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Behavioral Economics: A Maverick Guide

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Abstract

These are revised notes from the first half of a course in behavioral economics offered at the School of Social Sciences of the University of the Republic in Uruguay in November 2014. This part of the course, entirely verbal, was aimed at outlining the essentials of behavioral economics. The principal assignments were from the second edition of Edward Cartwright's *Behavioral Economics*. The second part of the course, taught by Dr. Martin Egozcue, is not included. It emphasized prospect theory, mental accounts and inter-temporal decision making, and featured substantial mathematical input.

Keywords: behavioral economics, perception, heuristics, empirical verifications, prospect theory, visceral and emotional considerations.

Resumen

Estas son las notas revisadas de la primera mitad de un curso de Economía del Comportamiento que se dictó en la Facultad de Ciencias Sociales de la Universidad de la República en Uruguay en noviembre de 2014. Esta parte del curso, totalmente verbal, tenía por objeto recoger lo esencial de la Economía del Comportamiento. Las principales tareas provenían de la segunda edición de *Behavioral Economics* de Edward Cartwright. La segunda parte del curso, impartida por el Dr. Martín Egozcue, no está incluido. La misma hizo hincapié en la teoría prospectiva, cuentas mentales y la toma de decisiones intertemporal, y contó con un sustancial contenido matemático.

Palabras clave: economía del comportamiento, percepción, heurística, verificaciones empíricas, teoría de prospectos, consideraciones viscerales y emocionales.

JEL: C9, Y9, Z.

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1. Introduction

Behavioral Economics might seem like a redundant name for an economics course. Don't all economics courses deal with human behavior in economic affairs, after all?

Unfortunately, the expression is not redundant.

A simplification of models is inevitable in any subject. That is the way of scientific advance. Yet, despite the dictum of Occam's Razor, and Einstein's advice to keep things as simple as possible, as that most distinguished scientist also cautioned, complex matters should not ignore complexities; one cannot solve a problem with the same type of thinking as that which created it.

Economics has been based, for some time, on models that assume optimization and maximization or very nearly that. Rationality has been the byword. That has been true of what has been termed positive economics, but it also has been true for traditional economics' view of descriptive economics in that it has been assumed that those who survived the travails of competition have optimized and maximized, or at least have come closer to optimization than most others. However, that may still leave them quite far from optimization. Mainstream economic theory has had a heavily normative presumption. It is not that economists have been so naïve as to ignore other considerations (which, they concede, may lead to different conclusions in individual cases). Nor is it that they believe that even surviving business enterprises seek only to do the best that is possible and are able to achieve that objective, but, as a distinguished member of the profession wrote, when proclaiming the theory of economic behavior, economists have generally assumed that successful economic actors behave *as if* they were optimizing. Models along those lines have explained a great deal, and it is true, the errors of some actors are offset by compensating errors of others—though leading figures in the profession doubted, indeed, long denied that it was possible to predict anything on the basis of individual errors. Moreover, competitive markets tend to limit deviations from optimizing behavior. Nonetheless, those optimizing models miss something, and what they miss can help us understand the present better, and often help us predict better and improve the way in which we cope with the future. Note that it is not uncommon that those who proclaim economic rationality as a guiding principle, make other (often idiosyncratic) assumptions about human behavior when it comes to individual cases, particularly when they are called in as advisors or consultants.

Behavioral economics is descriptive; it deals with what transpires in the real world, and as such it introduces assumptions of human behavior that often differ from those of traditional economic theory. Sometimes it reveals that the behavioral assumptions of human activity turn out to be precisely as economists have long maintained (particularly in the long run), but, more frequently, it shows that human behavior draws on psychological factors and on matters of a sociological, cultural and political nature—even on neurological factors—and that these lead to deviations from rationality, certainly rationality in the restricted sense of mainstream economics.

Economists' assumptions of human rationality continue to hold despite the increasing availability of more data, the advances in models to cope with so much data, and an improvement in measurement techniques, all of which provide testimony of the shortcomings of the assumptions. Despite our frequent use of the words, maximization and optimization—in professional writings as well as in everyday conversation—the fact is that some problems do not lend themselves to optimization (certainly not in the time a decision must be made), that objectives other than optimization for the decision making unit often are involved, and that there are limits to the willpower of people to do what they say they set out to do. For those reasons, traditional economic models often lack adequate guidance on how better to manage matters, particularly for changing circumstances, especially those frequently unknowable ones that the future brings.

Is it any wonder that most economists were so taken by surprise by the magnitude of the financial and economic collapse of recent years—and that they have had so little of help to offer the economic world since then (indeed, that they have groped with incentives in an uncertain effort to bring us out of the economic doldrums)? Even behavioral economists, most of whom are micro-oriented, have had little to say that has proved very useful in dealing with the larger picture.

This course incorporates several approaches. I emphasize the main thrusts of behavioral economics, the inclination to supplement careful calculation with heuristics or rules of thumb, learning, and applications such as those in finance (behavioral finance) and public policy (as, for example, “nudging” to get economic agents to do what is more in their interest). Implicit in this presentation is that the essence of the contribution of behavioral economics to the main line of economic analysis tends to have little to do with mathematics, something which will be maintained further, in dealing with inter-temporal choices. That is not to say that mathematics has not been invoked, and the role of math will

be dealt with in greater depth in the second half of the course, where a more mainstream stance is taken. Note that the discussion of nudging and some of the latest uses of the behavioral approach, transforms behavioral economics into something more than simply a better description of what economic actors do and have done.

Dr. Martin Egozcue handles the second part of the course (which is not detailed here). He provides a rigorous coverage of several major breakthroughs, notably concerning prospect theory and mental accounting, and reveals that a number of matters have in fact been clarified by the application of mathematics. Most of the reading assignments are from the second edition of the text by Edward Cartwright, which presents a relatively comprehensive overview with an innovative thrust. The mathematics in the Cartwright text is almost exclusively that of algebra. Other assignments are added (and more mathematics is added), as indicated in these Notes and those of Dr. Egozcue.

In contrast to most courses in behavioral economics, I give attention to the potential of open-ended, in-depth interviews in detecting behavioral hypotheses that prevail in the real world. Moreover, the discussion of strategic interaction goes beyond that of the usual emphasis on game theory (Behavioral Game Theory) and indeed takes a much more agnostic position with respect to the importance of the latter.

Many of the contributions of behavioral economics have been around for many years, but were not taken seriously by the economics profession until they were at least shown to be more than anecdotal, in laboratory and field (natural) experiments. Unfortunately, there has been little effort to indicate which of the anomalies are widespread, which are relatively common, and which simply reflect exceptional circumstances. Nor has there been much effort to explain why some anomalies continue little affected while others disappear with recognition and repetition. Experimental economics began in the late 1940s and gained renewed importance by the late 1970s. The approach was particularly stimulated by experimental work in psychology that seemed to cast doubts on the behavioral assumptions of traditional economic theory. Experimental economics is important for the empirical component of behavioral economics, much as econometrics is for economics generally, but just as most economics courses present only econometric results, this course presents only the results of that portion of experimental economics and field experiments that relate to behavioral economics, only occasionally delving into the technical issues of the measurement approaches. Reference also will be

made to field (natural) experiments, which are emerging as an even more promising means of ascertaining the generality of the behavioral assumptions we employ.

In dealing with strategic behavior, the course deals with behavioral game theory as only one of the alternatives for introducing the behavioral assumptions found in the real world. In this respect, the course includes less on game theory than in the Cartwright text and in most courses dealing with behavioral economics. Neurology may underlie many of the behavioral findings, as an increasing number in the field believe, but while outlining the basics of what has been termed neurological economics, the course will follow the lead of the eminent behavioral economist, Richard Thaler, in maintaining that as useful as it is to understand that the machinations of the brain may explain much of what takes place in many day-to-day undertakings, neuroeconomics does not appear to have added significantly to the basic conclusions of behavioral economics; the course will not delve deeply into neurological matters. Somewhat more weight will be given to assumptions about evolutionary factors, those matters that seemed to have occurred over time, in explaining human tendencies, particularly conscious decision making that does not seem to correspond to what seems strictly rational.

Course Text: Cartwright, Edward. 2014. *Behavioral Economics*. Second Edition. Routledge. Since the course does not follow the sequence of the Cartwright text precisely, students might consider reading the text straight through. Readings that most nearly coincide the course topics will be offered, however. Topic 1: Cartwright, pages 3-4.

Recommended Reading: Daniel Kahneman, *Thinking Fast and Slow* (2011, New York, Farrar, Straus and Giroux). Translations into Spanish and other languages were made available in 2012.

Suggested Readings:

Friedman, Milton. 1953. "The Methodology of Positive Economics," In Friedman, *Essays in Positive Economics*, 3-43. Chicago: University of Chicago Press. This outlines the traditional *as if* argument of economic theory.

Bazerman, Max. 2012. *Judgment in Managerial Decision Making*, Ch.I. Eighth Edition. New York: John Wiley. (Alternatives: Chapter 1 of any edition as far back as 1990.) A lively presentation aimed primarily at students of business administration. Bazerman has written widely on organizational behavior.

Simon, Herbert. 1986. "The Future of Arm Chair Economics." *Challenge*. 29, 5: 18-25. Simon, a political scientist, psychologist and early researcher in artificial intelligence as well as an economist, was awarded a Nobel Prize for the first major effort in behavioral economics.

Levine, David K. 2012. *Is Behavioral Economics Doomed? The Ordinary versus the Extraordinary*. Open Book Publishers. The second half of the book is of particular interest (the first half being largely an argument that all concerns can be dealt with through game theory).

2. Historical Background

It is almost always possible to find historical antecedents, and so it is for behavioral economics. At the same time, what I consider most relevant is what those who formulated the antecedents finally employed as their *modus operandi*. Adam Smith mentioned a number of important behavioral concepts in a volume published nearly two decades before *The Wealth of Nations* in 1776, most notably the central proposition of Prospect Theory; unfortunately, the behavioral concepts did not make it into the subsequent, more celebrated book. Similarly, some of the notions of prominent early-to-mid-Nineteenth Century economists would seem to lend themselves to a behavioral approach, but that was not their emphasis. Psychological factors, even the possibility of refutable empirical assumptions, seemed to enter into the analysis of economics with marginalists William Stanley Jevons and Carl Menger, but this was at an early stage of the development of psychology when the first experiments corresponded more clearly to what economics assumed about behavior. As psychology developed further and the findings of experiments were less along the lines of what our discipline assumed, economic theory abandoned reference to psychology, as Cartwright notes, citing particularly, the work of Pareto.

Irving Fisher, the most prominent American economist of the first half of the 20th Century voiced behavioral concerns, but that is not what emerges most prominently in his writings and it is not what he is still known for today. John Maynard Keynes wrote of "animal spirits" and considered several implications of a behavioral nature (in his personal investments as well as in his theorizing), but that is not what the gist of Keynesian economics is about and what almost all of his followers (and those who have taken issue

with them) have focused on. To this day, macroeconomics has lagged in its incorporation of behavioral economics.¹

Pareto and Walras introduced the concepts—and the mathematical expression of those concepts—that have driven economics since the early 20th Century, particularly since the end of the Second World War. Equilibrium and optimization concepts have dominated, along with the admittedly less optimizational national income concepts since the 1930s. Economics remained largely what was termed a positive discipline, particularly microeconomics, the latter, even more so following mathematician Von Neuman and economist Morgenstern’s game theory with its axioms of rational behavior. Recommendations concerning economic behavior and economic policy were recognized to be more normative, of course, but both were felt to follow from positive economics, though most of the profession felt that economic policy went beyond the increasingly scientific economics, involving political and philosophical considerations.

There were those who raised particular concerns about the behavioral assumptions of the prevailing economic theory, of course, particularly in the Twentieth Century. Veblen spoke of conspicuous consumption and “keeping up with the Joneses” in the 1920s. The latter was picked up by Duesenberry who introduced the relative income hypothesis and positional concerns in the early 1950s. This was emphasized by Hirsch and Frank (in the case of the latter, to the annoyance of those who had hired him). Later, Simon, Leibenstein, and others, voiced concerns about the efficiency with which resources were combined. Veblen was a rank outsider, however, in part for social and personal reasons. Duesenberry and Leibenstein gained tenured positions at Harvard, but were hardly the dominant voices there.

At a more formal level, Allais, Ellsberg, Markowitz, Edwards, Schelling and Baumol made important contributions. Allais showed that economists’ behavioral assumptions of rationality were not always what choices revealed (not even the choices of prominent professional economists), and Ellsberg revealed that the *source* of any uncertainty between choices can affect the outcome, contrary to what rational behavior would predict. Allais’ important contribution in this field appeared in French, and was

¹ There are exceptions to this. The work on social norms and happiness dealt with in these Notes, are really macro topics. Moreover, Bewley’s interview approach described below, though micro in character, reflects that author’s efforts to obtain better behavioral bases for macroeconomic analyses. An important survey in this area is Ian McDonald’s collection of articles, *Behavioural Macroeconomics*, especially Akerlof’s “The Missing Motivation in Macroeconomics.” Unfortunately, as perusal of these stimulating pieces reveals, and despite several important analyses, there is much less empirical verification than found in microeconomics.

largely ignored by English speaking economists for many years. Moreover, it was essentially dismissed by leading economists and statisticians. The article will be dealt with in more detail in Dr. Egozcue's presentation. Edwards was a psychologist writing on decision theory, and though he tended to support the notion that people generally behaved in a largely rational manner, he indicated that they tended not to incorporate new information in a strictly rational manner (they acted conservatively, he maintained). He succeeded in getting a brilliant group of psychology students to examine decision making. Economists did not read the work of psychologists at that time, however. They considered that behavioral matters were covered by Friedman's optimization and "as if" assumptions about human behavior, and were not really of further interest to economic science. Ellsberg's contribution was assigned more often in theory classes in the 1960s and '70s, but he became remembered most for his association with political matters ("the Ellsberg Papers," which dealt with the war in Vietnam). Schelling was cited primarily for his application of game theory to decision making in the Cold War, and Markowitz won a Nobel Prize for his highly rationalist work in financial analysis. Like Marshak, Radner, some of Markowitz's contributions about the importance of gains and losses (rather than overall wealth) serving as the basis of economic decision making, and the inconsistencies in attitudes toward risk, were ignored by most in the economics profession—until later, when they were resurrected by the psychologists Kahneman and Tversky. Ironically, in the late 1940s, mainstream economist Friedman, writing with the mathematician-statistician, Savage, published an article that raised some of the same questions later emphasized by behavioral economists—though as his responses and the major body of his work reveal, he did not continue along those lines. Baumol took positions contrary to Friedman, but turned increasingly to less controversial topics that economists were more focused on.

