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Abstract

An underappreciated aspect of F.A. Hayek’s mature views about rationality is the inter-relation of the “pure logic of choice” and rule-following behavior. Sometimes it is asserted that Hayek abandoned his earlier understanding of individual rationality and replaced it with a completely rule-oriented conception of decisionmaking. In fact, however, the analysis in Hayek’s Sensory Order gives us the framework in which the relative roles of explicit choice-logic and rule-following can be discerned. Furthermore, this framework also shows that his fundamental conception of individual rationality is pragmatic, contextual, modifiable, and ecological. While standard neoclassical economists were axiomatizing the explicit logic of choice, Hayek was decades ahead of these economists in understanding the nature of decisionmaking outside of completely artificial worlds in which there are no cognitive limits and in which the structure of the environment is simple. This article attempts to lay the foundation for an integrated understanding of Hayek’s pragmatic rule-following rationality and the “ecological rationality” of Gerd Gigerenzer and other researchers.

There has been much discussion recently relating Hayek’s concept of evolutionary rationality to modern developments. In particular, Vernon Smith (2008) has stressed the compatibility of his own experimental research program with the fundamental ideas of the Scottish Enlightenment and, in particular, with Hayek’s interpretation of these ideas. There can no longer be any doubt that under the right set of institutions relatively ignorant individuals can generate overall orders of impressive complexity.

My task in this paper is to probe more deeply than previously into the nature of individual decisionmaking as it is conceived in the broad Hayekian perspective. In particular, I want to show that Hayek’s early problems with the pure logic of choice are consistent, through the ideas of The Sensory Order (1952), with his later emphasis on rule-following. Hayek came more and more to see the problems with a purely Cartesian (deductive) analysis of choice during the period when other economists were developing and perfecting an axiomatic approach to
This axiomatic framework imposes mathematically simple but cognitively demanding structural criteria on “rational choice.” It gives us a universal calculus that enables the agent to make putatively good choices in a wide array of situations if it were to have knowledge it is unlikely to have. Today’s behavioral economics\(^2\) accepts the normative or prescriptive status of the rational choice axioms while rejecting their descriptive accuracy.\(^3\) Thus the *ideal* of rationality, in both the standard and behavioral approaches reflects its formal axiomatic basis and abstracts from the content of the problem situation, the structure of the environment and the limitations of human cognition.

The contrast between Hayek’s rule-following and the choice-optimizing research programs is very important for understanding modern developments, especially in behavioral economics. It also shows the deep affinities between Hayek’s foundational work and the “ecological rationality” framework of psychologists like Gerd Gigerenzer (2008). Although I concentrate on Hayek’s contributions, the groundwork is laid to show the strong Hayekian aspects of the ecological understanding of individual rationality.

Prelude: The Pure Logic of Choice

Hayek first expressed his difficulties with what he called the “pure logic of choice” in his article “Economics and Knowledge” (1937) and thereafter in many subsequent places. By this term he meant the traditional non-axiomatic conception of rationality derived from the work of Walras, Pareto and others.\(^4\) The pure logic of choice has two aspects. The first is the basic idea of purposefulness. Human behavior is purposeful. This is not only an assumption we make in most of the social sciences, especially economics, but it is also the basis of our interaction with each other in society. The idea that people have desires and beliefs and behave to achieve purposes

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\(^1\) For Hayek, this is the period beginning in 1937, the date of the publication in *Economica* of “Economics and Knowledge” and 1973, the date of the publication of volume 1 of *Law, Legislation and Liberty*.

\(^2\) By “behavioral economics” I mean the heuristics and biases literature applied to economics.

\(^3\) Nevertheless, some behavioral economists are reluctant to give up the axiomatic approach even when it comes to descriptive purposes. They are attempting to develop a framework with “behavioral axioms” (Bernheim and Rangel, 2009).

\(^4\) They are exemplified by the equimarginal principle: the marginal rates of substitution between any two commodities or factors must be the same in all their different uses (Hayek, 1945 [1948], p. 77)
relative to these is sometimes referred to as “folk psychology.” It is the elementary psychological insight that we all use in everyday life.

