

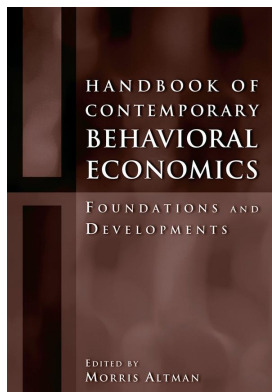
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BELIEFS IN BEHAVIORAL AND NEOCLASSICAL ECONOMICS

ALAN JAMES MACFADYEN

In the most basic formulation of the rational choice model, which underlies neoclassical economics, an individual with given desires makes the optimal choice from among available opportunities. This suggests that individuals are cognitively active decision makers. However, for many behavioral economists, a major failing of neoclassical economics is the simplistic nature of its view of cognition. In line with this view, this chapter argues that conventional economics has failed to give adequate recognition to the concept of “beliefs.” More extended discussions of rationality make explicit room for beliefs. Elster, for example, argues that a model of rationality requires more than “desires” and “opportunities”; desires themselves are subject to rational evaluation, and individuals must gather an optimal amount of information and utilize that information to form optimal beliefs (Elster 1989a, ch. 4). The critical importance of beliefs in models of human behavior has been widely recognized in philosophy (e.g., de Souza 1987, 19) and evolutionary economics (e.g., Robson 2002, 89) as well as in cognitive psychology. This essay contrasts the role given to beliefs in behavioral economics with the narrow, almost invisible part it plays in conventional neoclassical economics. It provides a brief discussion of why models of economic behavior can usefully incorporate the concept of beliefs, presents a brief overview of what a “belief” is, sets out a framework for incorporating the concept of beliefs in economic analysis, and provides specific examples of the importance of the concept of beliefs by examining the beliefs of neoclassical and behavioral economists.

WHY INCORPORATE BELIEFS?

It would seem commonplace to suggest that what we do must reflect what we believe, and that what we believe is, at best, a partial reflection of the complex reality of the world we inhabit, and often a severely biased depiction of that reality. For this chapter, it is useful to draw on Earl’s suggestion (1983, 139–47) that economics could learn much from the “personal construct” theory of George Kelly (1955). Kelly argued that we are all “naïve scientists,” constructing, testing, and modifying theories about the complicated and changing world we inhabit. Our personal constructs both interpret and limit our interpretations of the world and our behavior in it. Typically, we organize our concepts into structures that we apply to specific settings, and in any setting the concepts are usually applied sequentially; this ordinal view of the world is consistent with a lexicographic method of decision making in which alternatives are dismissed from consideration if they fail to meet the standards defined by specific concepts. Kelly argues that our concepts tend to be dichotomous, specifying both what is included and what is excluded; concepts are usually also range-limited.

Different situations will call forth different construct systems, and these systems may not be consistent with one another. Nor need specific concepts be applied in the same manner in different construct systems. For Kelly, construct systems act both to provide meaning to the world and also to allow exploration and learning; that is, they are simultaneously limiting, serving to buttress our current beliefs, and expansive, serving to increase our adaptability to new situations.

Kelly's approach is consistent with many other theories in the social sciences. Earl has argued that Kelly's personal construct theory can be tied to psychological models of cognitive dissonance. Festinger (1957) suggested that individuals are uncomfortable with incompatible beliefs and will engage in patterns of thinking that reduce the associated dissonance. This could be managed in a variety of ways, some of which would strike economists as rational (gathering more complete information and modifying beliefs in a considered manner), while others appear irrational (separating incompatible beliefs into separated construct systems, engaging in wishful thinking, or modifying beliefs arbitrarily to achieve consistency). Akerlof and Dickens (1982) have applied Festinger's theory to economic behavior, including examples of belief modification. That we see the world through assorted concept systems forms part of the psychology literature on mental models (Johnson-Laird 1983), categorization (McGarty 1999), children's ways of understanding the world (Gopnik and Meltzoff 1997), and the learning of concepts (Murphy 2002). Some neurologically based research on consciousness suggests that the brain has a variety of learning systems (Pfeifer and Scheier 1999), which fits well with the suggestion that we develop a number of somewhat separated belief systems, an idea that has also appealed to some philosophical analyses of beliefs (Joyce 1999, 70–71). From a decision-making point of view, some analysts have described our behavior as involving sequentially applied dichotomous criteria (Tversky 1972); others have emphasized framing effects, which could derive from the application of different construct systems in different contexts (Tversky and Kahneman 1986); and yet others have seen a dynamic aspect to belief systems as they evolve over time in response to changing environmental conditions (Nisbett and Ross 1980). Behavioral economists are familiar with the distinction Scitovsky (1976) makes between "comfort" and "joy," drawing on Berlyne's (1960) arousal theory of motivation; this can be related to the uneasy balance we try to establish between defensive reactions to maintain our existing construct systems and exploratory efforts to widen our horizons.

Two construct systems are of special interest: first, belief systems defining our view of how the world functions, and second, our beliefs about ourselves, who we are, what we value, and how we see ourselves in relation to other people. Bandura (1997) argues that we wish to view ourselves in positive terms and to believe that we can exercise some control in our lives. This could contribute to assorted biases such as attributing positive outcomes to ourselves and negative outcomes to outside forces (attribution bias); imagining approval from others, thereby increasing self-validity; self-serving beliefs that justify decisions undertaken; and the belief that our abilities are relatively higher than other people's (uniqueness bias). (Gilovich 1991, ch. 5, and Goethals and Klein 2000 provide useful reviews of such biases.)

