowledge is what allows the agent to interpret reality, using something that, as I will suggest presently, is a kind of categorization-action system. Some elements of the stock of knowledge are so fundamental that they are not merely non-conscious but are actually "a condition of every experience in the life-world and enter into the horizon of experience" (Schütz and Luckmann 1973, p. 104). At the other extreme are pieces of explicit knowledge. In between lies a realm containing various kinds of routine knowledge: skills, useful knowledge, and knowledge of recipes.

In the Schütz-and-Luckmann terminology, *skills* refers to fundamental habitual abilities like walking, swimming, or skiing. *Useful knowledge* refers to a what we might call routines or "pre-solved problems" involving bundles of skills. Examples would include chopping wood, shaving, or writing. Finally, *knowledge of recipes* is less concerned with basic skills but still involves some degree of automaticity and standardization. If walking to the stove is a skill, and measuring ingredients involves useful knowledge, then actually producing the meal involves knowledge of recipes. We might quibble about the terminology, which is slightly different from that of the more recent authors; but it is clear that the basic idea is the same.<sup>(28)</sup> We might even say that the distinctions among these three types of knowledge reflect what Nelson and Winter (1982) think of as "levels" of routines, where higher-level routines are routines for controlling lower-level routines.<sup>(29)</sup>

All of this may seem to have strayed a bit from the Popper-Latsis account of situational logic. But this is not necessarily so. Schütz sees the role of the situation in quite similar terms. One's action at any moment are constrained by the situation, which is built up "biographically" -- that is, in a path-dependent way -- out of past situations. It is not merely the basic stock of knowledge that constrains; it is also the agent's plans and interests that close off potential indeterminacy.

The plan-determined interest, which is determined from the hierarchy of plans in the course of life, limits the necessity for the determination of the situation. The situation needs to be determined only insofar as this is necessary for mastering it. The plan-determined interest selects the "open" elements of the situation which are to be determined in greater detail, against the background of predetermined (i.e., prestructured) elements of the situation. At the same time the plan-determined interest limits the process of explication through which the situation is determined to that which is "practically necessary," that is, to that which is relevant for mastering the situation. (Schütz and Luckmann 1973, p. 115.)

In a *routine situation*, the plan-determined interest can close off the open elements of the situation using only habitual knowledge -- skills, useful knowledge, recipes. It is only when the situation presents new elements -- *problematic situations* -- does the agent have to deliberate, that is, to "consciously try to correlate [the new elements] with the stock of knowledge" (Schütz and Luckmann 1973, p. 115).

The agent's situation in this account is not determined only "biographically" but also, and importantly, in a social context. This simply means that the categories of action are formed in interaction with others. The specific



mechanism by which agents form categories of knowledge and action is the process of *typification* (Schütz and Luckmann 1973, pp. 229 ff.). It is in this sense that Schütz relies on something very like a categorization-action system. Each experience is unique; but each experience also has features that are like those of past experiences. Typification is a process of abstracting from the concrete example to the more stylized category into which it fits. When we see a driver coming down the road towards us, it is a unique concrete experience; but we react to that driver using the categories of action appropriate to typical drivers -- drivers in the abstract.<sup>(30)</sup> Only when a concrete experience does not fit with existing categories do we have to modify our categories, perhaps to add a new category or to refine an existing one. Someone from Connecticut driving in Boston may soon learn to form the category of "Massachusetts driver" and to be more prepared for unannounced maneuvers than would be necessary when encountering typical drivers in other places. Notice that this process of typification is very much akin to the business of following paradigms -- which are typified behavior patterns -- and qualifies in general as an account of the generation of mental models.

