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Austrian Economics, Evolutionary Psychology and Methodological Dualism: Subjectivism Reconsidered

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Abstract: The methodological individualism and subjectivism of the Austrian tradition in economics is often associated with a methodological dualism, i.e. the claim that the nature of its subject matter, namely purposeful and intentional human action, requires economics to adopt a methodology that is fundamentally different from the causal explanatory approach of the natural sciences. This paper critically examines this claim and advocates an alternative, explicitly naturalistic and empiricist outlook at human action, exemplified, in particular, by the research program of evolutionary psychology. It is argued that, within the Austrian tradition, a decidedly *naturalistic* approach to subjectivism can be found in F.A. Hayek's work.

Keywords: Austrian economics, evolutionary psychology, methodological dualism, subjectivism

JEL-classification: A 12, B 41

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“In short, I shall contend that the empirical element in economic theory – the only part which is concerned not merely with implications but with causes and effects ... – consists of propositions about the acquisition of knowledge.”
F.A. Hayek (1948a: 33)

1. Introduction

The combination of methodological individualism and subjectivism is commonly regarded as constitutive of the research tradition that was originated by Carl Menger (Kirzner 1992a: 73; Vanberg 1998)¹ and for which the name “Austrian economics” has become the modern label (Vaughn 1994: 3f.; Kirzner 1992b: 122).

Methodological individualism entails the commitment to explain aggregate or collective social phenomena in terms of behavioral choices made by individuals, their interaction-effects and unintended consequences.² This commitment, in turn, implies that an individualist approach must include as its theoretical core – or its principal explanatory conjectures – general assumptions about human behavior. The Austrian research tradition is *subjectivist* in its insistence on the fact that *subjective preferences and beliefs* are essential determinants of human action, and that an adequate theoretical account of human behavior must pay proper attention to these determinants.

It is ultimately its thoroughgoing subjectivism that marks the critical difference between the Austrian tradition and mainstream, neoclassical economics (Streissler 1972: 427f.). The latter may also be said to adhere, in essence, to methodological individualism and to account for the subjectivity of human valuations in its concept of utility (Lachmann 1977: 156). With its fiction of perfect information, however, neoclassical orthodoxy entirely assumed away the very complexities that arise from the subjectivity of perceptions, knowledge and expectations (Witt 1992: 216; 2003: 25).³ Notwithstanding its various refinements, the orthodox approach in essence proceeds as if all economic agents would “see” the world as it truly is (and as the economic theorist supposedly sees it) and were able to reliably foresee the consequences of their actions. Such perspective rules out the possibility that inter-personal differences and inter-temporal changes in behavior may be due to differences and changes in subjective beliefs about the world, and it affords the economic theorist the luxury of not having to deal with what, in this regard, goes on in people’s minds.

There has been general agreement within the Austrian tradition that an economics that has anything of relevance to say about real world economies cannot afford the luxury of disregarding the subjectivity, and therefore variability, of human knowledge and beliefs.⁴ Yet,

¹ With reference to Carl Menger F.A. Hayek speaks of “that methodological individualism which is closely connected with the subjectivism of the social sciences” (Hayek 1979: 64).

² The principle of methodological individualism has been the subject of extensive debate in the social sciences. For a detailed examination of that debate see Vanberg 1975.

³ U. Witt (1989: 410): “There (in neoclassical economics, V.V.) the subjective imponderabilities ... are simply assumed away: Perfect information or, more recently, rational expectation models hypothesize a one-to-one relationship between ‘objective’ conditions and the individual agent’s perception of these.” – L. Lachmann (1977: 158): “From our point of view, the crucial significance of the emergence of expectations as a problem rests in the fact that ... they have thus far proved refractory of all attempts to incorporate them into the formal apparatus of the late classical economics of our time.”

⁴ This is, of course, also the central message of H.A. Simon’s critique of the neoclassical concept of rationality. As Simon (1997: 25f.) puts it: “Neoclassical theory, put in the simplest terms, proceeds as though the facts of the

Austrian economists have been in much less agreement on what such *subjectivism* implies for the manner in which economics can be - or should be - carried out as a scientific enterprise. In fact, among advocates of different strands of Austrian economics there has been considerable disagreement on the methodological implications that a commitment to subjectivism entails (Caldwell 1991: 488; Lavoie 1991: 471, 1994b: 55; Shand 1981: 13).

The purpose of the present paper is to take a closer look at some of the principal arguments that have been advanced by Austrian economists on the methodological implications of subjectivism. More specifically, I shall take issue with claims, raised by a number of authors within the Austrian tradition, that recognizing the subjectivist determinants of human action requires economics (as well as the other social sciences) to adopt a methodology that is fundamentally different from the causal explanatory approach of the natural sciences. After summarizing these claims (in section 2), I shall critically examine (section 3) and contrast them with an alternative, explicitly naturalistic and empiricist outlook at human action, exemplified by the research program of evolutionary psychology (section 4) and by the theoretical perspectives of biologist E. Mayr and philosopher K.R. Popper (section 5). I shall further argue that such an alternative, empiricist research program has actually been advanced from within the Austrian tradition itself, namely in F.A. Hayek's work (sections 6 and 7).⁵ My conclusion will be that there are ample reasons for advocates of the Austrian research program to revise some of their traditional views on subjectivism, and to part with methodological claims that tend to foreclose prematurely promising research.

2. Subjectivism and Methodological Dualism in Austrian Economics

In their efforts to specify what they consider to be the most consistent version of "subjectivism" Austrian economists have distinguished between a "subjectivism of preferences" and a "subjectivism of expectations" (Lachmann 1977: 28) or between "static" and "dynamic" subjectivism (O'Driscoll and Rizzo 1985: 22; Kirzner 1992b: 122).⁶ Such distinctions are meant to emphasize that a consistent subjectivism must go beyond recognizing the subjectivity of human valuations and take serious the fact that human purposeful action is always based on subjective expectations and interpretations, i.e. on mental activities such as "ordering and formulating ends, allocating means to them, making and revising plans, determining when action has been successful" (Lachmann 1982: 37).

There is no need in the present context to comment on the controversy over whether or not Carl Menger (Chamilall and Krecke 2002) and second or third-generation Austrians, such as Ludwig von Mises, can justly be said to have already paid sufficient attention to the "subjectivism of expectations" (Lachmann 1982: 36) or adopted a "fully subjectivist treatment of choice" (Kirzner 1992b: 126).⁷ Nor is there a need to address the issue of whether it was

real world are known. ... Now, if you think people can deal with the world as it really is, so that you do not have to worry about their subjective view of it, then in order to predict their behavior you simply calculate what would maximize utility in that real world. ... If you believe, however, that our minds are very limited, that we can only form a very approximate picture of the world, then ... you need a theory of how we make our decisions: you need a theory of procedural rationality."

⁵ U. Witt (1989: 417; 1992: 221) has argued in a similar direction, pointing out that Hayek's "different attitude towards the subjectivism problem" is much closer to Carl Menger's original, "psychologically inspired, empirically oriented" approach than to Misesian tradition in Austrian economics.

⁶ On the two forms of subjectivism G.P. O'Driscoll and M.J. Rizzo (1985: 22) note: "The first form is most closely related to the traditional subjective theory of value and we shall call it 'static subjectivism.' In this case, the mind is viewed as a passive filter The second form, on the other hand, views the mind as an active, creative entity This form of subjectivism we shall call 'dynamic subjectivism.'"

⁷ About L. Robbins' (1935) influential attempt to infuse Austrian subjectivism into mainstream economics I. Kirzner (1992b: 126) notes: The "subjectivism which Robbins brought to synthesis from Vienna was severely limited to the 'static' aspects of subjectivism." – On this issue see also J. Wiseman 1985.

not until the “Austrian revival of the 1970s” and its “radical subjectivism”(Lachmann *ibid.*) that the Austrian tradition arrived at a consistent “subjectivism of active minds” (*ibid.*: 37), or whether, as others suspect, the recent “radically subjectivist” movement marks, instead, a departure from the paradigmatic core of the Austrian research program (Kirzner 1995: 13). My exclusive concern here will be with the above noted claim that the subjectivist dimensions of their subject matter require economists to adopt a methodological approach that is fundamentally different from the causal explanatory methodology commonly practiced in the natural sciences. This claim continues to play a prominent role within the Austrian tradition ever since it was first and most forcefully pronounced by Ludwig von Mises and, whether directly or indirectly, Mises’ arguments on this issue have clearly been most influential in shaping the general paradigmatic outlook of modern Austrian economics (Witt 1989: 411).

According to Mises, what separates the methodology of economics, and the sciences of human action more generally,⁸ from that of the natural sciences is the fact that they deal with “conscious behavior or purposive activity” (Mises 1990: 19), i.e. with “behavior open to the regulation and direction by volition and mind” (*ibid.*), by contrast to mere reactive responses to stimuli “which cannot be controlled by volition” (*ibid.*: 23).⁹ Explicitly rejecting K.R. Popper’s falsifiability criterion as the relevant test for empirically contentful scientific theories Mises (1978: 69) declares: “It is obvious that all this cannot refer in any way to the problems of the sciences of human action.” And by contrast to Popper’s view that the same general methodological principles apply to all empirical sciences, including the behavioral and social sciences, he insists on a “methodological dualism” that “splits the realm of knowledge into two separate fields, the realm of external events, commonly called nature, and the realm of human thought and action” (Mises 1957: 1).

Mises’ arguments in support of his dualism claim are somewhat different for the two branches of the sciences of human action he distinguishes between, namely *praxeology* or the *praxeological* disciplines on the one side and *history* or the *historical* disciplines on the other (Mises 1978: 41). Economics as a praxeological discipline, so Mises argues, is concerned with “the a priori category of action” (*ibid.*), not with the particular circumstances surrounding observable actions. It deals “with the categorical essence of choice and action as such, with the pure elements of setting aims and applying means” (1990b: 21), not with “the concrete content of the ends men are aiming at” (Mises 1978: 73) or with “the quality of the ... means applied” (Mises 1990: 9).¹⁰ It is based on “aprioristic reasoning” (*ibid.*:29) about “choosing as such,” not on psychological arguments on “internal processes determining the various choices in their concreteness.”¹¹

The study of the particularities of concrete acts is, in Mises’ scheme, the task of the second branch of the sciences of human action, of history. History “comprehends the totality of what is experienced about human action” (Mises 1990: 43), its scope is “to investigate

⁸ As he notes, Mises adopts “the rather heavy term ‘sciences of human action’” (1978: 9) only reluctantly for want of a better term: “The German language has developed a term that would have been expedient to denote the totality of the sciences dealing with human action as distinguished from the natural sciences, viz., the term *Geisteswissenschaften*.”

⁹ As Mises emphasizes, to say that human action is purposive is to say that it is goal-directed, “aiming at a definite end and guided by ideas concerning the suitability or unsuitability of definite means” (Mises 1978: 34), it is not to say that it is “*objectively* rational” as judged by an observing third party. Rejecting common interpretations of the rationality postulate in economics he notes that “economics does not deal with an imaginary *homo oeconomicus* ... but with *homo agens* as he really is, often weak, stupid, inconsiderate, and badly instructed” (1990: 24). - I have discussed Mises’ views on human action and rationality in more detail in Vanberg 2004.

¹⁰ Mises (1990: 21): “Not what a man chooses, but that he chooses counts for praxeology” (*ibid.*: 21). - What praxeology asserts about “action as such” is, as Mises (1978: 44) argues, meant to be “strictly valid without any exception for every action.”

¹¹ Mises (1990: 21): “Praxeology is not based on psychology and is not a part of psychology. ... Psychology deals with the internal processes determining the various choices in their concreteness.”

what ends people aim at and what means they apply for the realization of their plans” (ibid.: 24). And such investigation is, so Mises argues, an exercise in *psychological* reasoning.¹² It is about “understanding the meaning of action” (ibid.: 12) in the sense of inferring the intentions and expectations that motivate actual human choices. By contrast to the praxeological approach of economics, Mises regards the method of understanding (*Verstehen*) as “the specific method of historical research” (ibid.),¹³ as the method that not only historians but “all other people always apply in commenting upon social events in the past and in forecasting future events” (ibid.: 26).

As noted, the reasons why Mises finds it necessary to insist on the methodological autonomy of the sciences of human action and their categorical separation from the methodological standards that apply to the natural sciences, differ somewhat for the two branches, praxeology and history. As far as Mises’ claim is concerned that the praxeological branch of the sciences of human action provides *a priori* knowledge about “the realm of human thought and action,” it is obviously incompatible with a methodology à la Popper, according to which only empirically refutable theories qualify as ‘scientific.’ Acceptance of such a methodological view would, so Mises argues, require one to “deny the cognitive value of a priori knowledge” (1978: 5) and it would disqualify all a priori theories, such as praxeology, as ‘unscientific,’¹⁴ an implication that, in his eyes, is in apparent conflict with the fact that “nothing is more certain for the human mind than what the category of human action brings into relief” (1978: 71).