Kelly's personal construct theory is compatible with the cognitive orientation of much of behavioral economics. There are exceptions. For example, some behavioral approaches are inclined to put more emphasis on reinforcement and habitual behavior (e.g., Alhadeff 1982; Foxall 1990; Lea, Tarpay, and Webley 1987). From an evolutionary perspective, questions can be raised about the value of emphasizing active, flexible cognition and choice; Gazzaniga (1998) refers to the "fictional self." Dennett's well-known work suggests that the reality of our consciousness lies in biology but that in order to understand it we should adopt an "intentional stance" in which we assume that people are goal-oriented problem solvers (Dennett 1987). For

most behavioral economists, an understanding of how people visualize the world and make decisions is critical to any analysis of their behavior. These concerns are particularly apparent in the voluminous literature on individual decision making, including Busemeyer, Hastie, and Medin 1996; Camerer 1995; Dawes 1998; Goldstein and Hogarth 1997; Hastie 2001; Kahneman and Tversky 2000; Payne, Bettman, and Johnson 1992; and Starmer 2000. Also relevant are numerous studies designed to help individuals make better decisions, such as Gilovich 1991 and Hammond, Keeney, and Raiffa 1999.

WHAT ARE BELIEFS?

“Belief” will be defined as an idea, concept, or value that an individual holds, with some probability, to be true. Beliefs may be held with certainty, but the probabilistic nature of this definition is consistent with a Bayesian interpretation. A belief is subject to revision in light of new evidence. This may increase or decrease the probability with which the belief is held to be true, although this probability may not be a clearly defined number in the individual’s mind. Nor is it argued that people are efficient Bayesians. In fact, most behavioral economists think that the failure of individuals to modify beliefs in a “rational” Bayesian manner has not been given sufficient weight by conventional economists.

Beliefs may refer to our understanding of how the world functions, what might be called beliefs “about” things. Belief also refers to what it is that we value, or our belief “in” something. In neoclassical economics this distinction has led to the division of analysis into “positive” and “normative” economics. We can make sense of the world only within various concept systems. It can be argued that the concepts we develop to describe the world (our positive beliefs) are inevitably influenced by what we value (our normative beliefs). A Marxist describes the world in terms of social classes; this concept does not play a role in neoclassical economics, but economic efficiency does. While this calls into question the independence of the positive and the normative, the distinction is still useful. Whether rationality should take values as given or be used to develop appropriate values is also a controversial issue (Elster 1989a, ch. 4; Viskovatoff 2001).

As discussed above in connection with Kelly’s personal construct theory, we understand the world through assorted belief systems. It is useful to think of these in a methodological framework where some beliefs are of primary importance, forming a hard core that is sacrosanct and not open to debate. A variety of subsidiary beliefs surround the hard core and are seen as part of the belief system but not essential to it. It is important for the social scientist to understand which beliefs make up the hard core of a belief system and when an individual is willing to reassess subsidiary beliefs. Of particular interest are those rare occasions in which the individual questions the hard-core beliefs, and the belief system itself is significantly modified or begins to crumble.

Can the term *belief* be applied to something that lies hidden in the unconscious? (This is different from the extent to which beliefs may be formed unconsciously.) Clearly some of our behavior is motivated in largely unconscious ways. The issue is whether such behavior reflects beliefs in addition to factors such as instinct, pure emotion, conditioning, or habit. The relationships between conscious and unconscious influences on decision making have proved controversial (Smith and DeCoster 2000). Hastie (2001, 663) finds appeal in the argument that unconscious intuitive and conscious analytical procedures lie at either end of a continuum of decision-making processes, most decisions involving a mix of the two. It will often be useful to think in terms of what might be called “latent” or “hidden” beliefs (or, following Pettit 2000, “virtual” beliefs), which are unconscious beliefs that would be recognized as beliefs if brought to our attention. For the most part such beliefs remain hidden, but circumstances might lead an individual to reveal them. Thus, for

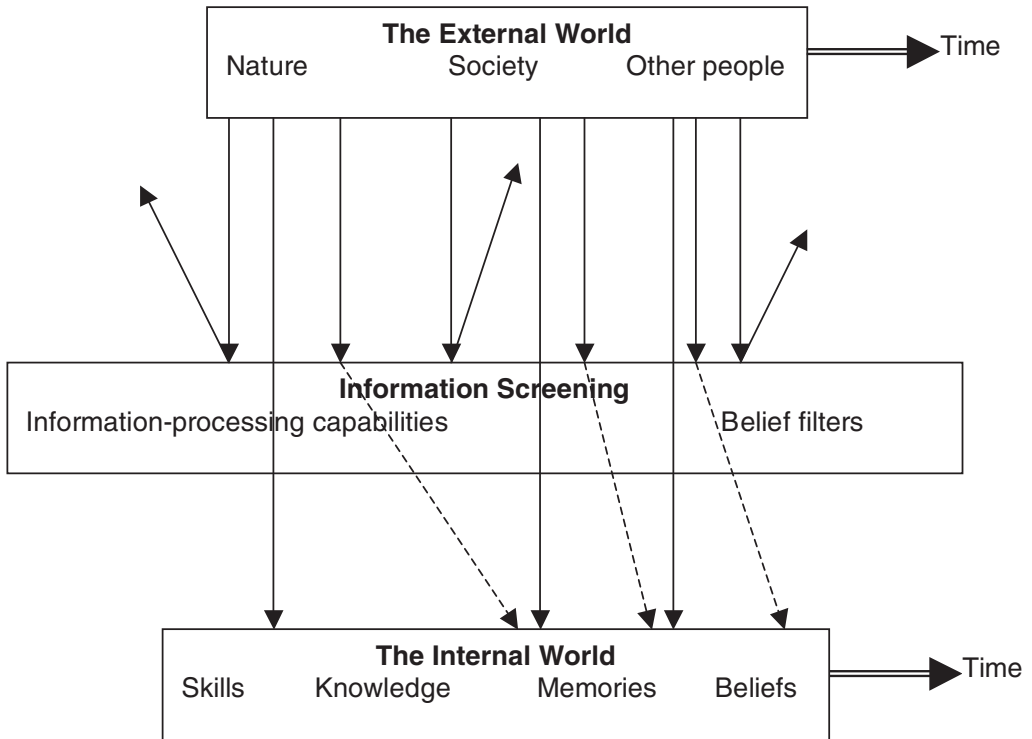
instance, in discussion it might be pointed out that what an individual has said provides an insufficient basis for his argument, and the individual would then bring into the open a previously hidden belief. It seems likely that most belief systems include a number of such latent beliefs. Damasio (1999) suggests that many beliefs lie hidden in memory until accessed, and that the mechanisms that access the beliefs are largely unconscious. This notion of latent beliefs has some similarity to other concepts in the social sciences. Thus, for example, psychotherapy often aims at uncovering hidden memories, which lie unacknowledged by the conscious mind. Another example is offered by Pettit (2000) in his defense of narrowly selfish rational choice explanations of behavior. Pettit speaks of “virtual” self-regard, which is not ordinarily acknowledged but is nevertheless present; in a situation in which consciously acknowledged motives would lead to behavior strongly detrimental to the individual’s narrow self-interest, a reaction is triggered, and narrow self-interest is brought into the conscious mind as a determinant of behavior.

