



## A Psychological Perspective on Economics

Daniel Kahneman

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# A Psychological Perspective on Economics

By DANIEL KAHNEMAN\*

My first exposure to the psychological assumptions of economics was in a report that Bruno Frey wrote on that subject in the early 1970's. Its first or second sentence stated that the agent of economic theory is rational and selfish, and that his tastes do not change. I found this list quite startling, because I had been professionally trained as a psychologist not to believe a word of it. The gap between the assumptions of our disciplines appeared very large indeed.

Has the gap been narrowed in the intervening 30 years? A search through some introductory textbooks in economics indicates that if there has been any change, it has not yet filtered down to that level: the same assumptions are still in place as the cornerstones of economic analysis. However, a behavioral approach to economics has emerged in which the assumptions are not held sacrosanct. In the following I comment selectively on the developments with regard to the three assumptions, on both sides of the disciplinary divide.

## I. Selfishness

The clearest progress has occurred in correcting and elaborating the assumption of selfishness, and the progress has come entirely from developments in economics, where the invention of the ultimatum game (Werner Guth et al., 1982) had a great impact. Experiments conducted in low-income countries by investigators armed with dollars confirmed conclusively that quite a few people will forgo a substantial sum for the sole benefit of denying a larger sum to an anonymous stranger who has treated them ungenerously (Lisa Cameron, 1999). Other evidence indicates that offers that would be rejected if they came from a person will be accepted if they are generated by a computer. Brain-imaging studies of people playing games

of trust and reciprocation have begun to appear (Kevin McCabe et al., 2001), and they confirm the significance of these games as social situations, in which behavior is determined to a substantial extent by motives other than profit.

A considerable amount of evidence, drawn from two-person games and from public-goods experiments, suggests that many people, at least in the Western culture, start out trusting and benevolent and reciprocate both good and bad behaviors. This propensity for reciprocity has been studied both empirically and theoretically (Ernst Fehr and Simon Gächter, 2000). Many people also have a propensity to punish, even at some costs to themselves, misbehaviors of one stranger toward another stranger. An important theoretical discovery is that the presence of a sufficient number of individuals with these motives in a population will turn individuals who do not have the same motives into apparent cooperators (Fehr et al., 2002).

The experimental and theoretical studies of selfishness that some economists have conducted represent a general advance for social science. They also represent a significant move in economics, beyond the model of economic agents that Amartya Sen (1977) famously labeled "rational fools." Some of the agents in Fehr's models are "opportunistic with guile" (Oliver Williamson, 1985), but their behavior is strongly constrained by the fact that they are compelled to interact with people who care about being treated fairly and are willing to do something about it.

## II. Rationality

No one ever seriously believed that all people have rational beliefs and make rational decisions all the time. The assumption of rationality is generally understood to be an approximation, which is made in the belief (or hope) that departures from rationality are rare when the stakes are significant, or that they will disappear under the discipline of the market. This belief is not shared by everyone: some economists have

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questioned both the idea that small deviations from rationality do not matter (e.g., George Akerlof and Janet Yellen, 1985) and the idea that arbitrageurs will drive irrationality out of the marketplace (Andrei Shleifer, 2000). Their position, if accepted, increases the relevance of nonrational behavior in economic analysis.

The standard of rationality in economics was, and remains, the maximization of subjective expected utility—a combination of von Neumann-Morgenstern preferences and a Bayesian belief structure. There have been important challenges to this definition of rationality. Both Maurice Allais (1953) and Daniel Ellsberg (1961) demonstrated preferences that violate expected-utility theory but have considerable normative appeal. A rich literature has developed in attempts to formulate a theory of rational choice that will legitimize the Allais and Ellsberg patterns of preferences. Herbert Simon (1955) introduced the concepts of satisficing and bounded rationality, which can be interpreted as defining a realistic normative standard for an organism with a finite mind.

In the mid-1980's Amos Tversky and I articulated a direct challenge to the rationality assumption itself, based on experimental demonstrations in which preferences were affected predictably by the framing of decision problems, or by the procedure used to elicit preferences (Tversky and Kahneman, 1986). We argued that the demonstrated susceptibility of people to framing effects violates a fundamental assumption of invariance, which has also been labeled extensionality (Kenneth J. Arrow, 1982) and consequentialism (Peter J. Hammond, 1989). Unlike the paradoxes of expected-utility theory, violations of invariance cannot be defended as normative. Furthermore, these violations are not restricted to the laboratory. The labeling of taxes is an obvious example of framing (Ed J. McCaffery, 1994). The power of default options is another. Brigitte C. Madrian and Dennis F. Shea (2001) reported that the enrollment rate in 401(k) plans is close to 100 percent when enrollment is automatic, but if action is required to enroll, only about half the employees will join the plan within their first year of employment. The cost of the activity is hardly sufficient to rationalize this behavior.