The first, major breakthrough in thought regarding behavior came with the work of Herbert Simon and the Carnegie School (the School of Industrial Management, not the Economics Department). Simon, received his Ph.D. in political science, and taught operations research (being a pioneer in artificial intelligence) and psychology as well as economics, obtaining a Nobel Prize in the latter in 1978. One of Simon's first efforts, with Newell, was to develop heuristics for business as a second best alternative to optimizing calculations that were not deemed feasible. Interviews that he, his colleagues and students held with businesspeople led to recognition of widespread slack in the efficiency with which resources were utilized, and to affirmations about the cognitive limitations of

humans, along with their underlying motivations. The concept of Bounded Rationality was formulated to take account of both—later used by traditional economists to suggest constrained maximization in a more traditional sense. Simon and his group (Cyert, March, Bromiley, who interviewed officials in several large corporations, and others, as well as, later, the evolutionary economists, Winter and Nelson) wrote of Aspirations and Satisficing, and also of *procedural* rationality (rather than the substantive, end-term, substantive rationality emphasized by mainstream economists to reflect the limitations imposed by the computational ability of humans, the time in which a decision had to be made, imperfect memory, perception problems and context—the state of the world). This more behavioral view began to gain adherents, especially by those who taught in business schools, but among most economists, the reaction was highly adverse. That may have been in part because of the seeming conflict between the emphasis on aspirations and satisficing, on the one hand, and on procedural rationality, on the other (though some mainstream economists came to take Simon’s satisficing to mean an approximation to optimization).

Required Reading: Cartwright, pp. 5-7.

Recommended Readings:

Allais, Maurice. 1953. “Le comportement de l’homme rationel devant la risque: critique des postulats et axiomes de l’ecole Americaine.” *Econometrica* 21, 4: 503-46. This is referred to as the Allais Paradox, resurrected in *in Econometrica* in 1979 by psychologists Kahneman and Tversky.

Ellsberg, Daniel. 1961. “Risk, Ambiguity and the Savage Axioms.” *Quarterly Journal of Economics* 75: 643-69. The first serious piece on ambiguity aversion.

Simon, Herbert. 1957. “A Behavioral Model of Rational Choice.” In Simon, *Models of Man: Social and Rational*: 241-60. New York: Wiley. Perhaps the key early presentation of behavioral economics.

Suggested Readings:

Simon, Herbert. “A Behavioral Model of Rational Choice. 1955.” *Quarterly Journal of Economics*.69,1: 99-118. The first academic presentation of Simon’s view.

Simon, Herbert. 1982 and 1997. *Models of Bounded Rationality*. Vols. 2 and 3. Cambridge: MIT Press. A collection of Simon’s work on behavioral economics and other topics.

Simon, Herbert. 1979. "Rational Decision Making in Business Organizations." *American Economic Review* 69:493-513. A presentation of the argument for what Simon termed procedural rationality.

3. Methodological Considerations

Since the time of Adam Smith and especially during the last half of the Twentieth Century, behaviorally oriented economists and many others had cited individual exceptions to the positions that economic actors functioned as self-serving maximizers, that enterprises were engaged in maximizing profits, and that prices were uniform in different markets, but these never truly registered for the reasons already mentioned and because of the presumed ability of arbitrage to eliminate economic discrepancies in short order. (Fischer Black, an eminent financial economist, active on Wall Street as well as in the academy, wrote a straight-forward and highly convincing piece concerning the limits of arbitrage.) The basic model of economics was held to reflect what happened and to predict quite well. Moreover, it was also maintained that many deviations from rationality were offset by others, and, in any event, they were not predictable.

Economists had come to conclude that their theories should be characterized by parsimony, generality, tractability, and as would be added, at least plausibility—the essential congruence of those theories with reality. Attitudes among economists began to change with accumulating evidence from cognitive psychology (notably that branch of cognitive analysis known as behavioral decision theory) and experimental economics. Experimental economics began as a means of testing microeconomic theory, but prodded by what they regarded as disturbing results from experiments by psychologists, initially skeptical experimental economists came to reveal an increasing number of anomalies in economic behavior. Some of the anomalies are described below and more in the Cartwright text.

Such experiments did not prove anything, but those engaged in conducting them encountered so many "anomalies" that an increasing number of economists (and especially their graduate students) began to wonder about the universality and usefulness of the rationality assumption of traditional economic models and some also began to question what exactly was involved in what economists referred to as rationality. Even though the laboratory experiments employed many controls not found in the real world (to begin with, initially, they ignored incentives, and they have continued to include a lack of the

deception so important to many real world transactions, along with an absence of learning—except for the game theorists who usually consider only the learning produced by the experience of games. Moreover, the participants in experiments were primarily inexperienced first and second year college students in elite colleges). Even so, the often less-than-completely rational results began to register. Results seeming to cast doubt on the traditional assumption of rational behavior also were found in field or natural experiments. These, such as inconsistent responses of physicians to differently framed diagnoses of identical disease situations and the seemingly inconsistent responses of citizens-at-large to differently framed auto insurance requirements of two neighboring states in the U.S., provided more serious evidence in favor of a behavioral approach. (Somewhat later, an even more convincing study of other-than-strictly rational behavior in the sports cards markets was produced.) Together, laboratory and field experiments have constituted the principal empirical evidence of behavioral economics.

Another source of empirical evidence comes from open-ended, in-depth interviews of economic actors, asked to explain how they made particular decisions (and, in a few cases, observed while in the process of making their decisions). While some of that work has been praised, most behavioral economists regard this approach for generating hypotheses about decision making behavior as too time consuming and otherwise unscientific and unsatisfactory. (Most behavioral economists appear to be satisfied with the hypotheses being turned up in laboratory experiments, which, it has been insisted, can easily be duplicated.) Note, though, that List and two other prominent experimenters are now testing some of the behavioral hypotheses uncovered by the most serious of the interview-based studies, that published by Truman Bewley.

Behavioral economics has come to be regarded more seriously by the economics profession as a consequence of the studies of experimental economics and the mathematical formulation given to Prospect Theory, the most prominent of the behavioral theories (the latter versions of which are referred to as second and third generation or Cumulative Prospect Theory). Discussion of the approach can be found in the Cartwright text. The advantages and disadvantages of the two types of experiments and the greater generalizability of the most appropriate field or natural experiments are summarized in the reading by List and Omar Al-Ubaydli.

Open-ended, in-depth interview-based studies appear to have been undertaken only by this author and Truman Bewley to date. Schwartz's studies, admittedly rudimentary, were published in 1987, 1998, 2004, 2006, and 2010. (In addition, a further effort was prepared in 2012.) The studies focused on manufacturing industries in the United States and Latin America and are summarized in a suggested reading. Those interview-based efforts point to a number of findings that probably could not have been obtained in laboratory or traditional field experiments, and to others that might be more amenable to resolution by experiments, but for which none appear to have been undertaken.

Truman Bewley, the other author (a mathematician as well as an economist), teaches General Equilibrium Theory at Yale University, and while he continues primarily in that field and does not regard himself as a behavioral economist, he was disturbed enough by the seeming unrealism of the behavioral assumptions of the models he had to worked with, that he took time out to interview more than 300 firms, labor leaders and consultants about wage formation, and is currently finishing a study concerning price formation that has involved nearly 600 interviews. A chapter summarizing his 1999 study is assigned, and an early draft of the study on price formation is listed as a suggested reading. The interviews and that first study were a follow-up to the relatively short 1990-1991 recession in the United States. His major conclusion was that morale—which he defined to include both unconsciously and consciously felt mental and physical pressures—influences productivity, and, in turn, profitability. His interviews led him to maintain that except for those cases in which there were severe impacts in the financial condition of enterprises that were obvious to employees, or in which there were sharp declines in the economy as a whole, the morale of those employed is affected more by wage reductions than by layoffs.

A few economists had published articles which *assumed* that the morale of those on the job might be adversely affected by wage cuts, though without any indication as to whether morale might be affected differently if wages were not reduced but, instead, some workers were laid off. It is difficult to imagine how insights concerning the differential impact on worker morale under those alternative situations could be obtained in highly controlled laboratory experiments with students, particularly if the usually youthful and inexperienced laboratory participants were asked to respond in a manner that would assume that they had been long employed and had become dependent on their wages for the well-being of their families. (Nor have there been experiments in which the participants

were workers, also confronted with the two types of situations, carried out in comparable or even more normal times.) The current efforts of List, Fehr and Gneezy may deal more satisfactorily with Bewley's findings regarding wage cuts and layoffs. Bewley's study also came to several other conclusions that might be more readily verified in the laboratory, but do not seem to have been. He found, for example, that labor unions and employees generally did not seem particularly concerned with severance pay (at least, not during relatively short downturns such as the one he studied), and that informational asymmetries do not seem to explain wage rigidity, despite the importance that the latter have been given in some theories of labor economics.

What follows, the case for interview-based studies, is drawn from an article Bewley published in the *Journal of Socio-Economics* in 2002 entitled, "Interviews as a Valid Empirical Tool in Economics."

Bewley begins his interviews with a conviction that it is important to understand people's motives and how they go about achieving objectives, given constraints. He acknowledges that the importance of avoiding proprietary information and assuring confidentiality is a concern—in obtaining good responses and in keeping the door open for subsequent researchers. Bewley also notes that while use of referrals increases the assumption of respondents that their answers will be kept confidential, it increases the danger of having a biased group. He discusses the advantages and disadvantages of an interview approach with that of a survey. (Omitted, though, is that the sometimes clarifying responses of some survey participants cannot be used, as was true in the more traditional survey undertaken by Blinder and Associates in the 1990s—but he advises against the use of generally inexperienced students as interviewers.) Bewley notes the advisability of not including proprietary and identifying information, along with the acceptance of refusals to respond to certain questions. He discusses ways to overcome some of the problems brought on by networking, adding that variety is important because without it, one cannot see the connections between responses and the circumstances of various types of respondents. It is necessary to look for the relation between the circumstances informants face and what they say, he maintains—to consider whether there is any uniformity in explanations due to the logic of circumstances or the culture of the business community or of particular industries. Bewley states that it is advisable to interview large numbers though he argues for the importance of key informants. He maintains that it is necessary to recognize a stopping

point—and while most of his interviews were of a comparable period of time, in some cases, he phoned back to clarify certain points.

Bewley maintains that an interview approach gives desirable freedom to interviewees though he concedes that it may be necessary to discount informant efforts to make strong points. The focus, he maintains, should be on a participant's concrete experiences, and on his or her decision making, avoiding abstractions (including those of economic theory). He notes that it may be necessary to broach important issues at several separate times and in different ways and to take note on how the respondent obtained the information he offers. Bewley stresses the need to commit the topics to be discussed to memory and to maintain eye contact. He stresses the usefulness of humor, especially if it is felt that respondents are dodging answers.

Bewley offers a number of suggestions for interpreting responses. Some are quite mechanical, but among the others, he notes that disagreements may reflect ambiguity on what the correct decisions entail. He maintains that interview data can be used to test existing theories and as the basis for formulating new theories. Bewley acknowledges that interview based studies are expensive, time consuming and physically demanding. He maintains that they are useful only if the views and practices of each category of people studied do not vary widely and it is not important to quantify the variation that exists. Honesty is important, especially if matters are very confidential. The interview method is best, Bewley maintains, when applied to people dealing with a class of decision problems for which the circumstances defining the problem vary a great deal and most people in similar situations make similar decisions. He stresses the need to consider people's explanations.

In responding to criticisms of the method, Bewley notes that people may not recognize their own motives. He notes, moreover, that their answers may reveal something about the concerns of the respondents. He finds rationality as well as irrationality in the answers of respondents, though he adds that economists should not cling to (their definition of) rationality and is critical of economists' inclination to rely excessively on introspection. His criticism of Milton Friedman and of the Lucas/Rapping theory of unemployment is based in part on the fact that circumstances change. Also, he distinguishes between using a theory for economic policy or to predict the impact of changes in the economy.

Bewley notes that observation may be better than ex post questioning. He closes, arguing for the usefulness of this approach of “main street economics.” In this, his conclusions recall earlier ones of another economist even more known for his dedication primarily to macroeconomics, the Nobel laureate James Tobin, who, in a co-authored piece prepared for psychologists in the 1960s, acknowledged that we may gain by asking businesspeople directly about their decision making. It does not seem that this conclusion of Tobin has ever been cited by other professional economists.

