

What is behavioral economics?

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Abstract

This paper is concerned with defining the characteristics of behavioral economics (BE), identifying the different strands of BE, and carefully comparing BE to mainstream economics (ME). The job of comparison is first to identify the key dimensions (related to its approach to science) along which BE, and its different strands, differs from ME, and second to use these dimensions to illustrate the differences. The dimensions selected for this use are: (1) narrowness, (2) rigidity, (3) intolerance, (4) mechanicalness, (5) separateness, and (6) individualism. After using these dimensions to characterize ME, they are used to characterize BE's strands.

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JEL classification: B4; B5

Keywords: Behavioral economics; Economic methodology; Schools of economic thought

1. Introduction

Quite a few economists identify themselves as behavioral economists these days. Although they share common characteristics, they do behavioral economics (BE) in significantly different ways. Many of them would be hard pressed to articulate exactly what it is that makes them behavioral economists (BEs). And some might be very skeptical that there are any clear defining features of BE. So what is BE? This paper is concerned with defining the characteristics of BE, identifying the different strands of BE, and comparing BE to mainstream or orthodox economics. A key part of the paper involves identifying a number of dimensions useful for comparing the different strands of BE with other types of economics.

An important question here is: is BE an economic school of thought? It is noteworthy that BE is not strongly associated with a political economic ideology or particular substantive propositions as is the case with some other economic schools of thought. What distinguishes BE is its scientific

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practices and its guiding notions of what good scientific practice ought to be. In other words, BEs practice and espouse scientific methods that are different, at least, from those typical of mainstream economics. To understand this, it is necessary first to gain some perspective by reviewing some important concepts from the philosophy of science, especially its application to economics (economic methodology).

2. Philosophy of science perspectives

Philosophy of science is concerned with issues common to all sciences such as: (1) what is good scientific practice, (2) how is truth established, (3) how do we decide what theory is best, and so on. By the late nineteenth century, modernistic thinking, which is associated with progress through reason and rationality, acquisition of universal truths through scientific methods patterned on those of physics, and the rejection of traditional metaphysics, became prevalent. Positivism, a high level, modernistic philosophy of science became the dominant view at the beginning of the twentieth century (Arzlan, 2003, p. 6). “Positivist thought rejects the validity of metaphysical and unprovable statements as scientific knowledge . . . [and] regards the human sense experience as the source of scientific knowledge” (p. 6). Positivist science is Science British style (with a capital S) (McCloskey, 1983, 1994). It emphasizes hypothesis testing and experiments as well as the observable, numerical, nontactit aspects of the world. Moreover, it involves rigorous, hard-nosed rejection of qualitative and intangible aspects, of insights deriving from introspection, and of historical and cultural aspects.

By 1964 in philosophy, positivism had “died” due to recognition of its many deficiencies (McCloskey, 1994, p. 3). It became clear that a broader, better definition of science was needed (p. 61). Positivists were simply too dogmatic about their “refusal to allow any subjective, qualitative elements, . . . a refusal that artificially limited their analyses and created gaps in their description of science” (Caldwell, 1982, pp. 89–90). “The positivist fixation on the objective side of science missed half of a beautiful and complex tale” (p. 244). The problem was that “positivists came to value objective, dispassionate analysis with an almost irrational passion, and therein lay the seeds of their ruin” (p. 89). Positivism ultimately had “become an oppressive rather than a liberating force” (McCloskey, 1994, p. 5).

As a result, it dawned on philosophers, if not most economists, that knowledge is a complex matter and that there is no simple scientific way to determine what is and is not knowledge (McCloskey, 1994, pp. 192–193). Thus, in Caldwell’s view, there is “no universally applicable, logically compelling method of theory appraisal” as positivists have led us to believe (p. 245). For Caldwell, post-positivism means methodological pluralism. McCloskey (1994) agrees but emphasizes that good science has the nature of a good conversation, i.e., scientists using rhetoric to persuade their fellow scientists of the relative truth of their propositions. It follows that scientists in their efforts to persuade should use not only facts and logic but stories and metaphors for completed human reasoning (pp. 61–62). In other words, there is no short, strict list of methods for doing good science. In this sense, most philosophers, at least, have gone beyond positivism.

3. The approach to comparison

The purpose of this section is to develop an approach to comparing BE to other types of economics, particularly mainstream economics (ME). The most important difference between behavioral and mainstream economists is that they hold different normative conceptions of

economics as science, and thus, use different scientific methods and have a different sense of scientific discipline. Thus, the job of comparison is first to identify the key dimensions (related to its approach to science) along which BE, and its different strands, differs from ME, and second to use these dimensions to illustrate the differences. The desired dimensions of comparison are ones for which there are critical and important differences between BE and ME. Further, these dimensional differences are related to BE's critique of ME and how behavioral economists describe their attempts to distinguish themselves from ME. The dimensions selected for this use are: (1) narrowness, (2) rigidity, (3) intolerance, (4) mechanicalness, (5) separateness, and (6) individualism. The meaning of each is explained below.

3.1. Narrowness

Narrowness may be the most important comparison dimension. Narrowness occurs when an economic discipline restricts its methods and/or its scope of substantive inquiry. When these restrictions are severe, the economic discipline would be judged to be narrow or high in narrowness. Where the restrictions are few, the opposite would be the case. An important source of narrowness in an economics discipline might be its positivistic philosophy and methods. Where positivism reigns supreme, the economics is narrow. This is so because, for example, positivism rules out nonquantitative and literary methods to scientific discovery. Where the discipline exclusively uses rigorous testable hypotheses framed in mathematics, positivistic narrowness would be high. Another narrow feature of positivism would be empirical methods that exclude such things as nonquantitative data, author collected data and observations, and surveys. The nonpositivistic rhetorical approach which utilizes stories and metaphors (as well as facts and logic) would presumably be judged low in narrowness (or broad).

Besides positivism, there are other significant elements that could make a discipline high on the narrowness dimension. One is a discipline's unquestioning acceptance of a few core propositions which are excluded from theoretical or empirical examination. Such exclusions necessarily add to the discipline's narrowness. A second source of narrowness could be a limitation on the kinds of questions that can be investigated. Narrowness may be high when socio-economic inquiries, inquiries involving historical and institutional aspects, inquiries involving philosophical or value-laden considerations, and other inquiries involving speculative or metaphysical aspects are excluded.