The idea of latent or hidden beliefs helps to explain both habitual behavior and the power of incomplete belief systems. At the same time the very unconsciousness of these latent beliefs poses problems; it might be extremely difficult in practice, for instance, to separate a previously latent belief from a spur-of-the-moment justification or an after-the-fact belief that we acted in an intentional way. Rather than admitting the possibility of unconscious beliefs, one might insist that to be meaningful a belief must be conscious, and that unconscious motives to act must be treated as something other. While there is a certain fuzziness in the concept of latent beliefs, it seems incontrovertible that we often hold beliefs that we do not explicitly recognize but which we would immediately accept as a belief if brought to our attention. As discussed above, such latent beliefs are often a key part of a belief system and must be acknowledged if such systems are to be understood.

Our beliefs are formed, supported, and modified in many ways. For the purposes of this essay three aspects of these processes might be highlighted. The first is the incidental nature of much learning. If asked why we believe something, our initial reaction will not usually be a description of where the belief came from; rather, it will be an attempt to explain why it makes sense for us to believe this. Second, our beliefs are formed in a social context, heavily influenced both consciously and unconsciously by the words and behavior of those we love, like, and respect. In addition, beliefs, including latent unconscious beliefs, are strengthened by repetition. Third, beliefs often possess emotional valence. For example, a belief gained at an early age in the family context, or derived from social norms, typically has strong emotional overtones and is particularly rigid, as is often true of the deepest beliefs defining our value systems.

It is useful to think of beliefs as a kind of filter. This is illustrated in Figure 9.1, in which a belief filter is part of the information-screening process, which is postulated as lying between the individual (and that person’s internal world) and the rest of the world (external to the person). The external world constantly emits a tremendous array of signals that are received by the information-processing screen. This screen is seen as comprising two main components, information-processing capacities and belief filters. The former refers to the inherent capabilities of the individual and the various external measurement instruments used. Belief filters give meaning to the information that is received, drawing on our existing beliefs. The arrows in Figure 9.1 represent bytes of information coming to us from the outside world. Three types of interaction are illustrated. The solid paths depict two extremes. Some signals pass through the screen directly and have an accurate perceived reality. Thus, a person can see a boulder on the path, or feel sunlight on skin and the sunburn that follows, or read the display sign that says oranges cost \$2.00 a kilogram. Other signals are not acknowledged at all; instead, they bounce back off the information screen. Without the appropriate instrumentation and/or knowledge, people are unaware that the boulder is

Figure 9.1 **Belief Filters**



sandstone of Devonian age, or that sunlight contains ultraviolet rays, or that a fruit stand on the edge of town is selling oranges at \$1.20 a kilogram. It is important to remember that accurate knowledge need not depend on direct personal perception. I cannot see ultraviolet light, but my schooling and reading of science lead me to accept its reality. Beliefs obviously play a role here: one reason for failing to receive a signal is that our current belief system holds no category to accept it, and therefore the potential signal is rejected entirely. Fernández-Armesto’s (1997) discussion of truth is useful here. He argues that people find four different sources for truth: authority (“The High Priest says so,” “Carl Sagan says so”), feeling (“I just know he loves me,” “I can’t believe anything else,” “There is danger in high places”), empiricism and perception (“You can see that robins nest in trees, but loons don’t,” “Brand X costs more than brand Y”), and rationalism (“The world must have had a creator,” “For us to understand the world and to acquire language so quickly, we must be born with certain fixed categories of thinking”). At any time our current beliefs will reflect a combination of these sources; the beliefs themselves and our receptivity to various sources form the belief filters discussed here.

In Figure 9.1 a number of the lines passing through the information screen are shown as bending to indicate that the meaning given to the external signal must be interpreted through our existing beliefs (both conscious and latent) and that this interpretation involves potential distortion. A belief filter might be seen as a complicated prism that sometimes refracts light away from us, sometimes lets it pass through unscathed, sometimes removes specific light waves while letting others through, and sometimes distorts the direction of flow. From a behavioral economics perspective, it is important to know how our existing beliefs function as filters of information and

how beliefs will grow and be modified over time. Remember that modifications in belief may involve a change in the belief (“Interest rates will be lower next year, not higher as I thought last month”) or a change in the certainty with which the belief is held (“I’m less certain than I was last month that interest rates will fall”).