The second aspect goes far beyond the first in postulating a quasi-omniscient agent who behaves in an optimizing manner in a world of perfect markets. This agent might be referred to as a Cartesian agent. Such agency is described in another context by Hayek as “purposive action based on conscious insight into the relations between cause and effect, or what Professor Gilbert Ryle called ‘knowledge that’” (Hayek, 1971 [1978], p. 291). Nothing of importance needs be changed in this brief description if we adapt it to include agents in a von Neumann-Morgenstern (1944) world of expected utility maximization. A Cartesian agent can fit perfectly in such a world in which its tastes are given, the possible states of the world are given, and the probabilities associated with each course of action are given. The agent consciously knows that if it does X it will produce a particular mathematically expected result with no ambiguity.

Therefore the pure logic of choice in its more comprehensive meaning refers to the rational agent’s deliberate coordination of its various actions, and not just to the general idea of purposefulness. The agent is purposeful not only action-by-action but also in an integrated way – it develops a series of intended actions that cohere given its perceptions and forecasts about the world. It engages in planning. The assumptions that the planning data are given and that the agent has no cognitive or computational limits enables the economist to close the system. The agent’s problem is mere computation. So what does Hayek find wanting in this pure logic of choice?

In his earlier, more strictly economics-related work, his criticism was that this logic is silent about how the agent’s fulfillment of individual rationality requirements results in actions or plans coordinated with those of the other members of society. The solution to this problem requires empirical hypotheses about the transmission of knowledge in society which standard economics did not provide (and still does not provide). Agents need to discover the lowest cost methods of producing particular goods in particular locations; they need to discover transient local conditions that offer either higher prices for sellers or lower prices for buyers; and they need to discover, as would be emphasized later by Kirzner (1973), arbitrage opportunities.
All of this means “simply” that the pure logic of choice needs to be supplemented by empirical hypotheses, but not that there is something fundamentally wrong with it.\(^5\) It is instructive that Hayek seems to believe that the pure logic of choice, at the purely individual level, is not problematic (1937). The \textit{ex ante} coordination of the individual’s actions as part of a single individual plan is a truism.\(^6\) All rational agents are intra-coordinated within the framework of the pure logic of choice.

Ultimately, however, Hayek would make a more penetrating criticism. At the most fundamental level, “[m]an is as much a rule following animal as a purpose seeking one” (Hayek, 1973, p. 11). Rule following, rather than Cartesian optimizing, is made necessary by at least two facts: (1) We live in a world of uncertainty and not in a risky, games-of-chance world and (2) Our minds have limited capacities to know and to compute. And yet through a process of trial and error, cultural and biological evolution, human beings have developed amazing adaptive know-how in both achieving conscious goals and in producing outcomes that increase the chances our species survival.\(^7\)

\textbf{Cartesian Reason: Characteristics and Limits}

Rationality has two inter-related aspects. The first is often referred to as theoretical rationality and applies to beliefs. The second is practical rationality and applies to actions. When an agent decides on a certain course of action its beliefs are involved, but in this case the ultimate standard of the acceptability of those beliefs is whether they enhance the efficacy of action. If belief in witches, for example, in a certain social context advances either the ends of social order or an individual’s own ends, a good case can be made for the rationality of that belief.

\(^5\) Hayek says that the source of confusion is taking the \textit{ex ante} coordination of a single individual’s actions in the form of one coherent plan and simply assuming that the social engineer must solve a similar interpersonal problem in aggregated form. Compare Hayek in “Economics and Knowledge (1937 [1948], pp. 35-37) and “Use of Knowledge in Society” (1945 [1948], p. 77). This is “not the economic problem which society faces” (p. 77). The key difference is that there is no single social mind that possesses all of the relevant facts.

\(^6\) However, if the individual later perceives that his initial assessment of the facts was wrong his initial plan will no longer be coordinated. The identity of \textit{ex ante} and \textit{ex post} individual coordination is not a truism.

\(^7\) I am not here interested in Hayek’s particular concept of cultural evolution and his related notion of group selection or in the precise process by which these rules come into existence. I am mainly interested in describing the nature and functions of the rules he argues human beings display in their actions. Nevertheless, as we shall see below the character of the rules he infers is connected to the process of group selection.
Cartesian practical rationality is modelled after a conception of pure theoretical rationality. Logical deduction from explicit true premises is the basis for action. Action must be “determined entirely by known and demonstrable truth” (Hayek, 1973, p. 10). As we have seen, implicit in this conception of practical rationality is an integrated relationship between the agent’s beliefs about the world, its own preferences and the deduced course of action designed to maximize the satisfaction of its preferences. When we modify the perspective to take account of a risky world nothing in the deductive method needs to change. As Arrow and Hahn showed the method is sufficiently versatile to accommodate risk (Arrow and Hahn, 1983). In this way, the impression is given of a universally applicable method of rational decisionmaking.