There is one other aspect of narrowness that is partly related to positivism, yet is somewhat different. This is an economic discipline's use of formalistic mathematical-deductivist modeling to the exclusion of other methods. Although positivism emphasizes quantification, it is somewhat at odds with the formalistic modeling because the latter is generally divorced from empirical work. Disciplines where formalistic mathematical modeling is dominant can certainly be judged as high in narrowness because of their exclusion of other approaches.

3.2. Rigidity

Rigidity differs from narrowness in that it means not bending or flexible, stiff, hard, and not deviating. If an economic discipline was high in rigidity, this would generally imply a strong attachment (perhaps an irrational attachment) to a particular form of narrowness. Such high rigidity implies that the discipline lacks the ability to be pragmatic and flexible with respect to the methods it uses. Conversely, a discipline low in rigidity can easily adjust its methods according to the type of inquiry involved.

3.3. *Intolerance*

Intolerance refers to a dismissive attitude toward scientific work not conforming to the prescriptions of one's own discipline. Disciplines high on the intolerance dimension are ones whose practitioners are not open-minded, and thus, are relatively hostile and arrogant towards other approaches to economic science. Disciplines low on intolerance have practitioners who are relatively accepting of the methods of other disciplines.

3.4. *Mechanicalness*

The quality of mechanicalness refers to the degree to which the economy and its actors are viewed by the discipline as behaving in machine-like ways. Disciplines high on mechanicalness are ones whose practitioners tend to conceive of the economy as a complex machine and tend to use machine-like metaphors and concepts such as equilibrium. The practitioners of disciplines low on mechanicalness tend to view the economy as an organic, holistic, evolving, human entity.

3.5. *Separateness*

Separateness refers to the degree to which an economic discipline is not closely linked or integrated with noneconomic disciplines, especially social science disciplines. A discipline high on separateness is one that is relatively self-contained, and thus, separate from other disciplines. A discipline that emphasizes interdisciplinary activity would be judged low on separateness.

3.6. *Individualism*

Individualism implies that the ultimate constituents of the social world are individuals. The individualism of a discipline refers to the degree to which all behavior and events can ultimately be understood as deriving from the characteristics and behavior of individuals. A discipline high on individualism is one where explanations invariably focus on individual decision-making behavior. A discipline low on individualism gives much more consideration to individuals as part of collectivities as well as social and group motivations and behavior.

3.7. *Using the comparison dimensions*

Comparing economic disciplines using the comparison dimensions is like locating places on a map, except that the map of the economic disciplines is a six-dimensional one, not a two dimensional one. To locate a discipline on the map, it is necessary to have judgments of the discipline's location on each of the six dimensions. Ideally, these judgments would be those of scholars who by virtue of their scholarship are in a position to make reasoned judgments on these matters. Practically speaking, it is not always possible to find such people or their writings. In any case, given the best six judgments obtainable on a particular strand of BE and six judgments regarding ME, these two map locations would provide a summary comparison of the two disciplines. With similar summaries for all the strands of BE, it should be possible to make an overall statement about what BE is with reasonable confidence. In a sense, we are discovering what BE is partly by finding out its characteristics, but partly by finding out its differences from certain other well known entities (disciplines). Perhaps a metaphor would help. ME is the elephant sleeping in the barn stall along with a variety of smaller animals representing different heterodox

economic (HE) groups, one of which is BE. The position and characteristics of the elephant are hard to miss. But to say something about the chicken or rabbit or duck in the stall, it is useful and important to say where it is in relation to the elephant. For example, the rabbit is 2 ft to the left of the elephant's right hind leg, and it is brown and furry (not gray or leathery). Through an analogous mapping, we hope to discover much about the essential nature of BE.

Inevitably, the characterizations below of ME and the BE strands are stereotypes. Certainly not all mainstream economists will conform fully to the ME characterization. Nor will all BEs conform exactly to one of the BE stereotypes. Nevertheless, these stereotypes are unavoidable if one is to make fruitful comparisons.

4. Assessing the elephant (mainstream economics)

A great many authors have commented on the highly *narrow* nature of ME. Gilad et al. (1984, p. 2) object to: (1) ME's positivism as the methodological foundation for economic research and (2) the exclusive use of deductive reasoning. McCloskey (1994, pp. 58–59) points out that since World War II, ME has acquired all the positivist trappings including numbers, models, and a tough mathematization associated with Science British style (see McCloskey (1983, p. 484) for 11 precepts of modern science that apply to economics). ME's positivism causes it to exclude many useful research methods and to suffer from “an artificially *narrowed* range of arguments” (italics mine, p. 509).

Other authors have focused on the narrowness associated with ME's formal mathematical methods. Mainstream economists “have adopted the view that formal, or mathematical, proofs are entirely sufficient to establish the validity of a theory rather than being just necessary” (Eichner, 1983, pp. 229–230). Further,

“The position of the ‘pure’ mathematician among economic theorists has become the dominant one, especially at the leading graduate schools where, as the teachers in the required core courses, they are able to exert a particularly strong influence on the profession. The result is that, in economics, the imperatives of mathematics – with the emphasis on formal rather than on empirical proofs and on elegance rather than on relevance – have replaced the norms of science.” (p. 231)

In a similar vein, Colander (1991) has emphasized ME's use of formal mathematical modeling to the exclusion of ideas, insights, different kinds of empirical analysis, history, policy, and institutions. In Rabin's (2002, p. 672) view, the mathematical formalism creates “highly simplified and stylized models of human cognition, preferences and behavior that . . . omit a tremendous amount of psychological reality.” Beed and Kane (1991) have examined important arguments critical of the mathematization of economics. Among these are: (1) mathematics is driving the theory, and therefore driving out nonmathematical economics (p. 586); (2) a good deal of economics is not naturally quantitative (p. 589); and (3) mathematics “is not suited to expressing the complete range of human actions and relationships” in economics (p. 592).

Similarly, Lawson (2003, pp. 3–5) finds that academic ME is dominated by mathematical-deductivist modeling which is not applied in conditions for which it is appropriate. Finally, The Report of the Commission on Graduate Education in Economics (1991, p. 1041) found much agreement among new Ph.D.s on the statement “graduate training in economics overemphasizes mathematics and statistical tools.” The Commission believes that the balance between studying mathematical technique and studying real economic issues is “not quite right” (pp. 1044–1045).

Another aspect of ME's narrowness is its unquestioning acceptance of three key assumptions: rationality, self-interest, and self-control (Thaler, 1996, p. 227). While mainstream economists have refused to examine these propositions, behavioral economists who have done so find that "humans are dumber, nicer, and weaker than *Homo Economicus*" (p. 227). That is, "the assumptions of unbounded rationality, unbounded willpower, and unbounded selfishness . . . are bad economics" (p. 235). Many other arguments related to the narrowness of economics could be cited. However, the above seems sufficient to establish the high degree of narrowness of ME.

