

Behavioral Economics: Toward a New Paradigm

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Abstract

This article discusses the challenges behavioral economics poses for neoclassical economics and the ways in which the young field may move forward. After reviewing some of behavioral economics' accomplishments and the responses to these accomplishments, the article asks whether its findings can be incorporated into the neoclassical paradigm and suggests additional steps behavioral economics may consider undertaking in order to expand its reach.

Keywords

behavioral economics, neoclassical economics, economics

This article discusses a relatively new field, behavioral economics (B.E.), the challenges it poses for the dominant economic paradigm, neoclassical economics, and the ways in which the young field may move forward. In Part I, this article briefly reviews select key accomplishments of B.E. thus far. It then turns to discuss the ways in which major scholars who ascribe to the neoclassical paradigm, when faced with the set of facts revealed, have responded. The article then turns to ask whether the findings of B.E. can be incorporated into the neoclassical paradigm or, instead, point to the need for a new one. Part II suggests additional steps B.E. may consider undertaking in order to expand its reach and provides additional data relevant to the question of whether B.E. points to a new paradigm or merely modifications of the existing, neoclassical one.

A few words on the two key concepts here used: B.E. and the neoclassical paradigm. B.E. has been variously defined as: “the combination of psychology and economics that investigates what happens in markets in which some of the agents display human limitations and complications” (Mullainathan & Thaler, 2001, p. 1); as “a field concerned with the empirical validity of neoclassical assumptions about human behavior,

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and, where these assumptions are found to be invalid, with describing behavior more adequately” (Calhoun, 2002, p. 38); as a field centered around the core “conviction that increasing the realism of the psychological underpinnings of economic analysis will improve the field of economics *on its own terms*—generating theoretical insights making better predictions of field phenomena and suggesting better policy” (Camerer & Loewenstein, 2004, p. 3).

While these definitions emphasize the role of psychological variables and propositions, B.E. (like other social phenomena) has acquired a life of its own that cannot be controlled by rational definitions of its originators. It is increasingly used to refer to evidence that choice behavior diverges from the assumptions of neoclassical economics (and more generally, the neoclassical paradigm)—whether or not these factors are psychological, sociological, anthropological, or others. The term is here used in this broader sense.

Reference is made to the neoclassical paradigm rather than merely to neoclassical economics, because the basic assumptions that underlie the kind of economics dominant in American colleges and increasingly in other parts of the world—assumptions that focus on rational actors, seeking to optimize their utility—now also underlie major segments of other disciplines. These include law and economics (an important school of legal thought), public choice (in political science), and exchange sociology, among others. Moreover, the same paradigm also has a public philosophy parallel in libertarian and laissez-faire conservative positions. Hence, discussions of the merits and limitations of the paradigm and the debate on whether it needs and can be modified—or replaced—apply much more widely than just to mainstream American economics.

Part I

Achievements of Behavioral Economics

A robust field. Replication is considered an essential requirement of a robust science. However, in social science research this criterion is not often met. Hence, it is a notable achievement of B.E. that its key findings have been successfully replicated.

To detail one example, in their pioneering 1974 experiment, Tversky and Kahneman found that responses to an obscure question (they asked participants what percentage of African nations were members of the United Nations) were systematically influenced by something that one would not expect people to be affected by if they were thinking rationally, namely, a random number that had been generated in front of them. When a large number was generated, the participants’ responses were larger on average than when a small number was generated (Tversky & Kahneman, 1974). This finding indicates that the perception of an initial value, even one unrelated to the matter at hand, affects the final judgments of the participants, a seemingly irrational connection.

The effect demonstrated by this experiment, which the two scholars labeled *anchoring and adjustment*, has been replicated using a wide variety of stimuli and participants.

Jacowitz and Kahneman (1995) found that participants' estimates of a city's population could be systematically influenced by an "anchoring" question; estimates were higher when participants were asked to consider whether the city in question had at least 5 million people and they were lower when they were instead asked whether the city had at least 200,000. Russo and Shoemaker (1989) further demonstrated this effect, finding that when asked to estimate the date Attila the Hun was defeated in Europe, participants' answers were influenced by an initial anchor constructed from their phone numbers. Prelec, Ariely, and Lowenstein (as cited in Ariely, 2008) found that when participants wrote down the last two digits of their Social Security numbers next to a list of items up for auction, those with the highest numbers were willing to bid three times as much on average than those with the lowest.

Behavioral economists have shown that anchoring is not restricted to obscure or trivial choices. Plous (1989) found that participants' estimates of the likelihood of nuclear war were much lower when they had been first asked if the likelihood was greater or less than 1% than when they had first been asked if it were greater or less than 99%.

Again, this is but one example. Other key findings have also been repeatedly replicated. Given that many other social science findings have not been replicated (either because no one has tried them or they did not pan out), B.E. deserves high marks in this regard.

