

unbounded willpower, and unbounded selfishness—all of which behavioral economics modifies.

The standard economic model of human behavior includes three unrealistic traits—unbounded rationality,

Behavioral economics has also been applied to intertemporal choice. Intertemporal choice behavior is largely inconsistent, as exemplified by George Ainslie's hyperbolic discounting (1975) which is one of the prominently studied observations, further developed by David Laibson, Ted O'Donoghue, and Matthew Rabin. Hyperbolic discounting describes the tendency to discount outcomes in near future more than for outcomes in the far future. This pattern of discounting is dynamically inconsistent (or time-inconsistent), and therefore inconsistent with basic models of rational choice, since the rate of discount between time t and t+1 will be low at time t-1, when t is the near future, but high at time t when t is the present and time t+1 the near future.

Behavioral economics and finance theories developed almost exclusively from experimental observations and survey responses, although in more recent times real world data have taken a more prominent position. Functional magnetic resonance imaging (fMRI) allows determination of which brain areas are active during economic decision making. Experiments simulating markets such as stock trading and auctions can isolate the effect of a particular bias upon behavior. Such experiments can help narrow the range of plausible explanations. Good experiments are incentivecompatible, normally involving binding transactions and real money.

Three themes predominate in behavioral finance and economics:

- We will be the property of the property of
- Framing: The collection of anecdotes and stereotypes that make up the mental emotional filters individuals rely on to understand and respond to events.
- Market inefficiencies: These include mis-pricings, non-rational decision making, and return anomalies. Richard Thaler, in particular, has described specific market anomalies from a behavioral perspective.

Models in behavioral economics typically address a particular market anomaly and modify standard neo-classical models by describing decision makers as using heuristics and subject to framing effects. In general, economics continues to sit within the neoclassical framework, though the standard assumption of rational behavior is often challenged.

Heuristics

- Prospect theory
- Loss aversion
- Disappointment
- Status quo bias
- Gambler's fallacy
- Self-serving bias
- Money illusion

Framing

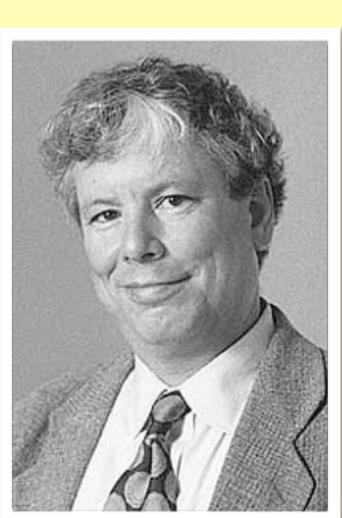
- Cognitive framing
- Mental accounting

Anomalies (economic behavior)

- Disposition effect
- Endowment effect
- Inequity aversion
- Reciprocity
- Intertemporal consumption
- Present-biased preferences
- Momentum investing
- Greed and fear
- Werd behavior
- Sunk-cost fallacy

Anomalies (market prices and returns)

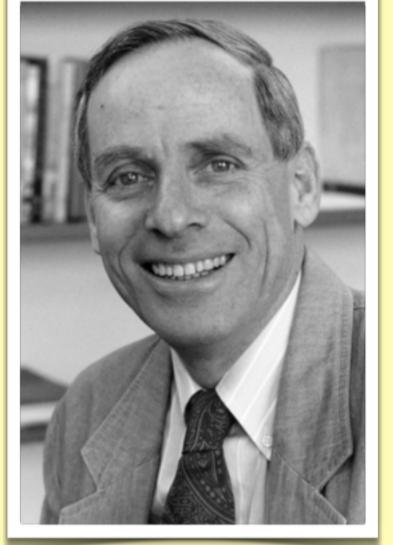
- Equity premium puzzle
- Efficiency wage hypothesis
- Price stickiness
- Limits to arbitrage
- Dividend puzzle
- Fat tails
- Calendar effect



Richard Thaler 1945-)

is an American economist and the Ralph and Dorothy Keller Distinguished Service Professor of Behavioral Science and Economics at the University of Chicago Booth School of Business. He is perhaps best known as a theorist in behavioral finance, and for his collaboration with Daniel Kahneman and others in further defining that field. Thaler has written a number of books intended for a lay reader on the subject

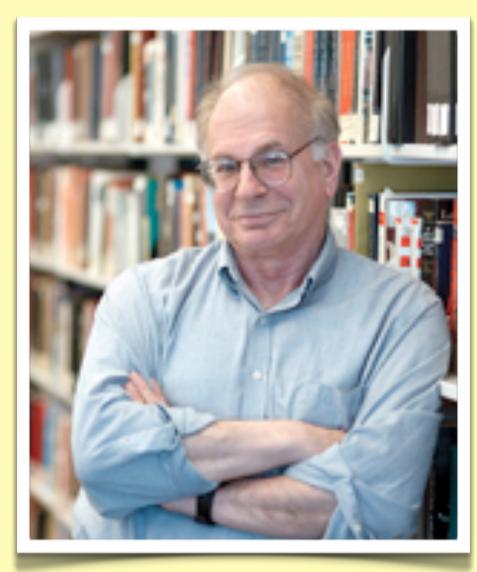
of behavioral finance, including Quasi-rational Economics and The Winner's Curse, the latter of which contains many of his Anomalies columns revised and adapted for a popular audience. His recurrent theme is that market-based approaches are incomplete: he is quoted as saying "conventional economics assumes that people are highlyrational - super-rational - and unemotional. They can calculate like a computer and have no self-control problems"



