

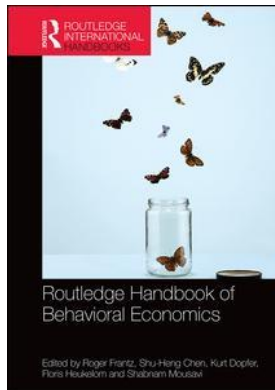
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Roger Frantz, Shu-Heng Chen, Kurt Dopfer, Floris Heukelom, Shabnam Mousavi

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4

HARVEY LEIBENSTEIN

A first generation behavioral economist

Roger Frantz

Behavioral economics. The integration of relevant insights from other disciplines, including but not limited to psychology, neuroscience, management, and sociology into economic models. Economics is best studied from an interdisciplinary perspective.

Introduction

It is not uncommon to read that behavioral economics began with scholars such as George Akerlof, Richard Thaler, Daniel Kahneman and Amos Tversky. It is not uncommon, but it is not correct. Behavioral economics began in the 1940s and 1950s with people such as George Katona, Herbert Simon, Harvey Leibenstein, and others. These scholars' behavioral economics, in general, does not "look" like the writings of Akerlof, Thaler, Kahneman or Tversky. But it represents the first building blocks of what became the "behavioral revolution."

In this chapter I will focus on, but not exclusively on, the behavioral economics of Harvey Leibenstein, whose name is synonymous with X-efficiency. Leibenstein integrated several theories from the fields of psychology and management into economic models and theories of organizational efficiency and human rationality. Efficiency and rationality are two of the foundations of economics. By challenging these foundations from the point of view of human behavior, Leibenstein ranks as one of the first generation of behavioral economists.

On the first page of his *General Theory of Employment, Interest, and Money*, Keynes (Keynes, 1936) explained the use of the word "general" in the title. His explanation was that it is about breaking down long held beliefs which Keynes found intellectually limiting. The same sentiment could have been expressed by Leibenstein about his behavioral economics in X-efficiency theory, or by Katona as he was developing psychological economics, or Simon while he was replacing the concept of perfect rationality with that of selective rationality. These three scholars, and others during their time, were breaking down long held barriers with their writing. Keynes says on page one that

I have called this book the *General Theory of Employment, Interest and Money*, placing the emphasis on the prefix *general*. The object of such a title is to contrast the character of my arguments and conclusions with those of the *classical* theory of the subject . . . I shall argue that the postulates of the classical theory are applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the

possible positions of equilibrium. Moreover, the characteristics of the special case assumed by the classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the facts of experience.

As the postulates of classical theory are a limiting point, so are allocative efficiency and perfect rationality limiting points. The “charge” of the first generation of behavioral economists was to make the initial case for the “general theory of human behavior.”

In the *Forward to X-Efficiency: Theory, Evidence and Applications* (Frantz, 1997), Leibenstein discusses Lionel Robbins’s 1932 book, *An Essay on the Nature and Significance of Economic Science*. In this book, Robbins defines economics as the efficient allocation of scarce resources in their alternative uses. Leibenstein comments that in this definition,

What got lost . . . was the businessman’s idea and the engineer’s idea of efficiency, which signify how well or poorly people and machines are working. Once allocative efficiency is combined with the maximization-of-utility or profits postulate there is no longer any room for the businessman’s and the engineer’s concept of efficiency. Thus, the idea disappeared that suboptimal operations by the firm and inside the firm are possible . . . Businessmen, engineers, and psychologists are aware of suboptimal behavior, but standard economic theory somehow does not easily or readily lend itself to the possibility of suboptimal operations.

(Frantz, 1997: xvi)

Leibenstein’s preference is for an interdisciplinary approach to economics. His major work, *X-efficiency theory*, called for an interdisciplinary approach to the study of efficiency (and rationality), combining economics with psychology, management and engineering studies. His work to incorporate non-allocative, X, (in)efficiency and selective rationality into economics was largely ignored by a majority of the profession.