In some respects, it should not be surprising that Schütz's approach appears so congenial to -- indeed, has in many ways anticipated -- that of modern-day writers like Lane, *et al.*, Denzau and North, Vanberg, and Choi. For it is arguably characteristic of these recent contributions that they have brought to the problem of economic behavior insights informed by what is broadly the tradition of phenomenology. For example, the analysis of Lane, *et al.*, is strongly impressed and informed by the Dreyfus critique of artificial intelligence, which develops and relies on the idea of expert behavior. But Dreyfus's sources are similar to those of Schütz. "As Husserl saw," he writes in attacking the possibility that intelligence could be built up from a system of context-free explicit rules, "intelligent behavior also presupposes a background of cultural practices and institutions" (Dreyfus 1979, p. 36). In other words, intelligent action presupposes a Schützian stock of knowledge: "intelligence requires understanding, and understanding requires giving a computer the background of common sense that adult human beings have by virtue of having bodies, interacting skillfully with the material world, and being trained into a culture" (Dreyfus 1979, p. 3). It goes without saying that Polanyi's theory of tacit knowledge and Kuhn's account of paradigms are also both in the same intellectual tradition as Schütz.

There are doubtless many reasons why, despite his obvious usefulness to the enterprise, Schütz does not appear on the radar screens of those who nowadays seek a new model of behavior in economics. But some of those reasons have to do with intellectual boundary-drawing, both then and now.

Schütz's account of behavior in the everyday world has been embraced widely within sociology, including by those who are critical of the traditional economic approach to explanation. Yet, as Prendergast (1986) argues, Schütz was in fact an ardent defender of the Austrian tradition in economics and of the possibility of "rational" models of economic behavior. Hartmut Esser (1993) has tried to reconcile this apparent contradiction (or, at any rate, to reclaim Schütz for rational choice) by arguing that Schütz's depiction of behavior is in fact consistent with rational-choice models. On the one hand, he claims, Schütz's account of conscious action is consistent with the tenets of subjective expected-utility (SEU) theory, an assertion that would seem a bit strained in light of Schütz's dislike for "spatial" models of choice. (SEU theory is nothing if not a spatial model of choice.) On the other hand, however, Esser notes quite correctly that much of Schütz's theory of behavior in the world of everyday life -- including the use of skills, routines, and recipes -- is consistent with a "soft" model of rational choice in which we take account of costly information, etc. I agree with Esser on this point -- so long as the intent is to broaden rational choice using the Schützian research program rather than to bottle Schütz back up within rational choice.

In the end, I believe, Schütz (like Mises) would not have wanted to place the analysis of the life-world within the sphere of rational behavior. The "ideal of rationality," he writes, cannot "be a methodological principle of the interpretation of human acts in daily life" (Schütz 1943, p. 142). In economics -- as distinguished from general sociology, or perhaps even from non-scientific inquiries -- we must use highly abstract or anonymous ideal types rather than the more concrete types; and these types must be strictly rational: "The ideal type of social action must be constructed in such a way that the actor living in the world would perform the typified act if he had a clear and distinct scientific knowledge of all the elements relevant to his choice and the constant tendency to choose the most appropriate means for the realisation of the most appropriate end (Schütz 1943, p. 148). In other words, the realm of economics is limited to what Hayek (1937) called -- critically -- the Pure Logic of Choice.



One may argue about how big that realm really is.<sup>(31)</sup> But the point is that the demarcation issue is not obviously one that should concern us today. We no longer need to have the same preconceptions about what constitutes "theory" or "science" as had the inter-war Viennese. The real problem is to find an appropriate and progressive model of behavior for the kinds of problems that interest us. The Schützian account of behavior in the everyday world -- and its present-day reformulations -- are good candidates.

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### Notes.

1. Which are conceived of as ideal types. I return to this point below in the context of the representative agent.
2. For an excellent discussion of Popper's principle and the debates surrounding it, see Caldwell (1994).