Required Readings:

Cartwright, 7-29, 35-36 and 372-379.

Bewley, Truman. 2002. “Interviews as a Valid Empirical Tool in Economics.” *Journal of Socio-Economics* 31,4: 343-353. A non-mathematical argument by an economist with major econometric and mathematical credentials.

Bewley, Truman. One of the chapters summarizing Bewley, 1999, *Why Wages Don't Fall During a Recession*, Cambridge, MA: Harvard University Press, in Peter Diamond and Hannu Vartianinen, eds, *Behavioral Economics and Its Applications*. Princeton and Oxford: Princeton University Press; or in Herbert Gintis, Samuel Bowles, Robert Boyd and Ernst Fehr, eds., *Moral Sentiments and Material Interests. The Foundation of Cooperation in Economic Life*. Cambridge, MA and London: MIT Press. The Bewley thesis has occasionally been cited for its findings, though usually not for the methodology used; however, as noted, the hypotheses generated by the interview-based approach are currently being tested by experimental economists List, Fehr and Gneezy.

Suggested Readings:

Al-Ubaydli, Omar and John List. 2013. On the Generalizability of Experimental Results in Economics: With a Response to Camerer. NBER Working Paper 19666. Cambridge, MA, especially Epilogue, pp. 36-37. An account of issues in laboratory and field experiments.

Bewley, Truman. 2012. An Interview Study of Pricing. Working Paper. An initial account.

Schwartz, Hugh. 2013. Ascertaining Behavioral Responses by In-Depth Interviewing and Direct Observation. SSRN.com Working Paper. Outlines hypotheses of human behavior uncovered in open-ended, in-depth interviews. Summarizes several published papers.

Questions to Consider:

1. Are laboratory experiments subject to fewer objections than those conducted in the field (the so-called natural experiments), and, if so, what are the implications of this?
2. Over 98 percent of the empirical work in behavioral economics does not resort to interview-based studies; is there an adequate justification for this?

4. Preferences

Even though critical, traditional economic analysis dispenses quickly with the matter of preferences. They are what they are, say some prominent economists, and though they are based on attitudes and values, there is little need to explain them or to deal with any problems they may appear to present. We can document them with indifference curves, it is maintained, but the explanations of why they are as they are is said to belong to psychology and other fields of study. Preferences involve rankings, which are stable in the short run. Though they may change, even in the long run they are said to be relatively stable, reflecting what sometimes amounts to a status quo bias.

What can be said, according to traditional economic theory, is that preferences should reflect the principles of rationality. They should reflect the axioms of completeness and transitivity, and several assumptions, notably cancellation, dominance and invariance. Thaler lists traditional economics' tenets of rationality as cancellation, expectation, risk aversion, asset integration preference ordering, invariance, attention to opportunity costs and marginal analysis, the irrelevance of sunk costs, the fungibility of money, the domain of utility, the prevalence of economic opportunities, rational expectations and Bayesian Learning (ordered, rational updating). These are dealt with in courses in microeconomic theory. The factors underlie rational preferences, generally best viewed as revealed preferences (Samuelson). A leading text puts all this together by stating that the preferences of traditional economics should adhere to basic rules of logic and probability theory, that they should be coherent, and that they should not be formed on the basis of immaterial or irrelevant factors. (Nonetheless, an increasing number of more or less traditional economists have begun to write about notions of multiple selves and meta or true preferences. Context is now given more attention, along with such matters as the relative levels of assets.)

Behavioral economics, as a descriptive concept, has introduced a number of qualifications. **The first of these qualifications is that preferences should not be**

entirely incompatible with empirical observations. This does not mean that assumptions must echo real life (sometimes impossible and often too narrow to cover significant categories), but the dictum rules out insisting that something as basic as the economic theory of descriptive economics should be exempt from observation. Beyond this, behavioral economics has staked out a number of additional explanatory factors concerning the assumptions about human behavior.

Psychologists have shown that differences in framing can lead to short run shifts in preferences, even to what has been termed preference reversal. Different words lead to different descriptions of the same situation, as marketing specialists and trial lawyers have long shown they are well aware. Mortality and survival rates trigger different responses, even when referring to the exactly the same results—even among professionals accustomed to dealing with those data. Different words evoke different heuristics or rules of thumb, some of which do not have the same consequences for decision making; the leading explanation for the shift in preferences is that different words tend to produce different emotional reactions and a resort to different heuristics—heuristics characterized as affective, in this case. Cognitive factors sometimes enter as well.

Experiments in this area in the early 1970s by the psychologists Lichtenstein and Slovic led to documentation of preference reversal which so shook up the economics profession that several leading economic experimenters attempted to disprove the results—an effort that was not successful by their own accounts. In the initial experiments of Lichtenstein and Slovic, participants were asked to choose between (1) a bet with a high probability of winning a small amount of money, and (2) another bet, with a smaller chance of winning a larger amount. The expected values were approximately the same. The participants were then asked to value each bet by stating the minimum amount they would accept to sell each of the bets if they had proprietary rights over them (or the maximum amount they would pay to buy the gamble). Most of those who preferred the first bet assigned a larger value to the second bet, and vice versa for those who had preferred the second bet. The results were subsequently replicated with real money in a Las Vegas casino. The choices based on dollars differed from those based on the indicated preferences and probability, it turned out. Economist Thaler and psychologist Tversky noted that preference reversal implies intransitivity (preferring A to B and B to C but not A to C), the failure of procedural invariance, or a deficiency in the payoff scheme used to elicit the cash equivalence of preferences. Studies show that potentially very disconcerting

lack of transitivity is rarely the cause of preference reversal. The most usual explanation is procedural invariance; the words used and the way in which solicitation is sought matters. Leading experimental economists showed subsequently that repetitions of the same type of experiment with participants who are given a chance to observe the results tends to lead to a reduction or an elimination of preference reversal—but, in real life, many decisions choices are unique and even similar ones often are spaced too far apart in time to be accurately recalled and thus to reflect greater consistency.

Second, preferences may differ according to a person’s endowment—his or her possessions—at least for goods that are not intended for immediate resale. This was shown in a series of experiments in the 1980s by Richard Thaler and several others. Such a finding goes against the basic notion of traditional economics, expressed by Nobel laureates, that whether someone is a buyer or seller of an item depends simply on its price. Most economists now accept the notion of an endowment effect despite its adverse implications for the discipline’s fundamental indifference curve analysis and for the notion of gains from trade. Fortunately, the endowment effect does not appear to hold for most categories of goods that are ordinarily bought and sold. The initial experiments were made with such articles as drinking mugs containing a university emblem and inexpensive pens, neither of which were intended for resale, though the significance of endowment also seems to be important generally for discerning the different preferences of the rich and those at the other end of the income spectrum. The general level of assets influences preferences. The endowment effect may also help explain why there is often such a difference between the price of a home, as evaluated by the buyer, and that sought by the seller.

Third, experiments have shown that the introduction of less preferred and presumably irrelevant options can influence choice, which is not rational, but, in large part, may reflect the difficulty humans have in dealing with large numbers of variables at the same time and of perceiving accurately, all of the consequences of the choices.

Fourth, psychologists Kahneman and Tversky, whose studies of prospect theory are examined later in the course, have shown, with the help of Wakker, that preferences may vary with alternative reference points, even at the same point in time.

Fifth, preferences on certain matters, particularly those involving one or more unknown options, may not have been formulated, and those preferences may first have to be constructed. Despite the importance of this point, insisted upon by Tversky and Slovic, even most behavioral economists have tended to ignore it. Note, though, that it builds on Simon's observation that in real world decision making, one of the key impediments to choice is that some of the options may not be known and search is necessary to determine them. One well-known economist, Plott, arrived at a somewhat similar conclusion, writing of *discovered* hypotheses (and preferences), but most economists seem to ignore the notion that some preferences may have to be constructed.

Sixth, preferences may shift quite a bit over time. Most economists, behavioral and traditional, while they do not deny the possibility of major shifts in preferences over time, have nonetheless assumed that such major shifts in preferences do not occur, even over time, amounting to a kind of a status quo bias. If those economists do allow for major shifts in preferences over time, they tend to ascribe it to major changes in context, or, at least, to an anchoring and adjustment response (described more fully below).

Preferences also may be influenced by what have been termed “menu effects”—general attraction effects—momentum effects (even involving products that are not closely related), and by what have been termed visceral effects, to mention a few factors. Yet another consideration apparently sometimes affecting preferences is attributable to the nature of happiness. Many behavioral economists would be hesitant to give much credence to these—with the exception that a substantial number of behavioral financial analysts do take the momentum effect seriously for the short run. More would refer to aspiration levels in determining preferences, exemplified in a study by several prominent behavioral economists to the effect that the work decisions of novice taxi cab drivers seem to reflect daily income targets—for novices, at any rate. A problem for researchers lies in unraveling preference falsification by those being questioned or surveyed or even whose choices are being viewed. Finally, going beyond those specializing in behavioral decision theory, some psychologists have followed Maslow and maintained that preferences are determined by a hierarchy of needs, beginning with physiological needs, and extending to needs for security, a sense of belonging, self-respect and personal realization. The largest number of psychologists would conclude that preferences are affected by motivations, which have been described as influenced by Need for Achievement, Locus of Control, Sensation Seeking and Risk Taking, Altruism, Time Preference, Life Style, An Inclination for

Changes in Preference, and Cognitive Abilities. Very few behavioral economists have dealt with these concepts, though Simon did explain the decision making choices of even some middle level corporate members as involving a form of altruism.

Questions to Consider:

1. What is the so-called endowment effect and under what circumstances is it likely to be of consequence?
2. Why might preferences not be stable in the short run?
3. Does the assumption that preferences are known impede an analysis of what takes place in the real world?

Required Readings: Cartwright, pp. 33-35, 47-54, 57, 112-113, 127-37, 425, 465-467. (Also, on the importance of context in influencing preferences: pp. 11, 46-59, 67-68. 132, 136-137, 166-169, 187, 201, 437, and 525-527.)

Slovic, Paul. 1995. "The Construction of Preferences." *American Psychologist* 50, 5: 364-71. An important contribution of psychology to behavioral economics—not yet incorporated into many studies by economists.

Suggested Reading:

Slovic, Paul and Sarah Lichtenstein. 1983. "Preference Reversals: A Broader Perspective." *American Economic Review* 73, 4: 596-605. A presentation for economists of the critical work by psychologists in the early 1970s.

5. Heuristics or Rules of Thumb

Heuristics are means of reducing the search necessary to find a solution to a problem. They are shortcuts that provide subjectively compelling substitutes for the use of probabilities in making judgments. Heuristics are particularly important in the presence of uncertainty but also where many factors enter into decision making and the pressure of time or the deliberation costs are major considerations. We turn to heuristics especially when engaged in what Kahneman refers to as "thinking fast," but, often, also when "thinking slow" and relying more on cognitive processes.

Some of the first academic heuristics were aimed at approximating optimization but with the work of the behavioral decision theorists, more heuristic models have sought to capture the way in which real-world choices were being made. The initial efforts of the behavioral decision theorists have been referred to as the heuristics and biases program,

with the deviations from what traditional economics would regard as rational calculation characterized as biases. Principal focus has been on the general heuristics outlined by Kahneman and Tversky, especially since their article in *Science* in the mid-1970s. Although the program began with an emphasis on cognitive processes, emotional or affective factors always were present, and are now more openly acknowledged. A leading objective of the heuristics and biases program has been to categorize the deviations from what is indicated as optimal by rational choice models, and to improve heuristics so as to reduce those biases or to take them into account in decision making. It has been shown that contrary to the expectations of leading mainstream economists, the deviations from optimality are not random but often systematic and predictable. Unfortunately, there is no accepted theory of heuristics and the use of different heuristics can lead to different results. Gigerenzer and associates have focused more on the development of specific heuristics, and given the limitations imposed by human abilities and time constraints, they have been critical of a biases approach, focusing instead on the relative accuracy of “fast and frugal” heuristics compared to the results of more comprehensive calculation. They regard their work as being in the tradition of Simon’s procedural rationality. There are a number of reasons for using heuristics:

- Decision makers may be unaware of an available, optimal way to solve a problem, and may not have the resources or access to credit to obtain help—or the deliberation costs involved may be greater than the added benefits of the “optimal” solution.
- Decision makers may be unable to obtain all the information necessary for an optimizing solution, or may not be able to do so by the time a decision must be made. Even if they can obtain all the information, they may not be able to complete the optimizing calculations in time.
- While optimization techniques may be feasible, they may not yet have been devised for some types of problems.
- Where there are multiple objectives, unique, optimal solutions are unlikely.
- The use of heuristics that can be applied rapidly may enable decision makers to keep certain matters secret until they decide to make the decision known. (This is important where alternatives to decision making are important.)
- The problem may not be in obtaining information, but in perceiving it correctly and avoiding attempts to deal with what is actually a variant of the true problem.

- An extraordinary amount of information may overwhelm decision makers, which may be magnified by the emotional character of the decision, the state of the decision maker at the time, or by what neurologists have characterized as decision fatigue, following a series of difficult decisions in a relatively short period of time.
- Seemingly winning formulas of some market participants that involve major risk and uncertainty may lead astray some of those who would ordinarily avoid such approaches.
- The use of heuristics may be called for if implementation of what is optimally calculated presents major problems.
- The use of heuristics may be the only plausible approach in cases of appreciable uncertainty.

