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1. The Psychological and Economical Perspectives on Human Decisions in Social and Interactive Contexts

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In recent years many social scientists have come to realize the value of a theoretical framework that uses traditional game-theoretic concepts to model the environment in which decisions are made, and of meticulous and careful experimental work on interactive decisions. Our common hope is that a combination of these two components would lead to breakthroughs and new insights on human behavior under various (natural or artificially induced) incentive structures. This goal has been a major driving force of Rapoport's work for a long time (Kahan & Rapoport 1984; Rapoport 1990) and it is fitting that the workshop in his honor focuses on the most recent developments toward this goal. Most chapters in this volume summarize experimental studies designed to explore to what degree nonstandard motives (e.g., fairness, pride, retaliation, trust, etc.) guide human behavior in strategic settings (modeled by games), and how people learn to adapt to the objective incentive structure. This chapter sets the stage for the rest of the book by discussing some of the traditional differences between psychologists and economists in the study of human choice behavior.

ON PSYCHOLOGY AND ECONOMICS

A fair amount has been written over the years on the interplay between economics and psychology. Most of the surveys were written by, and for, economists (for recent surveys see Earl, 1990; Lewin, 1996; Rabin, in press; Sugden, 1991; and for a review for psychologists see Lopes, 1994). Because psychology is, in general, less formal (mathematical) than economics, some speculate that economists can master the psychological content of a specific content area easier and quicker than psychologists can understand and appreciate the methodological rigor of economical models. This may begin to explain why mainstream economists believe that economics without psychological and sociological research is inadequate (Simon, 1986) and that “there are gains to be had from seeking help from psychology in at least some areas of their research” (Earl, 1990, p. 718).

Psychologists seem to be more skeptical in their views regarding the potential contribution of economics to psychology, as well as the effect of psychological research on studies in economics. The sharpest criticism is expressed by Lunt (1996) who argued that “economists are not ready, prepared or even vaguely interested in changing their core assumptions as a response to psychological work” (p. 283). A somewhat more positive view is expressed by Lopes (1994), who believed that

Psychologists and economists have different perspectives on the world. With effort, any of us could learn to see from the other perspective. But we cannot do both at once, and it is not easy to maintain the alien perspective for long. Still, the effort is worthwhile. (p. 198)

In the introduction to the proceedings of the Conference on the Behavioral Foundations of Economic Theory, held in October 1985 at the University of Chicago, Hogarth and Reder (1986) wrote that

it is possible that the two disciplines (economics and psychology) will continue to ignore each other for many years to come. Indeed, given the different substantive interests that motivate inquiry in the two disciplines, we believe that the bulk of most work in both areas will continue to develop in their present separate ways. (p. S200)

The chapters in this volume illustrate how economists and psychologists (and in some cases, jointly) study closely related issues using similar methodologies. In our view, the volume attests to the fact that psychologists and economists *do* learn from each other and *can* work together to improve our common understanding of human behavior. Thus, this collection supports Lopes’ position and, in our opinion, refutes Hogarth and Reder’s bleak scenario.

The goal of the introductory chapter is to highlight some of the differences between the assumptions commonly invoked (explicitly or implicitly) by economists and psychologists in the study of human choice. We believe that better understanding of these differences can facilitate accumulation and communication of knowledge across disciplinary boundaries. There are eight basic assumptions. In each case we highlight the contrast between the traditional views of psychologists and economists and examine the degree to which recent research managed to reduce the gap between the two disciplines in this context.

Before reviewing the differences between economics and psychology it is instructive to speculate on their origin. In our opinion, the two disciplines have distinct views on human choice behavior simply because they examine the same behavior from different perspectives that are dictated by their respective scopes and interests. *Psychology* is usually defined as the study of the thought processes and behaviors of humans and other animals in their interactions with their environments. Among other things, psychologists study sensory perception, emotion, motivation, problem solving, use of language and other mental tasks, group interaction, adjustment to social and physical environments, and the normal and abnormal development of these processes. *Economics* is traditionally considered to be the study of how human beings allocate resources to produce various commodities and how those goods are distributed for consumption among all members of a society. A basic tenet of economic theory is that resources are scarce, or at least limited, and that not all human needs and desires can be met. A major concern of economists is how to distribute these resources in the most efficient and equitable way.

This volume focuses on the domain where the two disciplines intersect – the study of human choice behavior. As the previous definitions indicate, this domain is but a small subset of their respective topics of inquiry. The tendency in every scientific field is to adopt assumptions and methodologies that apply to the largest possible number of content subareas (in fact, the boundaries of a discipline are delineated by the commonalities underlying all its subdomains). One implication of this tendency to establish broad and general common grounds across contexts is that some of the unique features associated with specific contexts are downplayed and even obscured. It is reasonable to attribute the differences between the traditional assumptions of psychology and economics on choice to the different contexts in which the two disciplines embedded this behavior.