Robinson Crusoe replaced by socio-economic man

Robinson Crusoe had been a celebrated figure of pure economic reason for decades. In Leibenstein’s 1950 article, “Bandwagon, Snob, and Veblen Effects in the Theory of Consumers’ Demand,” he presented a model whereby a consumer is interdependent, not independent, with others, taking cues from others before deciding how much to purchase in response to a price change.¹ In this article Leibenstein shows the influence of his Princeton mentor, Oscar Morgenstern. Morgenstern in his article, “Demand Theory Reconsidered,” says that

Collective demand is generally understood as a summation of individual demand schedules (for the same commodity). We shall in the following, unless otherwise stated, accept this additivity, but only as a first approximation. It is only valid if the demand functions of the various individuals are independent of each other. This is clearly not true universally. Current theory possesses no methods that allow the construction of aggregate demand curves when the various constituent individual demand curves are not independent of each other.

(Morgenstern, 1948: 175)

This lacuna in the literature ended in 1950, although in his typical reserve, Leibenstein says that “My purpose, in this paper, is to take a step or two in that direction” (Leibenstein, 1950: 183). Interdependence took three forms: the desire to be “in style,” the bandwagon effect; the desire for “exclusiveness,” the snob effect; and, as an expression of conspicuous consumption, the Veblen effect. One result of his model is that a price change affects both quantity demanded *and* demand. In the case of Veblen effects, the demand curve is upward sloping to the right.

Being in style, being exclusive, or engaging in conspicuous consumption implies that the individual has knowledge of what others are doing and what is important to them. Leibenstein says about knowledge that,

One of the difficulties in analyzing this type of demand involves the choice of assumptions about the knowledge that each individual possesses. This implies that everyone knows the quantity that will be demanded by every individual separately, or the quantity demanded by all individuals collectively at any given price—after all the reactions and adjustments that individuals make to each other’s demand has (*sic*) taken place . . .

(*Leibenstein, 1950: 190*)

Leibenstein’s bandwagon, snob, and Veblen effects are about the foresight which one has about how others will react to a given price change. The existence of a bandwagon effect means that the more of *X* that others are expected to purchase, the more the individual will purchase at any price. That is, the bandwagon demand curve is more elastic than a demand curve without interdependent preferences. The existence of a snob effect means that the more of *X* that others are expected to purchase, the less will the individual purchase at any price. The snob demand curve is less elastic than a demand curve without interdependent preferences. The Veblen effect shows that an individual’s knowledge and expectation about how others feel about highly priced goods can produce an upward sloping demand curve. An individual’s behavior results in unintended consequences—the elasticity of the demand curve.

Leibenstein performs a *Gedankenexperiment*, gathering data from questionnaires. (Doing so, he violated the orthodox economic maxim of “watch what people do, not what they say.”) The consumer is asked how much he or she would purchase if he or she expects total demand to be x_1 . The consumer then indicates how much he would purchase at a range of prices. The results from all of the consumers then yields a market demand curve based on the assumption that all consumers are purchasing a total of x_1 units. Leibenstein calls this Survey 1. Survey 2 asks consumers how much they would purchase given that total demand is that yielded by Survey 1. The results from Survey 2 become the parameter for Survey 3 and so forth. The result of each survey beginning with Survey 2 is a separate market curve, each one based on a different expectation of total market demand. It does not seem an exaggeration to say that Leibenstein’s analysis was a starting point for experimental economics (Dean and Perlman, 1998: 133).

Vernon Smith in his 2009 book *Rationality in Economics* discusses how experiments show that an individual’s demand is dependent on others’ demand, and how an individual’s behavior results in unintended consequences. Smith says that,

From the experiments, it is easier to see how people might hold a belief revealed in a survey, but that belief need not persist or be strong enough to change their myopically self-interested response in impersonal exchange. It also tells you, by implication, perhaps why someone might vote for a policy intentionally designed to change outcomes, but his or her market behavior creates outcomes contrary to those intentions.

(*Smith, 2009: 165*)

In “The Economic Theory of Fertility Decline” (1975), Leibenstein “introduces a sketch of a new theory of consumption based on social status considerations” (Leibenstein, 1975: 2).