Lab and field. Many B.E. studies are conducted as experiments under lab conditions. This method is preferred by scientists because it allows extraneous variables to be controlled. However, extensive reliance on lab studies has led some critics to suggest that B.E.'s key findings may apply only—or at least much more strongly—under the artificial conditions of the lab, and not in the field (i.e., in real life).¹

Recent work in B.E., however, has shown that its findings do hold outside of the lab. For instance, a study by Madrian and Shea (2001) illustrates how the status quo bias—that "individuals have a strong tendency to remain at the status quo, because the disadvantages of leaving it loom larger than advantages" (Kahneman, Knetsch, & Thaler, 1991, pp. 197-198)—and loss aversion shape employee decisions on whether or not to participate in 401(k) retirement savings programs. Because of these two biases, many millions of individuals do not contribute to these saving programs, even though these contributions are clearly in their self-interest. In another B.E. experiment conducted in the field, Gneezy and Rustichini (2004) found that neoclassical theory expectations regarding incentives and punishments did not accurately predict the behavior of parents at a day care center. Furthermore, a number of recent contributions to B.E. rely on field data, including Lowenstein's (2004) work on behavior and volition.

Neoclassical Responses to B.E.

With regards to the robust findings of behavioral economics, there are several options concerning the ways neoclassical economic paradigm might respond,² all of which are being applied.

Treat behavioral economic findings as marginal. Tim Harford (2008), writing in the *Financial Times*, reports that many economists hold that B.E. “merely illuminates some fascinating but relatively minor foibles.” He adds that he has “long been persuaded that the evidence shows that we are fundamentally rational creatures when it comes to most decisions that really matter.” Similarly, Richard Thaler (1991) argued in an earlier book that B.E.’s findings apply only in “certain well-defined situations” (p. 3), and others have stated that the findings of B.E. merely require economists to “modify one or two assumptions in standard paradigm in the direction of greater psychological realism. Often these departures are not radical at all because they relax simplifying assumptions that are not central to the economic approach” (Camerer & Loewenstein, 2004, p. 3). Most economists seem to agree, generally ignoring B.E.’s findings and continuing instead to work within the neoclassical economics framework (Simon, 1999).

This marginalization of B.E. is supported by some research that shows some of the biases it uncovered wear off over time, or as behavior is repeated. In one oft-cited B.E. study, some students were given a decorated mug and asked at what price (if any) they would sell it, while other mug-less students were asked to choose between receiving a mug or receiving a sum of money. Those who had been given the mugs assigned it a much higher value (median of \$7.12) than those who had not been given one (median of \$3.12), demonstrating that people tend to value losses higher than gains (Kahneman et al., 1991). However, economics deals with a large number of transactions among units that are standardized, the way most consumer products and currencies are, hence no such attachment is to be expected when behavior is repeated. Thus, one would not expect the same “endowment effect” to be found among people who sell mugs day in, day out, as their business. And while an artisan may well take pride in a pair of shoes he or she crafts and be reluctant to part with them, a shoe factory employee working on an assembly line is unlikely to have such a feeling. Indeed, John List (2003) demonstrated an inverse relationship between trading experience and the impact of the “endowment effect.” He found that professional dealers, who conducted many transactions over time, were much less affected by the endowment effect than amateur traders (List, 2003).

Many of the key findings of B.E. are, however, much more difficult to minimize in this way (or, the record shows, in any other). The results of congenital cognitive limitations and systematic flaws in people’s choice making are evident in areas of behavior no one would consider marginal. Millions of people do not contribute to their Individual Retirement Accounts, although it is clearly to their advantage to do so. Many take out mortgages for which they could not possibly keep up the payments. And many call their brokers to ask their advice on which stock to purchase on the assumption that these brokers can beat the market averages, despite strong, consistent, robust data showing that one cannot consistently outperform the market (see e.g., Malkiel, 1999).

In another attempt to minimize the findings of B.E., some economists argue that even if many individuals act in ways that seem to conflict with the rational, utility-maximizing assumptions of the prevailing neoclassical model (from here, “optimizers”)—or, as some behavioral economists have put it, act “irrationally” (see e.g., Ariely, 2008)—in

aggregate, they act as if they were all optimizers. Hence, neoclassical economics can safely ignore B.E.'s findings. For instance, Gary Becker, a Nobel Laureate in economics, argues: "It doesn't matter if 90 percent of people can't do the complex analysis required to calculate probabilities. The 10 percent of people who can, will end up in the jobs where it's required" (Stewart, 2005).

This line of argument is not supported by evidence. Becker provides no data to demonstrate that 10% (or even 1%) of economic actors are optimizers or that the markets in aggregate act rationally, as opposed to, for instance, gyrating between periods of irrational exuberance and greed and irrational fear and panic (Shiller, 2005). And, one might wonder, if X% of individuals are indeed optimizers, what are the mechanisms through which these people are put into positions that allow them to shape the economic decisions of all others?

In short, attempts to deal with the challenges posed by B.E. by acknowledging the validity of its findings but insisting that their implications are limited seem not to hold.

Making the irrational rational. Neoclassical economists have been particularly ingenious in suggesting that behaviors that seem irrational are actually rational. These efforts to reconcile the findings of B.E. with the basic neoclassical model take several distinct forms. First, some of these arguments achieve this reconciliation by using tautologies, especially by employing the same item of behavior to both reveal the preferences of the actor—and the optimal way to serve them. Richard Thaler (1991) writes, "no matter how strange a particular economic action might seem to be, some economist can usually construct a rational explanation for it" (p. xvi). Thus, neoclassical economists have argued that if a person who never drank wine and had no intention of drinking wine suddenly purchased a bottle of wine, this must have been a rational choice—because otherwise why would he or she have bought it (Tagliacozzo, as cited in Kirzner, 1976). Others argue that when a person chooses to become a criminal, he or she "must have" weighed the pros and cons and made a rational decision that being a criminal was the optimal choice (Andreano & Siegfried, 1980; Becker, 1968; Murray, 1984; Rubin, 1980).