Rationality in this sense “demands complete knowledge of all the relevant facts” including probabilities. “But the success of action in society depends on more particular facts than anyone can possibly know” (Hayek, 1973, p. 12). One way in which the agent can utilize knowledge to which it has no access and no awareness is, of course, through the price system. Hayek emphasized this method in “The Use of Knowledge in Society” (1945). Agents can take into account relative scarcities in a very mechanical way if they are dealing with equilibrium prices. When viewed from the perspective of an individual in an efficiently functioning market, the individual is still capable of acting as a (modified) Cartesian rationalist.

However, the knowledge required for people to act in the real world is not limited to what can be explicitly known even if it is supplemented by market prices. There are other vital pieces of knowledge that are required (O’Driscoll and Rizzo, 2015). For example, market prices are not always in equilibrium and so people may need to “outguess” the observed prices. Furthermore, individuals need to process the information they receive. They use often tacit methods for learning or making inferences which do not require perfect computational or inferential ability, or the acquisition of all of the relevant facts. In this perspective, quasi-omniscience is not a requirement of successful action.

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8 …[M]en are in their conduct never guided exclusively by their understanding of the causal connections between particular known means and certain desire ends, but always also by rules of conduct of which they are rarely aware, which they certainly have not consciously invented…” (Hayek, 1970 [1978], p. 7)
None of this implies that Hayek, in his later work, gave up the idea that the conscious use of means to attain ends has an important role in individual decisionmaking. While Hayek does not precisely define or locate its role, it is clear that his view concentrates the role in what Leonard Savage and others have called “small worlds” (1954). The standard economics conception of decisionmaking will have a significant role in those areas where “our acquaintance with the particular circumstances is sufficient” (Hayek, 1970 [1978], p. 8). Outside of small worlds, rules will often provide the framework of individual purposiveness. The rules will provide a “general schema which is then adapted to the particular circumstances” (Hayek, 1962 [1967], p. 56). Furthermore, the rules will constrain the options among which deliberate choice is required “[b]y eliminating certain kinds of action altogether and providing certain routine ways of achieving the object” (p. 56).

The Pragmatic View of Rationality

The standard view of the rationality of action is fundamentally an adaption of theoretical rationality. It is the rationality of thought compressed into an abstract theoretical framework. It is intended to be universally applicable.

In this section I want to examine the pragmatic nature of Hayek’s conception of rationality as elaborated in his later work. To understand this we must first appreciate the sense in which a very “low-level” life form like a cell or a worm “knows” what to do. We say that the worm knows what to do if, in a given environment, it does what is necessary to find food, preserve its life and reproduce. Granted: human beings are not worms or individual cells. Nevertheless, we can “know” the right thing to do in the given or projected circumstances even when we are not conscious of the rules we are following. We can do better than we can explicitly know. This emphasis on implicit or tacit knowledge makes clear that the ultimate standard of practical rationality is success in attaining the relevant ends. The “knowledge of the world” that individuals acquire are “rules of conduct adapted to the environment and acting like information about the environment although they do not say anything about it” (Hayek, 1970 [1978], p. 10).
We can contrast theoretical rationality with practical rationality when we try to understand the function of “myths” or “errors” in the attainment of important social or individual ends. Let us examine two examples. First, consider the beliefs of the Azande, an indigenous people of the Sudan, who have been studied by many anthropologists, most notably E. E. Evans-Pritchard (1937) and, more recently, by the economist Peter Leeson (2014). Without going into detail, the Zande people use their belief in oracles and witches to settle relatively small disputes among themselves. This set of beliefs and derivative practices work to produce efficient dispute resolution when the use of more formal and elaborate methods would be, for them, too expensive. Clearly, no scientist who uses the accepted canons of theoretical rationality would believe in witches and oracles. And yet the system of belief improves the welfare of the Azande. Even more important for our purposes here, the theory the Azande use about the origin of witches contains a contradiction. They believed according to one interpretation:

Witchcraft is an inherited trait through same-sex descent. Every line of same-sex descent has one proven witch. But not all Azande are witches. And yet, by deduction, all Azande must be witches. The empirical evidence that the Azande acknowledged was that some suspected witches were not in fact witches. Evans-Pritchard confronted the Azande with this contradiction and they accepted it. But they did not care. Why? In the practical application of their system of thought the contradiction played no role. It was purely of theoretical interest.