One corollary of this analysis is that the existing differences are not inevitable. It is possible to imagine that the two disciplines could have developed in slightly different directions that would have favored alternative sets of underlying assumptions. And, more important for our goals, it is equally easy to envision how they could both shift focus and converge toward a new common core of axioms and a unified methodology. We hope that this volume makes a contribution in this direction.

TRADITIONAL DIFFERENCES AND CURRENT VIEWS

To appreciate the significance of the differences between the economic and psychological perspectives, it is instructive to compare chapters on consumer behavior in economics and marketing textbooks (the latter are heavily influenced by the psychological view and research literature). The uninitiated reader may not even realize that both chapters presume to explain the same phenomena. The psychological (marketing) treatment of consumer behavior emphasizes the interaction between individual differences and environmental and situational influences. In particular, effort is devoted to study the cultural context of consumption, social class and status, reference groups, family and household influences, individual differences in economic and cognitive resources, needs, involvement, motivation, knowledge, expertise, attitude, personality and lifestyle. Psychological processes such as attention, comprehension, memory, and cognitive and behavioral theories of learning, persuasion, and behavior modification constitute an integral part of any treatment of consumer behavior in marketing. We refer to all these factors jointly as “the social context of consumer behavior.” In sharp contrast, the economic treatment of consumer behavior emphasizes utility maximization and the theory of consumer demand, ignoring for the most part the social context and framing within which consumers operate.

The main differences between the assumptions traditionally invoked by economics and psychologists can be summarized along the eight dimensions that are reviewed next. Note that for the most part we do not discuss the commonly considered differences in methodology.¹ We believe that methodological differences are derivatives of the more fundamental differences discussed in this chapter.

What Is Scarce?

Economists assume that environmental resources are scarce but, ironically, consider the mental resources available to the actors whose behavior is modeled to be unlimited. Psychologists, on the other hand, have always been interested in studying the mechanisms that allow humans and other animals to cope with, and adapt to, an environment that is characterized by subjective information overload (see research by Miller, 1956; Navon & Gopher, 1979). Most traditional economic models presume that scarcity is a characteristic of the external domain whereas abundance is typical in the internal mental realm. Most psychological models, on the other hand, presume that the locus of scarcity is internal. Just as fat has replaced starvation as the number one dietary concern in the developed world, information overload has replaced scarcity as an important emotional, cognitive, and social problem in many psychological models.

Recently, however, there are some indications that these traditional positions

could be replaced with a compromise that recognizes the importance of considering both types of scarcity. With the wider acceptance of Simon's (1957) notion of bounded rationality, some economists are willing to concede that in principle scarcity of resources may apply to *homoeconomicus*, as well as to the physical environment in which a person operates. At the same time social psychologists have become more involved in the study of social dilemmas, consumption of finite common resources and voluntary contributions to public goods (e.g., Dawes, 1980; Komorita & Parks, 1995) – situations that involve scarce environmental resources. Indeed, almost all the chapters in this volume implicitly assume scarcity of both environmental and cognitive resources.

Normative Versus Descriptive

It is tempting to relate the differences between psychology and economics to the traditional distinction between *normative* (how one ought to behave) and *descriptive* (how one actually behaves) theories. We consider this classification to be too sharp and artificial, and believe that it does not represent fairly and accurately either discipline.

In their groundbreaking book *Games and Decisions*, Luce and Raiffa (1957) stated that

it is crucial that the social scientist recognize that game theory is not descriptive, but rather (conditionally) normative. It states neither how people do behave nor how they should behave in an absolute sense, but how they should behave if they wish to achieve certain ends (p. 63).

Propositions of normative theory are generally tautological; they are derived logically from definitions and axioms and, as such, are analogous to mathematical theorems. For a proposition to be of interest to behavioral scientists (and, in particular, to economists and psychologists) and to qualify as scientifically meaningful, it must say something about the real world and be falsifiable by some conceivable observation of behavior.

Traditionally, game theorists have been insensitive to the data produced in experimental and nonexperimental settings and have even dismissed these data as irrelevant. As Kadane and Larkey (1983) noted,

When anomalies occur between theory and data as they have frequently in the past 30-plus years, there may be a flurry of activity to conduct new experiments with new procedures that produce data consistent with the theory. Such a procedure asserts that the anomaly resulted from faults in the experimental procedures and not faults in the theory (p.1377).

For the most part, this is no longer the dominant approach in game theory.