Mises’ apriorism¹⁵ has been the subject of extensive debate and criticism, and there is no need to repeat in detail here the arguments that speak against Mises’ claims.¹⁶ It may suffice here to note that the relevant issue is not, as Mises’ phrasing of the matter tends to suggest, whether a priori theories can have “cognitive value” (the cognitive value of mathematics is surely undisputed). The issue rather is whether theories can be a priori certain and non-refutable and, at the same time, have any empirical content, inform us about the world of our experience. Popper’s falsifiability criterion is not meant to disqualify non-refutable theories as “meaningless,” it is meant to separate *empirically contentful* theories from theories that, even though they may provide meaningful insights into *matters of logic*, do not inform us about *matters of fact*, including facts of human thought and action.¹⁷

What deserves more attention in the context of this paper are Mises’ *substantive* arguments for why the sciences of human action, the historical disciplines no less than their praxeological counterparts, cannot be measured against the same methodological criteria that

¹² Mises prefers, indeed, to use the terms “thymology” and “thymological” instead of “psychology” and “psychological” in order to separate the kind of psychology that he favored - namely a psychology that is concerned with “the mental activities of men that determine their actions” (Mises 1978: 47f.) - from what he considered a too narrowly positivist “experimental psychology” (ibid.: 47).

¹³ Mises (1978: 50): “Understanding ... refers not to the field of praxeology and economics, but to the field of history. It is a thymological category.”

¹⁴ Mises (1978: 70): “If one accepts the terminology of logical positivism and especially also that of Popper, a theory or hypothesis is ‘unscientific’ if in principle it cannot be refuted by experience. Consequently, all a priori theories, including mathematics and praxeology, are ‘unscientific.’ This is merely verbal quibble.”

¹⁵ M. Rothbard (1990: 317) has summarized Mises’ apriorism as follows: “He assumes nothing about the wisdom of man’s ends or about the correctness of his means. He ‘assumes’ only that men *act*, i.e. that they have *some* ends, and use *some* means to try to attain them. This is Mises’ Fundamental Axiom, and it is this axiom that gives the whole praxeological structure of economic theory built upon it its absolute and apodictic certainty. ... For this Axiom is true for all human beings, and everywhere, at any time, and could not even *conceivably* be violated.”

¹⁶ I have critically examined Mises’ arguments in some detail in Vanberg 1975: 85ff. – See also Vanberg 2004: 21.

¹⁷ A theory or conjecture that – as Rothbard (1990: 317) puts it – “could not even *conceivably* be violated” cannot tell us anything about the world of our experience because it allows for all conceivable states of the world. It does not tell us what is *factually* impossible but only what is *logically* impossible and, therefore, *inconceivable*.

apply to the natural sciences. This is, in the first instance, the argument that *mental* phenomena represent a realm that is categorically separated from the realm of “external” (physical and physiological) phenomena, and that they escape, therefore, the methods of the natural sciences that are appropriate only for the latter realm. The fact that action is determined by ideas, that it “is the mind’s response ... to the conditions in which nature and other people’s actions place a man” (Mises 1990: 20), puts it, as Mises asserts, outside the explanatory scope of the natural sciences.¹⁸ – It is noteworthy, and I shall return to this issue later, that the way Mises puts this argument leaves some room for interpretation. While most of his comments on this matter appear to imply that the divide between the two realms can, for principal reasons, never be overcome, in other comments he explicitly limits his claim to “the present state of our knowledge” (ibid.: 25),¹⁹ allowing for the possibility that the issue may have to be reconsidered in light of the knowledge available at future points in time.

Mises’ argument that “the methods applied in dealing with natural events” (1978: 47) are not applicable to the study of mental phenomena is specifically directed at positivistic and behaviorist approaches. Their principal shortcoming is in his view that, by reducing the study of human action to stimulus-response schemes (ibid.: 40, 121), they ignore the anticipatory capacity of the human mind upon which intentional and purposeful conduct is based, in particular man’s capacity to anticipate the conduct of his fellow men (ibid.: 47). The method that acting man employs in such anticipation is, as Mises argues, the same method that constitutes the methodological autonomy of the various historical disciplines, namely the “study of meaning” (ibid.: 43) or the method of “understanding (Verstehen)” (ibid.: 48). It is a method that allows these disciplines privileged access to “the ultimate principles” governing the phenomena they study (Mises 1990: 9), namely knowledge “about the meaning which acting men attach to their action” (ibid.: 8). Understanding, or the study of meaning, deals with “the reactions of the mind,” i.e. “with something invisible and intangible that cannot be perceived by the methods of the natural sciences,” which, so Mises argues, the natural sciences must, however, recognize “as real also from their point of view, as it is a link in a chain of events” (Mises 1978: 47f.).

It is not only the method of understanding but also the “the category of finality” (ibid.: 36) that separates, in Mises’ view, the sciences of human action from the natural sciences.²⁰ As he puts it: “The natural sciences are causality research; the sciences of human action are teleological” (ibid.: 7).²¹ While the former argue in terms of cause and effect, the latter argue in terms of “final causes” (ibid.: 37), in terms of “the ends sought by acting men in pursuit of their own designs” (ibid.: 7). It is, so Mises notes, the finality or ends-oriented nature of purposeful human action that makes it impossible to “apply to the behavior of man the same methods the natural sciences apply in dealing with the behavior of mice or of iron” (ibid.: 37).

As an additional, and separate, argument in support of his autonomy claim Mises finally stresses the fact that the sciences of human action deal with phenomena the *complexity* of which precludes the kind of experimental research that he considers constitutive for the natural sciences. As he puts it: “The experience to which the natural sciences owe all their success is the experience of the experiment. ... The social sciences cannot make use of

¹⁸ Mises (1978: 121): “(H)uman reaction is determined by ideas, a phenomenon the description of which is beyond the reach of physics, chemistry and physiology. There is no explanation in terms of the natural sciences.”

¹⁹ Mises (1990: 25f.): “But as long as we do not know how external (physical and physiological) facts produce in the human ‘soul’ definite thoughts and volitions resulting in concrete acts, we have to face an insurmountable dualism. ... Reason and experience show us two separate realms: the external world of physical and physiological events and the internal world of thought, feeling, and purposeful behavior. No bridge connects – as far as we can see today – these two spheres.” - See also Mises 1957: 1.

²⁰ Mises (1978: 121): “(T)he natural sciences have no intellectual tool to deal with ideas and with finality.”

²¹ Mises (1978: 43): “The natural sciences do not know anything about final causes. For praxeology finality is the fundamental category.”

experiments. The experience with which they have to deal is the experience of complex phenomena” (1990: 5).²²

Mises is generally recognized as the single most influential inspiration for modern Austrian economics. Even if not all aspects of his theoretical system - such as, for instance, his apriorism - find general acceptance, it is, in particular, his methodological dualism that seems to have become a rarely if ever disputed core tenet of the Austrian paradigm. I. Kirzner (1978: vi) certainly expresses a commonly shared view when he approvingly notes: “Economics, Mises explained again and again, is a discipline the character of which differs drastically from that of the natural sciences.”

More recently the methodological dualism in the Austrian school has been reinforced and given a new direction by the “radical subjectivism” of Ludwig Lachmann. Though Lachmann does not agree with Mises’ praxeological apriorism, he too insists that it is the intentionality and purposefulness of human action as a “manifestation of the human mind” that commands “the methodological independence of the social sciences” (Lachmann 1977: 61).²³ Taking his lead from Max Weber²⁴ and the “understanding-approach” (*Verstehende Soziologie*) in early twentieth century German sociology, Lachmann argues that the method of *Verstehen* “which aims at the discovering the meaning of things” (ibid.: 49) is the adequate method for Austrian economists for whom “the thought design, the economic calculation or economic plan of the individual, always stands in the foreground of theoretical interest” (ibid.: 47).²⁵ It is a method, he notes, that is “closed to the natural sciences” (ibid.: 58) and that “apparently conflicts with most methods used in and suitable to the natural sciences” (ibid.: 49).

While Mises and Lachmann equally emphasize the role of understanding as the principal method of the sciences of human action, a method that they see in contrast to behavioristic approaches,²⁶ there is a significant difference in their respective interpretations of this method. As has been noted above, to Mises it is an exercise in *psychological* or – as he prefers to call it – “thymological” reasoning, it is an inquiry into the intentions and expectations that motivate human choices. By contrast, and in a somewhat ambiguous manner, Lachmann insists that as a “principle of explanation” the method of *Verstehen* “has nothing to do with psychology” (Lachmann 1977: 155). As an “analysis of observed phenomena in terms of pre-existing plans” (ibid.), he argues, it is concerned “with purposes, not with motives, with plans, not with the psychic processes which give rise to them, with acts of our conscious minds, not with what lies behind them” (ibid.).²⁷

Lachmann’s version of the *Verstehen* approach has become the inspiration for a rather peculiar – and highly controversial (Vaughn 1994: 127ff.) – variety in modern Austrian economics, described by its advocates as “interpretative turn” (Lavoie 1994a: 1), a turn that is

²² Mises (1978: 69): “There are in this orbit no such things as experimentally established facts. All experience in this field is ... experience of complex phenomena”.

²³ Lachmann (1977: 169): “The concept of ‘Purpose,’ for example, has long been discarded by the older natural sciences like physics, and has now even been expunged from biology. Yet, it remains an indispensable tool of the social sciences. Where human action is concerned, a purely behavioristic approach can answer none of our questions. It certainly cannot *explain*, i.e. *make intelligible*, a single human act.”

²⁴ Lachmann (1977: 95) - Lachmann (ibid.: 35) notes about the relation between Max Weber and Ludwig von Mises: “Their personal acquaintance was brief, though, confined to the few summer months Weber spent at the University of Vienna in 1918. Both men shared an interest in neo-Kantian philosophy and an aversion to the cruder brands of positivism and behaviorism.” – I have compared Mises’ and Weber’s versions of subjectivism in some detail in Vanberg 1975: 85ff.; 101ff.

²⁵ Lachmann (1977: 153) defines *Verstehen* as the “method which explains human action in terms of plans, constituted by mental acts and linking an imagined future to an active present.”

²⁶ Lachmann (1977: 153): “The alternative principle of explanation is, of course, that of ‘response to stimulus.’”

²⁷ A somewhat different emphasis is implied when Lachmann (1977: 173) notes: “Not the psychological causes of human action, but their logical consequences form the subject matter of the analytical social sciences.” – See also ibid.: 168.

claimed to be “simply a vindication of the traditional Austrian positions against positivist neoclassical philosophical attitudes” (Lavoie 1994b: 54). The “hermeneutical Austrians,” as Don Lavoie (*ibid.*: 55) and other champions of this “turn” call themselves, share the Austrian emphasis on subjectivism, “methodological dualism” (Lavoie 1991: 477) and the rejection of a “crude behavioristic stimulus-response scheme” (*ibid.*: 486). And they endorse, in particular, Lachmann’s view of economics as “a subject that needs to deploy the methods of *Verstehen*, of the interpretation of meaning, and not think of itself as a natural science trying to establish causal laws” (Lavoie 1994a: 9). It is their main tenet, however, that, in order to be true to Lachmann’s “vision of what a truly interpretive approach to economics can be like” (*ibid.*: 11), Austrian economists must adopt a different - namely “hermeneutical” - methodological foundation for their analytical efforts than what has been practiced in the Austrian tradition so far. As Lavoie (1994b: 55) phrases it: “The hermeneutical Austrians contend that none of the Austrians’ usual methodological positions, from Aristotelianism to Kantianism, to Neo-Kantianism, to Popperianism, adequately captures the virtues of their own substantive economics, and that contemporary hermeneutics does.”

In embracing the “post-modernist philosophical position” (Lavoie 1994a: 5f.) to be found in the “philosophical hermeneutics” of such authors as Martin Heidegger, Hans-Georg Gadamer, Paul Ricoeur or Richard Rorty (Lavoie 1994b: 54), the “hermeneutical Austrians” hope to find the appropriate methodology that, finally, allows the subjectivism of the Austrian tradition to be developed to its full potential, namely to the “*economics of meaning*” (Lavoie 1994a: 9) that Lachmann envisioned. The essential merit of these “contemporary versions of the *Verstehen* approach” (Lavoie 1991: 482) is, according to Lavoie, that they imply a reinterpretation of what “subjectivism” is about, away from the idea that “meaning is ‘internal’ to a single mind” (*ibid.*: 472) towards the notion that meaning “resides ‘within’ the inter-subjective.”²⁸ Though it is by no means easy to decipher what such reorientation of subjectivism is exactly meant to be about, it is apparent that Lavoie sees the distinguishing characteristic of the hermeneutical approach that he endorses in the fact that it is *not* about “seeing things from the agent’s point of view” (*ibid.*), but is concerned with a kind of “meaning” that is separable from the intentions of the acting person.