A number of authors have made comments suggesting the *rigidity* of ME. On several occasions, McCloskey has noted that mainstream economists are neurotic concerning the scientific methods they use: mainstream "economists are neurotic about science" (1994, p. 55) and ME suffers from the "neurotic inhibitions of its artificial methodology" (1983, p. 515). Neurotic behavior tends to be fixated or rigid; it certainly is not on the flexible side. In Rabin's (2002, p. 659) view, ME is not flexible about including important findings of BE. He notes that there is "residual resistance" to expanding in this direction and that "the amount of time and intellectual energy . . . devoted to articulating reasons why this research should not be done is still too high" (p. 659). He finds this resistance within ME "frustrating and surprising" (p. 667). Finally, the rigidity is indicated by ME's insistence that research contributions must include mathematical modeling just to be counted as legitimate economics (Lawson, 2003, pp. 4–5).

McCloskey has noted ME's *intolerance*. If good science is like good conversation, the participants in the conversation must be willing to listen to each other, have respect for others' opinions, and must rely on persuasion, not force (McCloskey, 1994, p. 96). That is, scientists should be tolerant of other scientists' views. Unfortunately, positivist proponents of Science have often used Science as a "cudgel with which to assail the arguments . . . [they] do not wish to hear" (p. 59). ME is no exception. Mainstream economists have been judged to be even more arrogant than physicists (p. 65); a sneering intolerance is very common when it comes to violations of positivistic standards (pp. 185–187).

ME is also judged high on *mechanicalness*. One aspect of this is ME's use of "static analysis of equilibrium *outcomes* rather than disequilibrium processes" and another is that economic agents never fail to optimize (Gilad et al., 1984, p. 2). Long ago, Veblen (1898, p. 389) criticized ME's conception of man as a "lightning calculator of pleasures and pains, who oscillates like a homogeneous globule of desire of happiness under the impulse of stimuli that shift him about the area, but leave him intact." Veblen further pointed out that it is more accurate to say that man is a "coherent structure of propensities and habits which seeks realization and expression in an unfolding activity" (p. 390). Other institutional and heterodox economists have also pointed out the lack of an evolutionary, human perspective in ME, i.e., the mechanicalness of ME.

ME has a high degree of *separateness* from other social science disciplines. This stems from ME's methodological commitment to a strategy and structure of separateness which is at once understandable, yet dogmatic and standing in the way of progress (Hausman, 1992, p. 274).

"The methodological commitment to a separate science of economics preserves the scientific appearance of economics and spares economists the maddeningly difficult and disorderly task of floundering among disparate data, attempting to identify significant causal factors. It preserves the aesthetic attractions of economics and keeps it a tractable subject for mathematical exploration." (p. 274)

ME is clearly characterized by a high degree of *individualism*. It may not be that every economic explanation can be reduced to individual decisions or behavior, but mainstream economists are often not satisfied unless the individualistic basis for aggregate theories can be found (Hausman,

1992, pp. 97, 322). Also, since ME is generally concerned with self-interested individuals, it gives relatively little attention to social and group motivations and the behavior of collectivities.

Now that we know where the elephant is, i.e., we have located ME on the economics map, it should not be that hard to locate the other animals (notably the strands of BE). Because the dimensions have been described and utilized once, it should be possible to locate the other disciplines with greater brevity of explanation. In some cases, it will not be necessary to utilize all the dimensions to obtain a satisfactory mapping of the discipline.

5. Assessing behavioral economics' strands

The word, strand, is the right one for thinking about BE. A strand is a part that is bound together (as in a rope) to form a whole. BE consists of quite a few strands as well as individual practitioners whose work does not fit neatly into any one of these strands. Because there is enough commonality in these strands, they do form a whole. The two earliest strands of BE emanate from the work of Herbert Simon and George Katona. Below a number of the important strands of BE are assessed starting with Simon.

5.1. Herbert Simon and the Carnegie School

This subsection focuses only on Herbert Simon, but the assessment of Simon holds largely true for other members of the Carnegie School as well as others following in Simon's footsteps. Simon's work is anything but narrow. First, Simon made a point of challenging key assumptions such as rationality and self-interest, which neoclassical economics unquestionably accepts. In various ways, he investigated the degree to which decision making is rational and self-interested. Second, although Simon was not opposed to mathematics, he made little use of it, and he was certainly not wedded to its use in formalistic modeling (Augier, 2003, p. 2). (Others have noted that a number of Simon's articles do feature mathematical models.) According to Simon, "My attitude towards mathematics and rigor is wholly pragmatic: an argument should be as formal and technical as it needs to be in order to achieve clarity in its statement of issues and its arguments – and no more formal than it needs to be" (as quoted in Augier and March, 2003, p. 138). Third, with respect to positivism, my judgment is that although Simon's methods are influenced by positivistic philosophy, they are not nearly as narrow as those of ME.

With respect to the rigidity dimension, Simon has, in my judgment, been pragmatic and flexible with respect to the methods he has used, i.e., he has not been rigid.

Simon clearly recognized the intolerance of ME. According to Simon, "It was during this period that I began to understand the intensity of economists' reaction to bounded rationality . . . they were not dealing with it on empirical grounds, but simply rejecting it as irrelevant" (as quoted in Augier, 2003, p. 11). Although Simon did not appreciate ME's intolerance, he was remarkably tolerant of economists' use of different methods.

With regard to mechanicalness, Simon's conception of individual decision making is much less mechanical and more psychological and social than that of the optimizing view of ME. Also, Simon thought that important ideas from evolutionary economics should be part of BE.

Unlike ME, Simon did not believe that economics should be separate from other social science disciplines.

"Understanding Simon's scholarship begins with understanding his embrace of a unified and interdisciplinary behavioral science . . . He was firmly resistant to demands for disciplinary

loyalty. He was one of a post-World War II generation of major scholars who did not see themselves as bound to a single, specific discipline but to the pursuit of topics and methods that were interdisciplinary.” (Augier and March, 2003, p. 136)

With regard to individualism, although Simon focused a lot of attention on individual decision making, his conception of decision making in organizations involved a significant role for the social influences of the organization on the individual, not to mention the psychological aspects of decision making.