For example, Rubinstein (1991), in his comments on the interpretation of game theory, wrote:

I approach this paper with the view that game theory is not simply a matter of abstract mathematics but concerns the real world. We are attracted to game theory because it deals with the mind. Incorporating psychological elements which distinguish our minds from machines will make game theory even more exciting and certainly more meaningful. (p. 909)

Similarly, Roth (1991) warned that

if we do not take steps in the direction of adding a solid empirical base to game theory, but instead continue to rely on game theory primarily for conceptual insights (deep and satisfying as they may be), then it is likely that long before a hundred years, game theory will have experienced sharply diminishing returns. (p.108)

In fact, there is a growing attempt by economists to refine game theoretical models that traditionally rely on idealized representations of human abilities and motivations to accommodate cognitive limitations and social context (e.g., Rabin 1993). In such an endeavor, new data lead to revisions or extensions of the original models and the models are then used to produce new predictions for testing. This view is no different than the one that quantitative psychologists have adopted and applied consistently for the last fifty years, in a variety of areas (e.g., Coombs, Dawes, & Tversky, 1970) including judgment and decision (e.g., Rapoport & Wallsten, 1972).

The Relative Value of Generality and Accuracy

All scientists would agree that a good model should be general *and* accurate, but there are differences of opinion concerning the relative importance of these two desirable properties. Psychological research uses a paradigm that relies heavily on controlled laboratory experimentation and hypothesis testing. This paradigm tends to emphasize and overweight accuracy over generality. As a result, psychological models tend to be localized in nature, often recognizing individual differences and context effects. Quite frequently they rely on ad hoc assumptions and qualifiers that may vary from one model to the next and cannot always be formulated mathematically. It is fair to say that mainstream contemporary psychology has abandoned the search for general principles and has accepted the fact that human behavior is better described by a variety of more modest and narrow laws and rules that are invoked based on context and/or situation-specific cues. In the behavioral decision-making domain, this view is exemplified in the work of Payne, Bettman, and Johnson (1993) on the adaptive nature on human decision processes.

On the other hand, the traditional approach in economics relies on the idea that behavior can, and should, be explained by a few general principles that may be applied to almost every conceivable situation. From the perspective of the marginal utilitarian, for example, the theory of utility transformed economics into science by making it possible to derive economic laws from a single fundamental law of human nature – the strive to maximize expected return (utility) – which can be deduced from a small set of compelling axioms of rationality.

It appears that, unlike the scarcity disagreement, the accuracy versus generality disagreement cannot be resolved easily. Although psychologists can argue reasonably that experimental data suggest that generality is too costly (in the sense that it requires very complex models), economists have good reasons to continue their search for general models. Localized models cannot be applied easily outside the lab because one rarely knows which of the numerous available models that often make contradictory predictions matches best the current circumstances.

Interestingly, two Nobel laureates in economics (Selten and Simon) appear to support the “psychological” view that generality is not necessarily the dominant dimension. In the Nancy L. Schwartz Memorial Lecture, Selten (1989) said:

I do not accept the criticism against the use of ad hoc assumptions. Look at human anatomy and physiology: bones muscles, nerves, and so on. Human anatomy and physiology cannot be derived from a few general principles. Let me say something else in defense of ad hoc assumptions. Experiments show that human behavior is ad hoc. Different principles are applied to different decision tasks. Case distinctions determine which principles are used where. It is better to make many empirically supported ad hoc assumptions than to rely on a few unrealistic principles of great generality and elegance. (pp. 22-23)

And,

It can be hoped that eventually many theories of limited range will grow together and evolve into a comprehensive picture of the structure of human economic behavior. Only painstaking experimental research can bring us nearer to this goal. (p. 27)

Similarly, Simon (1993) wrote:

Instead of political science or history as derivative of economic analysis, there is a need for economics based upon the facts of history and political and social life. Such an economics will have little to say *a priori* but will reason from numerous painfully gathered facts. (p. 160)

Rationality

The human mind is something of an embarrassment to certain disciplines, notably economics, decision theory, and others that have found the model of the rational consumer to be a powerfully productive one. (Schelling, 1985, p. 191)

In economics, the rationality assumption constitutes a dominant paradigm that has no counterpart in contemporary psychology. Psychologists and economists consider a person to be rational if the person makes consistent and coherent decisions in pursuit of his or her own objectives and goals. However, in economics this is often an “if and only if” definition whereas in psychology a much weaker “if” definition is considered appropriate. Traditionally, economists believe that goal-directed behavior portrays the most interesting economic activities and they emphasize the role of conscious choices. Psychologists, on the other hand, believe that conscious choices (and behavior) reveal just the tip of an iceberg, and that components such as instincts, habits, conditioned and innate drives, and so on that cannot necessarily be portrayed as goal-oriented, remain hidden below the surface. Psychologists believe that in many circumstances, including important economic ones, these hidden drives are at least as important and influential as deliberate thinking in determining behavior. A more extreme position is that in some cases (for example, in contingent valuation applications) people do not have built-in opinions and preferences waiting to be revealed; rather, one’s preferences and goals are constructed, refined, and occasionally revised during the decision process. Clearly, the economic goal-directed definition of rationality is not suitable for evaluating behavior in such cases.