Whether or not such “hermeneutical subjectivism” amounts at all to a research program that can be meaningfully classified as “Austrian” need not be of concern in the present context.²⁹ Of principal interest here is the fact that Lavoie and his fellow “hermeneutical Austrians” not only subscribe to but even reinforce the methodological dualism that Mises had made a trade-mark of the Austrian school, and that to them, as for Mises, it is its concern with “the purposes of the individual human beings who make up an economy” (Lavoie 1991: 474) that requires economics to adopt a methodology entirely different from that practiced by the natural sciences.³⁰

²⁸ With reference to a *Verstehen* approach that inquires into the subjective meaning of actions Lavoie (1991: 482) notes: “I see no reason to interpret subjectivism in this way. ... Meaning can be viewed as something that resides ‘within’ the inter-subjective, and this is taking place out in the open all the time and all around us.”

²⁹ For a critique of this new, hermeneutical branch of the Austrian tradition see H. Albert (1988) who concludes that “the anti-naturalistic hermeneutics in the spirit of Heidegger ... leads to a methodological subjectivism which has nothing in common at all with the original subjectivism of the Austrian School” (*ibid.*: 593). – Albert’s main objection is that “nothing can be gained ... by wiping out the important difference between the problem of the *interpretation of words and sentences* and the problem of the *explanation of human action* by using the term ‘hermeneutical’ in the loose way which we owe to modern hermeneutical philosophy” (*ibid.*: 595).

³⁰ Though in this regard, too, Lavoie (1991: 477) argues somewhat ambiguously when he notes: “The point is not to abandon the study of causation, but to recognize the fact that many of the relevant causes we are looking for in economics are themselves meanings.”

3. Methodological Dualism Critically Examined

So far I have mainly recorded the principal arguments that have been put forward in the Austrian tradition in support of the claim that economics, if it is to take proper account of the intentionality and purposefulness of human action, must adopt a methodology fundamentally different from that of the natural sciences. The purpose of the present section is to critically examine these arguments, while the remaining sections of this paper will discuss theoretical approaches that, in contrast to the dualism claim, adopt an explicitly naturalistic outlook at human action.

Methodological arguments are meta-theoretical arguments or *statemens about theories*. They come either in the form of normative principles that are supposed to guide scientific inquiry into fruitful directions, or in the form of factual judgements about certain properties of theories. If they are meant as normative principles, methodological arguments can be neither true nor false. They can only turn out to provide more or less fruitful guidance to scientific inquiry, and they can prospectively be judged in terms of their likely effects. If they are meant as factual claims about theories, they can be true or false. They can be critically examined in terms of the viability of their premises and they can be confronted with the factual properties of theories.

In the sense of the noted distinction, methodological dualism can be meant either as a normative principle or as a factual claim. If it is meant as a normative principle, as the recommendation that the sciences of human action should adopt in their explanatory endeavors a methodology categorically different from the causal-explanatory approach of the natural sciences, it has to be judged in terms of its 'fruits,' i.e. the insights it generates, compared to the 'fruits' of research programs that aim at a naturalistic, causal explanation of human action. If it is meant as the factual claim that human action, for principle reasons, simply cannot be explained in terms of naturalistic, causal theories, it is either true or false. And whether it is one or the other has to be judged in terms of the sustainability of the reasons cited in its support and in light of the factual state of our theoretical knowledge. It must be regarded as questionable when its premises can be shown to be faulty, and it must be regarded as falsified when theories become available that allow for a causal explanation of human action.

The 'Austrian' defense of methodological dualism, summarized above, is essentially based on the factual claim that a causal explanation of intentional human action is impossible. If this claim is meant to say that we have no theories that would provide a satisfactory explanation, it must be judged in terms of our current theoretical knowledge and may have to be revised as new knowledge becomes available. If it is meant to say that such explanation is 'in principle' impossible, because of the 'nature' of human action, it ignores the simple fact that we have no other knowledge of the 'nature' of things, including the 'nature' of human action, than what our theories tell us. To make such 'in principle' claims means, therefore, that one pretends to know more than one possibly can know, namely more than what our currently available theories tell us. It follows that the dualism claim deserves serious discussion only if it is meant in the first sense, i.e. as a judgement about the state of our theoretical knowledge at a given point in time.

It helps to avoid confusion about the methodological status of the social sciences to carefully distinguish at the outset between two issues, namely, on the one hand, the issue of whether the subject matter of the social sciences includes 'subjective' phenomena, by contrast to the 'objective' phenomena studied by the natural sciences, and, on the other hand, the issue of whether the methods applied in studying these phenomena should be or need to be 'subjective,' by contrast to the 'objective' methods of the natural sciences (Boehm 1982: 44). Only the second issue is of relevance here. That the social sciences deal with subjective phenomena such as people's purposes, intentions, expectations, beliefs, etc. is not

controversial at all among defenders of the methodological autonomy of the social sciences and their opponents. The controversy is about whether their concern with subjective phenomena requires the social sciences to adopt a methodology fundamentally different from that of the natural sciences.³¹

With regard to the latter issue, a major source of ambiguity in the Austrian rejection of a natural sciences approach to social science is the failure to carefully distinguish between the rejection of a *'mechanistic'* approach and the rejection of a *causal explanatory* approach to social phenomena. When Mises (1978: 3) charges that the “study of economics has been again and again led astray by the vain idea that economics must proceed according to the pattern of other sciences” it makes quite a difference whether this is meant as a critique of attempts to model economics “after the scheme of classical mechanics” (ibid.: 39), or whether it is meant as a rejection of the notion that the logic of explanation is the same in all empirical sciences, in the social sciences no less than in the natural sciences. It is the second and not the first issue that is controversial among advocates of methodological dualism and their opponents. Both sides can easily agree in their critique of an economics that - like “Walrasian general equilibrium analysis” (Lavoie 1994: 10) - transfers the mechanical paradigm of classical physics to the study of human action, interpreting the world of social interaction in analogy to the world of interacting physical forces (Mirowski 1989). What they disagree about is the issue of the methodological autonomy of the social sciences.

F.A. Hayek has explicitly distinguished between the two issues, and this is the proper place to look at his arguments, anticipating the later, more general discussion of his approach (section 6). As has often been noted, one can find in Hayek's writings, especially in *The Counter-Revolution of Science*, remarks on “the contrast between the subjectivist approach of the social sciences and the objectivist approach of the natural sciences” (Hayek 1979: 47) that seem quite similar to Mises' or Lachmann's dualistic outlooks. In particular his critique of the methodological attitude that he describes as “*scientism* or the *scientistic prejudice*” (1979: 24)³² has been cited as evidence of such similarity (Dufourt and Garrouste 1992: 28). Yet, a careful reading of Hayek's arguments clearly shows that the target of his criticism of “*scientism*” is not an empiricist, naturalistic approach to social phenomena but an approach that seeks to mold the social sciences along the “physics model”(Hayek 1982: 289) in “slavish imitation of the method and language of science” (Hayek 1979: 24), based on a “superficial similarity of procedure with that of the physical sciences” (Hayek 1978a: 31). His rejection of a ‘*scientistic*’ approach to the social sciences that mimics the specific paradigm and analytical apparatus of physics does not imply, however, that he endorses Mises' apriorism or Lachmann's anti-naturalistic hermeneutics (Witt 1992: 222).

In fact, in contrast to Mises' verdict, quoted above (p. 4), Hayek on a number of occasions has explicitly endorsed K.R. Popper's falsificationist methodology (Hayek 1973: 29, 146; 1976: 43; 1978a: 31), for instance, when he notes about Popper's “critical rationalism”: “It seems to me the best term for describing the general position which I regard as the most reasonable one” (1967d: 94). The fact that in the preface to his “*Studies in Philosophy, Politics and Economics*” (1967: viii) Hayek attributes a “slight change” in the tone of his critique of “*scientism*” to the influence of Karl Popper has often been quoted in

³¹ It is interesting to note that from C. Menger to L. von Mises the ‘Austrian’ perspective on this issue has changed. Menger (1963: 59, fn. 18) argued: “The contrast between the theoretical natural sciences and the theoretical social sciences is merely a contrast of the phenomena which they investigate from a theoretical point of view. It is by no means a contrast of method.” – Mises (1978: 45) voices the opposite view when he states: “What distinguishes the sciences of human action from the natural sciences is not the events investigated, but the way they are looked upon.”

³² See e.g. Hayek (1979: 78): “The attitude which, for want of a better term, we shall call the ‘objectivism’ of the *scientistic* approach to the study of man and society, has found its most characteristic expression in the various attempts to dispense with our subjective knowledge of the working of the human mind, attempts which in various forms have affected almost all branches of social study.”

support of the conjecture that Hayek's original views on the methodology of the social sciences were much more in agreement with Mises' methodological dualism. Such interpretation is, however, not only difficult to reconcile with Hayek's early call for an empiricist approach to "mental phenomena" (1979: 48) to which I will return below (section 6). It is also in contrast to Hayek's own assessment of the matter.³³

While he shares Popper's general methodological outlook, Hayek emphasizes, though, that the criterion of falsifiability must be interpreted somewhat differently in the social sciences than in a science like physics, because of the complexity of the phenomena that they study. In this sense he is in perfect agreement with Mises' argument that the "experience with which they (the social sciences, V.V.) have to deal is the experience of complex phenomena" (Mises 1990: 5). By contrast to Mises he does not draw the conclusion, however, that this is a reason to claim methodological autonomy for the social sciences, nor does he conclude that the complexity of the phenomena they study prevents the social sciences from aiming at causal explanations. Hayek's conclusion rather is that, because of the specific problems that arise "in connection with those essentially complex phenomena of which social structures are so important an instance" (Hayek 1978a: 32), our explanatory ambitions must be more modest in the social sciences than in the physical sciences. While the latter can aim at "complete explanations" and "specific predictions," Hayek sees the social sciences generally limited to what he calls "explanations of the principle" and "pattern predictions" (Hayek 1967a: 11; 1979: 86). Yet, this is, as Hayek points out, a limitation that the social sciences share with the natural sciences to the extent that the latter deal with complex phenomena as well.³⁴

The methodological distinction that Hayek emphasizes cuts across the traditional distinction between the social and the natural sciences. It is a distinction between sciences that study "relatively simple phenomena" (Hayek 1967b: 25), or "closed systems" with a "sufficiently small" number of connected variables (Hayek 1967a: 3f.), and sciences that study "the more complex phenomena of life, of mind, and of society" (Hayek 1967b: 25), such as, in particular, evolutionary biology (Hayek 1967a: 11f.).³⁵ According to Hayek, what is true for the theory of evolution by natural selection can be said about theories of complex phenomena more generally, namely that they provide "an account of a process the outcome of which will depend on a very large number of particular facts, far too numerous for us to know in their entirety" (Hayek 1973: 23f.). Even if we understand the general laws that are in operation in the respective realm, due to our lack of knowledge of the particular facts that determine the course of events, we will not be able to come up with more than an "explanation of the principle" and a "prediction merely of the abstract pattern the process will follow" (ibid.).

Such limitation to explanations of the principle and to pattern predictions does not mean, so Hayek argues, that we have to abandon a falsificationist methodology. Because, and to the extent that, they exclude conceivable courses of events, theories of complex phenomena

³³ Recollecting his early reading of Popper's original German version (published in 1935) of *The Logic of Scientific Discovery* Hayek notes that he had been led, "already, to the understanding of what became Popper's main systematic point: that the test of empirical science was that it could be refuted, and that any system which claimed that it was irrefutable was by definition not scientific" (Hayek 1994: 51). And he continues: "I was not a trained philosopher; I didn't elaborate this. It was sufficient for me to have recognized this, but when I found this thing explicitly argued and justified in Popper, I just accepted the Popperian philosophy for spelling out what I had always felt" (ibid.).

³⁴ Hayek (1967a: 20): "(A)s the advance of the sciences penetrates further and further into more complex phenomena, theories which merely provide explanations of the principle ... may become more the rule than the exception. Certain developments of recent years, such as cybernetics, the theory of automata or machines, general systems theory, and perhaps also communication theory, seem to belong to this kind."