In sum, Herbert Simon’s BE approach is: (1) low in narrowness, (2) not rigid, (3) not intolerant, (4) low in mechanicalness, (5) very low in separateness, and (6) much less individualistic than ME.

5.2. *George Katona and the Michigan School*

George Katona (1980) along with his collaborators at Michigan University developed a behavioral economic approach that emphasized psychology. Compared to ME, this approach was low in narrowness. Katona emphasized low level theory with a great emphasis on empirical observation of behavior; his approach was far from abstract, *a priori* economic theory (Warneryd, 1982, pp. 4, 6, 24, 25). To obtain information on important subjective, intervening variables, he made great use of surveys, often involving interviews, to learn about attitudes, aspirations, expectations, optimism/pessimism, social learning/cognition, habituation, and stereotypes. He did not accept the strict economic view concerning rational economic decision making. Although his approach has elements of positivism, it was far from the strict positivism of ME. It certainly did not involve mathematical formalism.

Because Katona’s procedures were relatively pragmatic, my judgment is that his BE is low on the rigidity dimension. No information is available regarding intolerance. His focus on intervening social psychological variables to explain behavior suggests a relative lack of mechanicalness.

Katona, a psychologist by training, used the nonnormative behavioral sciences, especially psychology and sociology, in conjunction with economics (Warneryd, 1982, p. 24). Notable is his use of Gestalt psychology and social psychology (p. 6). Thus, his BE is low on separateness. His consideration of social and social psychological aspects suggests his work was also relatively low on individualism.

5.3. *Psychological economics (PE)*

Psychological economics is the strand of BE that borrows from psychology, especially cognitive psychology, in order to attain more realistic understanding of economic behavior than what is possible with ME. Notably PE explores systematic departures from the economically rational decision making behavior postulated by neoclassical economics. Leading practitioners of PE include Colin Camerer, Ernst Fehr, Daniel Kahneman, David Laibson, George Loewenstein, Matthew Rabin, and Richard Thaler.

PE is less narrow than ME but more narrow than the two strands of BE assessed above. According to Camerer and Loewenstein (2003, p. 6), PE research tends to follow a standard recipe: (1) identify normative assumptions or models used in ME; (2) identify anomalies, clear violations of the assumptions or models; (3) use the anomalies as inspiration to create alternative theories that generalize existing models; and (4) construct models of economic behavior using the revised assumptions, test them, and derive new implications. As part of this PE process, the core

ME assumptions of self-interest, rationality, and self-control are challenged (Rabin, 2002, p. 658). Nevertheless, PE's basic methods do not represent a radical departure from ME. PE, in Rabin's view, "continues to employ ME methods construed broadly" (p. 658). The purpose of much PE research is, thus, simply to "modify one or two assumptions in standard theory in the direction of greater psychological realism" (Camerer and Loewenstein, 2003, p. 2). It follows that PE shares much of the positivism of ME. Correspondingly, PE research tends to focus on relatively tangible, quantifiable factors and to limit its consideration of intangible, qualitative, holistic aspects. PE is "built on the premise that ME *methods* are great . . . [and] that most ME *assumptions* are great" (Rabin, 2002, p. 658). Although some PE practitioners utilize mathematical methods extensively to describe behavior or show where ME is in error, PE is generally less mathematical than ME. Rabin (p. 672) finds the mathematical formalism of ME to be a "necessary evil". On the one hand, it is evil because it entails "highly simplified and stylized models of human cognition, preferences, and behavior that, in every instance, omit a tremendous amount of psychological reality." On the other, it is necessary in order "to formulate precise and testable hypotheses." It should be noted that PE currently embraces a full range of empirical methods including all the empirical methods of ME as well as laboratory and field experimentation, use of field data, computer simulation, surveys, and even brain scans (Camerer and Loewenstein, 2003, p. 6). Psychological economists like to think of themselves as "methodological eclectics" (p. 7).

Because PE is more flexible and pragmatic in its methods than ME, but less so than other strands of BE, PE is in my judgment in the middle on the rigidity dimension. There is some evidence that a number of leading PE practitioners at elite universities are not very supportive or accepting of behavioral economists who do not share the methods and discipline of PE. Thus, in my judgment, PE has a higher degree of intolerance than other BE strands but not as high as ME.

PE is much less mechanical than ME owing to its use of other social science disciplines, especially psychology. PE is low in separateness compared to ME, but it is not nearly as interdisciplinary as Herbert Simon's work. PE's most important link with other disciplines is with Behavioral Decision Research, a subfield of psychology (Camerer and Loewenstein, 2003, p. 9). PE sometimes links with other social science disciplines. One interesting new development is PE's connection with neuroscience to develop neuroeconomics (p. 44). Lastly, PE is much less individualistic than ME, as practitioners of PE recognize that behavior may not be self-interested or strictly rational, and they recognize important social influences on individual decision making.

5.4. *Harvey Leibenstein and X-efficiency (XE) theory*

Starting with his first pathbreaking article on X-efficiency in 1966, the thrust of Harvey Leibenstein's XE research has been to develop a conceptual framework for understanding why less than optimal internal efficiency (X-inefficiency) is the usual state of affairs in firms (Leibenstein, 1976, 1987; Tomer, 1989, 1994). Among the scholars who have done research in this tradition are Shlomo Maital, Morris Altman, Roger Frantz and John Tomer. In my judgement, Leibenstein's research is midway on the narrowness dimension; it is less narrow than ME but not as broad as the work of Herbert Simon. First, a very important element of XE theory involves questioning the rationality postulate, particularly the idea that people maximize. XE theory does not challenge the self-interest postulate. Second, Leibenstein's work has an element of positivism, but it is not the strict positivism of ME. The style and methods of XE theory are similar to those of ME in the sense that the variables in XE theory are generally quantitative ones, and the theory is in principle testable. Leibenstein's own contribution has been purely theoretical but others could presumably do the relevant empirical investigations. Note that given XE theory focuses on the underlying

relationships inside the firm, there are special challenges to carrying out such empirical work. Third, the exposition of XE theory has not used mathematical formalism. Leibenstein has generally used graphs to depict the essential theoretical relationships of his models. This has made his work more accessible than that of the mainstream economists who use formal mathematical proofs, albeit that some of Leibenstein's more complicated graphs can be difficult to understand.