Leibenstein turned Robinson Crusoe into socio-economic man

Firm behavior. In Leibenstein’s theory effort or productivity, and costs of production may be seen as the outcome of a “game.” In his 1976 book, *Beyond Economic Man*, Leibenstein used the prisoner’s dilemma game to illustrate the importance of interdependence, and the determinants of the level of X-efficiency (Leibenstein, 1976). Employees must decide on their effort levels. The firm must decide how well they treat the employees. The employees can work with great effort, average effort, or little effort. The firm can treat the employees with great concern, average concern, or little concern. Regardless of what the employees *expect* the firm to do: the less effort the employees display, the more utility they receive. Regardless of what the firm *expects* the employees to do: the less concern for the employees, the lower are their costs and the higher their profits. The interdependence of expectations and “rational” behavior results in low effort and low profits. Pareto optimal solutions are replaced by sub-optimal solutions as the norm. The invisible hand has a “sore thumb.”

Work effort. Supervisors, peers, and the individual worker affect effort. Supervisors, sending “vertical” pressure down to the individual would typically like more effort. Peers create “horizontal” pressure for the individual to supply effort which falls within the group’s norm. Individuals are often asked by peers to “follow the herd.” Individuals exert pressure on themselves to work with a certain level of effort, a level which depends upon a myriad of things including expectations about themselves, their psychological make-up, and health status. What is the lowest level of effort given by the employee? It is an effort level that is acceptable to *both* the supervisor (s_1), peers (p_1), and self (i_1). Individuals will produce with a minimum effort level which overlaps s_1 , p_1 , and i_1 . What is the highest level of effort acceptable to both supervisors (s_2) and peers (p_2), and self (i_2)? Individuals will produce with a maximum effort which overlaps s_2 , p_2 , and i_2 . Individuals are subject to forces pushing them for more or less effort, and they compromise with themselves to satisfy the social forces with which they interact. In XE theory, Leibenstein called these ranges inert areas. Again, the social nature of production is evident in Leibenstein’s writings. Leibenstein considered humans as social beings, with a psychological make-up that leads to watching what others do and what are their preferences, and then reacting. He applied these ideas to consumers, employees and supervisors, and fertility behavior.

X-efficiency theory: non-maximization/selective rationality

Non-profit maximizing models of the firm were not Leibenstein’s creation. John R. Hicks (1935), Tibor Scitovsky (1943), William Baumol (1959), Robin Marris (1963, 1964), Oliver Williamson (1964), and Joseph Mosen and Anthony Downs (1965) were some of those scholars who wrote about “complex objective functions. Scitovsky and Marris wrote about utility maximization, Baumol about sales maximization, Williamson about “expense preference” functions, and Mosen and Downs about monetary and non-monetary lifetime income. Hicks is the author of the oft quoted comment that “The best of all monopoly profits is a quiet life” (Hicks, 1935). The orthodox view of the firm as a profit maximizer was being broken. But firms were maximizing something, some “complex objective function.”

Leibenstein went one step further. Not only were firms not profit maximizers, but individuals were not maximizers *of anything*. Individuals were not (unboundedly) rational. We are not (necessarily) irrational: *we are selectively rational*. Our level of rationality ranges from 0 percent to

100 percent. The foundation upon which economics rests was thus challenged. Leibenstein's X-efficiency theory was, therefore, an attempt to spell out the implications of non-maximization/selective rationality for economic theory. It was one small step for an economist, one giant leap for the economics profession.

Leibenstein applied the concept of selective rationality to several fields, including fertility behavior. In "The Economic Theory of Fertility Decline" (1975). Leibenstein assumes that rationality is selective:

For an economic theory to be valid, one need not assume that *typical* behavior is "rational." It is sufficient that behavior at critical junctures be of a "rational" type. Assume that the age of marriage and the birth of the final child depend on calculated considerations, although all intervening fertility behavior is "spontaneous," Note that under these conditions *average* typical behavior appears to be non-rational, but marginal behavior is rational. . . . In addition, it is not required that all households behave this way. If a reasonable proportion do, then an economic theory that depends on rationality is significant.