³⁵ Hayek (1967b: 31): "Probably the best illustration of a theory of complex phenomena ... is the Darwinian theory of evolution by natural selection."

are empirically contentful and refutable (Hayek 1967b: 28),³⁶ even if we need to recognize that the “degree of falsifiability necessarily decreases” (Hayek 1973: 29), compared to theories of more simple phenomena. This inherent “drawback” of theories of complex phenomena³⁷ is in Hayek’s view neither a reason for the social sciences to claim methodological autonomy, nor should it be considered a defect that they need to overcome in order to be more ‘scientific’ (Hayek 1967a: 16). Instead, he argues, for sciences of complex phenomena such as economics “it may prove necessary deliberately to cultivate the technique of explanation of the principle” (ibid.: 21).³⁸

The principal lesson from Hayek’s argument on the complexity issue is that we must carefully distinguish between two claims, namely, on the one hand, the claim that the complexities of human action and of social phenomena put limits on the degree of specificity and falsifiability that we may hope to achieve in our explanatory efforts and, on the other hand, the claim that these complexities make it necessary for the sciences of human action to abandon the standard concept of causal explanation in favor of a different methodology. This distinction is of immediate relevance for the principal argument that Austrian advocates of methodological dualism rest their case on, namely that the subjectivity of intentional human action precludes any causal, ‘mechanistic’ explanation.

If this argument is meant to say that the complexity of the mental processes from which human actions result make it, as a rule, impossible for us to fully explain and to predict specific actions, it is perfectly compatible with Hayek’s view on the methodological status of theories of complex phenomena. In this interpretation, Austrian subjectivism can well be accommodated within the standard notion of causal explanation, more broadly understood to include not only ‘deterministic’ explanations but explanations of the principle as well.³⁹ The case for methodological dualism can, therefore, not be based on the complexity argument alone, but needs to be supported by additional arguments for why a causal explanation of intentional human action should not be possible. The versions of Austrian subjectivism that I have summarized above (section 2) appear to rest their case for methodological dualism essentially on two arguments. This is, on the one side, the argument that, because human action is based on subjective intentions and expectations, *understanding* these intentions and expectations rather than *causal analysis* is the appropriate method of inquiry. And this is, on the other side, the argument that, because human action is purposeful and goal-directed, it must be explained in *teleological* rather than in *causal* terms.

In examining the ‘understanding’ issue one should, again, at the outset separate what is controversial and what is not controversial among the advocates and the opponents of methodological dualism. Our ability to successfully interact with others is, quite obviously, based on our capacity to infer their intentions, beliefs and expectations from their observed behavior as well as on our capacity to predict their behavior, based on assumptions about their motivations. That we can, in this sense, ‘understand’ other persons’ actions, in our daily lives as well as in our role as social scientists, is not controversial at all among advocates of methodological dualism and their opponents. What the latter oppose is the claim that “this fact

³⁶ About the Darwinian theory Hayek (1967b: 32) notes: “The theory as such, as is true of all theories, describes merely a range of possibilities. In doing this it excludes other conceivable courses of events and thus can be falsified. Its empirical content consists in what it forbids.”

³⁷ Hayek (1967a: 16): “It is undoubtedly a drawback to have to work with theories which can be refuted only by statements of a high degree of complexity.” - Hayek (1967b: 28): “Such a theory will, of course, in Popper’s terms, be one of small empirical content.”

³⁸ Hayek (1967b: 29): “The advance of science will thus have to proceed in two different directions: while it is certainly desirable to make our theories as falsifiable as possible, we must also push forward into fields where, as we advance, the degree of falsifiability necessarily decreases. This is the price we have to pay for an advance into the field of complex phenomena.”

³⁹ J. O’Driscoll and M. Rizzo (1985: 22ff.) appear to take this view when, in their discussion of the methodological implications of “dynamic subjectivism,” they note that Hayek’s non-deterministic concept of pattern explanation is “consistent with dynamic subjectivism” (ibid.: 27).

must lead to specific methodological problems which require a general methodology for the social sciences which differs from the methodology of the natural sciences” (Albert 1988: 575).

When we seek to ‘understand’ other persons’ behavior, we seek to identify mental states, namely intentions, beliefs, expectations, etc., that would make the behavior ‘meaningful’ or consistent. In doing this, we form *conjectures* about what kind of intentions, beliefs, etc. may have actually motivated the behavior that is to be explained (Koppl 1994: 72). These conjectures may be true or false, and the crucial issue is how we can decide among potential “competing conjectures about subjective meaning” (ibid.: 73). The heuristic strategy to imagine ourselves in the position of the person whose behavior we want to explain may be a useful tool for *generating* such conjectures, but it clearly does not qualify as an *inter-subjective test* for choosing among competing conjectures. The latter requires us to refer, in some manner, to observable indicators for the, themselves unobservable, intentions, beliefs, etc. that are imputed to the actor (Witt 2003: 24). Obviously, if one wants to avoid circular reasoning, the behavior that is to be explained cannot at the same time serve as the observable evidence from which the imputed mental states are inferred (Böhm 1982: 47). One needs to refer to inter-subjectively accessible evidence that is, on the one hand, independent of the behavior that is to be explained, and that can, on the other hand, be conjectured to indicate the actual presence of the mental states that are imputed to the actor.

As soon as one specifies the method of ‘understanding’ in the above manner, it becomes very doubtful whether *understanding* actions is something entirely different from a *causal explanation* and whether there is, indeed, any reason for drawing a categorical methodological line between the understanding-based analysis of social phenomena and the nomological, causal analysis of physical phenomena (Albert 1988: 581, 586f.). Both, the imputation of mental states as reasons for action as well as the specification of observable indicators for mental states imply conjectures about causal relations, namely as conjectures about how mental states are causally connected to revealed behavior and how mental states, themselves, are connected to, or causally affected by, observable events.⁴⁰

What has been said above about the issue of ‘understanding’ is of direct relevance for the second principal argument in defense of methodological dualism, namely the claim that, because of its purposiveness and goal-directedness, human action has to be explained in *teleological* rather than in *causal* terms. Here again, it is useful to separate first the controversial from the uncontroversial. What is not controversial at all is the fact that human action is *goal-directed*, based on ‘planning ahead,’ on foresighted anticipation of its consequences. In this sense it is, if one wants to use this term, ‘*teleological*,’ aiming at a “telos”.⁴¹ Controversial is only whether this undisputed fact implies that human action requires a special, namely a ‘*teleological*’ type of explanation, an explanation that is about ‘final causation,’ ‘backward causation’ or ‘causation by consequences,’ by contrast to the ‘efficient causation’ of the standard causal model.

Upon closer inspection the claim that human action represents a case of backward causation or causation by consequences, as opposed to ordinary causation by antecedent causes, turns out to be little more than an instance of careless and misleading use of language. Its advocates surely do not want to say that actions are literally caused by the consequences that materialize as their effects. What they most probably want to say is that human actions are motivated or ‘caused’ by their *anticipated* and *desired* consequences. Yet, to argue that an

⁴⁰ Citing the views of A. Schütz and F. Machlup, R. Koppl (1994: 72) points out that an ‘understanding’ approach need not be “anti-theoretical” and need not imply a dualism “according to which quite different epistemological principles apply to mental and physical phenomena.”

⁴¹ When L. Robbins (1981: 3.) notes that explanations in economics “must to some extent be *teleological*” he clearly uses the term ‘teleological’ in this sense. He does not want to deny at all that explanations in economics are subject to “the usual logical requirements of a science” (ibid.: 9). He only wants to emphasize “that explanations of economic relationships must involve considerations of purposes” (ibid.: 3).

action occurs because the actor expects and wishes them to bring about consequences of a certain kind is clearly not the same than to argue that actions are caused by the consequences that result from them. By contrast to the latter the anticipation of consequences and the desire to bring them about *antecede* the actions that they motivate. To account for their role as causes of actions does not require us at all to abandon the standard notion of 'efficient causation.'

Opponents of methodological dualism have no reason to deny that such cognitive factors as intentions, desires and beliefs play a causal role in human action, and they can easily agree with the claim that "the sciences of human action are teleological" (Mises 1978: 7) if this is only meant to emphasize that explanations of human action must account for the role of *cognitive* factors, by contrast to purely physicalist accounts in the natural sciences. They will, however, insist that causation by such cognitive factors is still causation in the standard sense, namely causation by *antecedent* factors, even if cognitive factors are admittedly causal factors of a special kind (Meyer 2002: 117; Mackie 1974: 285f., 295f.).

4. Evolutionary Psychology: A Naturalistic Approach to Mental Phenomena

As noted above, methodological arguments are statements about theories. Methodological dualism is a conjecture about the relation between two bodies of theories, theories about mental phenomena on the one side and theories about "external events" on the other. It claims that, because of inherent differences between these two realms, theories about "the realm of human thought and action" (Mises 1957: 1) are of a categorically different nature than theories about external events. Even though this claim is often stated as if it were an ontological statement about the "nature" of the respective realms, it can in fact, as I have argued above, never be more than a conjecture about the state of our theoretical knowledge. After all, we cannot know more about the "nature of things" than what our theories tell us. Accordingly, it is ultimately not in terms of methodological arguments per se that the claim of methodological dualism must be judged, but in terms of our theoretical knowledge. This fact is, even if only in a passing manner, recognized by Mises when he limits his dualism claim to "the present state of our knowledge" (Mises 1990: 25), implicitly acknowledging that it may have to be revised in light of future theoretical developments.

The 'behaviorist' psychology that Mises accused of neglecting the cognitive foundations of human action may have, indeed, been a just target of his fundamental objections against empiricist, naturalistic approaches to human action. Yet, psychology has not only changed since Mises made his case, it underwent, in particular, what has been called the '*cognitive revolution*,'⁴² and whether Mises' verdict is still valid today has to be judged in light of contemporary psychological theories, theories that take a significantly different outlook at mental phenomena than the "crude behavioristic stimulus-response scheme" (Lavoie 1991: 484) that Mises and modern hermeneutical Austrians attack.⁴³

⁴² H. Simon (1997: 79): "About thirty years ago there occurred in psychology a 'cognitive revolution', which resuscitated older methodologies – rejected by Behaviorism – for studying complex human thinking, problem solving and decision making; and which introduced powerful new methodologies." - H. Simon sees in the cognitive revolution the prospects for a theory of the mind on which a 'subjectivist' economics can be based. As he argues: "Unless we have a theory of how the human mind operates, we have few grounds on which to build an economic theory that will talk about the kind of uncertain world we live in. ... I believe that we have made great progress toward building a theory of human thinking in the last 30 years, and therefore I am optimistic about the opportunities to apply it to economics" (ibid.: 26).

⁴³ Modern cognitive psychology explicitly seeks to account for internal, dispositional variables that intervene between "external events" and behavioral responses. They are, therefore, hardly a just target of Mises' (1978: 37) comment: "The same external events produce in different men and in the same men at different times different reactions. The natural sciences are helpless in face of this 'irregularity.'"

The purpose of this section is to take a closer look at *evolutionary psychology* as one of the post-cognitive-revolution approaches in modern psychology. To be sure, the tenets of evolutionary psychology are by no means undisputed and they are presented here not as unquestionable wisdom but as conjectures that are subject to further inquiry and critical examination. Yet, evolutionary psychology is of particular interest in the present context because it represents, on the one side, a rigorous effort to provide a purely naturalistic, causal account of the human mind and of human action, and sees itself, on the other side, as an integral part of the cognitive reorientation in psychology, a reorientation that explicitly rejects the “anti-mentalism” (Badcock 2000: 111) of behaviorism. According to L. Cosmides and J. Tooby (1987: 302), two main initiators of this research program, evolutionary psychology is concerned with “the discovery and principled investigation of the human psyche’s innate cognitive programs.” “It unites modern evolutionary biology with the cognitive revolution” (Cosmides, Tooby, Barkow 1992: 2).⁴⁴

While the principal ambition of evolutionary psychology is to better understand “the evolved information-processing mechanisms that comprise the human mind” (Cosmides, Tooby, Barkow 1992: 2), its fundamental tenet is that, because humans are the product of the evolutionary process, the explanation of their characteristics, including the “architecture of the human mind,” must be sought in the evolutionary process (Cosmides and Tooby 1987: 278; 1994c: 47). Since the human mind is a product of evolution - so evolutionary psychologists argue - inquiring into the conditions of man’s evolutionary history should provide clues for our understanding of how the mind works. They base their research strategy on the argument that, “given the long human generation time, and the fact that agriculture represents less than 1% of the evolutionary history of the genus *Homo*” (Cosmides and Tooby 1992: 222), our genetic make-up can safely be assumed to be essentially the same as that of our ancestors who predated the appearance of agriculture and modern forms of life. Therefore, evolutionary psychologists conclude, the most reasonable conjecture is that man’s genetically coded psychological mechanisms are adapted to the problem environment that our ancestors were exposed to for thousands of generations, living as hunters and gatherers in small bands (ibid.: 219; Cosmides, Tooby, Barkow 1992: 5). And we should expect to find the kinds of recurrent problems that such a hunting and gathering way of life typically posed to be reflected in the evolved architecture of the human mind (Cosmides and Tooby 1994b: 86).⁴⁵ Inquiring into these adaptive problems, this is the fundamental heuristic premise of evolutionary psychology, provides “a powerful engine of discovery” (Cosmides and Tooby 1992: 221), “a heuristic for generating testable hypotheses about the structure of the cognitive programs that solve the adaptive problems in question” (Cosmides and Tooby 1987: 302).