The use of heuristic shortcuts is most appropriate where they closely approximate the result of optimization calculations. “Fast and frugal” heuristics are appropriate for situations in which there are “flat maxima” in which several options lead to similarly high rates of return.

Mainstream economics provides a suitable set of tools for dealing with a well-defined, clearly enunciated and usually small set of alternatives. Unfortunately, decision makers frequently confront a poorly defined set of choices, and often confront many alternatives. Moreover, the first major challenge may arise in the search for the more important options and the recognition of the consequences of those options. Indeed, in many cases the decision maker may even have to construct preferences in order to be able to proceed intelligently. For decisions based on evolving technologies, some private decision makers have observed that heuristics which aid in horizon scanning are often more useful than those that substitute for final calculations. This is not to deny that decision makers sometimes fail to use optimization calculations when they are appropriate, or that they use incorrect heuristics or fail to take biases into account.

There should be guidelines for the formation (and improvement) of heuristics, the search for information with given heuristics (including “stopping rules”—the latter stressed by some individuals in the Gigerenzer Group), and for the way in which a decision should be made using the information obtained.

5.1 The Categories of Heuristics and Their Biases

Tversky and Kahneman considered three general purpose heuristics: representativeness, availability, and anchoring and adjustment. Slovic later brought together the work of a number of researchers on the role of emotional considerations which he characterized as the affect heuristic. Others wrote of several additional categories of general purpose heuristics.

Problems may arise in acquiring information including considerations related to availability, perception, the frequency (and order) of data presentation, and the concreteness and vividness of information. Availability biases may arise as a result of the ease with which people can recall specifics from memory (at least in certain contexts). The content of specifics also may influence assessments about their relative importance. Availability acquisition biases can lead to overestimation of the probability of well-publicized, dramatic or recent events, leading to “availability cascades.” A prominent example is the belief that most people have is that homicides are more common than suicides, though the reverse is true. Imperfect perception also can be serious and is often accentuated by differences in education, life experiences, personality, and context.

Biases in processing information may begin with incorrect understanding of information. There is a tendency to overvalue certainty, even the appearance of certainty, particularly in cases involving several steps in which there is certainty only in a final step. Low probabilities present particular difficulties, often being overestimated, but sometimes underestimated and sometimes ignored. True probabilities are not recognized on occasion because of the use of data from too short a time period (recall the 1990s calculations of the mathematicians and Nobel laureates of Long Term Capital Management) and also because of failure to understand interconnections.

Errors that arise in evaluating statistical relationships can lead to the selection of inappropriate heuristics. There are illusory associations, a tendency to attribute causality to correlations, inappropriate use of linear extrapolations, and incorrect approaches to estimating nonlinear extrapolations. Failure to incorporate new information correctly or even consistently is common. Moreover, we often seek results that confirm our anticipations and prejudices rather than seek contrary evidence. And, we tend to ignore the fact that models based on the enunciated criteria of experts have been shown to be better predictors than the ongoing judgments of those same experts.

The heuristic, representativeness, involves judgments of the likelihood of an event or identification, based on its similarity to a class of events or individuals. There are no uniform guidelines on the degree to which representativeness affects judgments of likelihood. Use of the heuristic sometimes reflects a failure to take account of base-rate information and, beyond that, of what has been termed a “law of small numbers.” Early experiments by psychologists showed that experiment participants tended to ignore base-rate data and focus on stereotyped personality characteristics in judging professional occupations. Characteristics often identified with certain groups of individuals were given more weight in identifying the group to which particular individuals belonged than base rate data—which often suggested that the individuals in question probably did not belong to those groups. Representativeness considerations appear to underlie much reasoning by analogy.

Failure to allow for “regression toward the mean,” a bias associated with representativeness, is perhaps best exemplified by the so-called “hot hand” in basketball and other sports. Another major bias is the conjunction bias, in which someone or something is irrationally judged to be more probable than the larger group to which the person or matter obviously belongs. Perhaps the most prominent example is found in the Kahneman-Tversky experiment in which participants identified Linda as a feminist bank teller even more than as a bank teller.

Availability is the heuristic reflecting the weight given to information in place of probability basically because of the ease of recall. That may be due to some recent dramatic event. Unfortunately, there is no agreement as to what constitutes a different degree of availability or the weight that should be given to differences in availability. The main bias of the availability heuristic is due to its extreme lack of sensitivity to sample size.

Anchoring and adjustment is a heuristic that involves adjustment from some starting point. The latter may refer to recent data such as the current rate of inflation or economic growth. Often, the factors explaining the starting point are less known or understood by those making the judgments. The anchor may involve random and even false data injected by individuals serving as “plants” hired by the organizers of experiments, who are instructed to respond with irrelevant data, sometimes those that just happen to be known to experiment participants such as the last four digits of their social security number.

Heuristics, particularly the representative heuristic, may lead to overconfidence. Indeed, overconfidence seems to be a general characteristic of human response, presenting itself even in assumptions about data such as the basic facts that constitute elements of a decision problem. Experiments have shown that people give excessive estimates even when they are asked to indicate information of which they are absolutely certain of. Yet excess confidence makes people feel good and moves them to do things that they might not otherwise have done, and this appears to be an important contributor to entrepreneurial activity. Overconfidence is sometimes attributable to an illusion of control and to an exaggeration of what can be expected even from better-than-average capability. Overconfidence seems to be a common phenomenon (which is not to deny the defective nature of some tests of overconfidence). Evidence suggests that most people believe they are better-than-average drivers or citizens and that their children are better than average in many respects. Yet some individuals express less confidence than warranted in some contexts. Both extremes can bias results. Problems with memory, discussed below in Section 10, also introduce biases into heuristics. Another common factor, particularly of the representative heuristic, is a status quo bias, which characterizes much reasoning that does not involve complete calculation and also much involving substantial uncertainty.

Several other general heuristics have been receiving more attention recently, notably the automated choice heuristic, choosing by default (which has become more widespread in savings and investment decisions), regret theory (which often leads to results similar to prospect theory but for which there is mixed empirical support), and especially, loss aversion, first observed as a particularly frequent anomaly in revealing seemingly altered attitudes to toward risk. Regret theory refers to decisions undertaken to avoid possible outcomes that would be regarded as particularly disappointing and thus regretted; it features a bias towards conventional choice. Loss aversion refers to tendency of individuals to value strikingly negative outcomes more than expected values that reflect the actual probabilities of those outcomes. While there has been little effort to document loss aversion, a tendency towards the phenomenon seems to vary quite a bit and, indeed, there are situations in which there does not seem to be any loss aversion at all. In any event, it is worth noting that both regret theory and loss aversion involve strong affective components.

Heuristics have usually been characterized as shortcuts to solutions that involve biases, the latter sometimes quite large. An exception to this approach has come from the

work of Gigerenzer and the Max Planck Institute. Gigerenzer, Selten and colleagues hark back to Simon and the focus on procedural rationality. Their approach emphasizes specific heuristics. For them, the emphasis on biases is misplaced, and indeed, they show that the heuristics they develop—often termed fast and frugal heuristics—sometimes perform as well as the results of full calculation. They stress that the heuristics are shaped by the environment and the prevailing context. It has been claimed, however, that the fast and frugal approach is subject to the bias of selecting overly familiar factors, and, at any rate, does not perform well in making judgments unless the rate of return is roughly comparable for alternative options.

For many problems, a solution requires more than a single heuristic. Such heuristics may take into account the type of decision making involved, the particular context, and the likely importance of missing information. To do this, data on heuristics and their biases should be recorded to be sure that they are adequately taken into account, and so that there will be a solid basis for improving the heuristics. Unfortunately, decision makers rarely record these data.

There are only a few published guidelines for determining the size and significance of biases, and for dealing with the predictive use of heuristics. Some problems are so complex that they may not be solved in a reasonably efficient manner in the time available. Such problems lend themselves to solution by an even less formal and structured approach—by pure intuition or by a kind of expertise that has been referred to as pattern recognition. (This is more complex than what is described as the use of recognition heuristics by the Gigerenzer Group.) Pattern recognition seems to be the secret of success of Grand Masters in chess, and that of the Warren Buffets in the business and investments worlds.

A major issue in processing information is how people frame information, which is dealt with in more detail in Section 6. Dubious recall of data and imperfect feedback can impede decision makers. The presence of many options, some irrelevant, can distort judgment, apparently more with some heuristics than others. Context and the physical and emotional state of a decision maker can influence the heuristic chosen. Hindsight bias also can provide an obstacle, as certainly, the misunderstanding of chance fluctuations and the nature of statistics generally, does. The most common biases affecting heuristics are attributable to loss aversion, lack of sufficient sensitivity to sample size, failure to allow for regression to the mean, conjunction situations, overconfidence, undue anchoring, the manner in which the information is framed, and ignoring prior probabilities.

5.2 The Affect Heuristic

An affect heuristic provides a first and almost automatic reaction to stimuli, often with little or no conscious reasoning. It tends to orient information processing and judgment. An affect heuristic involves what psychologists term the experiential system, drawing on past experiences. It incorporates images marked by positive or negative feelings that provides clues for judgment and decision making. Such imagery has been shown to influence people's preferences for visiting specific cities, their reaction to certain technologies, their views favoring health-enhancing behavior such as stopping smoking or eating healthier foods, and in inclinations to invest in new versus old companies and in "growth" stocks. The stronger the emotional element, the greater the tendency to ignore probability. (As for the tendency to ignore findings of comparable proportions, note that a four-fifths finding usually carries more weight than a probability finding of .8, and often, even more weight than actual numbers. Often, but, alas not always—which points to one of the serious difficulties of resorting to a behavioral approach, and of employing the same models for all cases. Judgments are influenced by the precision of affective impressions. Another consideration is that most respondents react more favorably to the likelihood of winning a lottery than to the actual monetary payoff (at least for lotteries other than those with very large payoffs).

The perception of risk is strongly linked to the degree to which a hazard evokes feelings of dread. Affect-laden images of frequencies and individual cases tend to weigh more heavily than probabilities. Somewhat counter to what might seem to be common sense, there is often a negative correlation between judgments about risks and benefits, in apparent conflict with the dicta that there is no such thing as a free lunch. In addition, it should be noted that people assess the perception of the risk of death to be much greater for those adversities heavily reported in the media such as accidents, homicides, fires and tornados than for less publicized causes such as diabetes, asthma, tuberculosis, stroke, heart attacks and even many forms of cancer. Attitudes often play a more important role than economic indicators in explaining some jury awards and also the willingness to pay for public goods, as do also what has been referred to as moods. Most disturbing is the degree to which the empirical findings are qualified by the word "often."

Affective reactions may trigger cognitive reasoning but they also may undermine it. The smiling faces in advertisements for mediocre products can manipulate perceptions of value. Background music can increase interest in very ordinary motion pictures. Affective

reactions can numb reasoning in some cases, as in smoking (recall the former case of “The Marlboro Man”), though the opposite seems at work with the current photos of severely diseased persons on cigarette packs of stricken individuals. A happy mood increases the likelihood of heuristic processing while a sad mood increases the likelihood of more systematic processing. Affective reactions include those which are visceral such as hunger, tiredness, and fear, most of which are general, along with those that are more strictly emotional and often directed at specific persons or groups.

Questions to Consider:

1. What are heuristics?
2. What is the difference between the heuristics and biases program, on the one hand, and the heuristics program of Gigerenzer and Associates, on the other? Are there weaknesses to one or both of these approaches?
3. There is an affective or emotional component to virtually every heuristic we think of as involving cognitive reasoning. Explain, giving two examples.

Required Readings:

Cartwright, 33-98, 190-191, 203-247. (Also, on time bracketing, myopia and life cycles: pp. 54-59, 77-81, and 86-93. On updating information: pp. 203-247.)

Schwartz, Hugh. 2010. Ch. 4, Heuristics or Rules of Thumb, In H. Kent Baker and John R. Nofsinger. *Behavioral Finance. Investors, Corporations and Markets*. Hoboken, NJ: John Wiley & Sons. An overview of heuristics.

Recommended Reading:

Kahneman, *Thinking Fast and Slow*: Part II.

6. Prospect Theory and Framing

Most of the presentation on Prospect Theory and Framing will be given in the second week. At this point it is only necessary to bear the following in mind with respect to Prospect Theory:

1. Actual decision making responds to changes in wealth rather than to states of wealth, as traditional economic presentations had tended to assume—that is to say, actual decision making responds to gains and losses. Initially (in 1979), PT was elaborated with respect to the gains or losses experienced in a single, unspecified reference point.

2. Differences in the attitudes toward risk (in risk preferences) can occur even at essentially the same point in time, depending on whether losses are involved.
3. There is a diminishing sensitivity to gains and losses.
4. Decision makers do not make choices based strictly on probabilities, but on what they view as prospects, which are a transformation of those probabilities—heuristics in effect although K & T did not use the term in their initial article on Prospect Theory . The transformation is quite uneven, with the prospects deviating most in the case of low probabilities (usually overevaluated, but sometimes undervalued or ignored).
5. Implicit in PT but not particularly dealt with until after the initial exposition: the importance of framing, the way in which elements involved in decision making are expressed. Also the matter of narrow vs broad choice (the former representing myopic decision making).

It is fair to say that mainstream economists have been reticent to use Prospect Theory because of the imprecise way in which probabilities are said to be modified, in particular, because of the importance of reference points, which were not well specified.

