

BEHAVIORAL ECONOMICS

A History

Floris Heukelom



Behavioral Economics: A History

FLORIS HEUKELOM

Radboud University Nijmegen, Netherlands



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32 Avenue of the Americas, New York, NY 10013-2473, USA

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www.cambridge.org

Information on this title: www.cambridge.org/9781107039346

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First published 2014

Printed in the United States of America

A catalog record for this publication is available from the British Library.

Library of Congress Cataloging in Publication Data
Heukelom, Floris, 1978–

Behavioral economics : a history / Floris Heukelom, Radboud University,
Nijmegen, Netherlands.

pages cm. – (Historical perspectives on modern economics)

Includes bibliographical references and index.

ISBN 978-1-107-03934-6 (hardback)

1. Economics – Psychological aspects. I. Title.

HB74.P8H48 2014

330.01'9 – dc23 2013027829

ISBN 978-1-107-03934-6 Hardback

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BEHAVIORAL ECONOMICS: A HISTORY

This book presents a history of behavioral economics. The recurring theme is that behavioral economics reflects and contributes to a fundamental reorientation of the epistemological foundations on which economics had been based since the days of Smith, Ricardo, and Mill. With behavioral economics, the discipline has shifted from grounding its theories in generalized characterizations to building theories from behavioral assumptions directly amenable to empirical validation and refutation. Central in this reorientation is the adoption of a normative-descriptive framework at the expense of economists' traditional positive-normative distinction. The book proceeds chronologically and takes the reader from von Neumann and Morgenstern's axioms of rational behavior, through the incorporation of rational decision theory in psychology from the 1950s through the 1970s and to the creation and rise of behavioral economics in the 1980s and the 1990s at the Sloan and Russell Sage Foundations.

Floris Heukelom is Assistant Professor of Economics, Radboud University Nijmegen. He specializes in the use of the experiment in twentieth-century economics and psychology. He has published in *Science in Context*, the *Journal of the History of the Behavioral Sciences*, *History of Political Economy*, and the *Journal of Economic Methodology*, among others.

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*To Marielle,
Kiki, & Pepijn*

Acknowledgments

From vigilant supervisors of the PhD thesis (2008) that lies at the basis of the present book, John Davis and Harro Maas became professional colleagues. This book owes much, if not everything, to them, and I feel proud to now count them among my friends. It is similarly difficult to overestimate the support of Jan Peil, Esther-Mirjam Sent, and Radboud University Nijmegen. By offering me a permanent position they provided the predictability of a stable job that allowed me to complete this project.

It seems impossible to thank all the individual members of the intellectual community of History of Economics in particular in which this book and its content were conceived, tested, challenged, and many times rewritten, so perhaps I may be forgiven for only thanking explicitly those who commented on the manuscript at various stages (in addition to the four above): Roger Backhouse, Mark Blaug[†], Marcel Boumans, Beatrice Cherrier, Annie Cot, Till D ppe, Ross Emmett, Philippe Fontaine, Craufurd Goodwin, Wade Hands, Klaas Landsman, Robert Leonard, Tiago Mata, Steve Medema, Phil Mirowski, Malcolm Rutherford, Andrej Svorencik, Roy Weintraub, and Carlo Zappia.

Furthermore, this book would not have been possible without the help of archivists at the various archives consulted. In particular, I would like to thank Rockefeller Archive Center's Amy Fitch, who not only keenly noted I might be interested in those unorganized boxes of Sloan/Sage behavioral economics material that had come in two days prior to my visit, but who also made me aware of a RAC grant-in-aid, with which I was subsequently able to study the files in those boxes more carefully.

A number of protagonists of my story were kind to answer queries by email, or in longer face-to-face interviews, including William Baumol, Robyn Dawes, Gerd Gigerenzer, Lyle Jones, Daniel Kahneman, David Krantz, George Loewenstein, James March, Robert Pachella, Stephen

Richards, Timothy Taylor, Richard Thaler, Barbara Tversky, and Eric Wanner. Dave Krantz may not have realized how much his enthusiasm to openly discuss mathematical psychology's early history at the University of Michigan and his permission to draw on his correspondence with Amos Tversky advanced my understanding of this period and topic. Similarly, I cannot but admire and deeply thank Eric Wanner's willingness to extensively discuss the history of the Sloan/Sage behavioral economics project, and to make available its archival records.