It is noteworthy that, in his *The Ultimate Foundations of Economic Science* (1978), Ludwig von Mises has pointed in rather similar terms to the evolutionary origins of the human mind, without drawing what would seem to be a rather compelling conclusion, namely that, if the human mind is a product of the natural forces of evolution, it should be a legitimate subject of naturalistic, explanatory inquiry.⁴⁶ One might well have expected von Mises to proceed to a naturalistic theory of the human mind when he argues:

⁴⁴ L. Cosmides and J. Tooby (1994c: 42): “Indeed, a theoretical synthesis between the two fields seems inevitable, because evolutionary biologists investigate ... the set of adaptive information-processing problems the brain evolved to solve, and cognitive scientists investigate the design of the circuits or mechanisms that evolved to solve them.”

⁴⁵ Tooby and Cosmides (1992: 64): “It is, therefore, meaningful to ask what kind of cognitive design features would have constituted good solutions to adaptive problems that persisted over many generations. Evolutionary biology and hunter-gatherer studies supply definitions of the recurrent adaptive problems humans faced during their evolution, and cognitive psychology describes the information-processing mechanisms that evolved to solve them.”

⁴⁶ H. Albert (1988: 592) points to the discrepancy between Mises’ evolutionary arguments and his methodological dualism when he notes: “Mises himself refers to the fact that the human mind has acquired its

The concepts of natural selection make it possible to develop a hypothesis about the emergence of the logical structure of the human mind and the a priori.

Animals are driven by impulses and instincts. Natural selection eliminated those specimens and species which developed instincts that were a liability in the struggle for survival. ... We are not prevented from assuming that in the long way that led from the nonhuman ancestors of man to the emergence of the species *Homo sapiens* some groups of advanced anthropoids experimented, as it were, with categorical concepts different from those of *Homo sapiens* and tried to use them for the guidance of their conduct. ... Only those groups could survive whose members acted in conformity with the right categories, i.e., with those that were in conformity with reality and therefore – to use the concept of pragmatism – worked (Mises 1978: 14f.).

Yet, instead of embarking on an inquiry into what an evolutionary account may be able to tell us about the structure of the human mind, Mises cuts off such a research avenue by simply declaring: “However, reference to this interpretation of the origin of the a priori categories does not entitle us to call them a precipitate of experience” (Mises 1978: 15). Instead, he insists that the human mind cannot be adequately approached, in a “Darwinian spirit,” as a natural phenomenon “without recourse to finality” (ibid.). It is the categorical difference between phenomena of the human mind and what goes on in non-human nature that, in his view, makes the mind’s evolutionary origins essentially irrelevant for our understanding of its functioning (ibid.: 1f., 8).

One of the principal conclusions that evolutionary psychologists draw from their Darwinian outlook is a critique of rational choice theories (Vromen 2002: 188). A theory that interprets the human mind as a general purpose mechanism with universal, content-independent problem-solving capacity is in their view extremely implausible from an evolutionary perspective (Cosmides and Tooby 1992: 164). Recognizing the evolutionary origins of the human mind imposes, as they argue (Cosmides and Tooby 1992: 108; 1994b: 88f.), constraints on what we can assume about its problem-solving capacities, namely *evolvability constraints* and *solvability constraints*. One must be able to show that the faculties that one ascribes to the human mind could, in principle, have evolved under the conditions that, as far as we know, characterized the evolutionary history of our species.⁴⁷ And one must, secondly, be able to show how these faculties enable the mind to, in fact, solve the problems in question. As Cosmides and Tooby (1992: 110) put it: “To be a viable hypothesis about human psychological architecture, the design proposed must be able to meet both solvability and evolvability criteria: It must be able to solve the problems that we observe modern humans routinely solving and it must solve all the problems that were necessary for humans to survive and reproduce in ancestral environments.”

It is in terms of the evolvability and solvability constraints that evolutionary psychologists find standard rational choice theory to provide an implausible account of human capabilities. As far as the solvability constraints are concerned, they argue that “no one has yet been able to specify a general learning mechanism or general cognitive problem solver that has the power to solve the complex array of adaptive problems faced by humans, either in principle or in practice” (Cosmides and Tooby 1987: 298). With regard to the evolvability constraints they point out that evolutionary biology provides a number of reasons why it is implausible to assume that “the human mind is an equipotential, general-purpose machine”

structure in the course of evolution. ... This implies that there are general laws of its functioning which can in principle be discovered.”

⁴⁷ Cosmides and Tooby (1994b: 97): “Cognitive programs that systematically violate this constraint cannot be selected for *Evolvability constraints* ... specify the class of mechanisms that can, in principle, evolve.”

(Cosmides and Tooby 1994b: 89), and why it is much more plausible to adopt “the contrary view that the mind is richly textured with content-specialized psychological adaptations” (Cosmides and Tooby 1992: 165), adaptations that serve to solve long-standing evolutionary problems (Cosmides and Tooby 1994a: 329; 1994c: 65). Evolutionary psychologists do not deny the presence of domain-general cognitive mechanisms, their argument is that not all innate cognitive programs can be of a general-purpose nature but that some of them must be domain-specific, “functionally specialized procedures that exploit the recurrent properties of the corresponding domain in a way that would have produced an efficacious solution under Pleistocene conditions” (Cosmides and Tooby 1992: 221). Such domain-specific cognitive mechanisms, Cosmides and Tooby (1994b: 89) argue, “can be expected to systematically outperform (and hence preclude or replace) more general mechanisms,” because - by contrast to the latter - they exploit the stable structural features of evolutionary recurring situations.⁴⁸

As a paradigmatic example of such specialized cognitive mechanisms⁴⁹ evolutionary psychologists point to Noam Chomsky’s (1980) psycholinguistics and its principal conjecture that the human capacity of language-learning cannot be explained on the basis of general-purpose mechanisms alone but requires the presence of a functionally distinct mental organ, a “language acquisition device” (Tooby and Cosmides 1992: 95; Badcock 2000: 246).⁵⁰ According to Cosmides and Tooby (1987: 290f.), Chomsky’s contribution marked a turning point in modern psychology because it drew attention to the idea that “just as the body has many different organs, each of which is specialized for performing a different function ..., the mind can be expected to include many different ‘mental organs’.”

An area to which evolutionary psychologists have paid special attention in their search for domain-specific cognitive mechanisms is cooperation for mutual benefit and, in particular, social exchange. As Cosmides and Tooby (1994c: 48) put it:

The adaptive problems that arise when individuals engage in this form of cooperation have constituted a long-enduring selection pressure on the hominid line.

Paleoanthropological evidence indicates that social exchange extends back at least 2 million years in the human line, and the fact that social exchange exists in some of our primate cousins suggests that it may be even more ancient than that. It is exactly the kind of problem that selection can build cognitive mechanisms for solving.

In a world in which mutually beneficial cooperation is a more sustainable source of gains than unilateral exploitation (Cosmides and Tooby 1992: 207), cognitive programs that better enable individuals to successfully engage in mutually beneficial exchange can be expected to outperform other mechanisms. And here, as in other areas of human problem-solving, evolutionary psychologists conjecture that specialized programs are likely to be better adapted to handle recurrent problem-situations than general-purpose algorithms, and that we should, accordingly, expect the human mind to contain specialized mechanisms designed for reasoning about social exchange (ibid.: 163, 207f.; 1994a: 330; 1994c: 49). Such specialized adaptations to social exchange are, as they argue, particularly important where the

⁴⁸ Cosmides and Tooby (1994a: 329): “Natural selection could equip humans’ cognitive specializations with design features and problem-solving strategies that exploited the presence of these problem-specific regularities to solve particular classes of problems in efficient ways appropriate only to this class. ... *For the problem domains they are designed to operate on, specialized problem-solving methods perform in a manner better than rational.*”

⁴⁹ Cosmides and Tooby (1994b: 88): “(H)umans are equipped with a diverse range of adaptations designed to perform a wide variety of tasks, from solicitation of assistance from one’s parents, to language acquisition, to modeling the spatial distribution of local objects, to coalition formation and cooperation, to the deduction of intentions on the basis of facial expression.” – See also Cosmides and Tooby (1992: 166).

⁵⁰ It has to be noted that Chomsky’s theory is itself subject to the kind of objections that are raised against “modularity theories” in general, including evolutionary psychology. See e.g. Tomasello (1999: 94, 203).

complexities of non-simultaneous trade are concerned (Cosmides and Tooby 1992: 169) and where, for instance, the capacity to reliably separate reciprocating cooperators from exploitative cheaters is an essential prerequisite for lasting success (ibid.: 181ff.).

Another issue that evolutionary psychologists have focused their research interest on, and one that is of particular interest in the context of this paper, concerns the human ability to “read other people’s minds” and to anticipate their likely behavior. By contrast to methodological dualists, like Ludwig Lachmann, who take this human ability, the capacity of “Verstehen” or “understanding,” as evidence supporting their anti-naturalistic methodology, evolutionary psychologists seek to provide a naturalistic, explanatory account of this very capacity as “an evolved attribute of human beings” (Badcock 2000: 114).⁵¹ As Cosmides and Tooby (1994b: 101f.) explain:

Another important set of evolutionary long-enduring regularities is the recurrent design features of other human minds. Evolved domain-specific cognitive specializations are even more necessary in this area, not only because other minds constitute the single most important selective force facing any individual human, but also because mental states such as beliefs, motives, intentions, and emotions cannot be directly observed. To allow a human to represent at least some of the mental states that generate other’s behavior, special inferential systems must be available to bridge the gap from the observable to the unobservable. For example, if there is a reliable correlation over evolutionary time between the movement of human facial muscles and emotional state or behavioral intentions, then specialized mechanisms can evolve that infer a person’s mental state from the movement of that persons facial muscles.

According to Cosmides and Tooby (ibid.: 102f.), research efforts in the field of cognitive development provide substantial support for the hypothesis that our evolved psychological architecture includes a specialized “theory of the mind module” that enables us to reliably develop models of other human minds.

As noted before, a relatively new research program like evolutionary psychology is, of course, not undisputed (Badcock 2000: 17ff., 108). What is important in the present context is, however, the general research program on which evolutionary psychology is based, not specific claims that are made by various researchers associated with this program. Objections that may well be raised with regard to such particular claims should not distract from the fact that the general paradigmatic outlook of evolutionary psychology is shared by a variety of modern approaches in the cognitive sciences, in psychology and in evolutionary biology that seek to study the human mind from a naturalistic, explanatory perspective (Tooby and Cosmides 1992: 93). This general outlook interprets the human mind as an adaptive, information-processing system that translates informational input into behavioral output. It seeks to explain the working principles of this information-processing system in light of the fact that its structure has been shaped by evolutionary forces. And it assumes that the human mind, like all information-processing systems, can be described in mutually compatible and complementary ways, on the one hand, in terms of its physical components – or its “hardware” – and, on the other hand, in terms of the programs that govern its operations – its “software.” (Cosmides and Tooby 1987: 283f.; 1994c: 44).

It is in terms of such interpretation of the mind as an information-processing system that L. Cosmides, J. Tooby and J.H. Barkow (1992: 8) note in their Introduction to *The Adapted Mind – Evolutionary Psychology and the Generation of Culture*:

⁵¹ It is worth noting that some of F.A. Hayek’s arguments on the issue of “Verstehen” or “understanding” are very much compatible with the outlook of evolutionary psychology. See Hayek (1967c: 46ff.).

The brain takes sensorily derived information from the environment [including the organism's 'internal' environment, V.V.] as input, performs complex transformation on that information, and produces either data structures (representations) or behavior as output. Consequently, it too, can be described in two mutually compatible and complementary ways. A neuroscience description characterizes the ways in which its physical components interact; a cognitive, or information-processing, description characterizes the 'programs' that govern the operation. In cognitive psychology, the term *mind* is used to refer to an information-processing description of the functioning of the brain. ... An account of the evolution of the mind is an account of how and why the information-processing organization of the nervous system came to have the functional properties that it does.⁵²

According to this outlook at the mind, human problem-solving behavior is guided by *programs*⁵³ that incorporate "knowledge" of relevant contingencies in man's problem environment and that enable humans to respond more speedily and effectively to typical, recurrent problem situations than an exclusively general-purpose device, called "rationality," would allow them to do.