Second, let us take the more mundane issue of people being overly-optimistic about the efficacy of their own behavior. This is a case of what might be considered a biased belief – not quite “irrational” in the sense of the Zande mythology but an error nonetheless. Notice, however, what calling an expectation overly-optimistic entails. We must assume either that there is an objective probability of a person’s intended course of action resulting in success or that there is a unique rational degree of belief in the success of his action. Once we leave the small, but comfortable, world of repetitious games, it is unclear where these would come from. Let us put this aside for the moment. Suppose a person’s expectations of, say, his ability to stop
or reduce a bad habit are excessive, that is, he estimates a greater chance of success than he “should.” It could, and has been argued, that such a person will spend too little on dieting assistance or on setting up constraints on his future eating behavior (“Don’t go to that restaurant with the free dessert bar.”). On the other hand, optimism can spur a person on to better behavior than otherwise by improving the person’s self-image and feeling of control. In this case, expecting or “wishing” can make it so. Thus whether a belief is justified from a pragmatic perspective will depend on its effects.

These are just two of many examples that can be adduced that show the difference between Cartesian practical rationality and pragmatic rationality. Pragmatic rationality is contextual, sensitive to the limitations of factual knowledge, and cognizant of the limits of human deductive and statistical abilities. Above all, its ultimate standard is the success of the agent’s actions.

Uncertainty vs. Dispersed Knowledge

Hayek’s early view of the incompleteness of the pure logic of choice was not based on uncertainty of the future but on the dispersed or fragmented quality of knowledge in society. The individual’s problem is to coordinate his plans with those of others who are likely to have different knowledge than he does. From the individual perspective, there is uncertainty about what others know and do, but the knowledge is “out there” and needs to be mobilized for the use of all agents. Hayek later recognized that this was not the most fundamental problem (Hayek, 1965 [1967], pp. 90-92). The fundamental problem starts at the individual level: “[T]he need of abstract rules [is] for the co-ordination of the successive actions of any man’s life in ever new and unforeseen circumstances” (Hayek, 1965 [1967], p. 91). This is the problem of the coordination of the
individual's various actions in a world in which the future is not knowable. In such a world we cannot decide all of our particular actions in advance (p. 90). They cannot be pre-reconciled.

It is not easy to discern how precisely Hayek conceives of uncertainty. One hint is his endorsement of the term “hypothetical predictions” when discussing the role of theory in the explanation of complex phenomena especially of society and mind (Hayek, 1964 [1967], p. 29). These are “predictions dependent on yet unknown future events” (p.29). For example, both the economist and the agent might be able to predict that if a new technology in the telecommunications business is successful that this will create dislocations (or opportunities) in the transportation business as people shift from traveling to remote communication. And yet the success of the new technology itself will be difficult to predict, not only because of its economic aspect, but also because the future course of technology is uncertain.

*Given* certain events, others may be predictable to some degree, especially to those individuals whose “attention” has been drawn to a particular area (Hayek, 1952a, p. 140). Furthermore, since individuals have the same mental structure and follow similar rules of behavior in similar situations, the reactions of others to possible events can often be predicted. What can be predicted is not a series of precise events, however, but some general category or pattern of responses. This is because social phenomena are complex. We do not know, even in principle, all of the parameters and variables that determine future events. Equally importantly, we cannot assign even approximate values to many of the factors that we know have a role. This is true obviously for relevant physical events (e.g., whether it will rain one month from now). But it is especially true for the particulars of human behavior. Even where people are behaving according to convention, the precise form their behavior will take will be dependent on facts that only they know.

It is unfortunate that Hayek did not discuss (as far as I am aware) Frank Knight’s (1921) distinction between risk and genuine uncertainty. Nevertheless, we can glean from Hayek’s

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9 While Hayek does not explicitly say so, we cannot decide all actions in advance *even contingently* as in the adaptation of general equilibrium by Hahn-Arrow-Debreu. Hayek’s world is not one big game of chance.
ideas on the limits to explanation in the social sciences something of how he saw the agent’s problem in facing an unforeseeable future. If the individual’s or firm’s problem is anything like the social scientist’s problem, then the “model” used to anticipate relevant future will be incomplete in several respects. First, it will not capture all of the possible outcomes something genuinely new could happen. In simply ruling out certain events or conjunctions of events, there is much else that remains unaccounted for. Second, it will not be able to assign objective probabilities to those possibilities conceived not only because the set is incomplete but also even an accurate stochastic model of future events is an enormous task in any interesting case.