(Leibenstein, 1975: 3)

Otherwise, standard neoclassical theory which "rests" on the assumption of rational behavior may not be the most appropriate theory. In "An Interpretation of the Economic Theory of Fertility: Promising Path or Blind Alley?" Leibenstein (1974) explains selective rationality as the outcome of two conflicting forces. He says that his theory of selective rationality "assumes that there is a higher degree of substitution between the extent to which people indulge themselves in 'casual' decision-making and the point at which economic constraints force, or create strong pressure for calculated decision making" (Leibenstein, 1974: 475). Pressure pushes people to be *more* calculating, or *more* rational. Leibenstein calls it being selectively rational. About the beginnings of X-efficiency theory, Leibenstein says that it was

Basically the outcome of an accident—having underutilized research assistants, who were willing to search out the details of technical reports on visits to enterprises in less developed countries . . . mostly from the ILO and the United Nations . . . Their work revealed a number of clear-cut, empirical examples of firms that appeared to be operating non-optimally and in other ways that contradict standard micro theory. It was forced by the data to reconsider my previously held positions.

(Frantz, 1997: xv)

Non-optimality is also discussed in the first few sentences of Leibenstein's 1966 article, "Allocative Efficiency vs. 'X-Efficiency'" where he says that:

At the core of economics is the concept of efficiency. Microeconomic theory is concerned with allocative efficiency. Empirical evidence has been accumulating that suggests that the problem of allocative efficiency is trivial. Yet it is hard to escape the notion that efficiency in some broad sense is significant.

(Leibenstein, 1966: 392)

Leibenstein undertook a new definition to one of the most basic concepts in economics: efficiency. Allocative efficiency is an efficiency produced in the market, and exists when the price of a product equals the marginal cost of production. If a firm is X-efficient, then it is producing on their production and cost frontiers.

X-efficiency theory is based on several postulates. First, maximizing behavior/fully rational behavior is one point on a continuum. It is the point where standard economic theory “lives.” The other end is completely irrational behavior. The degree of rationality is a variable, what Leibenstein called “selective” rationality. The degree of rationality depends on external and internal pressure for rational behavior. Pressure in X-efficiency theory is pressure from competitors, peers, supervisors, and from one’s personality. Rationality which is selective means that rationality varies among people and is subject to change over time. Hence, selective rationality, and the theory behind it, X-efficiency theory, is an evolutionary concept.

The human personality in X-efficiency theory has two parts, a superego and an id. The superego is the part of us which wants to do the best possible job. It is willing to be calculating, analytical, and logical, regardless of the dis-ease it creates. The id is the “California surfer dude,” dude. Leibenstein also referred to the id as our “animal spirits” (Leibenstein, 1976: 79). The id wants to make the easiest possible decisions, does not want to be “hassled” with details, dude, wants to avoid headaches from calculating, being analytical, and logical. The superego is close to, if not fully rational. The id is, dude! The level of rationality is a compromise between the needs of the superego and the id, the behavior of peers, the demands of supervisors, and the level of competition in the product market. In other words, internal and external pressures.²

Second, behavior is subject to an “inert area.” People get into a “comfort zone,” a range of effort which they, their peers and supervisors, are comfortable with. Moving outside this range will be resisted. Given selective rationality, the maximum effort level will be achieved if and only if it is within the inert area. The inert area can shift over time, towards more effort if market pressures increase, or towards less effort if, for example, labor–management relations worsen. The inert area concept implies that at least some decisions are made passively.

Third, labor contracts are incomplete. Employers simply cannot control or stipulate all aspects of the labor contract. What activities the employee engages in must be at the discretion of the employee.

Fourth, production functions are not completely specified, meaning that a given amount of inputs outputs will fall within some range. The implications of X-efficiency theory are that output and cost are not determined by technology in a mechanical fashion. Firms operate below their output frontier and above their cost frontier. Economics becomes a bit messy. Messy is not good, and, ergo, X-efficiency must be rejected.

Fifth, within “reason” employees have effort discretion. In his 1945 article Hayek said that “the task of keeping costs from rising requires constant struggle, absorbing a great part of the energy of the manager” (Leibenstein, 1976: 200–1). The term “absorbing a great part” implies effort discretion. Leibenstein calls it the “struggle of the firm against effort entropy” (Leibenstein, 1976: 201).