Even though its focus is on the kind of "knowledge" that is the result of natural selection and that is "stored" in genetically encoded programs (Cosmides and Tooby 1987: 287) evolutionary psychology does not deny the role of general-purpose devices and the plasticity of human learning. Evolutionary psychologists insist, however, that such general-purpose devices and human learning can only work with the aid of domain-specific cognitive mechanisms that selectively pre-structure the otherwise unmanageable complexity of the world. As Tooby and Cosmides (1992: 105) put it: "A mechanism unaided by domain-specific rules of relevance, specialized procedures, 'preferred' hypotheses, and so on could not solve any biological problem of routine complexity in the amount of time the organism has to solve it, and usually could not solve it at all."⁵⁴

The clue to understanding the impressive problem-solving capacity and cognitive power of the human mind, this is the principal tenet of evolutionary psychologists, is to be found in the richness of its evolved content-specific mechanisms. They hold "that the human capacity for adaptive flexibility and powerful problem-solving is so great precisely because of the number and the domain-specificity of the mechanisms we have" (ibid.: 113), and they reject accounts that attribute such capacity entirely to domain-general, content-independent mechanisms. Not only are such accounts, in their view, highly implausible in light of accumulating research-evidence (ibid.: 103). To attribute man's cognitive abilities to a globally defined capacity "rationality" means, they censure, merely to put a label on a phenomenon instead of actually examining it (ibid.: 113). As Tooby and Cosmides (1992: 122) put it, rationality "is not an explanation for anything, but is rather a phenomenon that itself requires explanation."

⁵² Cosmides and Tooby (1987: 282): "Behavior is ... elicited by information, which is gleaned from the organism's external environment, and, proprioceptively, from its internal states. ... *The evolutionary function of the human brain is to process information in ways that lead to adaptive behavior.*" – Cosmides and Tooby (1994a: 328): "The brain is a complex computational device, a system that takes sensory information as input, transforms it in various ways, stores it, analyzes it, integrates it, applies decision rules to it, and then translates the output of those rules into the muscular contractions that we call 'behavior.'"

⁵³ The term "program" is explicitly employed in analogy to its use in information science. As Tooby and Cosmides (1992: 66) note: "(A)n information-processing program, whether in an organism or in a computer, is a set of invariant relationships between informational inputs and 'behavioral' outputs."

⁵⁴ Tooby and Cosmides (1992: 103): "The inexhaustible range of possibilities latent in behavior, categorization, interpretation, decision and so on, is not just an abstract philosophical point. It is an implacable reality facing every problem-solving computational system. ... Any design for an organism that cannot generate appropriate decisions, inferences, or perceptions ... is lost in an ocean of erroneous possibilities."

5. Purposive Action as Program-Based Behavior

Methodological dualism represents what Tooby and Cosmides (1992: 21) describe as a “doctrine of intellectual isolationism,” a doctrine that, as they note, “has been the reigning view in the social sciences” (ibid.). It is one of the more wider ranging ambitions of evolutionary psychology to oppose the doctrine of isolationism and to advance, instead, a “conceptual unification” (ibid.), that seeks to systematically integrate explanatory efforts in the social sciences with insights that are generated in neighboring fields such as, for example, cognitive science, evolutionary biology or neurobiology.⁵⁵ Evolutionary psychologists see their own explanatory efforts embedded in a number of theoretical developments in several disciplines that point towards, as Tooby and Cosmides (ibid.: 23) call it, an “Integrated Causal Model” of human behavior, a model that “connects the social sciences to the rest of science” (ibid.: 24).

As noted before, evolutionary psychology is, indeed, just one among a number of recent research efforts that, in mutually compatible ways, seek to provide a naturalistic account of the cognitive foundations of human behavior (Vanberg 2002; 2004). The central theoretical notions around which these research efforts center have been captured, in a particularly pointed manner, in Ernst Mayr’s concept of teleonomic or program-based behavior and in K.R. Popper’s concept of conjecture-based problem-solving. Their arguments deserve to be, at least briefly, discussed here.

Evolutionary biologist Ernst Mayr has suggested an outlook at purposeful behavior that locates the capacity for goal-directedness and intentionality in the presence of behavioral programs that are encoded in an organism and enable the organism to anticipate the consequences of its own actions.⁵⁶ Mayr refers to such purposeful, intentional behavior as *teleonomic* behavior in order to avoid the ambiguities of the term ‘*teleological*’⁵⁷ as well as to emphasize that his ambition is to provide a nomological, causal explanation of goal-directedness and intentionality. As he explains: “A teleonomic process or behavior is one that owes its goal-directedness to the operation of a program” (Mayr 1992: 127). And such program-based behavior, he argues, can be explained in causal terms, “there is no conflict between causality and teleonomy” (Mayr 1961: 1504).

Expressly adopting the concept from information theory, Mayr defines a *program* as “a set of instructions” (Mayr 1992: 128), as “coded or prearranged information that controls a process (or behavior) leading toward a goal” (ibid.: 127f.). Programs can serve to guide goal-directed behavior because they incorporate conjectural knowledge of the world, knowledge of relevant contingencies based on which likely consequences of alternative courses of action can be anticipated. Such programs can, in principle, be stated as instructions or decision-rules of the form, “if problem of type A is encountered, then action of type X is a suitable response.”⁵⁸ An important consequence of looking, as Mayr suggests, at purposeful action as *program-based* behavior is that it draws one’s attention to two principal issues. This is, on the one hand, the question of how programs are coded in an organism and how they become adapted to the organism’s respective problem-environment. Mayr uses the term *encoding* to refer to this issue. And this is, on the other hand, the question of how coded programs can be implemented to provide guidance in specific choice situations, an issue that Mayr refers to as

⁵⁵ It could be just as well be directed against ‘hermeneutical Austrians’ when Tooby and Cosmides (1992: 22) note in reference to an other advocate of ‘hermeneutics’: “For example, Clifford Geertz advocates abandoning the ground of principled causal analysis entirely in favor of treating social phenomena as ‘texts’ to be interpreted just as one might interpret literature.”

⁵⁶ I have discussed Mayr’s approach in more detail in Vanberg (2002: 15ff.).

⁵⁷ E. Mayr (1961: 1504): “We biologists have long felt that it is ambiguous to designate such programmed, goal-directed behavior ‘teleological,’ because the word teleological has also been used in a very different sense.”

⁵⁸ Such instructions or decision-rules can, of course, reach any degree of complexity by additional specifications added to the if-clause and the then-clause.

decoding. Decoding is about solving the problem of applying programs or decision-rules that are about *types* of problem-situations and *types* of actions to specific choice-situations, situations that are always unique in their particular constellations of circumstances.

Encoding can, as Mayr points out, be explained as a feed-back process that establishes a systematic link between the performance of programs (success or failure) and their future role in guiding behavior. The two main processes through which such encoding occurs are *evolution*, affecting genetically encoded programs, and *learning*, affecting memory-coded programs. The encoding that the evolutionary biologist studies – and that evolutionary psychologists focus their attention on – is governed by the feed-back process of natural selection of successful programs, a process through which ‘knowledge’ is incorporated in genetic codes that allow for adapted behavior. The genetically coded programs, in turn, provide the foundation on which - or the framework within which - the learning of memory-coded programs occurs.⁵⁹

The distinction between *encoding* and *decoding* corresponds to Mayr’s distinction between *ultimate* and *proximate* causes of behavior and between the explanatory focus of the “functional biologist” and the “evolutionary biologist.” Proximate causes of behavior are the programs that govern the responses of the individual to the immediate factors of the environment (Mayr 1961: 1503). Ultimate causes of behavior are the factors that have shaped these programs. The functional biologist who “deals with all aspects of the decoding of the information contained in the DNA code” (ibid.: 1502) is interested in the proximate causes of behavior. By contrast, the evolutionary biologist who studies “the laws that control the changes of these codes from generation to generation” (ibid.: 1502) is interested in the ultimate causes that “are responsible for the evolution of the particular DNA code of information with which every individual of every species is endowed” (ibid.: 1503).

To explain behavior in terms of proximate causes means to employ conjectures about the “psychological mechanisms” or “programs” that allow an individual to cope with problems faced in its environment.⁶⁰ Looked at from such a perspective, the method of “Verstehen” or “understanding” can be interpreted as a particular research strategy for conjecturing about “proximate causes” of behavior, namely the strategy of imagining oneself in the choice-situation faced by the individual whose behavior is to be explained. As discussed above, the problem the Verstehen-approach faces is that, if one wants to escape circular reasoning, one needs to specify operational methods for how the conjectures generated by ‘understanding’ can be critically examined. Mayr’s distinction between proximate and ultimate causes of behavior suggests ways in which conjectures about “psychological mechanisms” or “programs” can be checked, namely in light of conjectures about how they themselves have come to be what they are. Conjectures about genetically coded cognitive mechanisms, for instance, can be critically analyzed in light of the question whether they could have evolved in the kind of problem-environment to which our species was exposed in evolutionary time.⁶¹ And conjectures about individually acquired, memory-coded behavioral dispositions can be critically questioned as to whether they could have been plausibly learned in the kind of environment to which the individual in question was exposed.

⁵⁹ Mayr (1961: 1502): “It is characteristic of these genetic codes that the programming is only in part rigid. Such phenomena as learning, memory, non-genetic structural modification, and regeneration show how ‘open’ these programs are.”

⁶⁰ Adopting the distinction between proximate and ultimate causes of behavior Cosmides and Tooby (1987: 281f.) note: “(T)he psychology of an organism consists of the total set of proximate mechanisms that cause behavior. ... (B)ehavior is an effect produced by a causal system: proximately by psychological mechanism.”

⁶¹ This is, as explained above, the explicit aim of evolutionary psychology. As Cosmides and Tooby (1987: 283) put it: “Evolutionary psychology ... relates explanations in terms of adaptive strategy to explanations in terms of proximate mechanisms. ... Psychological mechanisms constitute the missing causal link between evolutionary theory and behavior. ... (I)t is the proximate mechanisms that cause behavior that promise to reveal the level of underlying order for a science of human behavior.”

In other words, conjectures about ultimate causes can provide indirect evidence for testing conjectures about proximate causes.

As Mayr emphasizes, to claim that teleonomic purposiveness can be explained in causal terms does not mean to ignore that “causality in biology is a far cry from causality in mechanics” (Mayr 1961: 1506). It is meant, however, to insist that the differences that divide these fields are a matter of complexity and not of different principles of explanation.⁶² In terms similar to Hayek’s comments on theories of complex phenomena, Mayr argues that it is because of the individuality and uniqueness characteristic of the organic world that “explanation will often have to be so unspecific and so purely formal that its explanatory value can certainly be challenged” (ibid.: 1503). To recognize such limits in the specificity of the explanations that can be provided does, however, not mean at all to “question the ultimate causality of all biological phenomena” (ibid.). Nor should the fact that the complexity of biological phenomena often precludes prediction be mistaken as a “lack of cause” (1505). As Mayr (ibid.: 1506) puts it: “The complexities of biological causality do not justify embracing nonscientific ideologies ... but should encourage all those who have been trying to give a broader basis to the concept of causality.”

A general outlook at purposeful action that is very similar to E. Mayr’s notion of program-based behavior has been suggested by K.R. Popper who argues that the behavior of all organisms – including purposeful human action – can be viewed as *conjecture-based problem-solving behavior*.⁶³ Problem-solving, Popper (1982: 150) states, is what all behavior – in fact, all life – is about. Like Mayr’s approach, Popper’s suggested outlook is meant to draw attention to the fact that the capacity to solve problems presupposes knowledge of relevant contingencies in the problem-environment. It posits that, as problem-solving agents, all living beings are guided in their behavior by pre-existing expectations about the world around them, expectations that constitute the organism’s conjectural knowledge of the world. And all such knowledge is, so Popper notes, the result of conjecture and refutation, of “competitive tentative solutions and the elimination of error” (Popper 1972: 145).⁶⁴

According to Popper, it is only in the light of its repertoire of conjectural expectations that an organism can perceive and identify problems. In other words, perception is always a theory-impregnated act of selective interpretation (ibid: 343). This is, as Popper argues, no less true for our most elementary, un- or subconscious sensory perceptions than for our most reflected scientific observations.⁶⁵ And just as we can only perceive our environment in the light of pre-existing conjectural expectations it is, he insists, only on the basis of our conjectural knowledge of the world that we can act and respond to the problems we face. Using the same language as E. Mayr, Popper speaks of such action-guiding conjectural knowledge as “action programs” (Popper and Eccles 1990: 134), as “dispositions to act, or to behave” (ibid.: 130).⁶⁶

The principal mechanism that governs the acquisition of expectations and conjectural knowledge is, as Popper supposes, essentially the same for all kinds of “knowledge,” whether it is incorporated in sense organs (Popper 1972: 72) or in explicitly stated scientific theories. As he puts it: “From the amoeba to Einstein, the growth of knowledge is always the same: we try to solve our problems, and to obtain, by a process of elimination something approaching

⁶² Mayr (1961: 1506): “Causality in biology is not in real conflict with the causality of classical mechanics.”