As the editors of Cambridge University Press, Craufurd Goodwin, Scott Parris, and Kristin Purdy courageously accepted my idea to publish a book on the history of behavioral economics and devised a reviewing process that turned my manuscript into a book. I would like to sincerely thank the three anonymous reviewers for the innumerable helpful suggestions and comments they offered, but at least as importantly also because of the triangulation of perspectives they offered, which in a way made me read my own manuscript.

The material in this book relies on a number of articles I have previously published. Chapter 3 is an extended and amended version of "Measurement and Decision Making at the University of Michigan in the 1950s and 1960s." *Journal of the History of the Behavioral Sciences* (2010), 46(2): 187–205. Parts of Chapter 4 draw on parts of "Three Explanations for the Kahneman-Tversky Programme of the 1970s." *The European Journal of the History of Economic Thought* (2012), 19(5): 797–828. Chapter 5 combines and extends "What to Conclude from Psychological Experiments: The Contrasting Cases of Experimental and Behavioral Economics." *History of Political Economy* (2011), 43(4): 649–682; as well as "A Sense of Mission – The Alfred P. Sloan and Russell Sage Foundations Behavioral Economics Program, 1984–1992." *Science in Context* (2012), 25(2): 263–283. Chapter 6 draws on "Building and Defining Behavioral Economics." *Research in History of Economic Thought and Methodology* (2011), 29: 1–29.

While writing this book I fell in love with Marielle and became the proud father of Kiki and Pepijn. It is to them I dedicate this book.

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Introduction

In economics, the market has been understood to steer behavior toward a competitive equilibrium in which all economic actors behave optimally and in which welfare of society is maximized. Yet many economists have also seen shortcomings to this ideal picture of the market in the forms of limited information, too few buyers or sellers, adverse selection, moral hazards, and other caveats. What psychologists Daniel Kahneman and Amos Tversky brought to economics in the 1980s was the idea that imperfections in the market may, in addition, be caused by fallible human behavior. This resulted in a new branch of economics called behavioral economics, and it won Kahneman the Nobel Memorial Prize in Economics in 2002 (Tversky died in 1996). This book presents a history of behavioral economics.

The common rationale of behavioral economics in the 1980s through the 2000s was in one version or another that “[b]ehavioral economics increases the explanatory power of economics by providing it with more realistic psychological foundations” (Camerer and Loewenstein, 2004, p. 3). This definition conceals a complicated relationship between economics and psychology that goes back at least to the eighteenth century. In addition, it suggests that economics and psychology are stable, universal entities. But the label of behavioral economics itself also seems odd. If economics deals with the behavior of individuals in the economy, “behavioral economics” seems a confusing pleonasm. If, on the other hand, one argues that economics by definition deals with structures and institutions superseding and being independent of theories of human behavior, “behavioral economics” seems oxymoronic. In any case, it calls for some explanation.

In the late eighteenth and early nineteenth centuries of Adam Smith and David Ricardo, the purpose of an economy was understood to be the production of *Wealth of Nations* (the title of Smith’s famous book of 1776).

Philosophically, this wealth of nations was argued to be roughly equal to the utility of utilitarianism, as first advanced by Jeremy Bentham around the same time. The objective of the nation's rulers, then, was (or should have been) to increase the wealth or utility of the nation. By exploring the functioning of the economy, (political) economists' objective was to set out how rulers could do so.

Expositions by economists of the working of the economy were based on what were called, principles, doctrines, or premises. These principles partly characterized the economic system, such as Ricardo's famous "true doctrine of rent," which characterized rent as only a remuneration for land and not for capital in the form of fences or buildings that may have been erected on the land. Other principles or doctrines, however, characterized the behavior of individuals in the economy. Examples included the pursuit of wealth and an aversion to labor.