Sixth, the proper level of analysis is the individual, neither the household or the firm. Leibenstein replaced the mechanical nature of economic theory with a version in which individuals were assumed to be social, not homo economicus, but human, and selectively rational.

The first empirical test of X-efficiency theory came in 1967 by John Shelton (Shelton, 1967). Since then there have been about 200 empirical studies in which the authors say that they are testing X-efficiency theory.³ (There are hundreds of studies which are virtually identical to the 200 studies just mentioned but they do not mention X-efficiency. There are a few of the 200 studies that cite some XE literature but do not mention it within the text.) The studies support the XE hypothesis. Below is a sample of empirical studies on financial and non-financial institutions. Noting that these studies at times are comparing apples, movie tickets, and Honda Civics, the average level of X-efficiency is about 0.75. On average, firms produce about 25 percent below their production frontier and/or 25 percent above their cost frontier. Among financial institutions the average level of X-efficiency is in Australia (0.91), Taiwan (0.81), Western Europe

(0.80), US (0.75), China (0.73), Latin America (0.69), and the Middle East (0.69). These studies cover data from every continent in the world, from many industries. The results of these studies seems clear: XE X-ists, and is important (Frantz, 1997, 2007, 2015a, 2015b; Frantz et al. 2015).

The concept of allocative efficiency given to the profession by Robbins left out the internal efficiency or inefficiency of the firm, X-(in)efficiency. In addition, *allocative market inefficiency is small, maybe 0.001 percent of GDP to 0.0001 percent of GDP. And it is small as compared to X-inefficiency which has been estimated to be perhaps two or three percent of GDP.* Oscar Morgenstern's concept of rationality, VNM rationality, is that of an expected utility maximizing individual, whose behavior is consistent with several axioms, including completeness, transitivity, and independence. Kahneman and Tversky's "prospect theory" (Kahneman and Tversky, 1979) and empirical studies showing preference reversal behavior (Holt, 1986) have challenged expected utility theory as an explanation of real human behavior. Mellers (2001) discusses three other theories which contradict expected utility theory and offer empirical evidence: rank-dependent expected utility, cumulative prospect theory, and security potential and aspiration theory (Mellers, 2001). XE is larger than Robbins' allocative efficiency, and selective rationality seems more consistent with real human behavior than Morgenstern's VNM rationality.

Leibenstein and the Austrians

Leibenstein expressed several similarities with the Austrian economists. My point here is not that Harvey was an Austrian, but that the Austrians shared beliefs with Leibenstein (and other first generation behavioral economists). Expressing the Austrian philosophy of methodological individualism, Leibenstein points out that "only individuals make decisions, and not the socially or legally constituted entities we call firms and households, although individuals make some decisions in the name of such entities" (Leibenstein, 1976: 3). The "molecular" units of the economy are firms and households, but the more basic or "atomistic" units are individuals. He adds that "we can only understand the behavior of such molecular units through the study of the organization and structure of their atomistic constituents" (Leibenstein, 1976: 3). The basic unit of economic analysis is the individual, and the theory based on the individual is what Leibenstein called "micro-micro" theory.

In addition, the atomistic elements are neither objective nor physical quantities. Leibenstein is here expressing the Austrians' belief in subjectivity. For example, the supply of labor is the quantity of workers, hours worked, but also mental and physical effort. Only the individual knows best how much s/he is giving. Only the individual knows how much of their knowledge they are using. Knowledge is subjective. Hayek called subjective knowledge tacit knowledge. In his 1957 book, *Economic Backwardness and Economic Growth* (Leibenstein, 1957), Leibenstein speaks of knowledge as being so vague that:

A man may have nothing more than a sense of its existence, and yet this may be the critical element. Given a sufficient inducement, he can search out its nature in detail and get it to a stage where he can use it. People normally operate within the bounds of a great deal of intellectual slack. Unlike underutilized capital, this is an element that is very difficult to observe.