⁶³ I have discussed Popper’s arguments in more detail in Vanberg (2002: 19ff.).

⁶⁴ K.R. Popper (1972: 145): “The tentative solutions which animals and plants incorporate into their anatomy and their behavior are biological analogues of theories and vice versa: theories correspond ... to endosomatic organs and their ways of functioning. Just like theories, organs and their functions are tentative adaptations to the world we live in.”

⁶⁵ The ‘conjectures’ built into our (sense-)organs can, Popper (1972: 146) notes, be regarded as “the biological predecessors of linguistically formulated theories.”

⁶⁶ Popper does, in fact, explicitly – and approvingly – refer to Mayr’s concept of program-based behavior (Popper 1987: 151).

adequacy in our tentative solutions” (Popper 1972: 261). All acquired knowledge – whether it is acquired in the process of genetic evolution or in the process of individual learning – consists, this is Popper’s central claim, in the modification “of some form of knowledge, or disposition, which was there previously, and in the last instance of inborn expectations” (ibid.: 71).

Popper’s theory of conjecture-based problem solving and of the growth of knowledge through trial-and-error elimination has become a major inspiration for *evolutionary epistemology*,⁶⁷ a research paradigm that has been developed independently of (and prior to) evolutionary psychology, but is closely related to the latter (Vanberg: 2002: 33ff.).⁶⁸ The central tenet of evolutionary epistemology is that all knowledge processes, i.e. processes that lead to an *expansion* of knowledge or problem-solving capacity, can be interpreted as instances of the “variation and selective retention process of evolutionary adaptation” (Campbell 1974: 450f.), where the latter is broadly understood to include genetic evolution as well as cultural evolution and the “variation and selection processes” that constitute individual learning (Vanberg 1994a: 174ff.).⁶⁹

What makes evolutionary epistemology particularly noteworthy in the present context is the fact that F.A. Hayek is counted among its principal founders.⁷⁰ In the section below I shall take a closer look at Hayek’s approach, an approach that exemplifies an interpretation of Austrian subjectivism that is markedly different from the methodological dualism advocated by authors like Mises, Lachmann and the ‘hermeneutical Austrians.’

6. F.A. Hayek: An Alternative Austrian Research Program

By contrast to the versions of Austrian subjectivism discussed above (section 2), F.A. Hayek advocates what one may describe as “naturalistic subjectivism.” He has developed a research program that seeks to provide economics with a behavioral foundation entirely compatible with an empiricist methodology. Beyond the few remarks made above (section 3), I shall not address here the often discussed issue of whether there has been a systematic shift in Hayek’s methodological outlook since the late 1930s and early 1940s “in a direction away from Mises toward Popper” (Boehm 1982: 50). What is of relevance in the present context is that already in his programmatic 1936 Presidential Address to the London Economic Club (Hayek 1948a) Hayek explicitly outlined an empiricist research agenda for a subjectivist economics, a research agenda that he has systematically explored in various directions in his later work on markets as systems of communication and on cultural evolution as a process of “collective learning” (Vanberg 1994a), as well as in what is often described as the most unusual part of his life-work, his contribution to theoretical psychology (Hayek 1952).

In “Economics and Knowledge,” Hayek takes issue with an economic theory that fails to address what must, in his view, be a principal concern of an *explanatory* economics, namely the *knowledge problem*, i.e. the problem of how effective economic coordination is achieved in the real world among agents who possess only subjective, incomplete and imperfect pieces of knowledge of the complex contingencies on which the successful pursuit

⁶⁷ The name “evolutionary epistemology” appears to have been coined by Donald T. Campbell (1974).

⁶⁸ Surprisingly, even though the research program of evolutionary epistemology predates the emergence of evolutionary psychology, authors who publish in the latter field seem to have taken no notice of its existence.

⁶⁹ M. Tomasello (1999: 216) refers to these three levels of evolutionary adaptation when he notes: “Modern adult cognition of the human kind is the product of genetic events taking place over many millions of years in evolutionary time but also of cultural events taking place over many tens of thousands of years in historical time and personal events taking place over many tens of thousands of hours in ontogenetic time.”

⁷⁰ In his survey of the field W.W. Bartley (1987: 20f.) lists F.A. Hayek among its “founders,” besides K.R. Popper, D.T. Campbell, Ernst Mayr and Konrad Lorenz.

of their plans depends.⁷¹ The principal target of Hayek's critique is a formal equilibrium analysis which evades "any real solution of the problem" (1948a: 51) by falling "in effect back on the assumption that everybody knows everything" (ibid.), an assumption that answers the question of how markets operate in a purely tautological manner but does not inform us about how they actually function.⁷² Implicitly, his critique is, however, also directed at Mises' praxeological a priorism, as can be concluded from Hayek's comments on a "Pure Logic of Choice" which is concerned with what "we know to be common to all human thought" (Hayek 1948a: 47). The 'axioms' of the 'pure logic of choice,' Hayek notes, *define* the kind of phenomena which we seek to understand, namely 'conscious' as distinguished from 'instinctive' action, and in this sense they are, of course, "universally applicable to the field in which we are interested" (ibid.). Yet, so Hayek states in no uncertain terms, the "tautological transformations of the Pure Logic of Choice" (ibid.: 39) have little to do with an explanation of social reality. As he puts it: "But the assumptions or hypotheses, which we have to introduce when we want to explain the social process, concern the relation of the thought of an individual to the outside world, the question to what extent and how his knowledge corresponds to the external facts. And the hypotheses must necessarily run in terms of assertions about causal connections, about how experience creates knowledge" (ibid.).

Hayek emphasizes, not any less than other Austrians do, the subjectivity of the valuations and theories that inform human action.⁷³ He explicitly stresses that "the analysis of what people will do can start only from what is known to them" (Hayek 1948a: 44),⁷⁴ and that "not only man's action toward external objects but also the relations between men and all the social institutions can be understood only by what men think about them" (Hayek 1979: 57). Yet, Hayek's methodological conclusions from the subjectivist premise are clearly different from those drawn by authors like Mises or Lachmann. This is not to deny the often observed fact that some of Hayek's arguments on the matter – in particular in his essay on "Scientism and the Study of Society" (Hayek 1979: 17ff.) – appear to come close to Mises' views.⁷⁵ Yet, as has been noted above (pp.13f.), a careful reading of these arguments, especially a reading that gives appropriate weight to Hayek's later clarifying comments, cannot fail to recognize that Hayek's version of subjectivism systematically differs in its methodological orientation from Mises' – as well as from Lachmann's – subjectivist outlook. By contrast to them his ambition clearly is to develop an empirical, explanatory theory of the role of knowledge or mental phenomena in human action and social interaction.

As far as the method of understanding is concerned on which e.g. Lachmann puts so much emphasis as the distinctive method of the social sciences, Hayek acknowledges that we

⁷¹ As Hayek has later stated it in an other context: "But the concrete knowledge which guides the actions of any group of people never exists as a consistent and coherent body. It only exists in the dispersed, incomplete, and inconsistent form in which it appears in many individual minds, and the dispersion and imperfection of all knowledge are the two basic facts from which the social sciences have to start" (1979: 49f.)

⁷² In his later seminal article on "The Use of Knowledge in Society" Hayek noted about the prominence of "equilibrium analysis" in economics: "But I fear that our theoretical habits of approaching the problem with the assumption of more or less perfect knowledge on the part of almost everyone has made us somewhat blind to the true function of the price mechanism and led us to apply rather misleading standards in judging its efficiency" (1948c: 87).

⁷³ Kirzner (1992b: 132) recognizes Hayek's concern with the role of knowledge as "a decisive, explicit extension of subjectivism in modern economics."

⁷⁴ Hayek specifically notes that in our efforts to explain human action we must remain aware of the difference between what is known by "the observing economist" (1948a: 39) and what is "known to the persons whose behavior we try to explain" (ibid.). And he points to the obvious – though in standard rational choice accounts often ignored – fact that "no superior knowledge the observer may possess about the object, but which is not possessed by the acting person, can help in understanding the motives of their actions" (1948b: 60). – On this issue see also Hayek (1979: 51).

⁷⁵ In fact, in a footnote to his often quoted remark "that every important advance in economic theory during the last hundred years was a further step in the consistent application of subjectivism" Hayek (1979: 52) states: "This is a development which has probably been carried out most consistently by Ludwig von Mises."

surely “constantly act on the assumption that we can in this way interpret other people’s actions on the analogy of our own mind” (1948b: 64). Yet, he cautions that such analogies are mere conjectures, “that we can never be sure” (ibid.), and “that we can understand less and less as we turn to beings more and more different from ourselves” (ibid.: 66).⁷⁶ More importantly even, Hayek’s own understanding of what ‘understanding’ is about is not in contrast to the notion of nomological explanation but is, instead, perfectly compatible with it (Hayek 1967c: 58ff.).

Hayek’s intention in emphasizing the role of subjective knowledge in human action is, quite apparently, not to claim a special methodological status – whether praxeological or hermeneutical – for economic and social analysis. To the contrary, his concern is with “economics as an empirical science” (1948a: 44), it is with an empirical, explanatory approach to “the role which assumptions and propositions about the knowledge possessed by different members in society play in economic analysis” (ibid.: 33). And such an empirical approach, he insists, must be based on conjectures about how knowledge is acquired and expectations are formed (Hayek 1979: 57), on “empirical propositions ... about how people will learn” (1948a: 55). These conjectures, Hayek emphasizes, are empirically testable “assumptions about causation” (ibid.: 46) and, as such, are “of a fundamentally different nature” not only from the propositions of formal equilibrium analysis (ibid.: 55), they are also “rather different from the general assumptions from which the Pure Logic of Choice starts” (ibid.: 46).

What is, in the present context, even more important than Hayek’s programmatic methodological arguments is the fact that, from his 1936 lecture on “Economics and Knowledge” (1948a) on, Hayek systematically pursued an empirical subjectivist research agenda that focuses on the issue of how imperfect human agents – instead of fictitious, perfectly rational homines oeconomici – acquire and communicate the subjective knowledge of the world that allows them relatively successfully to operate within their respective problem environments, and relatively successfully to cooperate with, and coordinate their actions with, other agents who are equally limited in their understanding of the complexities of the world around them. Hayek’s entire life work can be viewed as a systematic effort to explore different aspects of this fundamental issue. His theory of the spontaneous order of the market seeks to explain how the price mechanism operates as a system of communication by which the fragments of knowledge dispersed among myriads of agents in an extended network of exchange relations are utilized to effectively transmit throughout the system information about changes in relative scarcities. His theory of competition as a discovery procedure seeks to explain how the market functions as an open experimental arena in which, by way of trial and error, continuously new and superior solutions to economic problems are discovered (solutions which may in turn, of course, generate new problems of their own). His theory of cultural evolution seeks to explain how the inter-personal and inter-group variety in acquired practices, artifacts, normative beliefs and conjectural knowledge feeds into a process of competitive selection that results in an inter-generational accumulation of experience-based problem-solving knowledge. Finally, and of particular interest in the present context, there is Hayek’s theory on how the human mind operates as the “repository” of subjective knowledge, an empiricist theory of mental phenomena that is outlined in detail in his *The Sensory Order – An Inquiry into the Foundations of Theoretical Psychology* (1952) as well as in some of his other contributions devoted to epistemological issues (1967a,b,c,d; 1978b; 1979: 31ff.).

About the theoretical perspective laid out in *The Sensory Order* W.B. Weimer (1982: 281) has said that it “is compatible with ... the resurgence of cognitive psychology (post-Chomsky and psycholinguistics), as well as the methodological views of science advanced by Karl Popper.” Even though it has found much less attention than other parts of Hayek’s work,

⁷⁶ For a comparison to Mises’ view on the role of ‘understanding’ in the social sciences see Mises (1978: 50, 71; 1990: 8f.).

the significance of *The Sensory Order* in the context of his overall research program has been well recognized by Hayek-experts such as Bruce Caldwell (2000: 9f.), while experts in modern cognitive neuroscience have praised Hayek's contribution as anticipating, in essence, ideas that have only more recently gained wider recognition in this field.⁷⁷

In *The Sensory Order* Hayek took up and expanded ideas that he had outlined several decades earlier as a young student in a manuscript, entitled *Beiträge zur Theorie der Entwicklung des Bewusstseins* (Contributions to a Theory of How Consciousness Develops) (Hayek 1920). In the abstract of this early paper he had explicitly stated that it was his ambition to propose a theory of the mind compatible with the world view of the natural sciences.⁷⁸ The term "sensory order" is used by Hayek (1982: 288) to refer to an organism's internal (mental) representations or 'models' of the outer world, models that embody knowledge of relevant contingencies in the organism's problem environment.