This approach violates a basic tenet of science, that propositions are formulated in ways that can be falsified. Leading economists have recognized the unproductive, tautological nature of an approach that states that whatever the actor does is said to "reveal" that actor's preferences. Nobel Laureate George Stigler (1966) pointed out, "a reason . . . can always be found for whatever we observe man to do" that "turn[s] utility into a tautology" (p. 57). This seems hardly a convincing way for neoclassical economics to absorb or otherwise contend with B.E.

Second, in contrast, the introduction of the concept of information costs, a form of transaction costs that can make what seems to be irrational behavior rational, is much more productive. Neoclassical economics used to assume that information is transmitted instantaneously, fully absorbed immediately, and all without costs. This assumption has since been corrected by recognizing that the collection and processing of information exacts costs. Hence, when the expected costs of obtaining and processing information outweigh the expected utility to be derived from said information, it is rational to stop

seeking or processing more information, even if this leads one to act without all the relevant facts—act “irrationally,” so to speak (Downs, 1957; Stigler, 1961).

To provide a simple illustration: A man who carries an umbrella every day, rain or shine, seems to behave irrationally. However, the concept of information costs suggests that this man calculated that the costs of checking weather forecasts every day (and evaluating their reliability) are higher than those incurred by carrying the umbrella on rain-free days, and thus his decision to carry the umbrella every day is a rational one.

From a B.E. viewpoint, for this way of reconciling its findings with the key assumptions of neoclassical economics, the key empirical question is whether people can correctly (i.e., rationally) assess the costs and benefits of information they have not yet collected or processed. For instance, when they plan to purchase a car, do they stop visiting more car dealers because visiting more costs them more than they would benefit from extending these visits? As Jon Elster (1986) has pointed out, to be optimizers, decisions about cutting off an information search would have to be based on assigning the unknown information a concrete value—would require one to “know the future” (Elster, 1986, pp. 25-26).

To the extent that this question is answered empirically, economics benefits and—I expect—B.E.’s key thesis will be reinforced, showing that people cannot optimize these deliberations any more than anything but the most trivial decisions. To the extent this question is answered by *assuming* that people judge information costs rationally, we are back to unscientific tautologies.

A third way neoclassical economics attempts to reframe the irrational as rational is by suggesting that people use heuristics (or guidelines or “rules of thumb”) as a kind of prefabricated rationality. These aids spare them the need to absorb and process information and hence, it is suggested, allow them to optimize despite cognitive limitations.

B.E.’s position on this issue is not perfectly clear. Tversky and Kahneman (1982) state that “in general, [heuristics] are quite useful, but sometimes they lead to severe and systematic errors” (p. 3). However, “useful” can be a long way from optimal, and—in contrast to their usually empirically rich work—no evidence is cited to support the suggestions that these rules are “in general” useful.³ No one collected a random sample of heuristics and showed that most, a majority, or even a fraction of them lead to rational behavior or that their selection does not suffer from the same cognitive difficulties other processing of information reveals. Many heuristics people do use are vague, subject to arbitrary interpretation, and even mutually contradictory. People who seek to invest in stocks are told to “buy low and sell high” and to “buy and hold”; that “stocks yield more than bonds” and that they should “hedge by allocating your assets between stocks and bonds”; that “anyone who held his stocks for 20 years or longer made money” and that “past performance is no guarantee for future performance.” Many heuristics are a mix between the pronouncements issued by the oracle at Delphi and nonfalsifiable tautologies, exemplified by the economic gag line regarding predictions: “Give them a figure, give them a date, but never both.”

Many of the questions raised about information costs apply here. How is a person to determine which heuristic is the right one to follow?

A fourth way neoclassical economics seeks to reconcile the findings of B.E. with its model is by trying to rationalize social bonds (family, friends, peers, communities) and social norms (the specifications of social and moral values). These, it has been shown, are major factors that affect people's choices.⁴ They affect choices on multiple levels, greatly influencing not only people's preferences and choices directly, but also which sources of information they draw on, how they "color" the information they intake, and even the extent to which they engage in search behavior.

Neoclassical social scientists have sought to rationalize the nonrational influence of social bonds and norms primarily in two ways. First, they suggest that people adhere to them based on their own rational deliberations; a person who conforms to peer pressure "must have" calculated that it "pays" to conform to what his or her community prescribes. Thus, Cass Sunstein (1996) argues that norms should be seen as a kind of subsidy or tax:

Hence an emphasis on social norms should not be seen as an attack on rational choice approaches to social and political problems. From the standpoint of an individual agent, norms provide a part of the background against which costs and benefits are assessed; more specifically, they help identify some of the costs and benefits of an action. From the standpoint of the individual agent, this is hardly irrational, and it is hardly inconsistent with self-interest. (p. 939)

Surely people do make such calculations. However, as there is no reason that these calculations will not be greatly limited by the same biases B.E. revealed limits other deliberations, these calculations are very unlikely to be optimal. Most crucial for the issue at hand, strong data show that to a significant extent, bonds and norms influence people "below the radar screen."⁵ The processes involved are persuasion, normative education, and leadership. For instance, the extent to which people save is deeply affected by beliefs they hold—which they internalized while being educated and are reinforced by subtle, informal social processes—about the stigma of being in debt and the merit of saving. The studies that show correlations between culture (and subculture) and the level of commitment to work hard point to beliefs as a major factor (especially religious ones).⁶