BELIEFS AND ECONOMIC BEHAVIOR

Behavioral economics builds on the premise that more useful economic models can be built through the explicit recognition of psychological concepts. There seems to be some division in the behavioral economics literature on whether this should be seen as requiring a new discipline as an alternative to neoclassical economics or whether it is largely a matter of adding psychologically relevant variables to conventional economic models. Two recent reviews by economists suggest that the latter approach is most productive. Mullainathan and Thaler argue that behavioral economics starts from conventional economic modeling: “The behavioral economics research program has consisted of two components: 1. Identifying the ways in which behavior differs from the standard model. 2. Showing how this behavior matters in economic contexts” (2002, 2).

Rabin says about behavioral economics that

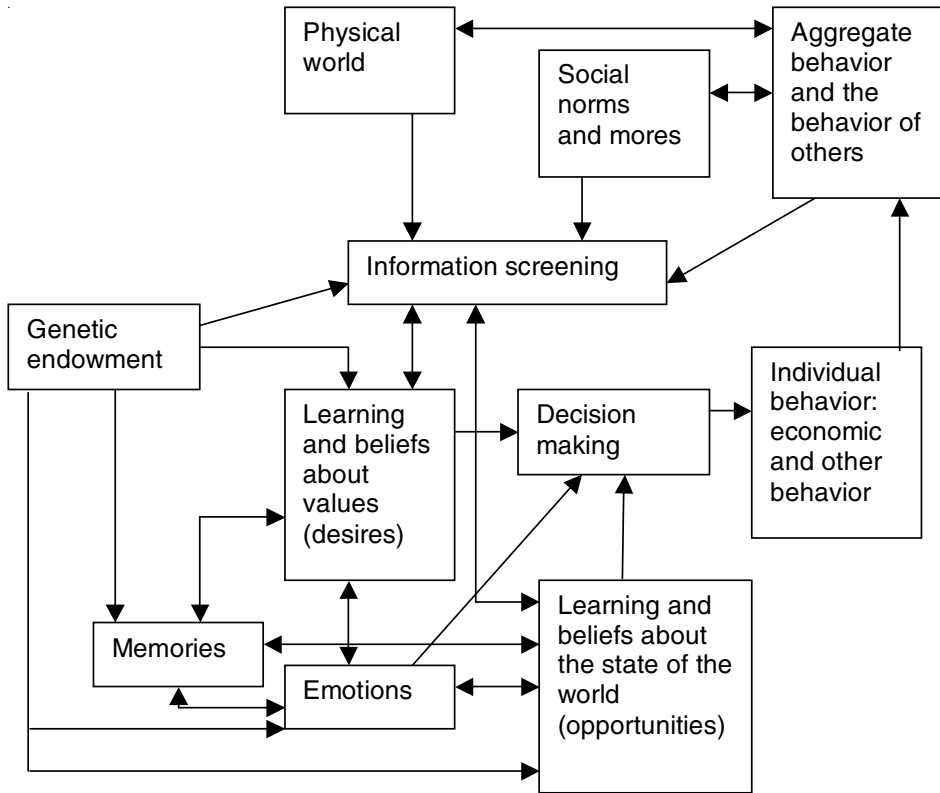
the underlying premise of this movement is far too compelling to consider it transitory: *Ceteris paribus*, the more realistic our assumptions about economic actors, the better our economics. Hence, economists should aspire to make our assumptions about humans as realistic as possible. . . .

This research program is not only built on the premise that mainstream economic *methods* are great, but also that most mainstream economic *assumptions* are great. It does not abandon the correct insights of neoclassical economics, but supplements these insights with the insights to be had from realistic new assumptions. (Rabin 2002, 658–59)

The suggestion that the neoclassical framework is fundamentally a failure and must be replaced by an alternative, psychologically oriented approach is a much stronger claim. Not surprisingly, this suggestion has often come from psychologists who turn to consideration of economic behavior. It lies beneath much of the European work in economic psychology, as seen, for example, in the behavioral psychology orientation that informs much of Lea, Webley, and Tarpay 1987. Lewis, Webley, and Furnham (1995) adopt a social psychology perspective and suggest that the key distinction between behavioral economics and economic psychology is that the former works largely by incorporating economic concepts in economic models, while the latter studies economic behavior from a psychological framework outside the traditional economic framework. Early pioneers in the field, such as Katona (1975) and Simon (1955, 1982), also imply that economists should abandon the conventional rational choice optimization model. And prospect theory can be interpreted as a replacement model that is psychologically richer (Kahneman and Tversky 1979; Tversky and Kahneman 1992).

Rather than seeing these two approaches as contradictory, it is preferable to see them as convergent. Thus Rabin’s recent (2003b) appreciation of Kahneman, on the occasion of his being awarded the Nobel prize, sees his work not as replacing conventional economic theories but as an outstanding example of a research program offering ways conventional economic models can be improved. This corresponds with March’s suggestion that neoclassical economics claims to have “won the war,” but only by building models that accommodate behavioral concerns (March 1978). Earl’s survey is more eclectic but suggests that “economists who are willing to take on board the

Figure 9.2 Economic Decision Making: A Behavioral Perspective



extra baggage of psychology may be able to enhance their predictive and explanatory capacities and thereby improve the quality of advice that they provide to policy makers” (Earl 1990, 750).