3. The English School, including Jevons and Edgeworth, also thought in terms of mathematical optimization, but their approach was underpinned by utilitarian psychology.
4. There is at least one other strand of criticism of the assumption of self interest, one in which self-interested behavior is contrasted with some kind of rule-following behavior. For example, Sen (1976) uses language that suggests he is contrasting what is in the end rule-following behavior with "rational egoism." But, as we will see in detail below, rule-following (or non-deliberative behavior generally) is not opposed to self-interested behavior but rather to case-by-case behavior. One can follow rules that serve one's purposes or are even in one's narrow interest. Nor is it necessarily the case that following ostensibly altruistic rules leads to altruistic outcomes: as my colleague Doug Heckathorn (1991) has shown, there exists an "altruists's dilemma," analogous to the more-famous prisoners' dilemma, in which following apparently other-regarding rules makes all parties worse off.
5. Of course, we may interpret some of the criticism of self-interested behavior (whether in its descriptive or in its normative guise) as actually an attack on the kind of complex society that makes simple altruistic behavior problematical. Such critics often prefer a return to simpler closed societies of face-to-face contact in which we are much more likely to be able to predict correctly the effects on others of our actions.
6. In an important sense, "information" is always parametric, in that, to be informative, a signal must fit in with some existing structure of knowledge (Langlois 1983).
7. A term from Nelson and Winter (1982, p. 46).
8. An exception is Kirman (1992).
9. In their interpretation, as in that of many neoclassical economists, an agent who sacrifices is actually maximizing under constraint of costly information (Jensen and Meckling 1994, p. n).
10. Although it is not made explicit, the notion that agents respond in different ways is consistent with a relatively diverse population of agents rather than a standardized ideal type. The qualitative story would be the same if we allowed some agents to be steadfast rule followers who actually obeyed the speed limit; but these would be REMM agents only to the extent that they did so not because they follow rules for their own sakes but because they followed this particular rule on the basis of conscious evaluation, discovering, for example, that for them the costs of potential sanctions, or the benefits of savings in gas, or even the psychic benefits of conforming to an ideology of fuel conservation outweighed the benefits of higher speed.
11. Even if we can get by with a relatively simple mental model, Jensen and Meckling have nonetheless opened up the Pandora's Box of psychology. If agents are alert, conscious evaluators, then the kinds of evaluations they make -- like calculating the opportunity cost of their time -- have to be plausible. If we believe that they don't literally calculate, then we have to have an "as if" alternative. This needn't be a natural-selection story of the Friedman sort, but could, in this case at least, involve a theory of decision-making or choice as a tacit skill (an idea Friedman indirectly broaches in his famous billiard-player example). I return to this theme below.
12. I mean by this situations in which the marginal incentives to better one's condition do not necessarily lead to a favorable outcome. The famous prisoners' dilemma is a paradigmatic example.
13. A founder of agency theory, Jensen is typically concerned with problems of dysfunctional behavior in organizations. The issue is then how one should advise managers to reform the incentive systems of those organizations. In the larger arena of political institutions with which North is concerned, however, there is seldom a *deus ex machina* available to bring about reform, and understanding the endogenous processes of institutional change becomes much more crucial.
14. For example, to Schotter (1981, p. 11), a social institution "specifies behavior in specific recurrent situations, and is either self-policed or policed by some external authority."