(Leibenstein, 1976: 41)

Hayek called vague knowledge unorganized or tacit knowledge, the knowledge of particular circumstances of time and place (Hayek, 1945). He believed that this was the most important

form of knowledge and distributed throughout the population. It is neither objective nor easily communicated knowledge.

Hayek relates unorganized knowledge to phenomena which seem X-efficient-like. He says that unorganized knowledge includes knowing how “to put to use a machine not fully employed, or somebody’s skill which could be better utilized . . . the shipper . . . using empty or half-filled journeys of tramp-steamers . . .” (Hayek, 1945: 522). He also cites the ability of “an inefficient manager to dissipate the differentials on which profitability rests, and that it is possible, with the same technical facilities, to produce with a great variety of costs” (Hayek, 1945: 523). Leibenstein replaced the mechanical nature of economic theory where all variables are clearly defined and measurable with a more subjective theory in which important variables are not and perhaps cannot be known.

A third similarity with the Austrians is Leibenstein’s lack of faith in the belief that prediction is the most important or the only way of evaluating a theory. He refers to this as the “romantic” view, calling it a “matter of faith or of taste” (Leibenstein, 1976: 13). Leibenstein preferred to evaluate a theory on whether it is able to

obtain coherent explanations of phenomena and events . . . Predictive capacity without explanatory capacity is worthless. . . . Only predictive capacity that arises out of having coherent and communicable explanations has scientific standing. The power to predict is subsidiary to the power to explain. Explanation without prediction is sufficient, but prediction without explanation is of no consequence from a scientific standpoint.

(Leibenstein, 1976: 13)

Leibenstein seems to mimic Hayek when he speaks about the fact that economics deals with a large number of variables and a large number of relationships among the variables. These variables include “economic” and “noneconomic” variables. The latter are particularly troubling because they “cannot be accounted for on the basis of existing knowledge” (Leibenstein, 1976: 14–15). And prediction, which requires accurate knowledge about the future, is very difficult. He says that

a system that will predict what will actually happen – is, in principle, impossible. Even if we knew all the necessary initial data, as the system unfolds the environmental parameters would change; they would influence some of the variables within the system and the results would not be in accordance with what we would have predicted at the outset.

(Leibenstein, 1976: 15)

Economists, says Leibenstein, cannot predict individual events; we can explain “general trends” (Leibenstein, 1976: 21). Hayek called this the “explanation of the principle.”

According to Hayek, equilibrium is attained when people have perfect foresight about the behavior of others, and when the behavior of each follows a pattern which is comprehensible to others.

Every person’s plan is based on the expectation of just those actions of other people which those other people intend to perform and that all those plans are based on the expectation of the same set of external facts . . . Correct foresight is then . . . the defining characteristic of a state of equilibrium.

(Hayek, 1945: 42)

According to Leibenstein, an individual's effort level in a multi-person organization depends on the effort level of others, and the pattern of effort must be understandable by others. Given these two prerequisites for effort equilibrium, an individual will conform to the group norm and put out a level of effort which falls within the norm. Leibenstein refers to this norm as the "inert area." Why do individuals stay within the inert area? According to Leibenstein, and Carl Menger before him, people remain within the inert area if the utility of leaving the inert area—producing more or less than the established norm—exceeds the utility of remaining within the inert area. Here Leibenstein shows his neoclassical side, and a fourth similarity with the Austrians.

The entrepreneur. Similarity number five involves Israel Kirzner's belief that neoclassical theory has no place for an entrepreneur, that Leibenstein's XE concept and his theory of the entrepreneur are important, and that some of Stigler's criticisms of XE are also important. According to Kirzner, entrepreneurs exist only when there are opportunities for earning economic profits. On the other hand, general equilibrium theory does not allow for such opportunities. Each person's plans are successfully completed, and no trades can leave two participants better off. In other words, there are no opportunities for economic profits, and hence there is no place for an entrepreneur. Leibenstein agrees with Kirzner about general equilibrium theory. Leibenstein says in chapter 6 of *Time, Uncertainty, and Disequilibrium: Exploration of Austrian Themes* that "If we want to get anywhere to solve the entrepreneurial puzzle, we have to stay away from the neoclassical general equilibrium syndrome" (Leibenstein, 1979: 129).