For these reasons the consistency or rationality of individual behavior is not to be found at the level of specific actions but at the level of the application of rules. When fine-tuning of actions is out of the question, “[t]he only manner in which we can in fact give our lives some order is to adapt certain abstract rules or principles for guidance...in our dealing with the new situations as they arise” (Hayek, 1965 [1967], p. 90).

It follows that the coordination of an individual’s actions as part of a plan no longer has the standard cast derived from the pure logic of choice or from the more recent axiomatic choice theory. The specific actions taken by the individual are not necessarily related by the standard properties of transitivity, consistency and so forth. Furthermore, the consistency of actions is not to be found in the (mis)application of static criteria to successive actions in time but to rules that constrain the individual’s options through time. To say that the individual’s particular actions are “rationalized” by reference to a rule that works is not to say that there is only one applicable rule. A more precise statement would be that the individual is following a hierarchy of rules, that is, a system of rules of “different degrees of importance” (Hayek, 1965 [1967], p. 91). If a given rule is perceived or expected by the individual to produce poor, counterproductive or indeterminate results, the individual may shift, in a specific order, to the

10 “Our actions form a coherent and rational pattern, not because they have been decided upon as part of a single plan thought-out beforehand, but because in each successive decision we limit our range of choice by the same abstract rules”(Hayek, 1965 [1967], p. 90).
other rules. When Hayek refers to individuals “rigidly adhering to rules” he means adhering to a system of rules and not to any single rule.\textsuperscript{11}

Contextual Rationality

By the contextual nature of rationality I do not mean the plugging in of specific values into a universal algebra of decisionmaking or learning. In Hayek’s work it means, for example, that the very method of learning is dependent on content, the understanding of the agent, and the purposes relative to the learning.

Content is important because certain cues in the environment will work for certain problems and not for others. For example, the recognition heuristic (choose the object you recognize and not the other) may work to satisfy a certain criterion when, drawing from a random sample, you recognize one object and not the other. So if asked which city of a pair has the larger population, the recognition heuristic will lead the agent to the correct answer most of the time (Gigerenzer, 2008, pp. 24-27). Accurate cues are important because they enable the mind to extend its reach farther than it could if it were required to process all of the relevant data, most of which it does not and cannot possess.

The understanding of the agent is important because events or actions can be classified in many ways. To discover the rule an agent is following, it is important to know the classification.\textsuperscript{12} For example, suppose we are interested in whether an agent has intransitive preferences. Consider a dinner party of polite people (Sen, 1993, p. 501). You are a guest and you are going to be offered some fruit. Before being offered anything, you check your “complete preferences.” As between a large apple and an orange you prefer the large apple;

\begin{itemize}
\item \textsuperscript{11} It seems clear that Hayek is influenced here by the common law method which does not involve rigidly classifying a pattern of facts under the rubric of a single legal rule. The common law method is to use a set of rules to determine the outcome of a case.
\item \textsuperscript{12} “Unless we can understand what the acting people mean by their actions any attempt to explain them, i.e., to subsume them under rules which connect similar situations with similar actions, are (sic) bound to fail” (Hayek, 1952b, p. 31).
\end{itemize}
between an orange and a small apple you prefer the orange. These are your relevant binary preferences since you know no other fruit is available. So now your host appears with one large apple and one small apple. Now you once again check your binary preferences. You think: I cannot take the large apple. That would be impolite as it would leave only the small one for the other guest. So you prefer the small apple. Manners are preserved but you are “irrational” since transitivity would imply that you prefer the large apple.

This problem arises because the economist is looking at physical objects alone and not the significance they have in a particular context. The relevant object of choice can be viewed, consistent with the agent’s understanding, as a composite commodity: fruit plus adherence-to-manners. Now there is no question of intransitivity because the composite large apple is not the same in each case in which it could be chosen. Whether a rule (transitive preferences) is violated or whether it is followed cannot be determined without attention to the agent’s own classification of objects.

The purposes of the agent determine, in large part, what it learns and even more fundamentally what it perceives about the world. For example, when subjects are presented with what appears to be a straight-forward logical problem, they may not give the “correct” answer because their pragmatic interests do not align with the logical structure of the problem.