Required Readings:

Cartwright, pp. 46-47, and 100-163. On framing: pp. 46-47, 50-51, 57, 66, 86, 120, 130, 154, 262, 350-354, and 436-438. On reference points: pp. 27, 47-59, 67-68, 76-78, 84-86, 120-126, 135, 137, 145, 153-155, 181-184, 187, 338-342, 350, 354, 360, 364, 449 and 470.

Recommended Reading:

Kahneman, *Thinking Fast and Slow*, Ch. 26.

7. Other Theories Alternative to Expected Utility Theory

Dealt with principally in second week. The key consideration to bear in mind is that Prospect Theory is only one way—though the most successful approach to date—of incorporating behavioral factors into economic models.

Required Reading: Cartwright, pp. 132-134 (on regret theory).

8. Mental Accounts

This topic also is dealt with principally in the second week. The key consideration to bear in mind is that economic agents often compartmentalize decisions, whether out of self-control or custom, acting, for example, as if money were not fungible and individual accounts should be evaluated separately, or as if the identifiable components of other

elements should be evaluated separately rather than together, as part of the whole to which they belong. One of the principal contributions of mathematics has been to show how much more complicated—and indeterminate—the analysis of mental accounts becomes when one shifts from two to many alternatives.

Required Readings:

Cartwright: pp. 54-60, 89-93, and 189-196.

Recommended Reading:

Kahneman, *Thinking Fast and Slow*, Ch. 32.

9. Inter-Temporal Discounting

Most presentations in economics employ the Exponential Discounted Utility Model developed by Samuelson and Koopmans to deal with future costs and benefits. In fact, neither Samuelson nor Koopmans were pleased with the formulation but they regarded it as a useful standard.

Basically, the traditional approach to discounting in economic analyses assumes a rate of discount that is the same for all periods, for all goods and services, and for all quantities. As a first approximation, income in the future certainly is worth less than present income, not only because investments may fail in absolute terms, but also because one has the option to save and to invest some funds for another day. Most of us would regard a higher level of income as preferable at certain later times in our lives than others though that begins to cloud matters; similarly, there are times when we know that higher costs in the future are not as bothersome as at other times. It is an unduly rough assumption that every period should be regarded equally if at the time that decisions are made we have enough information to know that that will not always be the case. Indeed, the assumption that we weigh each time period equally is so counter to human judgment that there is a serious question as to whether it should be used, particularly in a course emphasizing revealed behavior.

Most teachers approve of receiving income each month, in twelve installments rather than earlier, in nine installments, even if they teach for only nine months. That is to say, they do not object to (and, in fact, most actually prefer) being paid a negative rate of interest. Moreover, most of us prefer to experience increasing levels of income over time

rather than the larger sum that might result from receiving a very large remuneration in the first years (some of which might be invested), and the same or even somewhat smaller annual amounts of income thereafter. If the latter were to lead to a higher level of income over the entire period then preference for the rising income profile would not be rational in strictly economic terms, though there might be psychological reasons for preferring it. Many such preferences would seem to be quite predictable. We have long recognized the irrationality of Christmas Club saving accounts, once popular, that pay no interest at all, but many of us continue with health club memberships of a financially dubious nature, and in many countries, the highways abound with advertisements for “payday loans” and auto title loans that have interest rates vastly higher than those available to most borrowers. Sometimes, particularly when it comes to long-term decisions, we delegate a good deal of our decision choices to others without even knowing the inter-temporal impact of the way in which those experts make their decisions.

These are all seemingly irrational human inclinations that were recognized long before the current interest in behavioral economics.

We have seen a slew of experiments that pointed to still other “anomalies.” The interest rate many demand to make a future level of money seem equivalent to the same level of money at present often varies according to the amount of money involved; 10% more might be required for \$100, but for many people who would demand a 10% return for a low amount, a rate of 5% would be a high enough if the amount in question were \$10,000. Many of us prefer to incur losses immediately rather than later on, and there is a difference in the time required for most of us to regard delays in losses as equivalent to gains in speed-ups. And, as first contended by Adam Smith as far back as 1759 with publication of *The Theory of Moral Sentiments*, and as the prospect theory literature has shown more convincingly, for most people, losses are regarded as more significant than the same amount of gains, and, for many people, this holds even more strongly over time.

Many of us would often opt for an ability to reallocate consumption over time—if only we could. In any event, we do not always calculate discount rates according to the utility we gain or lose, as it might seem that we should. Moreover, it is not always clear whether we should be considering the utility we experienced (as best we can recall it), or, more likely, the utility we anticipate (as best we can gauge what it will be). Inflation and our expectation of inflation, complicates matters, as does uncertainty and ambiguity, all of which are likely to differ from time to time. Various visceral influences sometimes enter,

as do impulsiveness, temptation, and other emotional factors including the force of self-control (see Section 11). They, too, vary over time. With respect to self-control, consider the matter of procrastination, about which a few words are added below (and more next week—though you might also want to read Levine’s take on this in *Is Behavioral Economics Domed?*). Complicating matters still further, experiments reveal different discount rates for costs than for benefits, and, often, for different goods and services, again with the differences sometimes increased over time. Worse still, the latter can change in different contexts and with different reference points. Much of this often varies for those of different levels of intelligence, education, experience, and for different cultures, social classes and kinds of upbringing—with the former certainly likely to vary over time.

One response to the above (that many behavioral economists have adopted) is to use hyperbolic rates of discount to reflect the fact that people tend to be more impatient in the short run, using higher discount rates, and less so in the long run, using lower discount rate—that they have a present bias. That would explain an initial preference for one option and a subsequent shift to another—a shift from a larger benefit later to a smaller one sooner (all the more-so if the latter alternative can be seen at the time of that second decision is made). We later come to regret many of these decisions—but not all, as Robert Frank has shown. (Some such preferences are quite deliberate, following from the fact that we sometimes deliberately make decisions that take the interests of others into account.) Hyperbolic rates of discount, along with quasi-hyperbolic rates (in which the impatience is assumed to occur initially, with the rates of discount the same for each period after that) seem to be replicated much more in everyday decision-making than the discount rates of traditional exponential analysis. They have been used to explain self-regulation, information acquisition, job search, retirement choices, procrastination, addiction, and investment in human capital. The research on hyperbolic discounting suggests that changes in financial markets influence welfare by altering the liquidity of assets, and, as a result, the tendency to consume.

Hyperbolic models do not explain all human behavior better, however, as, e. g., the decision of school teachers to accept payment in twelve months for work done in nine, or the general preference for an increasing income profile. Moreover, like the exponential discounting models they replace, most hyperbolic models also tend to assume that economic agents attempt and are able to maximize a utility function, thus ignoring much of the contribution of the Carnegie School and the more recent behavioral decision theory. A

major problem with hyperbolic and quasi-hyperbolic models is the lack of an adequate psychological foundation—either a theoretical one or one reflecting the result of empirical work in the field or in laboratories. Where it does prove useful, it is possible that a hyperbolic approach may reflect the way in which humans evolved in assessing time over centuries, even thousands of years. Moreover, since we know that costs and benefits reflect the activity of different parts of the brain, it is also quite likely that some of inter-temporal decisions are formulated in one part of the brain, and others, in another part of the brain—which may explain the use of different rates of discount for costs and benefits. But consider, also, that the brain changes over time.

It is possible to set forth equations for exponential and hyperbolic discounting and to show that the former are better at explaining many inter-temporal decisions. The Cartwright text does that, as does the course exposition that will be presented next week. Nonetheless, while loss aversion is a general phenomenon, and, so, perhaps to a somewhat lesser extent is prospect theory, behavioral economics cannot yet point to a single approach to resolving inter-temporal decisions that cope well with a sizable number of situations. There are too many situations for which hyperbolic and quasi-hyperbolic discounting are inadequate. Analysis of individual cases of inter-temporal decision making and subsequent testing of the hypotheses that those cases seem to imply is required. Otherwise we may just be substituting one sometimes inadequate measure for inter-temporal decision making with another. We are not really describing human judgment as behavioral economics sets out to do.

How much we learn from experience seems to vary (consider the persistence of some money illusion over several centuries), but there are a number of policy implications. The first defense against irrational myopic decisions is to resort to commitment devices—alarm clocks, whole life insurance, illiquid savings accounts, debit cards instead of credit cards, abstinence, and even acting along the lines of Ulysses in the *Odyssey* (in which he had himself tied to the mast and had wax placed in his ears so as to avoid the temptation of the sirens). Secondly, greater attention can be given to the cost of switching choices. Finally, more responsibility can be given to government—to provide more consumer information, to establish safety requirements, to provide incentives for saving, especially for retirement, to foster environmental safeguards, and to add to and maintain infrastructure and social safety nets. (With respect to environmental policy, note the striking differences between the policy recommendations of Great Britain's Stern report on

climate change with its low rate of discount and those of Nordhaus' analysis, which used higher rates of discounts). More comprehensively, there is the Nudge approach, advocated by economist Thaler and lawyer Sunstein, considered in the last section and the still broader approach suggested there by several economists at the Kennedy School (see Section 16).

Finally, a word more on procrastination. Procrastination is a common human tendency and while there have been few efforts to explain actual cases of real world procrastination, academics have come forth with a number of theoretical explanations. The most important has been by O'Donoghue and Rabin. Procrastination concerns human behavior over time and a choice that is usually regretted. In the model of O'Donoghue and Rabin, people underestimate the magnitude of the self-control problems and changes in preference. The question is not so much the way in which future benefits are discounted. Rather, the authors state that people tend to put aside an option that involves small benefits and sizable costs in the current period, perhaps often acting myopically. Later (and, indeed, often more than once), they make the same decision again, perhaps reflecting difficulties in self-control when there is no firm commitment. In addition, there also may be a shift in preferences. The latter may be attributable to decision maker recognition of other options or to changes in the environment. The article explains many types of procrastination but might it have been even more revealing if questions had been asked of some of those who procrastinated? In any event, consider also the special case of drug addiction in which it has been shown that the addiction alters the brain sufficiently to change the way in which the cost-benefit calculation is made.

Questions to Consider:

1. Does traditional economic theory require that inter-temporal decisions use exponential discounting?
2. What is the psychological argument for hyperbolic discounting?
3. Explain procrastination.
4. Explain addiction.
5. What can behavioral economics offer to improve inter-temporal decision making?

Required Readings:

Cartwright, pp. 164-202 and 203-247.

T. O'Donoghue and M. Rabin (1999). "Doing it now or later," *American Economic Review*. 89: 103-124.

S. Frederick, G. Loewenstein and T. O'Donoghue (2002). "Time discounting and time preference." *Journal of Economic Literature*, 40: 351-401.

10. Experienced Utility, Memory, and Anticipated Utility

As obvious as the topics would seem to have been, few economists showed an interest in the basic issues of experienced utility, memory and anticipated utility until psychologists began to demonstrate the importance of these matters. Kahneman was a leading contributor.

Decision making ought to be based on expectations, the utility that is anticipated, of course (particularly since sunk costs are irrelevant). But any analysis of decision making reveals that what is referred to as anticipated utility is, in fact very much influenced by the utility that was experienced in the past, which, in turn, comes down to the memories of it. Moreover, what we remember as what we experienced in the past may differ from what we actually experienced; our emotions at the time as well as our general mood, the state of our body and external conditions may explain that, and matters seem to be further influenced by the tendency to recall our reactions primarily at the outset, the end of the experience or certain other moments, as Kahneman has shown with recollections of the pain associated with certain medical procedures. Rarely do our memories reflect an evenly weighted average of what we recall. We may tend to overestimate the probability of an event, as the Germans, urged to recall the extraordinary experience of the early 1920s, overestimate the likelihood (and costs) of inflation more than those in many other countries, given prevailing circumstances. Or we may underestimate the probability of an event, along the lines of those who built homes in environmentally vulnerable areas and compounded their decision by not even taking out flood or other specialized insurance.

In addition, consider what economists had to say about expectations in the past and how little it has rested on the findings of other social sciences.

Questions to Consider:

1. What is utility and how should we gauge it?
2. What kinds of problem do considerations of memory have in influencing our assessments of utility, particularly anticipated utility?

Required Reading:

Cartwright, pp. 53-59 and 184-185.

Suggested Readings:

Kahneman, *Thinking Slow, Thinking Fast*, Ch. 35 .

11. Visceral and Emotional Considerations (and, independently, Completely Irrelevant Factors)

It might not seem like it from the traditional exposition of economists, and even from some the initial work in behavioral economics, but human decision-making is, of course, strongly determined by more than just cognitive factors.

To begin with what might seem to be the most striking consideration, experiments have shown that it is possible to influence choice by introducing factors that are completely irrelevant—factors that are not even as high in preferences as others that are not among the most preferred. This may be regarded as an extension of the fact that choice becomes distorted, with action even paralyzed at times by a very large number of alternatives, as in the case of considering rational choice in the presence of several dozen breakfast cereals at a typical grocery store. Kahneman notes that adding irrelevant but vivid details to a monetary outcome also disrupts calculation. It may be that including irrelevant factors, and especially a large number of factors (even if some are relevant), tends to lead to serious miscalculations of likelihood and to excessively difficult measurements of utility, both of which reinforce the tendency to resort to heuristics that include significant elements of visceral and emotional factors.