Most economists view human behavior as intentional or reason-based. That is, an individual acts because it is seen as being in the individual’s interest; actions are judged by their expected ends, and the belief that the act will generate a positive result motivates it. This suggests two main avenues of extension to conventional economic analysis: first, the nature of desires, and second, cognitive limitations. Before exploring these in more detail, it will be useful to set out a more general framework. While some think of behavioral economics as the overall marriage of economics and psychology, the main emphasis has been on opening up the “black box” of decision making. Thus the strongest links have been with cognitive psychology. An emphasis on beliefs reflects this, as can be seen in Figure 9.2, which extends Figure 9.1 to allow a focus on economic behavior. The external world (the physical and social environment) is shown at the top of the figure, and the individual is at the bottom, with information screening as a link between the two. In this formulation, the social nature of external links is emphasized. We are responsive to a variety of social norms and often look to the behavior of others to guide our choices and help us to evaluate them. From a cognitive view, beliefs about the world and about what one values, as well as learning that modifies such beliefs, are key to understanding decisions.

Figure 9.2 incorporates three important internal influences on our behavior in addition to beliefs. The first is our genetic endowment, which imposes constraints on our capabilities. The

second is memory, which is constantly triggered by our current situation. The third is our emotions. It seems clear that complex interdependencies tie memories, emotions, and beliefs together, and that much useful research remains to be done related to the relevance for economic behavior of these interconnections. In Figure 9.2 decision making is seen from a cognitive perspective as involving actions that have a deliberative underpinning; hence choices rely on beliefs and learning. Beliefs, learning, and information-screening processes are mutually interdependent. Information screening, in combination with the internal forces of genetic endowment, memory, and emotion, influences both beliefs and learning.

Beliefs, Genes, Memory, and Emotions

“Desires” and “opportunities” are not preexisting phenomena but dynamic grounds for behavior requiring their own explanations. As Elster (1989a) noted, there is an inconsistency in attempting to explain behavior with these as the two primary concepts, since desires are obviously subjective, while opportunities are external to the individual. However, as suggested by Figure 9.2, broadening this framework involves a complex mix of factors.

Sociobiology emphasizes genetic factors, likely developed in the hunter-gatherer phase of our development, but generalizing to new situations as they arise. Thus, for example, one might utilize a genetic explanation for the cognitive processing constraints that will be discussed below. It has been suggested that we may have evolved somewhat different decision-making propensities for different situations (Cosmides and Tooby 1996), which would be consistent with context-dependent decision making (Payne, Bettman, and Johnson 1992). Some economists have proposed inherited tendencies underlying our economic actions (e.g., Robson 2001, 2002). Robson is supportive of a biological basis for conventional rationality but suggests that “costs of complexity” might help explain why time preferences exhibit hyperbolic discounting, operating as an average of genetically induced impulses toward both immediate gratification and more careful consideration of the future (Robson 2001, 30). A number of simulation models of adaptation to changing environments have been used to assess how behavioral rules are used and could help us understand genetic evolution (e.g. Gigerenzer, Todd, and ABC Research Group 1999; Young 1998).

The beliefs that underlie our decisions are often drawn from memory (Damasio 1994, 1999). We tend to see our memory as a giant filing system recording all our past, but this is a misleading and simplistic view. Kahneman (2000a, 2000b) finds that the utility stored in memory is not identical to the utility associated with events as we live them. He suggests that analysis of behavior ought to distinguish among at least four forms of utility. “Decision utility” is inferred from the choices individuals make. “Predicted utility” refers to the expectation individuals have of the utility they will receive from an outcome. “Total utility” is the aggregate reported utility during an experience. “Remembered utility” is how previously experienced utility is recalled. Memories primarily reflect the strongest emotion felt and our feelings at the end of an experience, ignoring the total utility and duration of the experience. Mullainathan (2002) notes that both the salience of a memory and the frequency with which we recall it affect its accessibility, and suggests that these characteristics of memory contribute to several decision-making heuristics and biases. Also relevant is hindsight bias, where previous beliefs are falsely recalled as being consistent with actual events (Hawkins and Hastie 1990).

Zajonc (1980) is usually credited with the recent emphasis on the role of emotions in decision making. From an evolutionary basis, it might be argued that emotions are likely to be “rational” in the sense of being compatible with our general interests (Hanoch 2002), although Tranel, Bechara, and Damasio (2000) argue that either too little or too much emotion may hinder effective decision

making. Thus emotions can be seen as simultaneously underlying our behavior and frustrating our ability to act optimally (Elster 1999; Helm 2001). A complication is that immediate visceral feelings differ from anticipated emotions, which we draw on as we assess possibilities (Gilbert and Wilson 2000; Loewenstein and Schkade 1999). A number of authors have seen emotions as helpful in economizing on costs of decision making (Hanoch 2002; Hastie 2001). One might also expect that more emotional experiences are more readily recalled, although the evidence on ties between emotions and memory may not be as strong as one might expect (Eagly et al. 1999). Finucane and colleagues suggest “that people use an *affect heuristic* to make judgments,” where strength of affect influences which associations people draw on (2000, 3). Kahneman (2003) has also argued for consideration of affect, stressing the importance of “intuition” in many decisions, perhaps operating through “attribute substitution,” where we replace some of the attributes of objects or tasks with other attributes (“heuristic attributes”) that come more easily to mind (Kahneman and Frederick 2002); an attribute with strong affect would readily serve this purpose. Individuals may be subject to a negativity bias, where unpleasant information has more impact than pleasant information (Ajzen 2001, 35). The necessity of anticipating future desires may incorporate “projection biases” (Loewenstein, O’Donoghue, and Rabin 2003).