The second main avenue taken by neoclassical economists to rationalize social norms is to suggest that these norms themselves are developed and adopted by various groups on a rational basis. One of the first to advance this idea was Ellickson (1991), who found that "members of a close-knit group develop and maintain norms whose content serves to maximize the aggregate welfare that members obtain in their workaday affairs with one another" (p. 167). Others, following Axelrod's (1984) work, have argued that rational norms arise out of experience. Cooter (1997) writes:

The economic analysis of social norms draws on a fundamental result in game theory: One shot games with inefficient solutions . . . often have efficient solutions when repeated between the same players. This generalization grounds the

“utilitarianism of small groups,” by which I mean the tendency of small groups to develop efficient rules for cooperation among members. (p. 947)⁷

Again, there is no reason to deny that norms can be agreed upon following deliberations. However, it remains to be shown in nontautological ways that these choices are optimal. Numerous studies of social movements, religious movements, nationalism, and fundamentalism all show that changes in norms occur through nondeliberative social processes already cited (leadership, education, and persuasion).

In sum, the attempts detailed so far to interpret the findings of B.E. so that they conform to the assumptions of the neoclassical model seem unsatisfactory.

Provide some slack. Another way an accommodation is sought is to acknowledge that there is some “play” among the variables while maintaining that the core assumptions of neoclassical paradigm still hold. For instance, the term *imperfect knowledge* implies that people’s choices may not be optimal, but are nearly so. However, by and large B.E. does not indicate that people are off just a bit, like a speck of dust on a shining golden surface, but—to stay with this metaphor—loaded down with lead. In matters that have the complexity of typical economic decisions, people’s choices are considerably suboptimal.

A similar adaptation has been introduced by defining down that which is entailed by being rational. The move is taken by B.E. and others, including Herbert Simon, a Nobel Laureate in economics, and a highly celebrated forerunner of B.E., who utilized the concept of “bounded rationality” explicitly to hold that although it seems that people’s choices are irrational, they actually act rationally—because they intended to act rationally! “Bounded rationality is not irrationality,” Simon (1985) writes. “On the contrary, I think there is plenty of evidence that people are generally quite rational; that is to say, they usually have reasons for what they do” (p. 297). Bryan Jones (1999) writes: “Bounded rationality asserts that decision makers are intendedly rational; that is, they are goal oriented and adaptive but because of human cognitive and emotional architecture, they sometimes fail, occasionally in important decisions” (p. 297).

Others used the term to suggest that people acted rationally because they used all the information available to them. For instance, in their study of herd behavior in financial markets, Cipriani and Guarino (2008) conclude that such behavior (specifically, ignoring information and instead imitating the behavior of other actors) is not necessarily irrational but “may be the result of the learning process of rational agents” (p. 48). When confronted with a mob of hundreds running and screaming down a street, one may either investigate the cause of the stampede or else join the herd. Again, given only two options, and no time for collecting and processing information—a situation very rarely encountered in making economic choices—one may well act optimally. However, in all other situations, declaring that blindly following the herd—say in the stock market—is rational is an extreme example of a more general tendency to try to protect the neoclassical paradigm by defining down what is entailed in being rational.

Divide up the turf between homo economicus and homo sapien. A much greater departure from the neoclassical model is implied by still another treatment of the same challenge.

Just the way the 1855 Berlin Conference divided Africa between the European powers by drawing lines, some favor dividing the social world between realms of behavior that adhere to the laws of neoclassical economics and those that are governed by different rules.

The study of preferences illustrates this approach. Neoclassical economics tends to assume that preferences are fixed and hence changes in behavior occur due to changes in income and prices (and other information). However, the precept that preferences are fixed is hard to defend, especially when one studies the education of children. Children's preferences are clearly initially implanted and thereafter further influenced by their parents, other educators, and the culture (or cultures) in which they are raised. To ignore this elementary set of facts, many neoclassical economists tend to portray economic man as a biological-psychological miracle, born fully formed, say in his or her mid-20s (Maital & Maital, 1984, p. 65), with his preferences "immaculately conceived."⁸ Indeed, many economic textbooks do not deal with the question of how preferences are formed.

Moreover, the preferences of adults remain in flux in ways they are unaware of, due to social and cultural changes that affect their beliefs and feelings, their selection of sources of information, and the way information is processed. For instance, neoclassical economists try to show that persuasive ads are actually "informative" because their model requires avoiding nonconscious, nondeliberative ways of changing preferences and choices. Thus, economists have argued that changes in consumer choices following advertisements that show celebrities using a given product are not due to some nonrational infatuation or identification with the celebrities, but "must be" because these ads provided the consumer with new information about the product.⁹ These kinds of scholastic interpretations are not very persuasive.

Among the small number of economists who deal directly with these issues, some have suggested that the world of studying preferences be divided—with social sciences studying their formation and then neoclassical economics taking them as given. For instance, Nobel Laureate Paul Samuelson (1983) suggested that economics leave the study of the ways in which preferences are formed for psychology and sociology. Economics then can take them as given and fixed and work from there on how people change their purchases and savings based on their income and prices, holding preferences constant. B.E. (and socioeconomics) are thus said to apply only to these exogenous areas.