Let us suppose that subjects are given a rule: If a previous employee gets a pension from a firm, then he must have worked for the firm for at least ten years. They are asked how they would go about testing if the rule has been violated (Gigerenzer and Hug, 1992). The subjects are given four cards, each representing one worker. The cards are \( p \) (got a pension), \( q \) (worked for ten years), not-\( p \) (did not get a pension), and not-\( q \) (worked for eight years). The other unseen side

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13 The “needs and wants” create “not only a disposition of the organism toward a certain class of actions, but also a special receptivity for certain classes of stimuli” (Hayek, 1952a, p. 97). This receptivity or “anticipatory excitation” will mean that the organism “will perceive them [stimuli] from a certain angle or a certain ‘point of view’; we shall discriminate them more fully with respect to certain types of responses toward which the whole organism is disposed at the moment” (p. 140).
of the card reveals the $p$ or $q$ status of the worker. Which cards are both necessary and sufficient to turn over to make a determination that the rule has been violated?

The logically correct answer is to turn over the $p$-card (got a pension) to see if on the other side there is a not-$q$ (worked for eight years). The other card that must be turned over is the $q$ card to see if someone who worked for ten years did not get a pension (not-$p$). Either of these outcomes would falsify the rule.

And yet the correct answer from a pragmatic perspective depends on the purposes of the agent. Suppose the subjects are divided into two classes. One is told to take the perspective of the employee; the other the perspective of the firm. A pension is a benefit to the employee and a cost to the firm. The task both groups were assigned is to determine whether the rule had been “violated.” Note that in this version of the test no-one is interested in the purely logical result per se. In fact, no one is interested in whether the rule has been violated in the logical sense of falsification. What each party is interested in is whether there has been violation in the sense of cheating.

For the employee, the relevant cases are $q$ (worked for ten years) and not-$p$ (did not get a pension). These just happen to be the correct answers from the perspective of the disinterested logician-observer of the rule. On the other hand, viewed from the perspective of the employer, the two relevant cases are not-$q$ (worked for eight years) and $p$ (got a pension). Both parties, however, are interested in the categories “benefit accepted” and “requirement not satisfied.” For the employee the benefit accepted is $q$ (working is a benefit to the employer) and the requirement not satisfied is not-$p$. For the employer the benefit accepted is $p$ (a pension is a benefit to the employee) and the requirement not satisfied is not-$q$. Analysis based on the interests or purposes of each party predicts the differences in answers. It is not that one party is rational (logical) and the other party is not. It is simply that the relevant context is different between the cases. Actual experimental results were consistent with this perspective (Gigerenzer and Hug 1992).
Gradations of Consciousness

Thus far we have seen that in a world of uncertainty the agent is not purely purposive and that it follows rules that are, in great measure, unconscious. When we contrast Hayek’s earlier work as a “narrow” economist with this later view, we may see some sharp contrasts. But I do not believe that this is a fruitful way to look at Hayek’s work because dividing Hayek’s work sharply misconstrues badly the underlying phenomena he was struggling to understand. We must remember, for example, that the essential ideas of The Sensory Order predate its own publication in 1952 to Hayek’s student days in the 1920s. Furthermore, Hayek was drawn back to ideas regarding the mind and rule-following behavior by his interest in the logical problems of the social sciences.  

What does it mean to follow rules “unconsciously”? Hayek, quite reasonably, avoids trying to define “conscious” or “unconscious” precisely. He uses our intuitive understanding to contrast the kinds of mental behavior that can be ascribed to the one condition or the other. The first thing to understand, however, is that there are gradations of consciousness. Even operations of the mind that seem fully conscious have a foundation or, perhaps, a fringe of unconscious rule following. For example, solving a series of differential equations – surely a “conscious” activity – presupposes, especially in the experienced mathematician, much that has become unconscious, implicit or even intuitive. The mathematician need not explicitly go through every component step in the process to get the solution. He need not re-derive all of the rules and techniques of the calculus. Similarly, we may make certain framework assumptions that are not explicit – say, that we are in a closed room or that we are dealing with a closed physical system.

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14 In the Preface to The Sensory Order, Hayek says of his movement from theoretical psychology in his students days to economics and back again: “But though my work has led me away from psychology, the basic idea then conceived has continued to occupy me; its outlines have gradually developed, and it has often proved helpful in dealing with the problems of the methods of the social sciences. In the end it was concern with the logical character of social theory which forced me to re-examine systematically my ideas on theoretical psychology” (1952a, p. v).

15 “There can...be little question, although in extreme instances the difference between conscious and unconscious mental events appears to be so complete as to make the difference appear to be one of kind, that there exist many forms intermediate between fully conscious and fully unconscious mental events which make the difference one of degree” (Hayek, 1952a, p. 134).