Beliefs and Desires

Hypotheses about the sources and structure of our desires have a long history in economics. For example, Menger envisioned a hierarchy of wants, and Veblen emphasized socially motivated consumption. More recently evolutionary psychology (Robson 2001, 2002) and the importance of social norms (Elster 1989b) have been incorporated into models of economic behavior. The structure of our desires raises the question of whether they have a hierarchical nature, as assumed by Maslow (1976) and many “humanistic” economists (Lutz and Lux 1979). Economists typically define utility functions in terms of levels, but Scitovsky (1976), for example, differentiated between “comfort” (derived from the level of consumption) and “joy” (stemming from the level of arousal or stimulation associated with changes in consumption). Prospect theory (Kahneman and Tversky 1979, Tversky and Kahneman 1992) argues that we evaluate options on the basis of changes from a reference point. It has also been suggested that our evaluations hinge on relative income and consumption in the form of social comparisons (our situation relative to others, as in Frank 1999). Social interaction effects, such as feelings of reciprocity, have been argued to be important (e.g., Fehr and Gächter 2000). In addition, desires and beliefs are responsive to repetition, which gives a “persuasion bias” (DeMarzo, Vayanos, and Zweibel 2003). Presumably many of our beliefs, and our feelings about ourselves, involve social acceptance and so are affected by social norms, widely accepted rules of behavior, and various feelings of social obligation (Akerlof and Kranton 2000; Goethals and Klein 2000).

The question of “sources” of desires has obvious links to psychological theories of motivation. MacFadyen and MacFadyen 1986 includes chapters illustrating how economic behavior could vary considerably depending upon whether based on instinct, reinforcement, social pressure, humanism, or existentialism. Some of these motivational forces are more easily understood in a cognitive framework, while others are primarily unconscious (MacFadyen 1986). One might also draw on personality theory to explore the nature of our desires (Albanese 2003).

In place of optimization, Simon (1955, 1982) suggested that desires are met by “satisficing.” People express their desires not through a complete utility function but through a dynamic process of changing aspiration levels; given current aspirations, our behavior settles as soon as we find a satisfactory situation. This provides a plausible explanation for habitual behavior. In a

continuously changing world, Heiner (1983) argued that predictable behavior reflects habits that ignore minor changes. The suggestion that desires are more labile than economists generally assume can be seen in models proposing that we have conflicting desires across time, which creates self-control problems (Thaler and Shefrin 1981), and advancing the idea that we should be viewed as possessing more than one utility function (but see Brennan 1989 in opposition).

The neoclassical economic model has taken desires and opportunities as given; moreover, desires are taken as complete (in the sense that every possible situation into which the individual might fall is readily comparable to other situations in utility terms) and unlimited (in the sense that there is always something else—more money, more time, or more of some good—that would raise utility). However, some of the work in behavioral economics casts doubt on the existence of a stable, complete utility function. For conventional economists, this is certainly one of the most troubling aspects of prospect theory, in which changes are always measured from a reference point and as gains or losses. As Kahneman and Tversky and many others have pointed out, this means that valuations are subject to framing effects, and the invariance of choice in the conventional economic model is lost. Identical choice alternatives may be ranked differently depending on how the information is presented.

It might be suggested that the modification to the conventional economic model required is relatively minor—for example, simply replacing the utility function in neoclassical economics with the prospect theory value function. However, some of the behavioral economics literature implies that the real problem is much more fundamental, calling into question the whole idea of any sort of reasonably well defined utility or value function. Rather, in many instances it has been suggested that coherent preferences simply do not exist. Even a naive psychological approach suggests a number of reasons why this might be the case. Preferences might be largely unconscious, called up only as needed and, because unconscious, not necessarily consistent with other preferences. They might be created anew by the individual as a result of experience. They might come into existence only when the individual is put into the position of having to cognitively think about what is valued (Fischhoff 1991; Kahneman 1994; Slovic 1995). Economists are not unacquainted with some aspects of this literature, as it has entered into the debate about whether the contingent valuation method (CVM) can be used to provide reasonable values for public policy analysis using benefit-cost analysis.

Another approach, this one with radical implications for conventional economics, argues that our beliefs and desires are conditioned almost entirely by our social setting, so all our actions are symbolic or ritualistic (Guerin 2003; Mason 2002). Instead of social outcomes being the aggregate of individual acts, individual actions become the product of the social setting. These models go beyond bandwagon or snob effects or models that include social norms. Instead, virtually all reference to any notion of individual rationality is dropped, and the relevant beliefs are “societal” beliefs (Bar-Tal 2000).

Cognitive Limitations

For most behavioral economists, information processing is an essential part of the decision-making process. This is founded in psychological literature emphasizing cognitive limits, such as the suggestion by Miller (1956) that we can manage “seven, plus or minus two” concepts, and has been well known in economics since Simon’s development of the idea of “bounded rationality.” (See Simon 1955, 1982; the recent survey of Simon’s work in Earl 2002; and the special issue [vol. 24, no. 2 (2003)] of the *Journal of Economic Psychology*, as well as reviews of bounded rationality in Conlisk 1996 and Lipman 1995.) Bounded rationality may be seen in a rational choice framework, tied to Lopes’s (1991) suggestion that the surprise is not that we are often irrational but that we are

as rational as we are. Since belief formation is costly, constrained by limited time and information-processing capabilities, it can be seen as a traditional economic optimization problem, the solution of which might involve various decision-making heuristics. (For excellent overviews of these heuristics, see Gilovich, Griffen, and Kahneman 2002; Kahneman, Slovic, and Tversky 1982.)