When asked and frequently, without being asked, people give reasons and justifications for their actions, but both economists and psychologists tend to discount these reasons as ex-post rationalization of, rather than rationale for, action. However, although economists ignore these data altogether and rely solely on observed and measurable behavior (the revealed preference doctrine), some psychologists find this verbalization a rich source for inquiry into the cognitive and subconscious processes underlying behavior (the traditional raw data of the clinical psychologists). Nonbehavioral information, some psychologists argue, may be more enlightening than actual behavior for the understanding of individual motivation, especially when moral considerations dominate choice.

Another often-made distinction is that in economics rationality is viewed in terms of the choices it produces (substantive rationality), whereas in psychology and other social sciences, it is assessed in terms of the processes it employs (procedural rationality; Simon, 1986). Consequently, for a model to be credible in economics, it has to work at the output end (i.e., to be valid in a predictive

sense), whereas the psychological plausibility of the process (i.e., its descriptive validity) is not quite relevant. This view is best expressed in Friedman's (1953) essay on the methodology of positive economics in which he argues that when economists make behavioral assumptions about individuals, these assumptions need not be accurate, and they may even be wildly implausible, as long as aggregate data such as prices and quantities behave *as if* the assumptions are accurate. Psychological models, on the other hand, strive to achieve a different balance between these two aspects. In fact, purely empirical prediction, without a reasonable understanding of its underlying process, has a bad reputation in some areas of psychology.

Finally, quantities and entities that are considered stable inputs in economic models, such as preferences and probabilities, are often considered by psychologists to be temporary outputs of rule-driven processes and context-specific problem-solving constructions.

The traditional justification for retaining the strong rationality assumption in economics, even in the face of contradictory results is the strive for generality. As discussed earlier, there are good reasons to believe that in some cases loss in generality can be very costly. And, the rationality assumption appears to facilitate construction of models that are general and provide a good approximation of behavior even when they are not exactly accurate (see Savage, 1954, for a discussion of this point). The belief that the rationality assumption is necessary to achieve generality follows from the argument that there is only one way to be rational, but many ways to behave irrationally. Erev and Roth (in press) pointed out that this argument is not strictly correct: The literature on equilibrium refinement shows that there is more than one way to be rational, and the robust results obtained in learning studies suggest that generality can be obtained without invoking a strong assumption of rationality. This state of affairs leads many economists to consider alternative, more general definitions of rationality, thus moving them closer to the psychologists' view. Indeed, none of the contributors to this volume (economists or psychologists) invokes the rationality assumption as a sole explanation of the behavior observed in their studies.

How Should the Incentives Be Modeled and Studied

The economic definition of rationality emphasizes conscious, goal-directed behavior and assumes that each player's objective is to maximize his or her expected utility. However the theory postulates practically nothing about the sources, nature, components, and determinants of this utility. Nevertheless, in actual applications of the theory, utility is habitually equated with income, wealth, or profit. Money is taken to be the primary source of utility presumably because money can buy products and services that, ultimately, lead to satisfaction, happiness, and fulfillment of other goals. For example, cooperation in mixed-motive situations (e.g., voluntary contribution to public goods or self-

restrained consumption of limited resources) is viewed as an anomaly and poses a major theoretical challenge to standard economic theory (e.g., Dawes & Thaler, 1988).

The implication that people desire only (or primarily) economic gains is a far stronger assumption than utility maximization, and it is unquestionably false, in the empirical sense. Psychologists recognize that money (income) cannot be equated with, and in some cases does not necessarily contribute to, well being, happiness, and life satisfaction and that many decisions are driven, at least in part, by cognitive processes and emotional considerations that are far removed from profit maximization. People's behavior, including their economic behavior, is deeply affected by habits, tradition, emotions, and social and moral values such as friendship, love, loyalty, pride, shame, remorse, envy, spite, self-esteem, sense of commitment, respect for duty, and so on. Furthermore, psychologists acknowledge that the factors motivating human choice are often context-dependent, may vary across individuals, and may change over time.

Economists and psychologists agree that human behavior can be affected by a wide set of incentives. But they do not necessarily agree on the methodological and operational aspects involved in the study and modeling of these incentives. Following von Neumann and Morgenstern (1947), there is almost universal agreement in economics that the incentives can be modeled by quantitative utilities. Because utilities are clearly related to money, experimental examination of the effect of incentives relies on manipulations of the monetary outcomes. Many psychologists believe that real-life incentives are complex and cannot be captured and quantified as simple utilities. Consequently, their effects cannot be studied experimentally by focusing exclusively on monetary incentives. These psychologists try to induce these "social motivations" through experimental instructions ("imagine that you are a business man who...") that highlight motives other than money. For example, such instructions may emphasize the context of decisions, their emotional components, or their personal relevance. In other cases they attempt to induce comparative processes ("in such situations, a typical participant achieves a certain level of success"), or emphasize group memberships and loyalties.