Kirzner says that,

Scope for entrepreneurship, we have discovered, is present whenever error occurs. Pure profit opportunities exist whenever error occurs . . . X-inefficiency is possible, it reflects error, and is necessarily reflected in the availability of entrepreneurial profit opportunities and scope for entrepreneurial discovery and improvement.

(Kirzner, 1978: 70–1)

Under conditions of equilibrium, X-inefficiency, "genuine disparities in efficiency among firms" (Kirzner, 1978: 72), cannot exist. "But under conditions of disequilibrium, when scope exists for entrepreneurial activity, there is no reason why genuine disparities may not exist among different producers, traceable . . . to differences to which producers have succumbed to error" (Kirzner, 1978: 73). So X-inefficiency exists under conditions of disequilibrium when there is a role for entrepreneurs. In Leibenstein's theory, entrepreneurs work when markets are in disequilibrium and are imperfect.

In Leibenstein's theory the entrepreneur interprets the "gaps" in (imperfect) markets. Entrepreneurs do not know where the gaps are. They discover them as a result of activity. Leibenstein thus concludes that in many ways entrepreneurs operate between markets. As in the Austrian theory of the entrepreneur, the entrepreneurial function in Leibenstein's theory is a process of discovery. Leibenstein replaced the emphasis of equilibrium with one of disequilibrium. Perfect markets were replaced with imperfect markets, and combined with disequilibrium lead to a role for the entrepreneur, a role which was all but lost in standard economic theory.

Was Leibenstein an Austrian economist? No, but he shared certain beliefs with them. Was he a neoclassical economist? I have given some examples showing Leibenstein to follow neoclassical thinking (e.g., people change their behavior patterns only if the marginal benefits exceed the marginal costs). But X-efficiency theory pulled him away from neoclassical theory, and the response of X-efficiency theory by some in the profession—X-efficiency is not consistent with neoclassical theory and, therefore, we reject it—pushed him even further away.

First generation behavioral economist

In his 1957 book *Economic Backwardness and Economic Growth*, Leibenstein, with a tip of the hat to Keynes, says that “In view of the framework of ignorance within which we are forced to work . . .” (Leibenstein, 1957: 3). In his 1960 book *Economic Theory and Organizational Analysis*, Leibenstein said that “we do not define firms as profit maximizing entities. Indeed, we want to leave the matter of objectives . . . free” (Leibenstein, 1957: 154). Before he published his 1966 article on X-efficiency Leibenstein was already convinced that ignorance and selective rationality are the proper framework for studying human behavior. In addition, firms are not profit maximizers, although he did leave it open that they may be maximizing something.

In the language of the id: rationality is, whatever dude! Michael Jensen, well known for several seminal ideas, including the agency theory of the firm and the capital asset pricing model, argued in 2008 that perhaps 50 percent of our lives are ruled by something other than rational behavior. In “Non-Rational Behavior, Value Conflicts, Stakeholder Theory, and Firm Behavior,” he says that

human beings are not rational in something on the order of 50 percent of their lives. I spent seven years with the Mind, Brain Behavior Initiative at Harvard (including membership on its steering committee) in my search for the source of the systematic non-rational behavior of human beings. And by that I mean not only people out there in the world, but every single person . . . , including me. The source of this non-rational behavior lies in the basic structure of the human brain. Neuroscientists have now uncovered the structure that leads all humans to engage in this non-rational behavior.

(Jensen, 2008: 169)

Kenneth Arrow shared the 1972 Nobel Prize with John R. Hicks, for his work on general equilibrium and welfare theories. Which is why his 1987 article, “Rationality of the Self and Others in an Economic System,” seems rather odd. Arrow argues against the monopoly of the rationality assumption in economics. In essence, he accepts the idea of selective rationality. He says that “Not only is it possible to devise complete models of the economy on hypotheses other than rationality, but in fact virtually every practical theory of macroeconomics is partly so based” (Arrow, 1987: 202). Even more, he says that the rationality assumption is not essential to economics, and when used must be supplemented by non-rationality assumptions. Thus, “the rationality hypothesis is by itself weak” (Arrow, 1987: 206). It is most useful when markets are competitive, in equilibrium, and when they are “complete.” Under other conditions “the very concept of rationality becomes threatened, because perception of others and, in particular, of their rationality becomes part of one’s own rationality” (Arrow, 1987: 203). In saying this, Arrow sounds very much like, Hayek (1945).