This approach, carving up the behavioral world, implicitly assumes that the exogenous changes take place before the endogenous ones. For instance, it assumes that people's preferences are shaped as they grow up, and then they are ready to enter the market and choose which kind of work they seek, what to purchase, and so on (Stigler & Becker, 1977). Or, it assumes that social and cultural changes modify the preferences of adults and then they, say, use their cars less and walk and ride their bikes more. Actually, both kinds of changes—of the preferences and changes in income and prices—take place at the same time and both affect behavior.¹⁰ Hence, when one compares behavior at two or more points in time, one needs to determine the mix of factors that drives the changes and the extent to which these are due to—or because of—changes

in income, prices, and other such economic factors. That is, both kinds of variables must be studied simultaneously if a valid science of choice is to evolve.

Moreover, exogenous and endogenous factors affect one another; they interact. As environmental concerns spread, more people will prefer to walk, use bikes, and use cars with higher gas mileage, which in turn affects prices of cars and gas, just as increases in their prices affect people's preferences and not just choices.¹¹ These observations point to the need for an integrated social science that would combine social and cultural factors with economic ones.

Part II

To briefly take stock of the argument so far: When a paradigm is faced with "stubborn facts," facts that contradict its key assumptions, those who adhere to the given paradigm are expected to defend it. A paradigm contains the accumulated results of decades if not generations of efforts by many thousands of scholars, a codification and distillation of their findings, observations, and insights. It would not make economic sense to cast it aside merely because some, even a growing number, of facts cannot be accounted for by the paradigm or contradict its core assumptions. Instead, one finds that neoclassical economists, like other scientists whose paradigm is challenged, seek to find ways to reconcile "stubborn facts"—established in this case by B.E.—with their paradigm. These efforts have taken the form of (a) minimizing the importance of the stubborn facts; (b) reinterpreting these facts to make them fit with the assumptions of the neoclassical paradigm; (c) cutting some, but limited, slack in neoclassical assumptions to accommodate the seemingly anomalous behavior; and (d) delegating these factors to exogenous realms. We saw that these treatments are not fully satisfactory.

As more and more evidence is accumulated by B.E. and others that people do not, and are profoundly unable to, act according to the key assumptions of neoclassical economics; that these departures are significant rather than relatively minor deviations; and that these departures are not "harmless" but lead to erroneous predictions, it seems more justified to explore whether a new paradigm might serve better.

A major reason the neoclassical paradigm is still dominant despite numerous cogent criticisms by highly regarded economists—including several Nobel Laureates in economics¹²—is that there is no alternative paradigm. One cannot beat a paradigm, even a flawed one, with nothing. I argue next that B.E. may serve as the basis for this new paradigm, especially if expanded along the suggested lines.

Universalistic, Particularistic, or Oscillating Limitations?

The key thesis of B.E.—that systematic biases are built into people's choices that prevent utility maximization (from here on, optimizing choices)—is subject to different interpretations, and B.E. would benefit if this matter were clarified. One can hold that these systematic limitations are found in all people, are "congenital" or even wired in (a "universalistic" interpretation); or that they are found only among some

people (a “particularistic” interpretation); or that one and the same person can sometimes optimize and at other times cannot (an “oscillating” interpretation).

Differences about the extent to which people fail to optimize are found not only among various students of B.E., but even in the work of one and the same scholar, sometimes even in the same piece. For instance, Sendhil Mullainathan and Richard Thaler (2001) define B.E. as “what happens in markets in which some of the agents display human limitations and complications,” seeming to hold a particularistic interpretation. However, in the same article, they seem to favor the universal interpretation when they write: “Since we have only so much brainpower, and only so much time, we cannot be expected to solve difficult problems optimally” and “Bounded rationality reflects the limited cognitive abilities that constrain human problem solving.” Finally, they suggest an oscillating interpretation as well, stating, “Bounded willpower captures the fact that people sometimes make choices that are not in their long-run interest.”

The universal interpretation (that the biases are congenital, expected to prevent all human beings from optimizing in all but trivial choices such as playing tic-tac-toe)¹³ is difficult to square with B.E.’s findings. In many of the studies conducted revealing systematic biases, a significant proportion of the participants made the “correct,” namely, rational choice.

For instance, Frederick asked students at two elite American universities the following question: “A bat and a ball cost \$1.10 in total. The bat costs \$1 more than the ball. How much does the ball cost?” Like other behavioral economists, Frederick highlights the finding that many of the students gave the wrong answer. Half (47/93) of a group of Princeton students, and 56% (164/293) of University of Michigan students answered incorrectly (in Kahneman, 2003). Note, though, that about half of the students provided the correct answer.¹⁴ Kridel et al.’s (1993) study of telephone customers shows that 65% of them would have saved money had they chosen to pay for service by the call rather than pay a flat rate. However, 35% did choose their service plan correctly. In another study, Kahneman and Tversky (1982) provided respondents with a description of a woman and then asked them to rank the probability of eight possible outcomes regarding her employment and activities. Of the respondents, 89% ranked the probabilities in an order that violated probability theory. However, 11% of the respondents did not make this error. In Madrian and Shea’s (2001) study of enrollment in 401(k) plans, 35% of the participants did not enroll, even though enrolling was clearly in their self-interest. Yet, about 65% did enroll, with time.