16 “Conscious experiences have in this respect justly been compared to mountain tops rising above the clouds which, while alone visible, yet presuppose an invisible substructure determining their positions relative to each other” (Hayek, 1952a, p. 139).
Let these assumptions be challenged and suddenly what was unconscious moves into greater consciousness (Hayek, 1952a, p. 138).

Hayek says that the mental events of conscious thought, however, tend to have certain specific and differentiating characteristics. I shall briefly list them here.

Conscious mental events in comparison with unconscious mental events are (Hayek, 1952a, pp. 132-146):

i. More fully discriminated from each other and perceived in greater detail;
ii. More “unified” in the sense that one conscious event or process “takes account” of the others;
iii. Determined not merely by current perceptions but also by those images “evoked” by the existing situation and, relatedly, what the agents expects on the basis on the existing situation;
iv. Organized in a definite position in a common spatial and temporal order. This includes conscious memory and conscious expectations;
v. Highly purposive and modifiable;
vi. Limited, that is, the agent has a limited capacity for conscious thought.

If we think of the pure logic of choice, especially in its formalized general-equilibrium risky-world version, we will see a definite relationship with Hayek’s conception of conscious mental events. All of the agents in such a world have clear and distinct options before them. The options or courses of action have associated expectations about their consequences. The various decisions of the agent are integrated in the sense that they fit a coherent plan. The distinctions (classifications) of the agent are purposive, that is, they are what it needs to know (and only what it needs to know) to optimize. The system is integrated or composable; if any data change all of the decisions will change. These features serve to mark off a limited domain in which standard axiomatic decisionmaking is possible. Thus Hayek’s characterization of conscious mental events is the key to understanding both the place of the pure logic of choice and why it is not the whole story of human decisionmaking.\footnote{Thus, for Hayek, Mises’s “praxeology” (Mises, 1949) cannot be a general theory of human decisionmaking. Praxeology is the study of the conscious adaptation of means to ends.}
We ought now to remind ourselves of the general point: “Fully” conscious mind is an ideal type rather than something which has an exact counterpart in reality. Therefore, depending on the degree to which the above listed requirements of consciousness are satisfied, a pure logic-of-choice analysis will more appropriate or less appropriate to the problem situation of the agent. When the pure logic is not appropriate, the particular rules agents will follow will depend on the relevant circumstances. By “circumstances” I mean both “the structure of task environments and the computational capabilities of the actor” (Simon, 1990, p. 7).\(^1^8\) I believe that this is Hayek’s general view as well.

It is a constant theme in *The Sensory Order* that the mind classifies and orders stimuli according abstract categories, and builds models of the relevant environment. These abstractions and model adjust, though not instantly, to the inputs inconsistent with the model. The same is true for conscious thought, but in that case the model must respect the limits of conscious mental effort in adapting to the structure of the environment in accordance with the agent’s purposes.

Unconscious Rules

If consciousness comes in degrees then rule-following may be more or less conscious. Hayek, it is quite true, strongly emphasizes unconscious rule-following. But emphasis is a pragmatic matter. In most of his work he was trying to counter the almost-universal trend of Cartesian rationalism. Nevertheless, the logic of his position in *The Sensory Order* does not in any way preclude conscious rule-following. This is almost self-evident once thought is given to the nature of rules.

As I said above, even a mathematical proof has certain implicit (non-conscious) aspects especially for the experienced mathematician. So we must ask at what *level* is a rule conscious or unconscious? A person may know that he is following a particular rule. He may know its *function* (purpose). He may have knowledge of why it works to achieve a certain function. These are not all at the same level. For example, I may know that I am following the “recognition rule” without knowing its function or why it works. Or I may know its function but

\(^1^8\) See also Gigerenzer (2008, p. 7) for discussion of “bounded rationality”
not know why it works. Some aspects of rule-following may be explicit and conscious while others may be implicit and unconscious. In either case, rules reduce cognitive load by reducing the number of factors that need to be taken into account in decisionmaking.

Rules, as we have seen, help us deal with large worlds or open systems. This is not to be confused (as a superficial reading of Hayek may suggest) with the claim that the world requires only unconscious rule-following.

Gradations of Purposiveness

Hayek often makes a distinction between purpose and function (Hayek, 1973). Purpose, strict speaking, implies conscious adjustment of means to ends. Function need not require the conscious adjustment of means to ends. Nevertheless, it does imply the adjustment has at least partially been made. Of course, “blind” natural selection could do the job.