In my judgment, Leibenstein's XE theory is relatively low on the rigidity scale. Although Leibenstein seems attached to his characteristic mode of analysis, there is some evidence that he has been pragmatic enough to depart from this mode when the situation warrants. My judgment is that Leibenstein is low on the intolerance dimension but I have no evidence to back this up. Because Leibenstein has relied heavily on the use of partial equilibrium analysis, XE theory can be considered relatively high on the mechanicalness dimension, but not as high as ME. The somewhat interdisciplinary quality of Leibenstein's research helps reduce its mechanicalness.

Leibenstein's general approach involves utilizing key insights from noneconomic behavioral disciplines but not explicitly drawing on noneconomic research. This might be called a limited borrowing approach. Use of these behavioral insights makes XE theory broader in its substance than ME. However, as indicated above, the style and methods of XE theory are very close to that of ME. What Leibenstein appears to have done is to present his novel behavioral ideas in a language that is familiar to mainstream economists. Thus, in my judgment, Leibenstein's XE theory should be rated midway on the separateness dimension.

Leibenstein's analysis focuses very much on the individual, an individual who is self-interested, but generally not fully rational. The "man" in Leibenstein's economics is a social man in the sense of being constrained by commitments, social obligations, conventions, identifications, and attitudes about cooperation. Psychological man is also present, man with achievement need, contaminating emotion, and with motivation/enthusiasm affected by the degree of bureaucracy. Self-actualizing man is, however, not present here. Thus, Leibenstein's XE theory should be rated somewhere between midway and low on the individualism dimension.

5.5. *George Akerlof and behavioral macroeconomics*

George Akerlof's (2002) Nobel prize lecture summarizes key elements of behavioral macroeconomics, especially his own contributions. Akerlof's dream has been to develop behavioral macroeconomics in the original spirit of Keynes' *General Theory*, a behavioral macroeconomics, however, which is less based on intuition and more explicitly based on sound psychology and sociology. Moreover, in doing this, he has hoped "to strengthen macroeconomic theory by incorporating assumptions honed to the observation of such behaviors" (p. 411).

Akerlof's behavioral macroeconomics is much less narrow than ME. First, unlike in ME, there is in Akerlof's research no unquestioning acceptance of core propositions such as maximizing. Second, there is an openness to research questions and issues which ME has not been open to. Third, Akerlof's research is not characterized by the use of formalistic mathematical modeling.

Akerlof's work does not suffer from rigidity, in my judgment, as he is flexible in the methods he uses. Further, I do not find any evidence of intolerance in his work, but it is not clear whether he is fully tolerant of other BE approaches which might be regarded as less rigorous than his.

Akerlof's work is, no doubt, interdisciplinary, and thus, much less separate than ME. Consider some important examples. First, Akerlof (2002) has been a pioneer in developing efficiency wage theories of involuntary employment, and he finds the "psychological and sociological explanations for efficiency wages are empirically most convincing" (p. 415). Second, in arguing for the effectiveness of monetary policy, Akerlof draws on cognitive psychology which views individual

decision makers as frequently using near-rational rule of thumb that simplify by omitting factors having only a small effect on the result (pp. 416–417). Third, Akerlof believes Keynes was correct to assume that workers resist nominal wage cuts. He finds this assumption coincides with psychological theory and evidence notably that concerning individuals' evaluating changes in relation to a reference point and putting more weight on losses than gains (p. 420). In sum, Akerlof has argued that important behaviors studied by psychologists and sociologists such as "reciprocity, fairness, identity, money illusion, loss aversion, herding, and procrastination help explain the significant departures of real-world economies from the competitive, general-equilibrium model" (p. 428).

In my judgement, Akerlof's work is relatively low on mechanicalness largely because of his emphasis on the sociological and psychological aspects of behavior. Similarly, relative to ME, his research is low in individualism as he does not subscribe to the narrow neoclassical view of individual behavior. It should be noted that Akerlof's work in behavioral macroeconomics has some close connections to the microeconomic work of the psychological economists especially insofar as it utilizes insights concerning departures from rational economic decision making.

5.6. *Richard Nelson, Sidney Winter and evolutionary theory*

Richard Nelson and Sidney Winter (see, for example, 1982) have pioneered in the use of evolutionary theory to explain about processes of economic progress or development. Their theorizing borrows the evolutionary idea from biology, especially Darwin's notion of natural selection involving differential rates of survival. They focus on firms' regular, predictable behavioral patterns which they call routines (p. 14). Routines are analogous to genes in that the better ones are selected due to the survival and prospering of firms containing these (Nelson and Winter, 2002, pp. 25, 30). This evolutionary theory is highly compatible with the hypothesis of an industry life cycle in which the rise and development of a new technology goes hand in hand with dramatic change in the number of firms in the market (p. 35). Many firms enter in the early, uncertain stages, and many later exit as the industry matures. Evolutionary theory has many applications to and implications for understanding technological change processes.

Evolutionary theory (ET) is in my judgement relatively low in narrowness. ET is open to a wider range of research methods than ME, and it is less positivistic. ET does not use formalist mathematical models, and it is relatively open to investigation of core economic propositions as well as being open to inquiries related to historical and institutional aspects.

Although it strongly emphasizes the use of the biological evolutionary metaphor, ET is generally flexible and pragmatic with respect to its methods. Therefore, in my judgment, it is low in rigidity. ET is also low on intolerance. While Nelson and Winter strongly desire an evolutionary alternative to ME, they do not express intolerance for either ME or other approaches.

ET is in my judgment low in mechanicalness. First, it makes limited use of mathematics. Second, there is a recognition that while human behavior frequently conforms to regular patterns or routines, humans generally do not behave in a maximizing way. ET is much less individualistic than ME. ET does not depend on individualistic explanations of behavior. ET is very compatible with concepts in the field of organizational behavior.

One important reason for ME's separateness from other disciplines is ME's assumption of economic rationality which is very different from the perspectives found in the other social sciences except for those territories "colonized" by economics (Nelson and Winter, 2002, p. 41). With regard to ET and other disciplines, "the particular intellectual barriers attributable to differing rationality assumptions are lowered significantly" (p. 41). Thus, ET facilitates interdisciplinary

interactions, and these have been strong, especially ET's interactions with modern organizational theory, business strategy, business history, and cognitive psychology.