The various questions that have been raised about the rationality assumption appear to have

legitimized and encouraged the development of economic theories that model departures from economic rationality in specific contexts. There have been quite a few of those, including the following:

- (i) a stock market in which all traders believe they are above average (Terrence Odean, 1998);
- (ii) a stock market in which traders are myopic and loss-averse (Shlomo Benartzi and Richard Thaler, 1995);
- (iii) a market in which traders are too quick to jump to conclusions (Matthew Rabin, 2003);
- (iv) models in which discounting is quasi-hyperbolic (David Laibson, 1997);
- (v) models in which self-control is an acknowledged problem (Thaler and Hershey Shefrin, 1981).

But the rationality model continues to provide the basic framework even for these models, in which the agents are "fully rational, except for ..." some particular deviation that explains a family of anomalies.

### III. Unchanging Tastes and the Carriers of Utility

Economists are thoroughly habituated to the sight of indifference maps, but for someone who has been trained as a psychologist they can be a source of puzzlement. It took me a long time to realize that the representation looked odd because I kept looking for an indication of the individual's current position in the map. There is no such indication, of course, because this parameter is supposed to be irrelevant: preferences for final states of endowment are assumed to be stable over variations of current endowment. This assumption, called *reference-independence* by Tversky and Kahneman (1991) is the interpretation of unchanging tastes with which I am concerned here. As I will show below, reference-independence can also be viewed as an aspect of rationality.

The assumption of reference-independence (or, equivalently, the idea that final states of endowment are the carriers of utility) has a long history in the theoretical analysis of decision-making under risk. Modern decision theory

traces its origins to the famous St. Petersburg essay in which Daniel Bernoulli (1738) formulated the original version of expected-utility theory. Bernoulli's decision-maker values financial outcomes as states of wealth and orders options by the expected utility of these states. The model incorporates an assumption of fixed tastes, because the utility of states of wealth does not depend on current endowment. This assumption has been retained in all subsequent versions of expected-utility theory.

An important article by Matthew Rabin (2000; see also Rabin and Thaler, 2001) showed that attitudes to wealth cannot explain the levels of risk aversion observed when the stakes are low. Rabin developed a method that permits inferences of the following kind (Rabin and Thaler, 2001 p. 222): "Suppose, for instance, we know that a risk-averse person turns down 50-50 lose-\$100-or-gain-\$105 bets for any lifetime wealth level less than (say) \$350,000, but know nothing about his or her utility function for wealth levels above \$350,000, except that it is not convex. Then we know that from an initial wealth level of \$340,000 the person will turn down a 50-50 bet of losing \$4,000 and gaining \$635,670." Most people will reject the small bet, and most will find it absurd to reject the large bet. Attitudes to wealth cannot explain these preferences.

If Bernoulli's formulation is so transparently incorrect as a descriptive model, why has it been retained for so long? The answer may well be that the assignment of utility to wealth is an aspect of rationality. The following thought experiment illustrates the point.

*Two persons get their monthly report from a broker:*

*A is told that her wealth went from 4M to 3M;*

*B is told that her wealth went from 1M to 1.1M.*

*Which of the two individuals has more reason to be satisfied with her financial situation?*

*Who is happier today?*

In Bernoulli's analysis only the first of these questions is relevant, and only the long-term consequences matter. The wealth frame fits a standard of mature reasonableness. But

a theory of choice that completely neglects the short-term emotions associated with gains and losses is bound to be psychologically unrealistic.

Prospect theory (Kahneman and Tversky, 1979) was offered as a descriptive model of risky choice in which the carriers of utility are not states of wealth, but gains and losses relative to a neutral reference point.<sup>1</sup> The most distinctive predictions of the theory arise from a property of preferences called *loss-aversion*: the response to losses is consistently much more intense than the response to corresponding gains, with a sharp kink in the value function at the reference point. Unlike a reasonable Bernoulli agent, a loss-averse decision-maker will always reject a single 50-50 bet to lose \$100 or win \$105. Estimates of the coefficient of loss aversion (the ratio of slopes in the negative and positive domains) converge on a value of about 2 (Tversky and Kahneman, 1992).