15. "Institutionalization occurs whenever there is a reciprocal typification of habitualized actions by types of actors" (Berger and Luckmann 1966, p. 51). I habitually expect the typical driver coming toward me to stay on the right, and other drivers habitually expect the same of me.
16. On the difference between rules as constraints and rules as principles of action, see Burrell (1967) and Pelikan (1992).
17. Or, better yet, in the Virgin Islands, where the convention is to drive on the left but most of the cars, which come from the mainland U. S., have left-hand drive.
18. John Finch (1996) has recently criticized my earlier discussions of situational analysis (notably in Langlois and Csontos 1993) on the grounds that I focus too heavily on the role of institutions and of the agent's situation in eliminating psychology, thus pushing into the background the issue of cognition as a research question. I'm not sure if this is a fair criticism of the article in question. But I'm quite sure that I actually share Finch's view about broadening situational analysis to include models of cognition. As I will argue below, "allowing cognition in" is in fact consistent with the larger tradition in which Popper's principle is located. As Caldwell (1994) puts it in a related context, the approach from situational analysis can be "an open-ended method of discovery."
19. As we will see, agents arguably respond even to uncertainty by trying to find an appropriate set of rules based on repeated behavior in the past.
20. That is to say, this model of rational choice is consistent with the non-psychologistic account of behavioral rule following.
21. Lane *et al.* are clear that even the *analyst* ought not to conceive of the agent as in a situation of choice. "Moreover," they write of their reconstruction of rational choice, "we do not insist that agents themselves provide explicit calculations of which action to choose. We only require that their actions taken together be consistent with such an explicit analysis provided from 'outside'" (p. 46). This does not mean, however, that their criticism of rational choice is a criticism of situational analysis. Indeed, as I argue below, their alternative is very much a form of situational analysis -- merely one in which the understanding (*Verstehen*, as the German-speaking writers would have put it) of the agent's behavior is informed by an alternative account of action.
22. As I have argued elsewhere ([Langlois 1997](#)), this picture of cognition was anticipated by F. A. Hayek in the *Sensory Order* (1952), a work only lately coming to be appreciated by cognitive theorists (Weimer 1982; Edelman 1987). In a larger sense, it is a view with roots in the empiricist tradition going back to Hume.
23. Although I will not discuss it in any detail, we could also add to this list the attempt by Koppl and Langlois (1994) to understand action in terms of what they call "social games," a notion inspired by Wittgenstein's concept of language games.
24. For Choi, the process of paradigm choice appears to be an agonizing one that the agent always tries to get over with as quickly as possible. Lane *et al.* present what may be seen as a different viewpoint when they talk about "generative relationships" as responses to uncertainty. That is, faced with structural uncertainty, agents may not jump directly to a clear paradigm of action but may choose (deliberately, though not, of course, consciously) to place themselves temporarily in an ambiguous situation whose eventual outcome they cannot predict. For example, expert chess players (those favorite examples of cognitive scientists) often work cooperatively in the early stages of a game to create novel but strategically ambiguous board positions from which one or both can eventually find a clear strategy -- even though such intermediate positions do not fit any preconceived plan or paradigm (Lane *et al.* 1996, p. 60). This is analogous to the conjecture that some kinds of organizational forms, possibly including business firms, might be explained as responses to structural uncertainty rather than to static transaction or other costs. People might organize in a particular way precisely because they don't know which resources or capabilities will be needed in the future (Loasby 1976; Langlois 1984). Choi's notion of a paradigm is, however, probably broad enough to bring the idea of a "generative relationship" under its umbrella.

25. Indeed, Schütz's "phenomenological sociology" is the major inspiration for the now-fashionable idea that, for many purposes, reality is "socially constructed" (Berger and Luckmann 1966).

26. I am not concerned here with whether Popper was influenced by Schütz or even with the extent to which Popper's notion of situational analysis is the same as that of Schütz. That would be a major study on its own, and one irrelevant to the arguments here. Suffice it to say, however, that Schütz and Popper were of the same generation of Austrian intellectuals and were acquainted with one another in Vienna between the wars. Both men attended the meetings of the Vienna Circle after 1928, where they were both considered "the loyal opposition" (Nagel 1978).

27. This view of action and time was widely shared by the Austrian writers. For example, Mises himself endorsed a Bergsonian view: "Action aims at change and is therefore in the temporal order. Human reason is even incapable of conceiving the ideas of timeless existence and of timeless action" (Mises 1949, p. 99). Notice also that Mises titled his famous treatise *Human Action*, not *Human Choice*.

28. Presumably both "skills" and "useful knowledge" would be counted together as examples of expertise in the terminology of Lane, *et al.*

29. See also the typology of Cohen, *et al.* (1996, pp. 663-64), which runs from (1) routines in the narrow sense to (2) rules of thumb to (3) heuristics and strategies to (4) paradigms and cognitive frameworks.

30. Technically, such an oncoming driver would be an example of what Schütz called a course-of-action type. For a comprehensive discussion of Schütz's theory of typification, see Natanson (1986).

31. This demarcation criterion for economics influenced the discussion in the famous marginalist controversy of the mid twentieth century, especially the arguments of Fritz Machlup, who was a close friend and staunch disciple of Schütz. As [Langlois and Koppl \(1991\)](#) argue, Machlup successfully defended marginalism, but in so doing painted it into an extremely tiny corner -- basically Marshallian partial-equilibrium comparative statics. (Cf. The discussion of "soft" rational choice above.)