We are often taught to think of emotional factors as interfering with rational, cognitive choice, but even before dealing with that, consider an aspect of affective heuristics emanating from what have been termed visceral factors (nicely expounded by Loewenstein). Hunger, thirst, sexual desire, drowsiness, cravings, severe pain, etc., lead to choices of an impulsive nature, with little or deliberation. They differ from what have usually been characterized as emotions in that they are not triggered by beliefs, and, for the most part, they are not directed against particular individuals or groups (though this is less true of borderline visceral factors such as fear). A deficiency in visceral factors may decrease an individual's quality of life, chances of survival, or likelihood of reproducing; a number of these responses seem to have an evolutionary explanation. The need to take visceral factors into account would seem to be stronger for routine than more complex

decision making. More often than not, where visceral factors enter into decision making there is an ex post recognition that a more rational decision would have been made (more rational in traditional economic terms), were it not for the presence of those factors. It tends to be recognized that what was done because of the visceral factors often was not in the long term interest. Most people do not fully appreciate the influence of visceral factors on current or future behavior, and when asked how a decision was made, they sometimes respond that they came to the decision “by the seat of my pants”—in part to avoid what might be regarded as difficult introspective analysis.

Visceral factors fluctuate, change more rapidly than tastes, but they are temporary, correlated with certain circumstances and thus are usually predictable, particularly because they tend to take place with little or no conscious cognitive input. Cognitive deliberation, often viewed as a source of stability, can be a source of instability. Visceral factors can produce a split between what one is driven to do and what one regards as best to do, reflecting largely cognitive forces. The decision of alcoholics to take another drink may be an example of this, along with the decision to continue with drugs. Often people cannot recall exactly what visceral states felt like in the past, which leads them to misjudge their impact in the future; when people are affected strongly by visceral factors—and are acting impulsively—they find it difficult to judge how long it will take for that state to dissipate, and exactly what it will be like when things are more normal, and they act more rationally.

Strong visceral factors can influence people’s immediate behavior more than they think is justified in normative terms, either beforehand or after those factors have dissipated, and because visceral factors are transient and generally not accurately recorded, people may underestimate their impact on behavior. This is despite the sometimes important and long-lasting consequences that those factors have for themselves and for society.

Loewenstein notes several categories of viscerally affected behavior that are of special interest to economics; bargaining behavior, inter temporal choice, motivation and the exertion of effort, self-control and much decision making under risk and uncertainty. Visceral factors may help explain much of the troubling simultaneous decisions to gamble and to purchase insurance (for which some economists would seek an explanation solely in traditional cognitive terms), gender and age difference and risk taking, and sexually risky behavior. People employ a variety of strategies in an effort to manipulate their own visceral tendencies and those of others, beginning with the use of self-control mechanisms.

(Governmental and other societal entities also may play a role.) Taking visceral factors into account seems to help explain some behavior that most people view as simply irrational, is, at least, quite predictable.

What is unclear—and has not been investigated much to date—is the degree to which visceral effects can be offset by incentives (financial and other)—although there is interesting anecdotal evidence that there are at least some individual cases where this takes place. (Consider, for example, the cases of the inventors who persevere despite hunger and lack of sleep.)

What have traditionally been regarded as emotional factors weigh heavily in decision making, and can be important in triggering decisions to use cognitive calculation as well as in the more commonly cited inclinations to counter cognitive reasoning. Note, too, that although Prospect Theory was dealt with initially as strictly part of cognitive decision theory, emotional factors have been acknowledged to be important, notably in the form of the intuition that leads to subjective estimations of likelihood weights that differ from those indicated by probability analysis—and in the choice of heuristics to aid in that different valuation. (Kahneman conceded that Tversky and he recognized that even though they were not specific about it when they wrote their seminal *Econometrica* article.) Visceral and emotional factors, brought together by psychologists as Affect Theory, have been subject to numerous experiments. In addition, social psychology has influenced decision making in several ways, notably with concepts such as Herding, Groupthink (in which normally rational people become caught up in some Zeitgeist, such as “This time it’s different.”), Mood swings, the Momentum reaction often associated with Stock Markets, and other aspects, perhaps most notably, confidence factors, which are also dealt with in the discussion of heuristics and prospect theory.

Emotions often involve some cognitive considerations as well as well as physiological arousal and are usually directed towards specific individuals, groups or institutions. Consider anger, hatred, guilt, pride, joy, anxiety, stress, grief, remorse, surprise, boredom, admiration, love, hope and frustration, but also counterfactual states such as regret. Some emotions are universal, while others seem to be specific to certain cultures. (Consider the experiments in very different societies grouped together in the volumes edited by Gintis and Henrich et al.) There is disagreement concerning the degree to which many emotions can be induced, the role of anticipation emotions, and the extent to which emotions can be controlled—on the effectiveness of strategies to avoid intensely

negative and often counterproductive emotions, for example. Some illustrations of efforts to induce visceral and emotional reactions can be seen in advertisements for food products as “natural,” cigarettes ads which use that tactic as well as others to minimize the serious risks involve in smoking, ads with smiling faces, and the often influential background music of movies and television dramas. The psychologist Hsee has made important contributions in this area, summarized by Slovic. Emotions can improve decision makings, in particular where natural choice theory is not able to resolve a situation and where no satisfactory rule of thumb is available, but they can also manipulate and undermine rationality (even broadly defined rationality), preventing us from thinking clearly about the consequences of actions. The impact of many motivations can be overcome (or reduced) by incentives, even by close monitoring. The interaction between emotions and material self-interest can be seen in some of the trust and ultimatum experiments, but perhaps best, in a cost-benefit model of emotions and in an economic analysis of regret. Expressions of guilt, shame, revenge, contempt, hatred and indignation are often viewed later as having been counterproductive. The variety of emotions we have interact with each other and together with cognitive factors, produce behavior. Clearly, emotions can shape preferences and choices in certain contexts, even in the short run.

Some recent work of psychologists focuses on motivation and mood (both of which are influenced by perceived ability), and on the multidimensionality of emotions as well as on cognition. Psychologists attempt to provide a conceptual framework for understanding the importance of emotions (and visceral effects) in guiding judgments and decisions, which they refer to as the affect heuristic. This is especially important in dealing expeditiously with personal attributes (in what is termed attributes substitution). Affective reactions to stimuli often occur first, automatically, subsequently orienting information processing and judgment. Some affect is present in all perceptions, but this may be truer for most everyday matters than for most business and government transactions. The utility we experience may be colored by feelings of affect that have become associated with certain past events, and make contrast with a parallel rational process system involving decision theory. At the same time, it is doubtful that utility maximization (whether the maximization of profits or any other goals) is really what energizes human behavior in many circumstances. (It may be the ability to react rapidly, as some biologists suggest.) In any event, affect conditions our preferences, which may help explain why our preferences

are not always stable even in the short run (and this may be every bit as important as differences in framing).

There is a strong relationship between images and decision making, ranging from predictions of preferences for investing in new companies to predictions of the likelihood of adolescents taking part in health-threatening and health-enhancing behavior such as smoking and exercise. The precision of an affective impression makes a difference, as does the degree to which the decision involves a comparison. Proportions generally dominate actual numbers in guiding decisions, though if it comes to a matter of saving lives, experiments show that options worded in terms of the number of lives saved are generally regarded more than those that focus on the proportion of lives saved. Warnings are more effective in vivid, affect-laden scenarios than when presented in relative frequencies. People are often insensitive to probability data when the consequences of some options carry strong affective connotation, as with cancer, and risks such as those involving nuclear hazards and toxic chemicals. Activities associated with cancer are seen as riskier and more in need of public recognition than activities associated with less dreaded forms of illness, injury or death, even though the overall adverse consequences of the latter also are quite high. In certain contexts (and this is one of the findings of the initial empirical work in Prospect Theory), alternatives with low probabilities can carry great weight, which seems to be important in explaining the simultaneous election of gambling and insurance. Judgments of risk and benefit are negatively correlated and often this does not change much with the presentation of hard evidence to the contrary; in fact, with many innovative activities, the greater the perceived benefit the lower the risk that is perceived. As a consequence of this and favorable affective associations, some activities to which people react favorably are perceived as having low risk even when this is not true. The impact of the availability heuristic may be due not just to the ease of recall, but to recall evolving images that bring affect to the forefront. Willingness to pay for provision of a public good or a punitive damage award in a personal injury law suit may be influenced by emotional attitudes regarding those matters as well as by indicators of economic value.

Preliminary studies suggest that individuals with greater intelligence lean more towards cognitive than emotional solutions. Aside from problems sometimes caused by this, there are exceptions to it when powerful drives or emotions intervene. (This qualified finding is part of the reason why traditional economists are so skeptical of behavioral economics and allied psychological analyses.) The tendency of greater intelligence to lead

to cognitive approaches is influenced by individual experience and expertise, social, cultural and economic factors, but, unfortunately, the extent of the influence is not yet clear (which further raises the skepticism of traditional economists about applying behavioral economics).

Although mainstream economics considered rational decision making as solely a cognitive process, and some of the initial contributions from psychology's behavioral decision analysis tended to reinforce that, it is now clear that emotional and even visceral factors can play a role in improving the rationality of decision making—as well as in undermining it, as had been emphasized previously. Visceral factors are essentially physiological and generally evolve without thinking about them. Emotional factors (affect), are more complex, and usually involve cognitive thought. Ascertaining exactly how the visceral and emotional factors influence decision making (and explaining the variations) remains very much a work in progress. To begin with, the role of incentives in offsetting emotional and well as visceral factors calls for more attention.

Although dealt with under other topics, the matter of confidence levels also should be considered in discussing emotional factors. This is mainly a matter of overconfidence, but lack of confidence is sometimes also a factor. High levels of confidence can reflect some special skill or managerial capacity, but more common is overconfidence, reflecting other-than rational factors. This can be seen in the famous Swedish example in which most drivers found in a hospital ward after an accident, characterized themselves as “above average drivers.” Unfortunately, some of the “proofs” of overconfidence are deficient.

Questions to Consider:

1. Distinguish between visceral and emotional factors.
2. How can irrelevant factors possibly influence choice?
3. Provide an example of a choice in which a presumably cognitive heuristic is dominated by one or more emotional factors.

Required Reading:

Cartwright, pp. 60-68.

Recommended Reading:

Kahneman, *Thinking Fast and Slow*, especially pp. 12, 103, 139, 169, 65-70, 326-331, and 393-395.

12. Strategic Interaction

In economics, both traditional and behavioral, the coverage of strategic interaction has been dominated by game theory and that literature is laid out in the Cartwright text. This has proven quite useful in certain contexts, though perhaps less so than was originally anticipated (in part because game theory is most useful where there are few players on at least one side). Some behavioral economists have adapted the original format, developing a behavioral game theory (of which some standard game theorists have been quite critical).

Four major assumptions characterize standard game theory according to the Wilkinson and Klaes text on behavioral economics. The first is that people have correct mental representations of the relevant game. The second is that people have unbounded rationality. The third is that equilibrium positions are reached instantly (there is no learning). The fourth is that people are motivated purely by self-interest. Behavioral game theory, on the other hand, maintains, first, that the representations of the relevant game be correct. Bounded rationality prevails in that there is incomplete information with a tendency to rely on factors such as focal points and signaling, and that there are limits on strategic thinking and backward induction. Correlated rather than Nash equilibria are common (although authorities such as Levine are comfortable with Nash equilibria). Further, it is maintained that “noise”—irrelevant and unwanted information—may interfere with intended signals. Third, equilibrium positions may change because learning (as revealed in games) takes place. (Actually, even a substantial amount of traditional game theory now involves this form of learning.) Fourth, social preferences are involved (particularly given real world limitations on backward induction), which also is likely to influence focal points. Behavioral game theory has a sounder basis in psychology and is supported more often by experimental evidence although little effort has been undertaken to incorporate material concerning the behavioral responses from real world actors that might emerge from interview-based studies.

There are other alternatives of strategic interaction, but it is useful to outline basic considerations with respect to learning, a dynamic process that is usually assigned importance in economic analysis (certainly in strategic interaction), but which economists have not yet explained well, and that is particularly important for behavioral economics. Wilkinson and Klaes consider four explanations, reinforcement learning, belief learning, experience-weighted attraction learning and rule learning, the first of which has not been well regarded since the 1960s, they maintain, and the last three of which have emerged

more recently from the thinking of behavioral game theorists. Although much of what economists have written about learning comes from the results of game theory experiments, what follows is taken from various papers of Simon, most written in collaboration with psychologists and represents the thinking of psychology as of the late 1990s. It extends learning concepts beyond those relevant for game theory. A similar summary was published by Schwartz in a book in 1998 and in an economics journal early in the 21st Century, the latter of which was included in a volume of articles on Simon, but this view has not been critically evaluated by economists. What follows is, perhaps unfortunately, the least accepted of the material in this course and can be skipped by those who seek the gist of what behavioral economists have concluded.

Learning can be defined as the understanding gained, usually over a period of time, which is retained long enough to lead to some change in behavior for the activities to which it applies. This definition would rule out lessons seemingly learned, perhaps even leading to satisfactory initial applications, but that are not subsequently applied in relevant real life situations. Most definitions of learning would not require that the changes in behavior be permanent, however. Langley and Simon have defined learning in complex systems as any process that modifies the system so as to improve, more or less irreversibly, its subsequent performance of the same task or similar tasks. Learning may change preferences, and may change the way in which processes are implemented. Learning may be reflected in innovations which have become an important topic in economic inquiry, especially by the neo-Schumpeterians.