Amnon Rapoport was one of the first psychologists to accept, and consistently follow, the economic convention of paying subjects in experiments as a function of their decisions (and ultimate performance). This methodology is now quite standard in the study of social (group) decision making, but not necessarily in other branches of psychology.

Monetary incentives are appealing because they are easy to quantify, explain (to the experimental subjects), and justify (to fellow researchers). In addition, their effects appear to be relatively uniform across subjects (all subjects have monotonically increasing utility functions for money, but not everyone reacts similarly to other cues induced by special instructions). It is quite clear, however, that the endorsement of this methodology is, to a large degree, a matter of convenience and convention. It certainly should not be interpreted as an

admission that other nonmonetary motives are unimportant, or irrelevant. In fact, one of the major challenges for a psychoeconomical descriptive theory of interactive decision making is to find an appropriate way to model the joint effects of the monetary *and* social factors. Practically all the chapters in this volume include such attempts.

Framing Effects

A fundamental tenet of traditional game theory and economics is that the effects of the environment on behavior are mediated by the incentive structure. Thus, in developing descriptive models of choice behavior, the effects of the environment can be captured, and abstracted, by the incentive structure. Empirical evidence from psychological experiments cast serious doubts on this assumption. Kahneman and Tversky (1979, 1984) showed that it is possible to manipulate environmental factors such that they affect behavior in a systematic fashion, without altering the incentive structure. They labeled this phenomenon – minor modifications in the presentation of simple choice problems leading to major changes in revealed preferences – “the framing effect.”

Although framing effects are robust and persistent, there seem to be no serious attempts to incorporate them in economical (and for that matter, psychological) models, and to give up the abstraction of the environment by the incentive structure. The concern is that because there are so many possible “frames,” general models that allow for such effects would be impossible to construct unless a general theory of framing is developed. And, unfortunately, it is unlikely that such a theory would be developed in the foreseeable future.

Most chapters in this volume bypass the framing problem by focusing on relatively abstract context-free frames. For example experimental studies of social dilemmas do not use terms such as “contribution,” “donation,” or “consumption” when communicating with the subjects because of strong connotations and normative associations. The justification for this convention is that these abstract context-free cases provide good approximations of the average or typical behavior across the multiple possible frames. Roth and Erev (1995), for example, approached this problem by distinguishing between initial tendencies and learning. They assume that framing affects initial tendencies, but learning is sensitive primarily to the incentive structure.

Both approaches appear sensible! However, we need to acknowledge that there is little evidence to justify either assumption beyond common sense and wishful thinking.

Learning and Equilibrium

Much of the research in economics involves equilibrium analysis. Its underlying assumption is that collective choices and markets are at equilibrium. At Nash equilibrium, no individual has positive incentives to change his or her behavior

unilaterally. Two major interpretations of Nash equilibrium in the context of rational players were suggested. The first assumes that the game is played only once (and a repeated game is “repeated” once), and the players have sufficient knowledge and ability to analyze it in a rational manner. Players reach the equilibrium by “thinking their way there,” so their observed choices reveal stable features of underlying preferences. This is a cognitive interpretation of equilibrium. The second interpretation does not require that participants in the game know its structure or any other facts at the outset. The assumption is that if people face a similar situation numerous times they learn to adopt better strategies by a trial-and-error process. A Nash equilibrium is considered a stationary point in this process. Players get to the equilibrium by adjusting their behavior in response to the demands of the environment and the behavior of their partners. These internal processes increase or decrease the individuals’ tendency to respond to certain external stimuli. This is a learning interpretation of equilibrium.

Learning is defined by psychologists as an enduring change in the neural mechanisms of behavior that results from experience with environmental events. The study of the general principles of learning has always been a central topic in scientific psychology, and has engendered some of its major achievements (e.g., Pavlov’s work on classical conditioning and Skinner’s work on operant learning). These principles are assumed to apply in practically every aspect and facet of human behavior. Economists however have studied learning only to the extent that this process can be used to justify equilibrium concepts.

The relationship between learning and equilibrium has received a lot of attention recently in experimental game theory, which is reflected in this volume. This research indicates that: (a) whereas convergence toward equilibrium is very quick in some settings (e.g., the market entry game studied by Rapoport, Seale, Erev, & Sundali, 1998; chap. 8, this volume), extremely slow learning is observed in other settings (e.g., ultimatum games studied in Roth & Erev, 1995), (b) in some settings initial learning (first 400 trials) does not move behavior toward equilibrium (some of the matrix games studied by Erev & Roth, in press; chap. 4, this volume), and (c) fairly general models (Erev & Roth, in press) can describe the learning process in various games quite well. These results stress the importance of studying and understanding the learning process per se, and not just as a justification of equilibrium. All the learning chapters in this volume indicate that a clear shift toward the more general (psychological) interpretation of learning is taking place in experimental economics.