5.7. *Behavioral finance (BF)*

Behavioral finance is to finance what behavioral economics is to economics. Arguably though, BF, rather than being an entirely separate field, is an applied branch of BE. This is because BF has very close connections to BE, especially to psychological economics; many BF practitioners are also behavioral economists by virtue of their research and their economics Ph.D.s. A key issue in BF is whether participants in financial markets behave fully rationally. In general, BF practitioners have drawn on the psychological insights of Kahneman, Tversky, Slovic and others to demonstrate how financial markets are frequently not as efficient as the proponents of the efficient market hypothesis would have it (Shefrin, 2000). That is, in the view of BF researchers, financial market behavior typically involves significant, systematic deviations from rationality and efficiency, deviations expected to persist for long periods of time (Shleifer, 2000, p. 2). Such deviations notably stem from: (1) the psychology related to how investors form their beliefs and valuations and (2) the fact that real world arbitrage is quite limited. Among the leading practitioners of BF are Richard Thaler, Robert Shiller, Andrei Shleifer, and Hersh Shefrin. Robert Shiller's book *Irrational Exuberance* (2000) is a well known contribution to this literature.

Behavioral finance is much less narrow than mainstream finance. Richard Thaler (1993) believes lack of narrowness is a defining feature of BF. In his view, the common thread in BF is "a concern with real world problems and a willingness to consider all explanations in the search for understanding . . . [it's] 'open-minded finance'" (p. xvii). BF practitioners are "willing to entertain the possibility that some of the agents in the economy behave less than fully rationally some of the time." BF researchers use quantitative methods more than behavioral economists but not because of an unthinking attachment to positivistic methodology. Their use of these methods is dictated by the nature of the subject of finance which lends itself more readily to quantification than many of the economics topics that concern behavioral economists. Although using quantitative methods, BF scholars tend to avoid formalistic mathematical modeling.

While BF practitioners generally strongly disagree with the efficient market hypothesis, their attachment to this viewpoint appears to follow from their research findings; it is not a matter of a rigid, unexamined position. BF researchers appear to be pragmatic and flexible in their methods. Therefore, they are low in rigidity. Neither have I found any evidence of intolerance on their part.

Because BF practitioners borrow heavily from the social sciences, especially psychology, their characterization of human behavior in financial markets does not suffer from mechanicalness. On the contrary, they tend to see the human participants in financial realms as fallible. BF is certainly not separate from other social science disciplines; it is very similar to psychological economics in this sense. Although BF researchers do focus on individual decision making and the factors that cause it to be rational or not, the societal and market context is considered in BF. Therefore, it is relatively low on individualism.

5.8. *Vernon Smith and experimental economics (EE)*

Experimental economics involving the use of laboratory experimentation has become well established in economics. Because its methods are increasingly used by behavioral economists, most notably psychological economists and behavioral finance practitioners, and because its findings have changed our view of economic behavior, it is arguably part of BE. It may not be

strictly accurate to consider EE a “strand” of BE because its essence is an empirical method, i.e., not a substantive field of inquiry.

Vernon Smith is generally acknowledged as the most important pioneer in this field. “The great accomplishment of Smith and his fellow experimentalists has been to convince the economics profession that economics *can* be an experimental science” (Bergstrom, 2003, p. 181). Rather than economics as an *a priori* science, due to EE, economics is increasingly becoming a science with “concepts and propositions capable of being or failing to be demonstrated” (Smith, 1989, p. 152).

Although many experimental findings indicate that individual decision makers are not nearly as rational as mainstream economists claim, EE findings also indicate that market outcomes are generally more efficient and rational than we would suspect given individuals’ lack of rationality. In Smith’s (2000, p. 11) view, “institutions serve as social tools that reinforce, even induce, economic rationality.” Thus, a very important contribution of EE is to help us understand how different types of market institutions function. For two important surveys of EE, see Davis and Holt (1993) and Kagel and Roth (1995).

EE is in my judgment less narrow than ME but more narrow than most of the strands of BE. It is less narrow than ME in that its experiments often involve investigation of and challenges to the core propositions of ME. Also, EE does not involve the mathematical formalism of ME. Further, in EE, there is no strict limitation on the kinds of questions that can be investigated. However, there does seem to be an element of positivism, and thus narrowness, in EE. As in natural science, there is an emphasis on hypothesis testing, using experiments to falsify or verify theories and assumptions, and so on. This inevitably means that some kinds of qualitative considerations will not be able to be included even if researchers are incredibly talented and creative. There does not seem to be among EE’s practitioners a desire to be positivistic in the sense of strict, hard-nosed rejection of qualitative elements. EE has clearly been a liberating force in bringing empirical scrutiny to core economic propositions. Hopefully, EE will not become an oppressive force which would be the case if EE practitioners were to exclude from consideration factors that cannot be included in experiments and if they were to reject other modes of investigation.

EE is low in rigidity. EEs seem pragmatic and flexible in designing experiments. Further, EEs understand that experiments are a complement to other modes of investigation. EE is low in intolerance. I have not noted any intolerance in EE writings. EE is very low in mechanicalness. Because EE uses human subjects in its experiments, it necessarily focuses on the behavior of humans. In this context, machine metaphors are not very helpful.

EE is relatively low on separateness, perhaps not as low as a number of other strands of BE. While many EEs have tended to focus on economics, especially markets, to the relative exclusion of other disciplines, there is nothing inherently separate about EE. The psychological economists who utilize EE naturally have incorporated psychological considerations in their experiments. EE is relatively low on individualism. There does not seem to be anything inherently individualistic about EE. Presumably, many of the experiments of EEs provide evidence concerning whether people tend to be motivated to act in individualistic or collective ways in different kinds of situations.

5.9. Summarizing the comparisons

Table 1 summarizes the comparisons of ME and the nine BE strands. One thing is very clear. On the six comparison dimensions, ME is far to the left side of the scale, and in the great majority of cases, the BE strands are far to the right side. In other words, the BE strands, in comparison to

Table 1
Comparing mainstream economics to behavioral economics strands on comparison dimensions

	High	←----->										Low		
Narrowness														
ME		PE	HL	EE	BF				GA	ET	GK	HS		
Rigidity														
ME			PE	BF			EE	HL	GA	ET	GK	HS		
Intolerance														
ME		PE	BF					GA	EE	HL	ET	HS		
Mechanicalness														
ME			HL					GA	PE	BF	EE	GK	ET	HS
Separateness														
ME				HL	EE			BF	PE	GK	GA	ET	HS	
Individualism														
ME							HL	BF	PE	GA	EE	ET	GK	HS

ME: Mainstream economics; HL: Harvey Leibenstein; EE: experimental economics; PE: psychological economics; GK: George Katona; GA: George Akerlof; HS: Herbert Simon; ET: evolutionary theory; BF: behavioral finance.

ME, are far less narrow, rigid, intolerant, mechanical, separate, and individualistic. Thus, BE is distinctly different than ME.