These data are used to show that people do not make rational choices and that they have congenital cognitive limitations. However, if giving the wrong answer is evidence of nonrationality, then giving the right answer is an indication of rational choice behavior. That is, the same data that show that numerous people choose poorly also show that the universal interpretation of B.E.’s central thesis is not tenable. For the same reasons, the oscillating interpretation seems not to hold, as many people are unable to make optimal choices in all but trivial situations. This might suggest that the particularistic interpretation should be embraced, but this would be true only if individuals

who do make an optimizing choice in a given situation also make it in all other situations. Perhaps one should draw on still another interpretation, which is next laid out: namely, that while no one chooses optimally, some people are less rational than others and the level of rationality can be enhanced at least to some extent.

Rationality as a Continuous Variable

Further development of B.E. would benefit if rationality were considered as a continuous and not dichotomous variable. To first illustrate the point: As previously mentioned, a study of 401(k)s shows that 65% of those who could enroll did so while 35% did not. As long as the choices are framed so that there are only two options, the data suffice to show that a large number of people act “irrationally” (by definition). But even in the case at hand, most of those who made the “correct” choice by enrolling in a 401(k) still did not make the optimal choice. Only a few of the 65% made the choice of enrolling on the first day they were eligible. After 3 months, still less than 20% had made the rational choice; it took 36 months—the loss of years of benefits—for the number to reach 65% (Thaler & Sunstein, 2008).

These findings allow one to highlight that it would be very fruitful to treat rationality not as a dichotomous variable (one either optimizes or one does not) but as a continuous variable. A dichotomous variable fully suffices if the central finding of B.E. is that the optimization model is not compatible with the evidence regarding choice behavior. However, if one is to develop an alternative model to the neoclassical one, degrees become significant for at least two major reasons.

First, the concept of degrees of rationality allows one to express the proposition that people’s decisions are not merely a bit short of optimal—say 92% rational (i.e., they almost make the optimal choices)—but that many are instead much closer to the opposite end of the continuum, say maybe 12% rational (in the sense that the choices they make are rather poor when compared to optimal choices).

Second, this concept calls attention to the value of studying the factors that increase people’s level of rationality—such as education, specialized training, relevant values, and self-control.

Public Policy Implications

The concept of degrees of rationality has implications for public policy. For instance, if education, especially training in decision making, increases the rationality of one’s choices—this would lead to rather different policies than if future B.E. studies revealed that such training is not very productive, as some studies already suggest. For example, Eddy (1982) demonstrated that most physicians (95 out of 100) in his sample were unable to combine two probabilities to determine the accuracy of a mammography. Other researchers report similar results (Casscells, Schoenberger, & Grayboys, 1978; see also Etzioni, 1988). Furthermore, Fischhoff (1982) reports that the education experts receive in their specialty (medical school courses for doctors,

courses in finance or accounting for financial analysts, etc.) does not cause their overconfidence with regard to the probable accuracy of their decisions and assessments to disappear; although, calibration training, which allows individuals to learn to correctly assess probable accuracy, has proven effective in reducing overconfidence in professions like weather forecasting.

These findings support public policies that build on the “liberal choice architecture” suggested by Thaler and Sunstein (2008), which entails creating organizational arrangements that help people make better choices—without requiring them to process information or learn to control their loss aversion or other emotions. For instance, allowing them to opt out of 401(k) programs rather than requiring them to choose to opt in is one example.

In short, treating rational choices as a continuous variable is productive not merely as a social science concept, but also as a resource for improving public policies.

Affective/Normative and Macro Variables

An especially promising expansion would be for B.E. to greatly extend its study of the effects of emotions, norms, and values on choice and of the macro social and cultural variables that greatly influence normative/affective choices. So far B.E. has focused a great deal on cognitive limitations; some attention has been paid to emotions (e.g., loss aversion) (Kahneman et al., 1991; Thaler & Sunstein, 2008), as well as some to normative factors (e.g., social norms) (Ariely, 2008). Granted, if all that one focuses on is people’s inability to optimize, one may combine the effects of cognitive, affective, and normative factors. However, to understand the ways these factors work, what drives these factors (i.e., treating cognitive, affective, and normative factors as dependent variables and determining that which account for their variance), and the ways these factors may be modified (to enhance the rationality of choices), these variables must be studied separately.

In reference to emotions, Daniel Kahneman (2003) put it especially well when he noted that

Utility cannot be divorced from emotion. . . . A paradigm of choice that completely ignores feelings such as the pain of losses and the regret of mistakes is not only descriptively unrealistic, it also leads to prescriptions that do not maximize the utility of outcomes as they are actually experienced. (p. 1457)

Behavioral economists may wish to pay more mind to a point already made by Aristotle: People are social animals. People are bound to one another in ways they are not aware of but that deeply influence one another’s thinking, judgments, and actions. In most B.E. studies to date, individuals are treated as atomized and are taken out of their social context with no other one provided. And most studies deal with intra-individual processes and not with interpersonal relations among participants.

For instance, the question whether group deliberations make choices more or less rational remains largely to be broached (Etzioni, 1988). (When I raised this issue with a behavioral economist he pointed out that B.E. is defined as the study of the psychology of economic choices. However, the term *behavior* implies a broader definition of the subject. More importantly, an individual's attributes are not free of social and cultural influences.)