George Akerlof, 2001 winner of the Nobel Prize, and Janet Yellen, in their 1985 paper refer to this as “near” rationality. Near to rationality means that rationality is selective. In their paper they show that selective rationality has an effect on equilibrium solutions (Akerlof and Yellen, 1985). Richard Thaler refers to selective rationality as “quasi” rationality (Russell and Thaler, 2001). They say that

Since rationality is *assumed*, there is little in the literature to suggest what would happen if some agents were not rational. This is surprising in light of the accumulating evidence

that supports Herbert Simon's view that man should be considered at most boundedly rational.

(Russell and Thaler, 2001: 1071)

Akerlof (1985), Arrow (1987), Thaler (1999), and Jensen (2008)—two Nobel Prize winners—add Herbert Simon (1957, 1976) and his theory of bounded rationality, and we have three Nobel Prize winners arguing against the notion of perfect rationality. Leibenstein argued against the same thing, writing before all of the above except Simon. Thaler and Akerlof put their “toe” into the conversation, talking about quasi and near rationality. They stayed close to the shore of neoclassical-beach. Simon waded up to his waist, talking about bounded rationality, which can mean anything from 1 percent to 99 percent rationality, but continuing to talk about maximizing given bounded rationality. But Leibenstein did not only put his “toe” into the conversation. Leibenstein jumped in, not close to, near or quasi to the shore of neoclassical-beach, not maximizing around bounded rationality. Not close to the shore, not bounded but maximizing. Not maximizing. Not perfectly rational, selectively rational, somewhere between 0 percent and 100 percent rational. What are the implications for economic theory? That was Leibenstein's agenda. Over lunch in Harvard Square, he once said to me that “My biggest mistake was not learning more math.”

Conclusions

We can see behavioral elements in the writings of Leibenstein beginning in 1950. George Katona's contributions began in 1940. In Simon we see it beginning in 1947, certainly no later than 1955. Richard Nelson, 1961; Vernon Smith, 1962; Sidney Winter, 1964, Richard Day, 1967. And you can trace some of the major topics of these behavioral economists to Frederick Hayek's 1945 paper on knowledge. Here is the real beginning of behavioral economics.

In his *Principles of Economics*, Marshall discusses external economies of scale as an advantage of many people working in a relatively small geographical area. What occurs is that the “mysteries of the trade become no mysteries; but are as it were in the air, and . . . individuals (sic) learn many of them unconsciously” (Marshall, 1920: 271). Leibenstein, who was 80 percent wide and 20 percent clever, said in his 1957 book *Economic Backwardness and Economic Growth* that,

some ideas, and these are difficult to acknowledge specifically, we may borrow almost imperceptibly from the intellectual climate in which we live and work. We do so almost without knowing it . . . it is impossible to acknowledge one's total intellectual indebtedness or even to acknowledge the most important instances, for these may well be the instances of imperceptible borrowing.

(Leibenstein, 1957: viii)

A lot of people have borrowed from Leibenstein, Simon, Katona, and the other first generation behavioral economists, whether they are conscious of it or not.

Notes

- 1 In *A Theory of Economic-Demographic Development* (1954) Leibenstein says that the interdependence also includes that among economics and other social sciences: “One of the most significant facts of economics and the other social sciences is mutual interdependence” (Leibenstein, 1954: 2–3).
- 2 I once asked Leibenstein whether he was attempting to incorporate Freudian concepts, superego and id, into economics. His response was a definitive, “No.”

- 3 There are hundreds of studies which are virtually identical to the 200 studies just mentioned but they do not mention X-efficiency. There are a few of the 200 studies that cite some XE literature but do not mention it within the text.

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