Before we conclude this section we wish to discuss learning and adaptation in a more general framework, of socialization and formal education and their treatment, or lack of, in psychology and economics. These comments are not intended to highlight differences between the two disciplines but rather to emphasize some important aspects that are currently neglected by both.

Most cultures and societies endorse some norms and values that contradict

the basic tenets of rationality. The well-known proverb “if there is a will, there is a way” encourages us to ignore base rates; idealization of extreme forms of heroism for a common cause (e.g., sacrificing one’s life for one’s country) promotes disregard to the most basic elements of self-interest and survival over the benefit to society; the high value some institutions attach to perseverance (e.g., “never quit” and “finish the job” even if that job is no longer as important to us as it was when originally started) reinforces sunk-cost effects. Barney (the purple menace to economists) who preaches that “sharing is fun” and “sharing is caring” socializes children growing up today. Clearly the need to promote such pro-social behaviors indicates that, in most people’s minds, these are not inherited tendencies. What might be inherited is our preparedness to *learn* such attitudes but not the attitudes and behaviors. This conclusion is consistent with much of the modern cross-cultural work in psychology (e.g. Triandis, 1995) that distinguishes between individualistic and collective cultures, and traces the impact of this distinction on behavior of individual members of these societies.²

Another interesting issue is the dual action of learning and teaching. It is well understood in developmental psychology that while parents are shaping their children’s behavior, they are also conditioned by their children’s behavior to react in certain ways. This is also captured in the classic cartoon reproduced in several psychological textbooks in which one laboratory mouse brags to its colleague “Boy do I have this guy conditioned. Every time I press the bar he drops in a pellet of food.” Players in games (even if they are played only once) are simultaneously “students” and “teachers.” As teachers they have their own theory of effective teaching, based on introspection, experience, and beliefs about how others learn. Some are convinced that “sparing the rod spoils the child,” emphasizing the role of punishment in education, whereas others believe in the effectiveness of “the carrot.” In any case, subjects in games are not only dynamic learners but also active teachers, shaping (consciously or not) the behavior of their opponents and partners. Surprisingly, this dual effect is completely ignored in economic modeling and, for the most part, in behavioral psychology.

Finally, most models of reinforcement learning in games emphasize only one type of instrumental contingency, namely, positive reinforcement. For the most part they ignore other types of reinforcement such as positive punishment (if the subject performs the instrumental response, it receives the aversive stimulus; otherwise not), negative reinforcement (the response turns off or prevents the presentation of the reinforcer), and negative punishment (the instrumental response prevents the delivery of an aversive stimulus – for example, explaining fair behavior as punishment avoidance, see Bolton & Zwick, 1995). Such omissions (in a different context) led Lunt (1996) to suggest that “economists work with simplified and anachronistic applications of psychological theory” (p. 283).

Social Context and “Hot and Cold” Cognition

The psychological assumptions underlying models in economics have become more prominent recently. Leading economists and game theorists attempt to formulate theories that allow for imperfect rationality or weaken established assumptions and hypotheses (e.g., Machina, 1982; Selten, 1975). In most instances bounded rationality is equated with limits on memory (capacity and selectivity) and mental computation, and these confines are used to address experimental anomalies or to offer a dynamic for selection among multiple equilibria. Consequently, experimenters (economists and many psychologists) make every attempt to strip the subjects of sources of argumentation and emotion. In effect, the experiments are designed to reduce the effect of “hot cognition” and see how people act when all distractions from “cold rationality” are removed. However, it is possible that some of the more interesting behavioral anomalies, especially those that are evident in games, are due to emotional impulses induced by social constraints and norms rather than to cognitive limitations, and seem to be much more fundamental and difficult to address (Lewin, 1996). The social context of human economic behavior is at the core of game theory and, therefore, it is quite surprising that sociological and social psychological approaches to economic behavior have had relatively little impact even in the field of experimental economics.

For example, Bolton and Zwick (1995) argued that the major source for the violation of economic rationality in the ultimatum game is not limited cognitive capacity but rather powerful emotional reactions to what players view as unfair treatment by the first movers. Although this explanation is offered in the economics literature, it is essentially a modified utility interpretation. The same analysis offered in the psychological literature examines the state of mind that leads from judgment of unfairness to likely anger to acting spitefully. Pillutla and Murnighan (1996) argued, for example, that anger is a better explanation for the rejections than the mere perception that offers are unfair.