A brief illustration of the role of social norms in choice behavior, using B.E.'s own data, follows: Heyman and Ariely (as cited in Ariely, 2008) asked students to drag circles across a computer screen into a box and then used the number of circles dragged in during a given time period as a measure of their output. Participants were paid \$0.50, \$5, or nothing at all, and dragged an average of 101 circles, 159 circles, and 168 circles, respectively. That is, the group that received no pay worked the hardest.

One may at first conclude that social norms—which Heyman and Ariely (as cited in Ariely, 2008) see as the motivators in the third experimental condition—added little to productivity, as only 9 more circles were moved in comparison to the number moved by participants who received \$5. Actually, the social norms moved *all* the 168 circles in the third condition, as the participants were not paid at all. Furthermore, Heyman and Ariely paid their laborers as they walked in, before they worked, so they had no reason to fear any loss if they did little work. Hence, clearly norms motivated them to work, even under what Heyman and Ariely considered market conditions and not normative ones, possibly because the participants believed that a fair day's work is owed for a fair day's pay, especially when \$5 were allotted rather than \$0.50. Finally, social norms function *least* when the work is routine, repetitive, and boring and has no social meaning (Etzioni, 1975)—like dragging circles. Therefore, there is good reason to suggest that norms are even more powerful than this study reveals.

Other studies of the role of norms in affecting cognition and choice behavior along B.E. lines include Lefford's (1946), in which he demonstrated that normative loading inhibits logical reasoning; Berg, Dickhaut, and McCabe's (1995) study of "trust games," which found that trust exists even in anonymous, one-time economic transactions; and Gerber, Green, and Larimer's (2008) study that shows that mailers with normative and social appeals affect voter turnout. There are many thousands of such studies conducted by other social scientists. B.E. would benefit if the implications of these studies for choice making would be explored and taken into account in future B.E. studies.

Furthermore, the study of B.E. could be much expanded by conducting more cross-cultural studies to determine the role culture plays in influencing choice behavior. In one such study, Levinson and Peng (2006) found that Americans and Chinese make different economic assumptions when estimating the financial value of objects over time and that contextual variables, such as whether the objects were presented as items the actors had lost or gained, had different effects based on the participant's culture. In addition, Oyserman and Lee's (2008) analysis of cross-national literature on the effects of individualism and collectivism found that studies "strongly imply an effect of culture on cognition" but "cannot address the question of which aspects of culture matter" (p. 329), suggesting a major area in which these studies can next be developed.

Another way to expand B.E. in this direction is to combine group experiments with personal ones. For instance, we know from earlier studies that the judgments of individuals regarding, say, the relative size of objects, are influenced by what the members of their groups say they are (Asch, 1955; Neto, 1995; Nicholson, Cole, & Rocklin, 1985). And B.E. has found that individuals assess sizes differently according to the “anchors” they personally use; however, these results are typically depicted as individual attributes (e.g., an individual compares the cost of a theater ticket to the size of his or her bank account, phone number, or Social Security number). A combined study would change both the personal “anchor” and the content of the group pressures (e.g., by changing the way stooges “see” the anchor). I expect that such a study will find that people under group influence are even less rational than free-standing individuals.

Beyond simply providing productive areas to mine for more social science findings, such expansions of B.E. would help develop key concepts and assumptions about human nature. Those who adhere to the neoclassical paradigm tend to reflect the Enlightenment precept that associates nonrational behavior, as well as behavior driven by affect and norms, with primitive, traditional, or religious modes of thinking and acting. A neo-Romantic view recognizes that people are much more limited in their intellectual capacities and that there are sound moral, social, and even economic reasons for choices to be based in part on social bonds, moral commitments, and traditions and for choices not to be dominated by detached, disengaged, seemingly factual considerations. The more B.E. explores the affective and normative factors that influence choices, I expect, the more it will be established that the neo-Romantic model provides a more fruitful paradigm than the Enlightenment one.

A New Paradigm?

Finally, B.E. seems ready to clarify whether its findings can be used to construct a different paradigm to study economics in particular and choice behavior in general: in short, whether it points to a new paradigm.

B.E. initially focused on a limited range of choices and did not study the kind of basic, microeconomic decisions people routinely make: for instance, the reasons people purchase certain goods but not others, day in, day out; what makes people save versus increase their debt; and which incentives make them work harder. B.E. has expanded to encompass more of these choices, but there is much room for its scope to grow in this direction. As the scope of B.E. expands, it will become impossible to avoid the question of whether B.E. seeks to augment, modify, deeply alter, or replace the basic neoclassical economic paradigm and its implications for choice behavior, from decisions on voting to choosing mates.

In this context, it is important to explore the position of Kahneman, the most influential behavioral economist. The cardinal distinction Kahneman (2003) draws is between intuitive beliefs and choices and reasoning (avoiding the term *rationality* altogether). *Intuitive* choices are impulsive, immediate, quick, effortless, particularly prone to biases, “slow learning,” and emotive. Above all, in my words, they are unexamined.

In contrast, *reasoning* is deliberative, slow, effortful, and able to correct biases generated by intuitive choices. However, no claim is made that reasoning even approximates the neoclassical model of optimization. *Particularly important, the data show that most choices are intuitive and only a few are based on reasoning or corrected by it.* In Kahneman's (2003) words:

The central characteristic of agents is not that they reason poorly but that they often act intuitively. And the behavior of these agents is not guided by what they are able to compute, but by what they happen to see at a given moment. (p. 1469)

Kahneman (2003) explicitly states that the combination of intuitive choices and reasoning provides a paradigm ("map") that is "distinct" from the choice model "assumed in the rational agent models" (p. 1449). He adds that psychologists hoped that economics would draw on their work for some hypotheses and that this happened to "some extent." Kahneman cites in this context a few works by his colleagues in B.E., but the evidence that neoclassical economics is adapting its core assumptions or models is rather scant.