Of particular significance in the present context is Hayek's claim that these internal representations or models provide the clue to our understanding of adaptive or purposive behavior (Hayek 1952: 122ff.). The fact that these internal models allow the organism to anticipate the likely consequences from different kinds of behavior is, in his view, the essential ingredient of purposive, problem-solving behavior. In this sense, Hayek notes, even machines governed by programs – such as, for example, "automatic pilots for aircraft" (ibid.: 126) – may be said to exhibit 'purposive' (problem-solving) behavior. Though such machine-behavior is, of course, very primitive compared to the complexities of human behavior, it has in common with the latter that it owes its problem-solving capacity to the existence of programs in which knowledge of relevant contingencies of the environment is incorporated.⁷⁹

In Hayek's account it is through the mind's "internal representations" – through models, rules or dispositions⁸⁰ – that all human *perception* as well as human *action* is guided, from our pre- or sub-conscious adaptations to our most deliberate and reflected responses to problems (Hayek 1952: 86f.; 145f.; 1967c: 45).⁸¹ It is, he argues, only on the basis of the

⁷⁷ J.M. Fuster (1995: 87ff.): "The first proponent of cortical memory networks on a major scale was neither a neuroscientist nor a computer scientist but, curiously, a Viennese economist: Friedrich von Hayek. ... Although devoid of mathematical elaboration, Hayek's model clearly contains most of the elements of those later network models of associative memory. ... The main reason for dwelling here on Hayek's model is simply that it has certain properties ... that conform exceptionally well to recent neurobiological evidence on memory." – Fuster (ibid.: 89) points to G. Edelman as "one of the theoreticians of the brain to have acknowledged the importance of Hayek's contribution" (Fuster ibid.: 90). See G. Edelman (1987: 25).

⁷⁸ In retrospect, Hayek (1982: 289) has noted about the writing of *The Sensory Order*: "When I then, about 1946, began looking at the current psychological literature, I found to my amazement that my problem seemed to be in exactly the same state in which I had left it 25 years before." – Hayek's principal reference at the time was D.O. Hebb's (1949) neuropsychological theory which has been of major influence on the development of modern cognitive neuroscience. – It is worth noting that J.H. Holland (whose theory of complex adaptive systems is very much compatible with Hayek's views in *The Sensory Order*) cites Hebb's theory as the major inspiration for his own work (Holland 1998: 19). – On Holland's theory see Vanberg (2004: 30ff.).

⁷⁹ Hayek (1952: 126): "Such machines ... would lack the capacity of learning from experience. But although for this reason such machines cannot be described as brains, with regard to purposiveness they differ from a brain merely in degree and not in kind."

⁸⁰ Hayek uses the terms 'models,' 'rules' and 'dispositions' alternatively to describe the mental events that take place "between the input of (external and internal) stimuli and the output of action" (Hayek 1982: 288). – While in *The Sensory Order* he mostly speaks of 'models,' in later publications he prefers to speak of "rules of action (or dispositions)" (Hayek 1978b: 43). As he notes: "(D)ispositions toward *kinds* of movements can be regarded as adaptations to typical features of the environment, and the 'recognition' of such features as the activation of the kind of disposition adapted to them. ... (A)ll the 'knowledge' of the external world which such an organism possesses consists in the action patterns which the stimuli tend to evoke. ... (W)hat we call knowledge is primarily a system of rules of action" (ibid.: 41).

⁸¹ On the "connection between the rules governing perception and the rules governing action" (1967c: 56) Hayek notes: "(T)he perception of events can also be regarded as a subsummation of particular stimuli, or groups of stimuli, as elements of an abstract class to which a response possessing certain characteristics is appropriate" (1978b: 40).

knowledge already incorporated in such internal representations that we are able, on the one hand, to single out in our perceptions those aspects of “the inexhaustible totality of everything” (Hayek 1979: 121) that are of relevance to us and, on the other hand, to select the appropriate, problem-solving course of action from an open-ended set of potential responses (Hayek 1978b: 38).⁸² As Hayek (1973: 30) puts it: “We never act, and could never act, in full consideration of all the facts of a particular situation, but always by singling out as relevant some aspects of it.” The ‘singling out,’ in our perception as well as in our action, is guided by “schemata of thought” (ibid.: 31), by conjectural expectations or “abstractions”⁸³ that provide the “basis of man’s capacity to move successfully in a world very imperfectly known to him” (ibid.: 30).⁸⁴

Hayek (1967b: 23) explicitly agrees with K.R. Popper’s argument that “observation is always observation in the light of theories,”⁸⁵ and like Popper he interprets “theory” in the broadest possible sense, to include the most basic genetically coded behavioral dispositions as well as the most reflected scientific conjectures, an interpretation captured in Popper’s statement, “from the amoeba to Einstein is just one step” (Popper 1972: 246).⁸⁶ And just like Popper he views the growth of knowledge in all forms as a process of trial and error-elimination, as experience-based “*modification of previous knowledge*” (Popper 1972: 71). As Hayek (1952: 143) puts it, “*all we know about the world is of the nature of theories and all ‘experience’ can do is to change these theories.*”⁸⁷ More specifically, Hayek interprets the process through which mental models, rules or dispositions become better adapted to the relevant problem environment as a process of classification and reclassification that is controlled by success and failure (Hayek 1952: 147).⁸⁸ In case of “expectations which will not be borne out by events” a reclassification or a “change of the frame of reference” is induced, controlled by, as Hayek puts it, “the pragmatic needs of the individual and the species” (ibid.: 145f., 168f.).⁸⁹

In Hayek’s account, the evolution of the mental order proceeds as a continuous reorganization of the classificatory apparatus in light of which external events are interpreted, at the level of biological evolution as well as at the level of behavioral learning and at the level of conceptual thinking (Hayek 1952: 107f.; 1967c: 52). At all levels, rules and dispositions better adapted to the actual contingencies in the world are a fruit not of pre-

⁸² Cosmides and Tooby (1987: 297) refer to the same issue when they note: “There are an infinite number of dimensions that could be used to carve the environment into categories; there is no assurance that a general-purpose information processing system would ever ... guide such a system toward the appropriate dimensions.”

⁸³ Hayek (1952: 143): “(A)ll sensory perception is therefore in a sense ‘abstract’, it always selects certain features or aspects of a given situation. ... Even the so-called elementary sensory qualities are in this sense ‘abstractions’.” - See also Hayek (1978b: 44).

⁸⁴ Hayek (1952: 142): “Perception is thus always an interpretation, the placing of something into one or several classes of objects.” - On “the general point that all perception involves a theory or hypothesis” see also Hayek (1967b: 23f.; 1967c: 53; 1978b: 37f.; 1979: 119).

⁸⁵ Hayek (1978b: 43) emphasizes the correspondence between his notion of “the primacy of the rules of action (or dispositions)” and Popper’s argument “that the capacity to generalize comes first and the hypotheses are then tested and confirmed or refuted according to their effectiveness as guides to action.”

⁸⁶ Hayek (1978b: 46): “(T)he capacity for abstraction manifests itself already in the actions of organisms to which we surely have no reason to attribute anything like consciousness.” – See also Hayek (1952: 108).

⁸⁷ In a footnote Hayek (1952: 143) adds: “I owe this way of putting it to my friend K.R. Popper, who, however, may not entirely agree with this use I am making of his ideas.”

⁸⁸ About the general outlook he adopted in *The Sensory Order* Hayek has noted in retrospect that he was led “to interpret the central nervous system as an apparatus of multiple classification or, better, as a process of continuous and simultaneous classification and constant reclassification on many levels (of the legion of impulses proceeding in it at any moment), applied in the first instance to all sensory perception but in principle to all kinds of mental entities, such as emotions, concepts, images, drives, etc., that we find to occur in the mental universe” (1982: 289).

⁸⁹ Hayek (1979: 36, fn. 8): “The classification of the stimuli in our central nervous system is probably highly ‘pragmatic’ in the sense that it ... stresses those relationships between the external world ... and our body which in the course of evolution have proved significant for the survival of the species.”

adapted ‘foresight’ but of tentative conjectures and ex-post selection by consequences.⁹⁰ While the ‘knowledge’ that has been accumulated over the evolutionary history of our species is incorporated, as genetically coded conjectures, in our sense (and other) organs, the capability of learning allows an organism to accumulate experience-based problem-solving knowledge over its lifetime that is incorporated in memory-coded models, rules or dispositions (Hayek 1952: 53, 106, 108, 129ff., 166; 1967c: 51). At the level of “conceptual thinking,” in particular in science, knowledge grows by way of deliberate conjectural reclassifications that progressively replace “the classification of events which our senses provide” (Hayek 1979: 31), in order to account for problems we encounter in the world of our experience, “problems which can be answered only by altering the picture which our senses give us of that world” (Hayek 1952: 173).

While Hayek’s ambition is to provide a naturalistic, explanatory account of mental phenomena, he emphasizes that, due to the complexity of the processes involved, “we shall never be able to achieve more than an explanation of the principle on the which mind operates, and shall never succeed in fully explaining any particular mental act” (Hayek 1952: 34). In the impossibility of a “full explanation” (ibid.: 439) of particular acts he sees, however, no reason at all to discard the standard notion of causal explanation. We can, as he argues, hold the view that every single action of a human being is caused by “the inherited structure of his body (particularly of its nervous system) and of all the external influences which have acted upon it since birth” (Hayek 1967b: 37) and, at the same time, insist that, “in spite of our knowledge of the principle on which the human mind works” (ibid.), we will in general not be able to explain single actions because it is impossible for us “to state the full set of particular facts which brought it about that the individual did a particular thing at a particular time” (ibid.).⁹¹

The limits of explanation and prediction in the realm of human action are, in the sense explained, for Hayek not a matter of fundamental methodological differences between the natural sciences and the sciences of human action. They are due to the uniqueness and novelty that characterizes the operation of a complex rule-governed system such as the human mind, a system that can adapt to a complex and changing environment through the simultaneous, combined application of models or rules (Hayek 1952; 130f.).⁹² As he puts it: “It is this determination of particular actions by various combinations of abstract propensities which makes it possible for a causally determined structure of actions to produce ever new actions it has never produced before, and therefore to produce altogether new behavior such as we do not expect from what we usually describe as a mechanism. Even a relatively limited repertory of abstract rules that can thus be combined into particular actions will be capable of ‘creating’ an almost infinite variety of particular actions” (Hayek 1978b: 48f.).

⁹⁰ Hayek (1978b: 42): “It seems to me that the organism first develops new potentialities for actions and that only afterwards does experience select and confirm those which are useful as adaptations to typical characteristics of its environment. There will thus be gradually developed by natural selection a repertory of action types adapted to standard features of the environment.”

⁹¹ Hayek (1967: 37): “The individual personality would remain for us as much a unique and unaccountable phenomenon ... whose specific actions we could generally not predict or control, because we could not obtain the information on all the particular facts which determined it.”

⁹² Hayek’s essential argument - namely that an apparatus that builds models by combining more basic rules “is of much greater efficiency than could be any ... apparatus which contained, as it were, a few fixed models of typical situations” (1952: 131) is very similar to the central argument in J.H. Holland’s theory of complex adaptive agents, namely that such agents use “building blocks to generate internal models” of the ever new problem situations they encounter (Vanberg 2004: 31).

7. Conclusion

My purpose in writing this paper has been to take issue with a tradition in Austrian economics that claims that recognizing the subjectivist determinants of human action requires economics (as well as the other social sciences) to adopt a different methodology than the causal explanatory approach of the natural sciences. In the preceding sections I have sought to counter this claim in a number of ways. I have examined the arguments that have been advanced in defense of this claim, and I have given reasons why these arguments must be doubted (section 3). I have discussed the research program of evolutionary psychology as an example of theoretical developments in modern psychology and cognitive science that seek to account, in an explicitly naturalistic manner, for the cognitive foundations of human action (section 4), and I have cited E. Mayr's and K.R. Popper's concepts of program- or conjecture-based behavior as theoretical paradigms that show how human purposefulness can be analyzed within a causal explanatory framework (section 5). Finally, I have argued that an outlook at subjectivism that is perfectly compatible with these naturalistic approaches can, indeed, be found within the Austrian tradition itself, namely in F.A. Hayek's theory of rule-based perception and action (section 6).

To the extent that modern Austrian economics, explicitly or implicitly, adheres to the methodological dualism advocated by authors like Mises and Lachmann, the arguments developed in this paper call for a reorientation. They are meant to show that the subjectivist research program of the Austrian tradition need not be associated at all with an anti-naturalistic methodology, but can well be pursued within a causal explanatory framework. They are an invitation to turn "the Austrian school ... into an evolutionary school" (Witt 2003: 26) or, to borrow a phrase from J.H. Barkow (1992: 635), to practice Austrian economics as "an evolutionarily informed and psychology-compatible social science."

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