The idea of loss-aversion was first extended to riskless choice by Thaler (1980), who used it to explain the endowment effect—the now well-documented discrepancy between willingness-to-pay and willingness-to-accept for the same good. Other implications were explored by Kahneman et al. (1991) and by Tversky and Kahneman (1991), and in several sources collected by Kahneman and Tversky (2000). Reference-dependence and loss-aversion are both involved in the sharp distinction that most people draw between opportunity costs and losses. Among many other phenomena, the relative neglect of opportunity costs explains target-income behavior by New York cab drivers, who stop work earlier on rainy days, when their opportunities are best (Colin Camerer et al., 1997). Loss-aversion contributes to stickiness in markets, because loss-averse agents are much less prone to exchanges than final-states agents. In experiments in which some randomly chosen participants were endowed with a consumption good and allowed to trade it, the volume of trade was about half of the amount expected from standard economic theory (Kahneman et al., 1990). Loss-aversion for

<sup>1</sup> Habit-formation models incorporate similar ideas, in a format that many economists will find more congenial.

the consumption good was involved, because exchanges of money tokens in the same institution conformed quite precisely to the standard analysis. Not all exchanges involve loss-aversion. For example, there is little reluctance to trade a five-dollar bill for five singles, and aversion to giving up goods is unlikely to affect the merchant who exchanges a pair of shoes for cash (Tversky and Kahneman, 1991). But the drying up of sales in real-estate markets that have experienced declining prices illustrates an unwillingness to accept losses relative to an existing reference price (David Genesove and Christopher Mayer, 2001). The boundary conditions for loss-aversion are yet to be delineated with precision (Ian Bateman et al., 1997).

The rules of fairness that embody a regard for loss-aversion also induce stickiness in markets. For example, cutting the wage of an employee is considered unfair even when the employee could easily be replaced at a lower pay. In general, imposing losses on others is considered unfair under conditions where failing to share gains is entirely acceptable (Kahneman et al., 1986). The asymmetry between losses and foregone gains is recognized in many aspects of the law (David Cohen and Jack L. Knetsch, 1992).

Adaptation and the consequent shift in the reference point that separates gains from losses have been interpreted here as a common form of taste change. The ability of a decision-maker to anticipate such changes in tastes is an essential but often neglected aspect of rationality (James March, 1978). Reviewing the relevant literature, George Loewenstein and David Schkade (1999) concluded that people generally underestimate the extent of hedonic adaptation to new states. Hedonic and affective forecasts are susceptible to a substantial duration bias (Daniel Gilbert et al., 1998). Assistant professors, for example, greatly overestimate the effects of a tenure decision on their happiness a year later (Gilbert and Wilson, 2000). Failures of hedonic prediction are even common in the short term. The participants in a study reported by Kahneman and Jackie Snell (1992) showed little ability to anticipate how their enjoyment of a piece of music or a helping of their favorite ice cream would change over a period of eight daily epi-

sodes of consumption. Loewenstein and Daniel Adler (1995) showed that participants in an experiment underestimated the price that they would demand to part from an object, if they were asked the question before actually taking possession of it.

The evidence of grave deficiencies in taste prediction appears to pose a significant challenge to many applications of the rational-agent model. In particular, it is difficult to reconcile this evidence with the extraordinary feats of hedonic prediction that are assumed in theories that assume the rationality of the choice to become addicted (Gary Becker and Kevin Murphy, 1988). Perhaps more than any other, the rational-addiction model highlights the large gap that persists between the criteria of reasonableness that are applied to views of human motivation in the disciplines of economics and psychology.

An increased willingness of economists to consider subjective data is a salient development of recent years. The many applications of measures of happiness in economic research reviewed by Bruno Frey and Alois Stutzer (2002) included their own studies of the effects of democratic institutions, as well as research by others on the effects of inflation and unemployment (Alberto Alesina et al., 2001). An interest in the experienced utility of outcomes (Kahneman et al., 1997) is a natural side-effect of the willingness to consider agents who are less than fully rational. If these agents do not necessarily maximize the quality of their outcomes, then choice is no longer the sole relevant measure of utility. This idea, if accepted, could have implications for many domains of economic analysis.

#### IV. Will the Gap Close Further?

Much has happened in the conversation between economics and psychology over the last 25 years. The church of economics has admitted and even rewarded some scholars who would have been considered heretics in earlier periods, and conventional economic analysis is now being done with assumptions that are often much more psychologically plausible than was true in the past. However, the analytical methodology of economics is stable, and it will inevitably

constrain the rapprochement between the disciplines. Whether or not psychologists find them odd and overly simple, the standard assumptions about the economic agent are in economic theory for a reason: they allow for tractable analysis. The constraint of tractability can be satisfied with somewhat more complex models, but the number of parameters that can be added is small. One consequence is that the models of behavioral economics cannot stray too far from the original set of assumptions. Another consequence is that theoretical innovations in behavioral economics may be destined to be noncumulative: when a new model is developed to account for an anomaly of the basic theory, the parameters that were modified in earlier models will often be restored to their original settings. Thus, it now appears likely that the gap between the views in the two disciplines has been permanently narrowed, but there are no immediate prospects of economics and psychology sharing a common theory of human behavior.

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