Kahneman (2003) adds that even B.E. has "generally retained the basic architecture of the rational choice model"¹⁵ (p. 1469), a valid observation that cries out for an explanation. Kahneman himself thought that "the model of the agent that has been here presented has a different architecture" (p. 1469), the central feature of which is that most choices are intuitive and are not corrected by reasoning.

Kahneman (2003) answers neoclassical economists' criticisms that psychologists have failed to develop an alternative model by pointing to midlevel generalizations that can and do explain and predict different phenomena in diverse settings. He also shows that it is a mistake to suggest that if behavior is not rational, it would be unpredictable, by demonstrating that once one embraces the intuitive/reasoning model one can predict what a person would do (e.g., if a crowd runs in a given direction, a person is much more likely to join it than to run in the opposite direction; Kahneman, 2003, p. 1469).

As I see it, B.E.'s findings, and those of many other psychological and sociological studies, show beyond reasonable doubt that: (a) Indeed, much choice behavior is not based on deliberations of any kind;¹⁶ (b) when reasoning does occur, it is often subject to the cognitive biases B.E. systematically observed and reported; and (c) both "intuitive" (or in Ellen Langer's [1978] words, "mindless") choices and those subject to deliberations are deeply affected by emotions and norms, and these in turn by social and cultural factors.¹⁷

Hence, a sound paradigm for the study of choice behavior would assume that people often make choices that are far from rational—not just imperfectly rational ones. It would make nonrational choices its default mode, and it would incorporate and develop propositions about the conditions under which choices are *relatively* more driven by evidence and logical interpretations (e.g., after technical education), without assuming that people can make optimal (i.e., fully rational) choices in nontrivial matters.

As this B.E. paradigm for the study of microeconomics is achieved, a similar alternative paradigm should be considered for macroeconomics, a thesis that cannot be explored within the confines of this article. On both levels, one should take into account that science progresses when there is a free market in ideas—when one paradigm can compete with others to establish which provides more reliable predictions, advances more parsimonious explanations compatible with the evidence, lays foundations for more robust public policies, and provides for ethical precepts that can be justified. About the last discipline in the world one would expect to shy away from competition would be neoclassical economics, and there is no principled reason B.E. should shy away from engaging in such a competition between its paradigm and the neoclassical one.

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Notes

1. For instance, Steven Levitt and John List (2008) wrote “there are many reasons to suspect that [behavioral economics’] laboratory findings might fail to generalize to real markets . . . ranging from the properties of the situation—such as the nature and extent of scrutiny—to individual expectations and the type of actor involved” (p. 909).
2. For review of the key findings of behavioral economics (B.E.), see Camerer and Lowenstein (2004).
3. Rabin (1996) writes that the study of heuristics “does not merely teach us that people aren’t perfectly rational; it proposes specific ways that judgment departs from the rational model” (pp. 27-29).
4. Although neither has been extensively investigated in B.E.’s research. See discussion that follows.
5. An apt phrase used to indicate that the influences are on a nonconscious level, taking place in ways people are unaware of. See discussion of the way preferences are formed and recast in the following.
6. For instance, in his classic version of this argument, Weber showed the impact of Protestantism on the rise of capitalism.
7. Also see Michael Hechter (1987), who explains norms by their function for social groups: “Groups exist in order to supply their members with some desired joint good. This good

can be attained only if members comply with rules that are designed to assure its production” (p. 41).

8. As Kenneth Boulding put it to a 1985 George Washington University Seminar on socioeconomics.
9. Lindsay (1984, p. 205) argues that when Joe Namath endorses L’Eggs (women’s stockings) and Muhammad Ali endorses a pest killer, and as a result people buy more of these goods, this is not due to persuasion, but information. For more discussion see Etzioni (1988, pp. 141-142).
10. For instance, Paul Stern (1984) demonstrated the independent effects of values and prices in studies of energy consumption.
11. For more discussion, see Etzioni (1988, Chapter 13).
12. The following Nobel winners have raised major questions about the neoclassical paradigm: Herbert Simon (1978), Robert Solow (1987), and Daniel Kahneman (2003).
13. According to W. Brian Arthur (1994), deductive rationality could apply to a game as simple as tic-tac-toe, but “rational ‘solutions’ are not found at the depth of checkers, and certainly not at the still modest depth of chess and go” (p. 406).
14. One may say that this is not an economic choice question in the first place; indeed, it is one of those trick questions provided in game shows or high school math games. It reveals though, as Kahneman (2003) pointed out, “how lightly the output of associative thinking is monitored: people are. . . often content to trust a plausible judgment that quickly comes to mind” (p. 1450).
15. For instance, Camerer and Lowenstein (2004) noted that the work of behavioral economics “does not imply a wholesale rejection of the neoclassical approach” (p. 3).
16. Note, as I mentioned earlier, that such intuitive behavior is largely shaped by social bonds and normative culture; therefore, intuition is not capricious or random.
17. See Chapter 6 of Etzioni (1988) on normative-affective factors.

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