In game-theoretic formulations the desirability of an action is equated with the value of its consequences. In other words, players maximize their utilities by picking a “best” strategy from a set of well-defined distinct alternatives. Given the feasibility of a strategy, the only issue that affects one’s choice is the strategy’s direct and indirect effectiveness in promoting the player’s objective function. Interestingly, in Adam Smith’s writing, there is a distinct assessment of actions that is not identified with the evaluation of the useful consequences of that action when seen on its own. This view is not generally shared in contemporary economics but is echoed in the psychological literature on the relationship among beliefs, attitudes, intentions, and behavior.

There is an ongoing controversy in the psychology literature (that is not echoed in economics) regarding the origins of attitudes. Many psychologists do not accept the view that all attitudes are belief-based (cold cognitive), and point to the direct influences from affect (emotions/hot cognition) to attitudes. The

existence of such a direct link may suggest that some behaviors are not determined only by the beliefs about their consequences, but also by the emotional residues of those actions. Further, the attitude-behavior relationship may be weaker when behavior is susceptible to social influence. For example, in the popular theory of reasoned action (Ajzen & Fishbein 1980), consumption behavior is subject to both attitudinal and social influence variables. Attitudinal or personal components and normative or social components determine intentions, which are the immediate antecedents of behavior. That is, one forms attitudes not only toward the consequences, but also toward the action itself. In such a model, attitudes toward consequences may be fixed, whereas attitudes toward the action are contingent on its social context.

There is, of course, nothing in the economic idea of assessment of consequences to prevent it from being influenced by the nature of the process that leads to the final outcomes. However, such dependency is seldom acknowledged in practice. In fact, many experimental economists employ anonymity and double-blind procedures to eliminate the effects of social context. In contrast, many social psychologists are interested primarily in the specific effects of varying social contexts and emotional climate on interactive actions.

SUMMARY

In this chapter we have highlighted the major differences between the traditional economic and psychological approaches to the study of choice behavior, and summarized some recent trends in both disciplines. Our analysis suggests that the gap between economists and psychologists on some of these dimensions appears to be shrinking. Researchers in both disciplines tend to agree that: (a) in most cases both environmental and mental resources are scarce, (b) the strong assumption of rationality should be weakened, (c) some of the important effects of incentives can be studied conveniently by manipulating monetary outcomes, (d) framing effects cannot be ignored but their presence does not necessarily invalidate the game theoretical abstraction of the incentive structure, (e) learning is more than a justification for equilibrium, and (f) quantitative models are useful for the development of a good descriptive theory.

Practically all the contributors to this volume endorse (implicitly, and in some cases explicitly) these emerging common assumptions. This is amply reflected in their experimental work and their theoretical models. We started our chapter by asking a deceptively simple question “Can psychologists and economists cooperate in the study of human decisions in social and interactive contexts?” Although we can not conclude it with an equally simple answer, we are encouraged by the recent developments in experimental economics and behavioral decision theory, and we hope that in the not-too-far future, the answer will be an unqualified “yes.” We hope that the collection of chapters in

this book contribute toward this end.

ENDNOTES

1. Camerer (1995, 1996), for example, emphasized that the difference between psychological and economic experiments should not be overstated. There is a substantial overlap across disciplines in methods and substantial variation within disciplines. However, the typical differences in methods are worth analyzing because they usually follow from different background presumptions about human nature and different target domains investigators hope to generalize. Among the important differences are: psychologists use natural stimuli, economists prefer abstract stimuli; psychologists do not pay because incentives usually complicate instructions; psychologists presume that subjects are cooperative and intrinsically motivated to perform well; psychologists do not repeat the tasks – they are interested in initial behavior, economists are interested in equilibrium.
2. This argument is a bit tricky and possibly circular. To establish this claim fully we would need to show that in societies that do not teach such behaviors (if such societies exist) these behaviors are nonexistent. The fact that something is taught does not necessarily imply that it would not have emerged otherwise in the absence of teaching (think of toilet training). Societies may achieve other secondary goals by teaching and preaching their values.

REFERENCES

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitude and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Bolton, G. E., & Zwick, R. (1995). Anonymity versus punishment in ultimatum bargaining. *Games and Economic Behavior*, 10, 95-121.
- Camerer, C. (1995). Individual decision making. In J. Kagel & A. E. Roth (Eds.), *Handbook of experimental economics* (pp. 587-703). Princeton, NJ: Princeton University Press.
- Camerer, C. (1996). Rules for experimenting in psychology and economics, and why they differ. In W. Albers, W. Güth, P. Hammerstein, B. Moldovanu, & E. van Damme (Eds.), *Understanding strategic interaction: Essays in honor of Reinhard Selten* (pp. 313-327). Berlin: Springer.
- Coombs, C., Dawes, R. M., & Tversky, A. (1970) *Mathematical Psychology*. Englewood Cliffs, NJ: Prentice-Hall.
- Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology*, 31, 169-193.
- Dawes, R. M., & Thaler, R. H. (1988). Anomalies: Cooperation. *Journal of Economic Perspectives*, 2(3), 187-197.
- Earl, P. E. (1990). Economics and psychology: A survey. *The Economic Journal*, 100, 718-755.
- Erev, I., & Roth, A. (in press). Predicting how people play games: Reinforcement learning in experimental games with unique, mixed strategy equilibria. *American Economic Review*.