An economic view of belief formation has interesting implications, including the suggestion that our beliefs may be particularly erroneous in situations in which the costs of forming rational beliefs are high (e.g., in complex and novel settings) and where the benefits derived are perceived as low (e.g., the consequences of the individual's single vote in elections or knowledge of the meaning of life). There are, however, logical inconsistencies in the suggestion that belief formation is but one example of a rational choice problem. On one hand, it poses an infinite regression problem, as suggested by Winter (1986); deciding how much information to gather to form a new belief is a rational choice problem that requires gathering information, which necessitates a decision on how much information to gather, and so on. On the other hand, if the decision-making heuristics are seen as having evolved as a way of economizing on decision-making costs, then it would seem that beliefs would not be formed rationally but would be subject to the various heuristics and biases that we are prone to use. From a behavioral economics perspective, this suggests that the view that beliefs are simply another part of the rational choice process is not convincing, and deeper exploration of decision-making heuristics and biases is necessary.

Less developed is a more general theory of when specific heuristics apply. (See Baars 1997 on unconscious context effects; Thaler 1999 on framing; Gigerenzer and Goldstein 1996 on cognitive algorithms; Heath, Larrick, and Wu 1999 on reference points; Griffen and Tversky 1992 on representations of probabilities and confidence judgments.) One link is ties to affect (emotion), as noted above. Some authors have applied simulation techniques to assess the effectiveness of alternative choice rules, often in an evolutionary setting with learning effects (e.g., Camerer 2003; Gigerenzer and Goldstein 1996; Gigerenzer, Todd, and ABC Research Group 1999; Rubenstein 1998; Samuelson 2002; and Young 1998). In consumer research, Bettman (1979) has developed a marketing theory based on information processing, and Rachlin (1989) combines behavioral and cognitive aspects into a theory of choice.

Certain heuristics and biases may be tied to our self-concept, which is one of our most important belief systems. Admitting that we have made errors may threaten our self-image and lead us to develop beliefs that are self-serving and self-deceptive (Dahl and Ransom 1999), including the restructuring of memories in our favor (Ross and Wilson 2001). Attempts to maintain our self-image and feeling of control could contribute to our resistance to radically new information (Camerer 1995, 595), which might lead to the well-known status quo bias, loss aversion, and sunk cost effects (Genovese and Mayer 2001; Samuelson and Zeckhauser 1988). Support of self-image could be linked to a number of the biases noted earlier, including hindsight (Christensen-Szalaski and Willham 1991), overconfidence (Benabou and Tirole 2002), the willingness to draw relatively firm beliefs from small samples (the "law of small numbers") (Rabin 2003a), the tendency to credit successes to our own actions, false hopes that we will be able to change our behavior (Polivy and Herman 2002), a belief that we are unusually skilled, and the well-known endowment effect (the tendency to increase the value of objects once we own them) (Kahneman, Knetsch, and Thaler 1991).

Expectancy Models

The suggestion that impulse toward action is directly correlated with a weighted average expectation is commonly invoked in the social sciences, as in the expected utility model (Savage 1954),

which, because of its familiarity, allows economists to relate readily to other expectancy value models. The most prominent is prospect theory (Kahneman and Tversky 1979; Tversky and Kahneman 1992), which also incorporates information-processing heuristics. Marketing models such as the Fishbein and Ajzen (1975) model of “reasoned action” see attitudes toward commodities as the sum, across possible consequences of buying, of the products of beliefs about the nature of the consequence times the valuation of the consequence. Psychological models, going back at least as far as Tolman (1932), have a similar structure based on the expectation that a particular outcome will occur and its valuation (e.g., its emotional valence). In all these models the expected value reflects the beliefs of the individual. A criticism of expectancy value approaches is that they presume an excessive degree of calculation on the part of the decision maker: many decisions are not important enough to warrant much attention, and the models presuppose greater deliberation than is possible for most people.

BELIEF SYSTEMS OF NEOCLASSICAL AND BEHAVIORAL ECONOMICS

Beliefs “About”: Positive Economics

Behavioral economists believe that our models should reflect how people are seen to behave, so heavy emphasis is placed on observations of individual behavior, and experimental studies are accorded high significance. Reliance on observation of behavior means that inductive methods are often used, and behavioral economists are not too concerned whether specific models are completely consistent with a broad overriding model.

Neoclassical economics operates on the broad general theory that individuals are rational decision makers. So it is highly deductive and ambivalent about the value of studying individual behavior. Many neoclassical economists argue that their prime interest is in aggregate economic behavior, particularly the operation of market mechanisms, and have accepted Milton Friedman’s instrumental methodology. From this perspective the assumption that individuals are perfectly rational is useful because it generates results that correspond well with observed aggregate behavior; that is, we are wise to assume that people behave as if they were completely rational. Beyond this, some neoclassical economists argue that deviations from rationality are relatively small and random and so “cancel out.” It has also been argued that a small group of rational individuals, or individuals who learn efficiently, will drive the market to the expected rational choice equilibrium. (For a behavioral view of these arguments see Rabin 1998, 2002).

The “as if” assumption is methodological, so the behavioral economic reaction to this must also be methodological: that some other assumption works better, or that we want to understand individual economic behavior as well as aggregate results. Most behavioral economists suggest that standard economic models can often be improved by adding behavioral elements, many deviations from rationality are not random, and rational marginal players do not necessarily drive economic systems to the result that would occur in a universe of rational individuals. A number of models have demonstrated that a subgroup of less than rational traders yields anomalies in market outcomes compared to the usual rational choice model (Akerlof and Yellen 1985; Haltiwanger and Waldman 1985; Russell and Thaler 1985). Camerer (1995), in his outstanding survey of experimental economic studies of individual economic decision making, returns repeatedly to this important issue. Learning as an avenue to rationality has also seemed unlikely to many behavioral economists, since naive new individuals continuously enter the economy, many major economic decisions are only undertaken once or rarely and so offer little chance for learning, and

learning is subject to information processing. People seem to have some difficulty in generalizing situation-specific learning, and even experts often perform very poorly in decision-making tasks (Camerer and Johnson 1991).