In the basic economic model, there is perfect knowledge and perfect rationality so that there is really no role for learning. Economists have moved beyond that and have long acknowledged learning in a variety of ways, in particular, as a lagged reaction that improves the ability to achieve technical efficiency over time, or to advance that and realize technological change. Mainstream economists have often referred to learning by doing—by producing, by exporting or by realizing some active experience—but the discipline of economics, which so emphasizes efficiency has had little to say about how one can (or should) achieve or assess an efficient process of learning, particularly if the underlying conditions are changing, as they usually are. Nobel laureate Joseph Stiglitz has written of “learning to learn.” An effort to integrate the analysis of learning into the general framework of economic analysis can be seen in Young Back Choi’s observations that even the basic decision making process involves learning (some decision making, I would

maintain) inasmuch as it reflects a successful search for a paradigm to cope with a situation that we could not make sense of before.

Even as economists find themselves grappling with the question of learning, most seem to ignore much of the work that is being done in psychology on the subject. To what extent can psychology help economics and finance to understand and does make the appropriate assumptions about learning?

Psychology offers half a dozen lines of thought on learning this can be categorized as

- Stimulus and Response
- Cognitive Learning
- Social Learning
- Learning by Programmed Instruction
- Latent Learning
- Organizational Learning

Stimulus and Response. The classic studies in this area analyze simultaneous stimulus and response. The work in the second half of the twentieth century had dealt with reinforcement (operant conditioning), which involved the use of repeated stimuli, with the ensuing responses characterized as instinctive. Skinner and his followers obtained results independent of the findings of physiological psychology or cognitive psychology. Also under the heading of Stimulus and Response has been the work in behavior modification, first with electric shock and, increasingly in recent decades, with drugs, as more and more problems have been analyzed in term of chemical imbalances. Many psychologists have adopted one or another of these stimulus response approaches. Very few economics have done so, the most notable exceptions being Alhadeff in the early 1980's and recent work on animal behavior.

Cognitive Learning. Cognitive learning deals with insights, reasoning and imagination and emphasizes retrieval and extraction, association, repetition, recognition and the solution of problems. Some psychologists have pointed to the difficulties of learning, in particular the need for suitable feedback, and to the phenomenon of negative or incorrect learning (this might be considered in the light of some of the work of Mancur Olson and other economists who have maintained that institutions do not always improve in terms of their economic impact—contrary to what one might expect from a survival-of-the-rational-optimizer line of thinking).

While the early work in cognitive learning recalls the name of Piaget, and often difficult verbal constructs, a new tradition has been evolving. This has developed in part from work with computer simulations and computer tutor programs, from the use of visual imagery in thinking, from what are referred to as connectionist learning schemes² and adaptive productions systems and from various protocols including one in which individuals are asked to “think aloud” while they are solving problems—that is, they are asked not to “introspect” or “retrospect.” This work dealt with at somewhat greater length below under the heading, *The New Research in Cognitive Learning*, is being used in the field of management science and seems to offer important applications for economics.

Social Learning. The term social learning refers to cognitive processes backed up by reinforcement. It has been broken down into direct learning, indirect learning, and imitation and emulation. One of the leading applications has been by those interested in marketing. The Nobel laureate Shiller is receptive to this use of psychology in economics but has observed that social learning is difficult to predict.

Learning by Programmed Instruction. Learning by Programmed Instruction draws on a variety of theories and received a great deal of attention in the mid 1960’s. Although the results were less successful than expected, the programs have become more interactive, and have been greatly improved.

Latent Learning. This term refers to phenomena such as the learning of rats in a labyrinth and to unplanned (unpremeditated) learning that draws on early general education. An example of the role assigned to latent learning that draws on early general education can be seen in the conviction of some individuals and enterprises that a strong primary and secondary school (and perhaps college) education that provides general tools, together with an inquiring frame of mind, are more important for success in business than training in specific skills or analytic tools.

Organizational Learning. Organization Learning has not received a great deal of attention from psychologists, but this neglect may come to an end as works in psychology have explained some of the central ideas of economic and business administration to researchers in the field. A major text in the theoretical aspect of managerial economics emphasizing the importance of coordination internal to the enterprise, Milgrom and Roberts 1992, refers primarily to the importance of “routines,” a concept introduced into

² Connectionist learning schemes postulate networks that learn by changing the strengths of their interconnections in response to feedback.

the economics and management literature by Nelson and Winter in their seminal 1982 volume.

The New Research in Cognitive Learning. In 1975, Simon wrote that learning does not refer to a single, simple set of human cognitive processes and does not involve one kind of change, or a change in one component of the system. He offered eight considerations for researchers to bear in mind, particularly those dealing with the learning processes of students:

1. The kinds and degree of understanding that a student achieves in solving a task can have important consequences for his or her retention of skill and knowledge, ability to transfer that knowledge, and the speed and efficiency with which additional knowledge is acquired.
2. Understanding has many facets.
3. An important component of problem-solving skill lies in being able to recognize salient problem features rapidly and to associate promising solution steps with those features. (In a later study, Simon provides the example of a chess master being able to recall the position of pieces in well-defined game situations much better than the novice, but not being much better in recalling the position of randomly placed pieces.)
4. Limits of short-term memory may prevent application of a problem-solving method that is understood.
5. Understanding generally requires not only storage of adequate semantic information but also availability of problem-solving schemata of a general and a specific character.
6. Syntactic may often be substituted for semantic processing a vice versa.
7. Understanding processes entails being able to construct representation of problem situations.
8. It is becoming increasingly possible to determine in detail what understanding any specific matter involves. Thus, it has become possible to write computer programs available for solving problems and acquiring new knowledge in that domain and how his or her knowledge is organized in memory.

Research has been shifting back and forth between the attention given to performance and that given to learning processes. Research in cognitive learning has attempted, first, to understand human performance, how the human brain stores and

processes various kinds of semantic representation and to incorporate that information into computer programs. Importance has been given to the recognition of patterns. A number of experiments in China have shown that students learned high school mathematics as well when they were presented with carefully chosen sequences of problems and were asked to work out the examples, as when they were offered instruction on the basic principles involved. (This finding seems to lend support to the contention that educational institutions have determined their teaching methods by use of very rough rules of thumb, without any deep understanding of learning processes.) The students in the mathematics learning experiment acquired knowledge from examples in what is referred to as “productions,” which are defined as sets of conditions leading to actions.

The students first discovered conditions under which the actions were appropriate and then elaborated the conditions to increase the efficiency of their actions. Researchers do not appear to know how close the results of the traditional teaching methods or the approach using worked-out examples are to achieving the most efficient mathematics learning results. A similar comment can be made with respect to the experiments that move to “adaptive production programs”—systems that reprogram themselves (computer programs that learn by generating new instructions that are annexed to existing ones.) Among the other issues that arise are the respective roles of logical reasoning, on the one hand, and selective search processes (search algorithms) using mental methods in problem solving, on the other. Other concepts include proceduralization, composition, and the building of efficient productions that recognize useful configurations (all of which have precise definitions). Finally, experiments have supported the intuitive proposition that the efficiency of learning mechanisms differs according to the learner’s native abilities and prior learning experience.

Langley and Simon (1981) list the characteristics of a good explanation of learning to learn as involving a “set of invariants,” but also as:

1. Explaining a variety of phenomena;
2. Being more basic than the phenomena it explains;
3. Being simpler than those phenomena; and
4. Being free of ad hoc components.

Two conclusions emerge. First, we are just beginning to understand the guidelines for improving the efficiency of learning. We have no notion of how to maximize learning processes, and we are only beginning to develop reasonable guidelines for satisficing,

though we do seem to have a better basis for avoiding learning disasters. Second, work in economics that attributes importance to learning is not even using available heuristics that might at least avoid serious error and perhaps facilitate satisficing. (If anyone doubts the next-to-last point, consider the experience of the period just before the financial and economic crisis that began in late 2007.) Note that Camerer concluded more than a decade ago that learning is very difficult even in simple deterministic situations. He reports that even experts in various fields routinely violate rationality in their use of readily available information. (Recall the dramatic example of that revealed by the Allais experiments with leading economists in the early 1950s in which the latter literally dismissed the errors they had made.) Moreover, we do not begin to know how to design experiments or specify models capable of capturing the learning of individuals with a great deal of tacit information that is not easily explicable.

Although a much better understanding of learning is critical to good economic analysis, from the point of view of most economists, psychology offers too many explanations. Considering cognitive psychology alone, while economics is devoting a great deal of attention to the findings of this subfield in the area of decision making, our discipline continues to ignore the improved new heuristics on cognitive learning.

Sociology may offer some assistance at the organizational level. A disconcerting phenomenon is that even if people learn, they do not always apply that learning beyond the immediately subsequent period. Furthermore, many decisions are made too infrequently to provide a good basis for learning, or if made more often, do not facilitate a quality of feedback that is conducive to learning. At least some of the learning required for economic and financial decision making requires much more than what is needed for the propositions about secondary school mathematics (where the basic solutions are well known). Finally, psychologists have shown that individuals' confidence tends to increase with experience, regardless of the character and quality of the judgments made with that experience. (This recalls a comment one leading economist made in referring to another's large and somewhat repetitive list of articles.

“You mean his two or three ideas.”)

Questions to Consider:

1. Why do you think that strategic interaction has received so little attention from pragmatically oriented economists?

2. What advantages does behavioral game theory have over traditional game theory in dealing with economic decision making?
3. If learning is so important to the way in which so many decisions are made, why don't economists incorporate more of what psychologists and others have to say about it?

Required Reading:

Cartwright, pp. 9-10, 19-26, 68-77, and 203-247.

13. Neuroeconomics

Neuroeconomics, a mix of neurology and economics, has been cited as underlying all behavioral economics by authorities such as Camerer but put somewhat aside by others such as Thaler as not having added at this point to what behavioral economics has to offer. It represents an effort to locate and measure the utility of certain circumstances and has been advanced by the use of position emission tomography (PET), magnetic resonance imaging (fMRI), and transcranial magnetic stimulation (TMS), primarily fMRI, which focuses on blood flows. (PET detects changes in neurotransmitter release.) Neuroeconomics is covered much more extensively in the text, but students should keep the following conclusions in mind:

1. The brain is composed of many components and systems and these interact in leading to our decision making;
2. Different stages of decision making recruit different components of the brain;
3. The brain responds differently during anticipation of incentives than in response to incentive outcomes, an indication of reference dependence; and
4. The processing of gains does not appear to be simply the opposite of the processing of losses.

Neuroeconomics has identified and better explained the locus of various aspects of decision making, but it has not yet been able to indicate what precisely needs to be done to alter outcomes; if the brain is inclined to perform in a particular manner in given circumstances, what type and level of incentives are required to lead to certain desired changes? Some types and level of incentives would achieve that but neuroeconomics is not at the stage of being able to answer that, and, indeed, we do not know if it ever will be.

Questions to Consider:

1. How much of decision making involves active participation of the decision maker?
2. To what extent can incentives or institutional changes overcome documented neurological tendencies in decision making?

Required Reading:

Cartwright, pp. 461-504. Also, on evolutionary factors: pp. 371-412.

14. Altruism, Justice, Social Norms and Institutions

The model of traditional economic analysis is one in which the motivation is self-interest. Social norms and issues of justice do not intervene, and as for institutions, they are minimal, only those that are required for an economic system such as capitalism to function (the concept of the night watchman). That is a model, however, it is not the real world.

In the real world, altruism, justice, social norms and institutions play a role, or may do so. People volunteer, and not only after they retire from remunerative employment, contributions are made to charity (particularly large ones after major disasters), and not only for tax deductions (indeed, some of the largest contributions in the United States were made before the concept of tax deductions came into play), tips are left for waiters even in circumstances unlikely to be repeated, citizens vote even when not compelled by law and though there may not be any apparent economic return, some employees work harder and longer than they really need to for the compensation they earn (while it is true that others are free riders as traditional economics assumes is likely to often be the case), companies volunteer to maintain stretches of public highway, enlightened selfishness if not quite altruism is extended in some places of employment by employees unlikely to rise much in rank, trust is often extended in a wide variety of situations, and so on. More than self-interest is often at play, and the extension is not exclusively to family and friends. Moreover, punishments are sometimes meted out and even at a cost to those who do the punishing, standards are established which, while in the public interest, often lead to moral hazard (with repetitions of a problem likely to be fostered), and certain individuals and groups are treated in a manner that is not in the best economic interest of those treating them unfairly or the larger society, for that matter. And there is deception, cheating and rank opportunism—along with a signaling of intentions that reduces the advantage that

market transactions would enable, but perhaps that may reflect expected reciprocity in some cases.

Economists have begun to write more of these matters in recent years, as outlined in the Cartwright text, and they are part of what is involved in behavioral economics. This type of response was given a new emphasis with the creation of ultimatum, dictator and trust games in recent decades. Fairness is now well recognized, but the standard of what is fair often varies between (and even within) communities and societies as well as over time, and almost always varies according to circumstances. Tipping a cab driver is expected in large cities but not in many smaller communities. Purchasing shares in a company with an outstanding future is generally well regarded (even where it goes against rational diversification), but raising prices after a destructive hurricane is not. And arriving at 2 PM for a contract signing may be essential on Wall Street, or expected in the case of a 6 PM cocktail reception, but such timely behavior is not even expected in some so-called developing communities. Picking up a ten dollar bill left on the sidewalk may always make good sense, but the ultimatum and dictator games economists have reveal that a very small division of unexpected and unearned gains is usually not regarded as fair and not accepted.