- Friedman, M. (1953). The methodology of positive economics. *Essays in positive economics*. Chicago: University of Chicago Press.
- Hogarth, R. M., & Reeder, M. W. (1986). Editors' comments: Perspectives from economics and psychology. *The Journal of Business*, 59 (4 part 2), 185-207.
- Kadane, J. B., Larkey, P. D. (1983). The confusion of is and ought in game theoretic contexts. *Management Science*, 29(12), 1365-1379.
- Kahan, J.P. & Rapoport, A. (1984), *Theories of coalition formation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 263-291.
- Kahneman, D., & Tversky, A. (1984). Choice, values, and frames. *American Psychologist*, 39, 341-350.
- Komorita, S. S., & Parks, C. D. (1995). Interpersonal relations: Mixed motive interaction. *Annual Review of Psychology*, 46, 183-207.
- Lewin, S. B. (1996). Economics and psychology: Lessons for our own day from the early twentieth century. *Journal of Economic Literature*, 34(3), 1293-1323.
- Lopes, L. L. (1994). Psychology and economics: Perspectives on risk, cooperation, and the marketplace. *Annual Review of Psychology*, 45, 197-227.
- Luce, D. R., & Raiffa, H. (1957). *Games and decisions*. New York: Wiley.
- Lunt, P. (1996). Rethinking the relationship between economics and psychology. *Journal of Economic Psychology*, 17, 275-287.
- Machina, M. J. (1982). Expected utility analysis without the independence axiom. *Econometrica*, 50, 227-324.
- Miller, G. A. (1956). The magical number seven plus or minus two: Some limits on our capacity to process information. *Psychological Review*, 63, 81-97.
- Navon, D., & Gopher, D. (1979). On the economy of the human processing system. *Psychological Review*, 63, 81-97.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. Cambridge University Press.
- Pillutla, M. M., & Murnighan, J. K. (1996). Unfairness, anger, and spite: Emotional rejections of ultimatum offers. *Organizational Behavior & Human Decision Processes*, 68, 208-224.
- Rabin, M. (1993). Incorporating fairness into game theory and economics. *American Economic Review*, 83, 1281-1302.
- Rabin, M. (in press). Psychology and economics. *Journal of Economic Literature*.
- Rapoport, Am., Seale, D. A., Erev, I., & Sundali, J. A. (1998). Equilibrium play in large group market entry games. *Management Science*, 44(1), 119-141.
- Rapoport, Am., & Wallsten, T. S. (1972). Individual decision making. *Annual Review of Psychology*, 23, 131-176
- Rapoport, An. (1990). *Experimental studies of interactive decisions*. Dordrecht, Holland: Kluwer.
- Roth, A. (1991). Game theory as a part of empirical economics. *The Economic Journal*, 101, 107-114.
- Roth, A. E., & Erev, I. (1995). Learning in extensive-form games: Experimental data and simple dynamic models in the intermediate term. [Special Issue] *Games and Economic Behavior*, 8, 164-212.
- Rubinstein, A. (1991). Comments on the interpretation of game theory. *Econometrica*, 59(4), 909-924.
- Savage, L. J. (1954). *The foundations of statistics*. New York: Dover.

- Schelling, T. C. (1985). The mind as a consuming organ. In J. Elster (Ed.), *The multiple self* (pp. 177-195). New York: Cambridge University Press.
- Selten, R. (1975). Re-examination of the perfectness concept for equilibrium points in extensive games. *International Journal of Game Theory*, 4, 25-55.
- Selten, R. (1989, May). *Evolution, learning, and economic behavior*. Paper presented at the Nancy L. Schwartz Memorial Lecture, Kellogg Graduate School of Management, Northwestern University, Chicago.
- Simon, H. A. (1957). *Models of man*. New York: Wiley.
- Simon, H. A. (1986). Rationality in psychology and economics. *Journal of Business*, 59(2), 209-224.
- Simon, H. A. (1993). Altruism and economics. *American Economic Review*, 83(2), 156-161.
- Sugden, R. (1991). Rational choice: A survey of contributions from economics and philosophy. *The Economic Journal*, 101, 751-785.
- Triandis, H. C. (1995) *Individualism and collectivism*. Bolder: Westview Press.
- von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behavior*. Princeton, NJ: Princeton University Press.