Purposiveness is thus related to consciousness. As such they each come in degrees. A person in a state of clearly and precisely directed attention will be conscious and purposive to the highest degree (Hayek, 1952a, p. 139). But even here there will unconscious elements. This is inevitable and may be the explanation for Hayek’s concentration on unconscious rule following: It is always with us.

Why certain mental events or processes come to consciousness while others do not is not clearly explained in Hayek’s work. Yet one aspect of this phenomenon bears emphasis and sheds light on the inter-relation between the mind and environment. If an environment is consistent with the underlying picture (model) that the agent has the rules could well be omitted from conscious examination. The responses of the agent to this environment can be handled by rules that are routine and require little new evaluation or even attention. They fade into the background and leave room in the limited space of conscious thought for responses to unexpected stimuli (Hayek, 1952a, p. 141). When expectations – whether explicit or implicit – are disappointed it may happen that the particular behavior comes to consciousness. “Wow,” says the agent, “what is this? I never thought the ground under me was made of sand. I never thought this behavior would get such a bad response or outcome.”
Not all disappointments reach such a high level that the re-evaluation of the rule must occur at the level of consciousness. The mind is sufficiently adaptive to switch to different rules or modify existing rules even slightly to reestablish an equilibrium of expectations. Similarly, the cure for disappointed expectations need not be employing the pure logic of choice, at the one extreme, or new purely unconscious rules, at the other. The agent could decide to adopt explicitly a rule of choice or of factual discovery that it imitates from the apparently successful behavior of others. Moreover, the agent could even discover what was insufficient in previous rules and explicit replace those features. The individually disequilibrating aspects of inadequate rules may bring matters to consciousness but that, in itself, does not determine the nature of the solution.

Individual Purposes or Group Purposes

In discussing purposes (functions) I have not distinguished between the purposes of the individual and those that advance the collective welfare of the group. This is an important issue because Hayek’s central evolutionary mechanism is “group selection” (1973; 1988). It is everywhere in his later work but it is ill-defined and poorly worked out. I shall not go into to the controversies surrounding this idea. However, it does seem better thought of by biologists today than previously. And it may be more plausible at the cultural and institutional level than at the genetic. Let all of this pass for now.

For us the relevant question is whether the explicit decisions of the logic of choice promote purposes (or enhance functions) of a different sort than those promoted by rules that have evolved under the pressure of group selection. Hayek does not supply the answer. A little reflection will show, however, that the survival of the group of which the individual is a member depends on finding to the right balance between individual purposes and collective “purposes” like the provision of public goods. The market, for example, could not exist in the absence of the pursuit of individual purposes or in the absence of necessary public goods. Therefore, it would seem that rules that survive, especially, in a complex social order will (imperfectly, to be sure) reflect each kind of purpose or function.
Hayek and “Ecological Rationality”

As I have tried to show, Hayek’s theory of individual choice and rule-following can be explained in an integrated way that shows the complex relationship between the pure logic of choice and rule-following behavior. Human beings are both purposeful agents and rule-followers. Neither makes much sense without the other. Certainly, there can be no purely Cartesian choice behavior. Even as an ideal type the category cannot stand on its own. As Hayek said, “Conscious experience...rests on a much more extensive basis of less fully conscious or subconscious images of the rest of the surroundings, which nevertheless...give to the conscious representations their place and value” (Hayek, 1952a, pp. 138-139).

Hayek understood that in a large world characterized by many unforeseeable events the integration of individual behavior is not at the level of the explicit plan but at the level of rules. But even this is only a rough tendency as expectations are often frustrated and new rules are being created. The putative equilibrium of rules is the result of the two blades of Simon’s (1990) scissors – the environmental task-problem and the limitations of the mind in its classificatory processes. Of course, this is also the source of a dynamic tension in the system. Adjustment of the two blades to each other is never perfect. It is a kind of broken, but serviceable, scissor. I think of this as the ecological rationality of the individual.

There is another level of ecological rationality as well. This is the process by which individuals with limited explicit knowledge can, given the right institutions, produce overall orders that are far more complex than individuals are capable of creating in a deliberate conscious way. I think of this as the ecological rationality of the system.

Hayek is justly famous for this second form of ecological rationality. Yet the first – Hayek’s ecological rationality of the individual – has not been explored in the depth it should be and in a way that reveals its place within his overall system of thought. I hope that this essay has contributed to a more comprehensive understanding of Hayek.
REFERENCES