Some of the communication problems between neoclassical and behavioral economists reflect differences in core beliefs. Thus, behavioral constructs shown to be consistent with a deductive model based on utility maximization are more likely to prove acceptable to a neoclassical economist. Behavior that is difficult to explain through the utility maximization model provides an obvious avenue for even committed neoclassical economists to consider alternative explanations. (See Thaler 1992, and the series of articles by him and various coauthors in assorted issues of the *Journal of Economic Perspectives* from the late 1980s, setting out numerous behavioral “anomalies.”) Since construct systems have a social component, we are often reluctant to abandon the security of conventional construct systems, but there may be cascade effects as highly regarded practitioners adopt new ideas. Increasingly civil interactions among behavioral and neoclassical economists are common!

Beliefs “In”: Normative Economics

Normative economics is necessarily more controversial than descriptive economics. Neoclassical “welfare economics” suggests that policies can be assessed in terms of their “efficiency” and “equity,” where economists have particular interest in economic efficiency, which is often assessed through benefit-cost analysis. Efficiency is defined in terms of Pareto improvements. A pure Pareto improvement is a change that makes at least one person feel better off without making anyone feel worse off, while a potential Pareto improvement is one where parties who feel better off could still gain after potentially compensating those made to feel worse off. Efficiency relies on two widely accepted ethical judgments, which might be labeled “democracy” (all members of society are taken into account) and “nonpaternalism” (values are those individuals themselves associate with changes). The latter provides a link to descriptive neoclassical economics, since individuals who are effective utility maximizers will make choices (and impute values) that reflect their interests.

As a general foundation for ethics it is pretty thin gruel, as recognized in Sen’s well-known dictum that only a “rational fool” would accept that a person’s preferences, choices, happiness, and well-being are all the same thing (Sen 1977). A large literature demonstrates that correlations between measures of happiness and real income are low (Easterlin 2002; Frey and Stutzer 2002; Lane 2000; Seligman and Csikszentmihalyi 2000). Kahneman, Deiner, and Schwarz (1999) provide a variety of papers discussing what “well-being” and “happiness” mean, as do Ryan and Deci (2001). The tenuous link between measures of happiness and economic well-being have been credited to the likelihood that assessments of happiness hinge on our relative status (Frank 1999) or adaptation to higher consumption levels (Easterlin 2002), or that happiness scales measure our success in meeting aspiration levels rather than our well-being (Kahneman 2003). In general, if preferences are not well defined, the efficiency criterion loses its ready rationale (Bromley 1990; Cowen 1993).

Despite this, neoclassical economists are reluctant to abandon the belief construct of economic efficiency, since it provides a broadly applicable tool for policy analysis. Economists may come to accept its use in a somewhat more restrictive manner, as one to be applied along with a number of criteria such as “equity.” Behavioral economics research may justify policies on efficiency grounds, as when Frank (1999) draws on the externalities associated with status effects and advocates a progressive consumption tax, with proceeds used to fund higher levels of public goods.

Before applying the efficiency criterion, one might ask whether underlying values are nonmalevolent, whether social comparison effects are pronounced, whether preferences seem to be clearly defined and stable, and so on. Paternalistic policies may be desirable in some circumstances, although most economists exhibit a degree of libertarianism as well (O'Donoghue and Rabin 2003; Thaler and Sunstein 2003).

Some behavioral economists are attuned to conventional economic policy analysis, but others have been attracted to greater behavioral "realism" primarily because of their strong normative interest in improving society. From this perspective the applicability of economic efficiency (as a valid criterion derived from utility-maximizing individual choices) is rejected. For example, Etzioni (1988) has founded an association for "socioeconomics" dedicated to the improvement of society; from a humanistic perspective, Lutz and Lux (1979) and Lutz (1998) suggest wide-ranging economic and social changes. Some analysts emphasize baser motives for our consumption, often grounded in socially influenced material values (Belk 1988; Dittmar 1992), which cuts the ground from the economic efficiency criterion. Many of these researchers have turned to psychological theories to find alternative criteria, which are often based on interpersonal or community values and assorted concepts of self-actualization.

CONCLUSION

The essence of the behavioral economics approach is that our science should be grounded in realistic depictions of the behavior of individuals. For most behavioral economists, this implies that the rational choice model of neoclassical economics should be expanded to incorporate more psychological realism. In this regard, cognitive psychology provides an obvious link, and, as this essay has argued, the concept of "beliefs" is critical. How we see the world, what we value, and how we act hinge to a significant degree upon our beliefs, and there is ample evidence (both in our observations of everyday behavior and in the research literature) that our beliefs are formed and applied in less than fully rational ways. Increasingly, economists are modifying their traditional models to include more realistic depictions of beliefs. One extension involves a more careful consideration of what it is that we believe "in": our underlying values and preferences. This can help us build better descriptive models (such as those that include relative income judgments, status effects, and concerns about reciprocity) and is essential as a basis for normative economic analysis. Recognition that our beliefs "about" the world will affect our decisions is also playing a more important role in economics, as more and more models examine the impacts of assorted decision-making heuristics and biases. It is gratifying to those who have been working in behavioral economics for some time to see the increased acceptance among neoclassical economists of concepts and research methods from behavioral economics. Recent surveys of behavioral economics (Mullainathan and Thaler 2002; Rabin 2002) have noted this trend and suggested that conventional economists will be increasingly willing to recognize that "the more realistic our assumptions about economic actors, the better our economics" (Rabin 2002, 658).

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