Amos Tversky (1937-1996)

was a cognitive and mathematical psychologist, a pioneer of cognitive science, a longtime collaborator of Daniel Kahneman, and a key figure in the discovery of systematic human cognitive bias and handling of risk. Much of his early work concerned the foundations of measurement. He was co-author of a three-volume treatise, Foundations of Measurement (recently reprinted). His early work with Kahneman focused on the

psychology of prediction and probability judgment. Amos Tversky and Daniel Kahneman worked together to develop prospect theory, which aims to explain irrational human economic choices and is considered one of the seminal works of behavioral economics. Six years after Tversky's death, Kahneman received the 2002 Nobel Prize in Economics for the work he did in collaboration with Amos Tversky



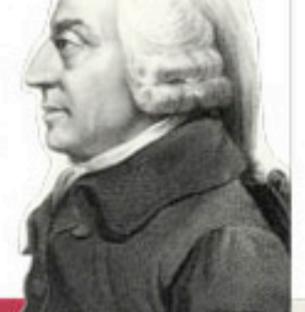
Daniel Kahneman (1934-)

is an Israeli-American psychologist and Nobel laureate. He is notable for his work on the psychology of judgment and decision-making, behavioral economics and hedonic psychology. With Amos Tversky and others, Kahneman established a cognitive basis for common human errors using heuristics and biases (Kahneman & Tversky, 1973; Kahneman, Slovic & Tversky, 1982; Tversky & Kahneman, 1974), and developed prospect theory (Kahneman & Tversky, 1979). He was awarded the 2002 Nobel Memorial Prize in Economics

for his work in prospect theory.

Kahneman and Tversky both became heavily involved in the development of this new approach to economic theory, and their involvement in this movement had the effect of reducing the intensity and exclusivity of their earlier period of joint collaboration. Although they would continue to publish together until the end of Tversky's life, their years of near-exclusive collaboration were coming to an end.

Although Adam Smith's thinking has shaped the popular conception of humans as homo economicus—a species that makes rational economic decisions—the great economist's lesser-known work, The Theory of Moral Sentiments, acknowledges that flawed human psychology affects economic decisions. Yet for a century and a half, few researchers took up this insight.

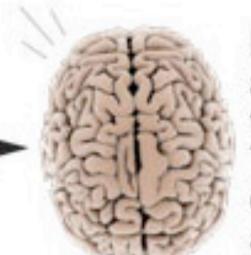


At a time of financial dynamism and then upheaval in the United States, a handful of economists, including Irving Fisher and Vilfredo Pareto, begin to write about the human factor in economic decision-making.

1920s and 1930s 1955

Maverick psychologist Herbert Simon suggests the concept of "bounded rationality," wherein humans are not perfect processors of information, as classical economics had assumed. Dismissed by many of his peers at the time, Simon later wins a Nobel Prize in economics in 1978.

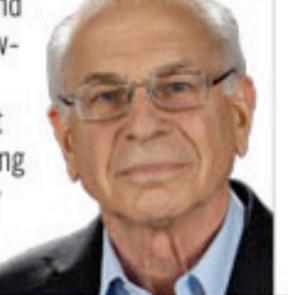
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1960s

Researchers begin to view the brain as a processor of information, rather than only a responder to stimuli. This insight opens new doors to combining the fields of psychology and economic decision-making.

Star psychologists Amos Tversky and Daniel Kahneman publish their nowfamous paper, "Prospect Theory," positing that the framing of different options is as important in determining how decisions are made as the very options themselves.



A pivotal conference at the University of Chicago is the first major academic event to focus specifically on behavioral economics, bringing together economists, psychologists, and sociologists.

1979

1986

Economists Hersh Shefrin and Richard Thaler introduce a "behavioral life-cycle" model of savings. People do not calculate their savings and spending rates so as to maintain a constant level of consumption throughout their lives. Instead, they find, humans prefer immediate gratification.



David Laibson becomes the first professor to be hired by a university (Harvard) specifically for behavioral economics.

The Quarterly Journal of Economics devotes an entire issue to behavioral economics.



1988

1994 1999

Economist Terrance Odean suggests that high trading volumes are largely due to the overconfidence of traders. Absent human emotion, it is difficult to see why anyone would logically want to buy a stock from someone willing to sell it to them.

The Federal Reserve Bank of Boston invites academics to a conference in hopes of garnering wisdom from the field of behavioral economics, whose profile is fast growing.

Money magazine christens Nudge: Improving Decisions About Health, Wealth, and Happiness—a bestseller by law professor Cass Sunstein and economist Richard Thaler—as the "movement's intellectual spearpoint.

An op-ed in St. Paul, Minnesota's Pioneer Press concludes: "Only Winner in Madoff's Scheme: Behavioral Economics."



1999

2003

2008

December 2008