6. Other behavioral economics

Although a good deal of BE can be readily subsumed in the above strand categories, there is quite a bit of BE that defies easy classification. Take, for example, the research of Robert Frank. Some of Frank’s research is in the PE category as it focuses on departures from rational choice in situations where people commonly make errors in judgment that reduce their welfare, choices they regret. But much more of Frank’s research deals with departures from rational choice without regret, where people are not making errors when they choose in ways not in accord with the rational choice model.¹ In these situations (tipping on the road, sacrificing wages for enhanced local status, retaliating against aggression even when it costs more than you stand to recover, etc.), people have no regret and do not want to change their “nonrational” behavior. Note also that Frank sometimes writes for a more general audience, often in a social critical vein, especially on the topic of income inequality.

Behavioral game theory is a research area concerned with how people play games. Games are situations in which “a person (or firm) must anticipate what others will do and what others will infer from the person’s own actions. A game is a mathematical X-ray of the crucial features of these situations” (Camerer, 2003, p. 2). “Analytical game theory is a mathematical derivation of what players with different cognitive capabilities are likely to do in games” (p. 3). In contrast, behavioral game theory concerns how people actually behave when playing games and considers departures from rationality which are ignored by mathematical versions of game theory. Behavioral game theory is not listed here as a BE strand because it is appropriately classified as a branch of PE (p. 3). Further, because it relies to a great extent on experimental methods, it overlaps with experimental economics.

¹ E-mail message from Robert Frank on January 12, 2004.

There is in the writings of a few behavioral economists important elements of a humanistic BE. Perhaps this is a potential or emergent strand of BE. Like humanistic psychology, humanistic BE is concerned with a holistic conception of humans and with the higher aspects of human behavior. These are aspects that are largely unrelated to cognitive psychology, the psychology emphasized in PE. Humanistic BE considers the highest human needs (and motivations), the ones that Maslow identified in his hierarchy of human need. Humanistic concerns become paramount in regard to certain topics such as the higher aspects of leadership, the formation of lasting social/organizational relationships, and the ultimate nature of rationality and well-being. Significant elements of humanistic BE can be found in the writings of Mark Lutz (for example, 1999) and Tomer (for example, 1999, 2002).

While socio-economics is not a strand of BE, nor, arguably, a research area within BE, socio-economics needs to be mentioned here because of its influence on many behavioral economists. When the term socio-economics is used today, it is frequently associated with the Society for the Advancement of Socio-Economics (SASE) organization founded in the late 1980s by Amitai Etzioni. In its infancy, the socio-economics of SASE was very much multi-disciplinary (sociology, economics, psychology, organizational behavior, anthropology, etc.), but today socio-economics is generally acknowledged to be an interdisciplinary endeavor carried out largely by sociologists. Among the most important basic elements of socio-economics are the notions that: (1) the economy is embedded (or partially embedded) in society and (2) people do not maximize just one utility (related to their own pleasure or interests) à la neoclassical economics; they also consider others, thus their morality and their membership in social collectivities are very important influences on their decision making (see Etzioni, 1988; Granovetter, 1985). No doubt, some of the research conducted by socio-economic practitioners today overlaps with some done by behavioral economists.

One other category deserves mention; it is what Peter Earl (1988, pp. 8–12) calls “pseudo-behavioralists”. Pseudo-behavioralists are “scholars whose inclinations are really (or normally seem to be) those of the orthodox, marginalist neoclassical economist” (p. 8). In this category, Earl cites Oliver Williamson and Kenneth Arrow, both of whom are acknowledged to have made major contributions to economics. Despite his early association with the leading lights of the Carnegie School, Williamson’s early work depicts managers as maximizing subject to constraints, quite different from the depiction of managers in Cyert and March’s (1963) research. Further, Williamson’s later work “gives the impression that there are optimal strategies and structures just waiting to be identified from a careful analysis of trade-offs” (p. 10). In other words, although there are interesting behavioral elements, there is a neoclassical type determinism and not much satisficing in Williamson’s work. Arrow, perhaps the top-ranking general equilibrium theorist and eminent neoclassical economist, has made occasional forays into behavioral economics and has picked “up something of a behavioral perspective on economics” (p. 10). Despite Arrow’s methodological pluralism, Earl argues that Arrow’s work represents a threat to genuine BE which does not blend easily with profit and utility maximization and equilibrium (pp. 10–12).

7. Is behavioral economics a distinct school of economic thought?

A school of economic thought refers to the thinking of a group of scholars who hold distinct, common beliefs about methodology, social philosophy (world view), a body of theory and research agenda, and a set of economic policy prescriptions (Foldvary, 1996, p. 1). Of the BE strands considered above, PE arguably best fits the above definition of a distinct school of thought. Some of the other strands come close. But given the significant differences among the BE strands, it is

more difficult to argue that BE as a whole is a distinct school of economic thought. While BE as a whole, as indicated above, is distinctly different from ME along the six comparison dimensions, it can not be said, for example, to have a clear, definite methodology and social philosophy. So Foldvary suggests another way to determine whether the thinking of a group can be considered a school of thought: “The research questions that characterize a school are often motivated by its belief in a Great Problem, a key source of social evil, the great obstacle to examine and overcome” (p. 1). In this latter respect, BE is arguably a school of thought because behavioral economists by and large regard the key social evil or Great Problem to be the dominance of ME in the economic profession. It should be noted that a number of behavioral economists, including some prominent PE practitioners, are not likely to agree on this view about what the evil/Problem/obstacle is.

8. Conclusions

Based on our careful comparison of BE’s different strands to ME as well as examination of BE’s overall characteristics, this paper finds that BE is a school of thought distinguished by the fact that it is much less narrow, rigid, intolerant, mechanical, separate, and individualistic than ME. Further, many behavioral economists are strongly motivated to develop the potential of BE so that it will one day end the dominance of ME (in its present form). It would be interesting, though beyond the scope of the present paper, to compare BE to other heterodox schools of thought. Also of considerable interest is the future direction of BE. Will the different strands of BE become better integrated with each other? If so, will it happen as one or several strands of BE become dominant or will it happen in a more pluralistic way? Will BE findings and perspectives become increasingly accepted, and thus, become part of the economic mainstream? With regard to the latter question, there is evidence of movement in this direction, but the comparisons of this paper suggest that there is still a very long way to go. Another possibility is that mainstream perspectives will become increasingly part of BE. However things evolve, my hunch is that BE will become a relatively more important part of economics. My hope is that in the process, the wisdom and insight of BE pioneers such as Herbert Simon, Vernon Smith, Harvey Leibenstein and others can be kept alive.