Social preferences and the institutions that reflect them differ between communities, and they can change over time. Indeed, they can vary even in short time frames with new exposure, learning and even repetition of events that were previously regarded as infrequent. Some environments foster more cooperation or consideration than others, and, indeed, some such inclinations may have an evolutionary explanation. Trust matters, as does anonymity, and the size of stakes and level of economic opportunity can as well. One's personal wealth may enter, as also may the level of competition, the amount of information that is available and the means of dealing with it. So, too, may any record of past intentions and the cost of punishment. Gender matters, at least in some situations (seen most readily by the differences in attitudes towards investment in which women have been shown to be more conservative and men more inclined towards taking on risk), as may age and the culture one comes from. Wilkinson and Klaes define social norms as behavioral regularities and socially shared beliefs regarding how one ought to behave, both of which are enforced by social sanctions (which I would define as institutional understandings). To the winner go the spoils, it is often proclaimed, but Mancur Olson explained why institutionally ossified World War II victor Britain lost ground as it allowed in-groups to continue with earlier privileged positions that once may have contributed to national

welfare and certainly to societal notions of fairness but no longer did, while defeated and institutionally much altered Japan gained in part precisely because of the elimination of former institutional privilege.

Questions to Consider:

1. Is altruism little more than what Simon termed “enlightened selfishness,” and is that not consistent with traditional economic formulations of self-interest?
2. Do institutions actually influence individual values and preferences?
3. Do dicta about taking full advantage of what is offered conflict with the findings of ultimatum games?
4. Fairness is universally understood and is the same everywhere. Comment.

Required Reading:

Cartwright, pp. 77-84 and 321-368.

Recommended Reading:

Frank, Robert, *Passions Within Reason*.

Suggested Reading:

Olson, Mancur, *The Rise and Decline of Nations. Economic Growth, Stagnation and Social Rigidities*.

15. Happiness

It is a legitimate question whether economics—even behavioral economics—ought to be focused on assessments that go beyond economic considerations. While one may note the psychological content of economic decision making, as behavioral economics does, it is quite another matter to assess the welfare or “happiness” implications of the resulting economic results. At the same time, it must be conceded that welfare has been a concern to economics at least since the turn of the 20th Century and perhaps since the writings of Malthus in the early 19th Century. And it should be acknowledged that Maximo Rossi of the University of the Republic has been an active contributor to this literature.

Happiness involves comparisons of the perceived well-being of the members of a community over time and, particularly to the extent that some people are less well-off while others are better off. Wilkinson and Klaes conclude, as have many economists, that happiness has increased over several decades. The position of this writer is that there is little basis for such a conclusion. Though for many years his real income was higher than

his father's in the 1950s, he would not agree that either he or the rest of his family are happier than those of family members were at the earlier time. And this is despite the fact that he believes he has generally been in a comparable social position to that of his family in the 1950s. Nor is this strictly a matter of the "law of small numbers." It seems to apply on a much larger scale.

Let us proceed with the majority analysis, though.

To begin with, there is a general inclination and considerable empirical work supporting the conclusion that while higher levels of income lead to greater happiness at first, this does not continue *ad infinitum*. Further, all agree that happiness and unhappiness are not symmetrical reflections of gains and losses. It is acknowledged, moreover, that happiness is a subjective category, compared to such matters as costs, individual income levels, or GDP.

Wilkinson and Klaes characterize happiness as a dispositional trait, rather than a reaction to external events. No dissent there though it is not clear that economics has much to offer in measuring dispositional traits.

Analysts of happiness and human welfare conclude that people adapt to repeated experiences of the same type of event, putting aside disagreeable and unsuccessful experiences (for the most part) if they are successful, and anticipating at least as much in the future as in the past. Experience becomes a reference point to which new experiences are compared. Agreed, but there are too many exceptions to generalize and, in any event, it is not clear how exactly this contributes to an evaluation of happiness.

Wilkinson and Klaes conclude that happiness results more from pursuing a goal than from attaining it. Psychologists certainly have been asserting this, but there may be many exceptions. Even if it is the case generally and is some truth in it, ask the former Japanese company Vice President who retired on a sizable pension at age 55 if he is happier now than before, given that he has no chance of becoming CEO of his company which he long sought, but he can sleep better at night and has a statistically better chance of living past age 65. And what of the great majority of Silicon Valley entrepreneurs who do not become millionaires despite long hours of sacrifice and higher rates of drug abuse and divorce than in their country as a whole—and for most of us who do not attain the goals we once held.

The authors of that text observe that people possess a psychologically immune system that speeds recovery from negative emotional events. This is true on average

(though not for all with some indeed becoming severely damaged mentally, and consider, in any event, the problem of intra-personal evaluations), but not becoming depressed is not the same as being more content than before.

Some happiness authors state that people reduce the emotional power of events by coming to make them seem ordinary and predictable, even explainable. This may be true on average, but even for those who succeed in doing this, does it mean that they are happier than before? Again, the task of intra-personal comparison may be insurmountable.

Some researchers base their models in part on evolutionary biology and on the assumption that happy individuals are more likely to breed successfully. The first part of the sentence certainly is relevant, but as for the second part, one would have to wonder if happiness is what best explains the ability to survive. Also, one would have to conclude that Latin Americans, with a much reduced rate of birth, are much less happy than 50 years ago—which would seem to go against some other findings.

Wilkinson and Klaes note several limitations of pursuing (even) the hedonic aspects of happiness:

1. There are limits to hedonic happiness and to our ability to measure happiness accurately.
2. There are adverse effects of hedonic introspection on well-being.
3. There are self-defeating aspects of happiness seeking, notably that people have faulty theories of happiness, that happiness-seeking may lead to a loss of the intrinsic value of activities, and that increased monitoring of happiness may interfere with happiness itself.

One of the contributions of the Cartwright text is presentation of the issues raised by Kahneman concerning what exactly is meant by utility—whether we have in mind the utility that is experienced (and, if so, at what points), that which is remembered, or that which is anticipated.

Required Reading:

Cartwright, pp. 465-504

16. Major Applications: Behavioral Finance, Public Finance and “Nudging”

Economists were reticent to accept behavioral economics until the mid-1990s and, indeed, there is still negligible work in a number of fields, especially in macroeconomics, and that despite the expressed concern of several leading economists. This section

considers several areas where major applications have been made. The most numerous have been in behavioral finance. The second is more mainstream public finance, where three economists have prepared a very useful survey, followed by an even more general application of behavioral economics to the design of economic policy. The third is the area of nudging—paternal libertarianism, in which the emerging contributions have included a popular book coauthored by a leading behavioral economist and an eminent lawyer who helped establish what is known as behavioral law, and who held a position implementing federal laws and regulations in the United States for several years.

In the mid-1990s the typical text on finance scarcely mentioned behavioral finance. The field was celebrating extraordinary years of financial gain and the naming of several Nobel Prize laureates. Efficient markets were proclaimed in the strongest terms, rationality was the byword and new mechanisms were innovated to take advantage of all of this by mathematicians and mathematically more able economists. Some authors found that studies raising doubts received a better response from journal reviewers if they did not cite psychologists whose experimental work seemed to be behind the new wave of events. Several analyses that pointed to anomalies were rejected by leading journals because they contradicted the basic principles of rationality. Even as this was happening, a prominent maverick mathematician strongly dissented, and some econometricians raised questions about the number of years on which the conclusions of market growth and market efficiency were based. In fact, an increasing number of anomalies were being documented with the journals of finance among those leading the way. Shiller's article documenting the extent of volatility in the allegedly efficient New York Stock Market disturbed the traditional view (though it was taken to task by a number of them), and the 1979 *Econometrica* article of Kahneman and Tversky on their alternative to the expected utility standard as the explanation of decision making was on its way to becoming the most cited article in economics. Shiller characterized the stock market as highly overvalued as early as 1995 and continued to do so up until 2000-2001 when the market indeed declined sharply; later, he warned of a housing bubble and ensuing economic collapse in the period just prior to the 2008-2009 crisis. While few experts or practitioners supported those views, the increasing interest of financial academics and practitioners in applications of behavioral economics coincided with the interests of an appreciable number of practitioners who were skeptical of the efficient markets hypothesis and sought a more active role in their field. (Levine's critique, cited earlier, continues with an emphasis on

rationality, however.) An increasing number of academics who had been influenced by the emerging behavioral decision theory undertook studies of market anomalies.

The best way to view the attention that behavioral economics has received in finance is to note that not only is there much more on behavioral finance in finance texts than as recently as the mid-1990s, but there are now also texts in behavioral finance. (Richard Thaler commented that in the future it will not even be necessary to use the word “behavioral” before finance.)

Lucy Ackert and Richard Deaves co-authored one of the best known recent texts in behavioral finance. It begins with two chapters on the foundations of finance—expected utility theory, asset pricing, market efficiency and agency relationships—and is followed by a chapter on Prospect Theory, framing and mental accounting. Chapter 4 concerns challenges to market efficiency, noise trading, and limits to arbitrage, incorporating a number of the empirical findings from behavioral finance literature. The first part of the chapter deals with lagged reactions to earnings announcements, small-firm effects, value vs. growth and momentum and the investment reversal phenomenon (whereby stocks that are winners in a period of years subsequently do not fare as well in the period ahead as those which were losers). The second part includes material on social factors but emphasizes limits to arbitrage—which traditional economic theory ignored (or presumably, only temporary)—and inefficiencies in pricing. Chapters 5-7 cover heuristics and biases, overconfidence and emotions.

Chapters 8-10 deal with investment behavior. Chapter 8, Familiarity, availability and home bias, covers studies that reflect several heuristics, and considers trend following, short vs. long term investments and the difference between good companies and good investments. Chapter 9 discusses overconfidence. Chapter 10, Individual Investors and the Force of Emotion deals with a wide range of topics including happiness. Attention is given to differences that may arise with “house money” and with alternative explanations of what has been called the disposition effect (whereby it is maintained that stocks that have gained are sold too soon and those that have lost value are held for too long). Chapters 11 and 12 deal with social forces and include coverage of the fairness studies, and also the collapse of Enron. Chapters 13 and 14 consider behavioral explanations for the anomalies of individual decision making, beginning with the literature concerning earnings announcements and the value vs. growth debate. Included is a discussion of the alternative efforts to deal with the momentum investing and the investment reversal phenomenon.

The insufficiently explained equity puzzle (whereby stocks earn a premium over bonds that exceeds their long term risk), bubbles and stock market volatility are also considered.

The remainder of the text includes applications of behavioral analysis to corporations, debiasing, behavioral investing and neurofinance.

While most courses in economics continue to make little mention of behavioral anomalies and assumptions, a rather different approach can be found in *Policy and Choice. Public Finance Through the Lens of Behavioral Economics*, by William Congdon, Jeffrey Kling and Sendhil Mullainathan. *Policy and Choice* begins with a number of general considerations, noting, for example, that psychological costs and benefits may differ from economic ones. Humans are characterized by imperfect optimization, bounded self-control, and preferences that differ from those assumed by traditional theory. There are unintended behavioral responses, if, for example, incentives are influenced by lack of willpower, procrastination, temptation and other factors such as context, an individual's state, emotional considerations, and addiction. Problems arise due to limits in the "attraction" of different categories of information, limits in human computational capacity and reasoning that is influenced by motivational considerations. A chapter follows that deals with diagnosing policy problems, assessing policy alternatives and prescribing policy responses. Part II offers a chapter each, on how behavioral economics might contribute to the concerns of asymmetric information, and on externalities and public goods, poverty and inequality and taxation and revenue. Brigitte Madrian's *Applying Insights from Behavioral Economics to Policy Design*, which is used in her course at Harvard's Kennedy School, builds on that, providing guidelines to economic policy design generally, and dealing with deviations from optimality that are due to such matters as location, lack of will power, and other-than-economic recognition rather than the economist's traditional focus on marginal costs and benefits.

The "nudging" literature completes the step of transforming behavioral economics from a passive indication of how economic actors make decisions to a more normative effort to get individuals and other economic entities to alter their decision making to ways more in line with their own interests (which, in some cases, may move them towards optimization in terms of society's objectives). The approach appears to have begun with Thaler and Bernartzi's successful efforts to have corporations induce employees to save more, but this approach, often referred to as paternal liberalism, now indicates how governments as well as private entities can induce individuals and others to change their

decision making along the lines of their own interests, in response to new incentives. A major question, emphasized by the Congdon et al. and Madrian contributions, is whether the default or other nudging options that happen to be selected, are necessarily the most efficient mechanisms for getting individuals to make decisions that are in their own or in society's interest.

Questions to Consider:

1. Do you think it is coincidental that the field of finance has been among the most prolific adopters of behavioral economics?
2. Explain how planning for retirement might take advantage of behavioral finance.
3. "Nudging" transforms behavioral economics from descriptive economics to something more normative. Comment.

Required Readings:

Cartwright, pp. 68-98, 137-146, 187-201, 291-319, 355-368, 396-412, 451-461, and 488-504. Also, on nudging and default hypotheses: pp. 93-98, 230-246 and 519-532. On addiction, pp. 451-461. On policy and behavior generally, pp. 505-532.

One of the following:

- a. Brigitte Madrian, 2014. Applying Insights from Behavioral Economics to Policy Design. Working Paper, NBER.
- b. William Congdon, Jeffrey Kling, and Sendhil Mullainathan, (2011). *Policy and Choice. Public Finance Through the Lens of Behavioral Economics* (Washington, DC. Brookings Institution).
- c. Selected chapters from Lucy Ackert and Robert Deaves, (2011). *Behavioral Finance. Psychology, Decision-making and Markets*.
- d. Selected chapters from Richard Thaler and Cass Sunstein, (2008). *Nudge. Improving Decisions About Health, Wealth, and Happiness* (2008, New Haven, CT., Yale University Press).

Suggested Reading: One of the others selected above.