References

- Akerlof, G.A., 2002. Behavioral macroeconomics and macroeconomic behavior. *American Economic Review* 92 (June (3)), 411–433.
- Arzlan, D., 2003. Postmodernism, Keynesian uncertainty and rational expectations: a methodological approach. Paper Presented at the Eastern Economic Association Conference in New York City on February 22.
- Augier, M., 2003. Will the real Herbert Simon please stand up? Or, Behavioral economics: hopes for the past—lessons from the future. Paper Presented at the Eastern Economic Association Conference in New York City on February 23.
- Augier, M., March, J.G., 2003. The economic psychology of Herbert Simon: introduction to a special issue. *Journal of Economic Psychology* 24 (April (2)), 135–141.
- Beed, C., Kane, O., 1991. What is the critique of the mathematization of economics? *Kyklos* 44 (4), 581–612.
- Bergstrom, T.C., 2003. Vernon Smith’s insomnia and the dawn of economics as experimental science. *Scandinavian Journal of Economics* 105 (2), 181–205.
- Caldwell, B.J., 1982. *Beyond Positivism: Economic Methodology in the Twentieth Century*. Allen and Unwin, London.
- Camerer, C.F., 2003. *Behavioral Game Theory: Experiments in Strategic Interaction*. Russell Sage Foundation, New York.
- Camerer, C.F., Loewenstein, G., 2003. Behavioral economics: past, present, future. Unpublished Paper.
- Colander, D., 1991. Why Aren’t Economists as Important as Garbage-men? *Essays on the State of Economics*. M.E. Sharpe, Armonk, NY.
- Commission on Graduate Education in Economics, 1991. Report of the Commission on Graduate Education in Economics. *Journal of Economic Literature*, 29 (September (3)), 1035–1053.

- Cyert, R.M., March, J.G., 1963. *A Behavioral Theory of the Firm*. Prentice-Hall, Englewood Cliffs, NJ.
- Davis, D.D., Holt, C.A., 1993. *Experimental Economics*. Princeton University Press, Princeton, NJ.
- Earl, P.E., 1988. *Behavioural Economics*. Edward Elgar, Brookfield, VT.
- Eichner, A.S., 1983. *Why Economics is Not Yet a Science*. M.E. Sharpe, Armonk, NY.
- Etzioni, A., 1988. *The Moral Dimension: Toward a New Economics*. Free Press, New York.
- Foldvary, F.E., 1996. *Beyond Neoclassical Economics: Heterodox Approaches to Economic Theory*. Edward Elgar, Brookfield, VT.
- Gilad, B., Kaish, S., Loeb, P.D., 1984. From economic behavior to behavioral economics: the behavioral uprising in economics. *Journal of Behavioral Economics* 13, 1–22.
- Granovetter, M., 1985. Economic action and social structure: a theory of embeddedness. *American Journal of Sociology* 91 (3), 481–510.
- Hausman, D.M., 1992. *The Inexact and Separate Science of Economics*. Cambridge University Press, Cambridge.
- Kagel, J.H., Roth, A.E., 1995. *The Handbook of Experimental Economics*. Princeton University Press, Princeton, NJ.
- Katona, G., 1980. *Essays on Behavioral Economics*. Institute for Social Research, Ann Arbor, MI.
- Lawson, T., 2003. *Reorienting Economics*. Routledge, London.
- Leibenstein, H., 1976. *Beyond Economic Man: A New Foundation for Microeconomics*. Harvard University Press, Cambridge, MA.
- Leibenstein, H., 1987. *Inside the Firm: The Inefficiencies of Hierarchy*. Harvard University Press, Cambridge, MA.
- Lutz, M.A., 1999. *Economics for the Common Good: Two Centuries of Social Economic Thought in the Humanistic Tradition*. Routledge, London.
- McCloskey, D.N., 1983. The rhetoric of economics. *Journal of Economic Literature* 21 (June (2)), 481–517.
- McCloskey, D.N., 1994. *Knowledge and Persuasion in Economics*. Cambridge University Press, Cambridge.
- Nelson, R.R., Winter, S.G., 1982. *An Evolutionary Theory of Economic Change*. Harvard University Press, Cambridge, MA.
- Nelson, R.R., Winter, S.G., 2002. Evolutionary theorizing in economics. *Journal of Economic Perspectives* 16 (Spring (2)), 23–46.
- Rabin, M., 2002. A perspective on psychology and economics. *European Economic Review* 46, 657–685.
- Shefrin, H., 2000. *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. Harvard Business School Press, Boston.
- Shiller, R.J., 2000. *Irrational Exuberance*. Princeton University Press, Princeton, NJ.
- Shleifer, A., 2000. *Inefficient Markets: An Introduction to Behavioral Finance*. Oxford University Press, Oxford.
- Smith, V.L., 2000. *Bargaining and Market Behavior: Essays in Experimental Economics*. Cambridge University Press, Cambridge.
- Smith, V.L., 1989. Theory, experiment, and economics. *Journal of Economic Perspectives* 3 (1), 151–169.
- Thaler, R.H., 1993. *Advances in Behavioral Finance*. Russell Sage Foundation, New York.
- Thaler, R.H., 1996. Doing economics without Homo Economicus. In: Medema, S.G., Samuels, W.J. (Eds.), *Foundations of Research in Economics: How Do Economists Do Economics?* Edward Elgar, Cheltenham, UK.
- Tomer, J.F., 1989. Review of Harvey Leibenstein's *Inside the firm*. *Journal of Economic Behavior and Organization* 12 (August (1)), 153–157.
- Tomer, J.F., 1994. Leibenstein, Harvey. In: Hodgson, G., Samuels, W., Tool, M. (Eds.), *The Elgar Companion to Institutional and Evolutionary Economics*, vol. 2. Edward Elgar, Brookfield, VT.
- Tomer, J.F., 1999. *The Human Firm: A Socio-Economic Analysis of Its Behavior and Potential in a New Economic Age*. Routledge, London.
- Tomer, J.F., 2002. Human well-being: a new approach based on overall and ordinary functionings. *Review of Social Economy* 60 (March (1)), 23–45.
- Veblen, T., 1898. Why is economics not an evolutionary science? *Quarterly Journal of Economics* (July), 373–397.
- Warneryd, K.-E., 1982. The life and work of george katona. *Journal of Economic Psychology* 2, 1–31.