It will be no surprise that questions were raised about how these principles of human behavior in the economy were established and about how they related to other philosophical or scientific investigations of human behavior. The answer by the revolutionary triad of William Stanley Jevons, Carl Menger, and Leon Walras in the 1870s was to redefine Bentham's concept of utility from a measure of the wealth of a nation into a measurement of the mental state of a hedonistic economic subject. Thus, utility was no longer a relatively vague and general concept for the wealth of a nation as a whole, but was an empirical measurement of pleasure derived by individuals. Jevons in particular advanced psychophysics as the means to provide the scientific basis for this reinterpretation of utility. Only ten years earlier, in the 1860s, the new field of psychophysics had risen from work by Gustav Fechner, Ernst Weber, and Wilhelm Wundt and had aimed to base all claims regarding human behavior and the human mind in empirical, and preferably experimental research (as opposed to philosophical speculation). The so-called marginalist revolution of Jevons, Menger, and Walras thus grounded economics explicitly in psychology.

That, however, was merely the start of discussions. One fundamental problem was that it was very difficult to measure this psychophysical utility individuals derive from their economic behavior. What was possible for psychophysicists' carefully controlled experiments with weights and balances, proved impossible in economics. A solution to these methodological difficulties that seemed fruitful for a while was the indifference curve analysis advanced by Francis Ysidro Edgeworth from the 1880s onward. The indifference curve is the idea that between two available goods there are combinations of different quantities of the two goods between which the

individual is indifferent. For instance, the individual may be indifferent about (a) two glasses of beer and one glass of wine and (b) one glass of beer and two glasses of wine. The curve that connects all combinations of glasses of beer and glasses of wine between which the individual is indifferent is called the indifference curve. In the end, however, it proved equally difficult to find a proper method to construct indifference curves from the data of the economy and economic behavior at hand, so that by the mid-1930s indifference curves were also finally disbanded as incapable of providing a solid scientific foundation for economics.

As sixty years earlier, psychology seemed to offer a solution, this time in the form of behaviorism. Behaviorism was a scientific program developed by John Broadus Watson, Burrhus Frederick Skinner and others, which reigned in U.S. psychology in the 1920s and 1930s. Behaviorism argued that all human behavior is only a response to external stimuli (present and past) and, hence, that all behavior can be explained by relating observed behavior to stimuli that the individual is and has been exposed to. In consequence, all references to internal states of mind were redundant.

Inspired by behaviorism, Paul Samuelson argued from the late 1930s onward that also in economics only observed behavior by individuals should be used as a basis for scientific reasoning. Samuelson's new theory of "revealed preference" assumed that in economic equilibrium, individuals choose what they prefer and, hence, that the preferences inside their minds could be inferred (i.e., revealed) by the economic choices they make. Thus, revealed preference argued that all references to internal (i.e., psychological) states of mind were unnecessary and that economics had nothing to do with the discipline of psychology insofar as it investigated or relied on internal states of mind. This theory of revealed preference would be the most influential account of human behavior in economics during the following decades.

In all this, use of the concepts of "behavior" or "behavioral" in histories predating the Second World War is, of course, an anachronism. Behavior as a concept encapsulating all acts of the human being – and, more controversially, of the animal being – originates in the United States of the early twentieth century. Subsequently, this new concept of behavior provided the basis for the label of the new development in psychology baptized behaviorism. It was around World War II that behavior's adverbial conjugation *behavioral* was introduced in relation to "science" and "economics." As early as 1943, Clark Hull from Yale University spoke about "the behavioral (social) sciences" in his *Principles of Behavior* (Senn, 1966; Berelson, 1968, Pooley, forthcoming). Yet, it was only after James Miller created the Committee on

the Behavioral Sciences at the psychology department of the University of Chicago in 1949 and the Ford Foundation's Behavioral Science Program was created in 1951 that the term became widely used, albeit from the start in different ways by its different users.

The use of *behavioral economics*, then, was initially popularized at the University of Michigan's Institute of Social Research in the late 1940s, where George Katona understood behavioral economics as investigating economic behavior, that is, as the subclass of behavior produced in the course of the agent's activities in the economy. Other users of the adverb *behavioral* included Ward Edwards, also at the University of Michigan, who, starting in the late 1950s, employed it as the name of his branch of operations research called behavioral decision research, and Herbert Simon, who in the 1950s and 1960s advanced what he labeled behavioral economics as an alternative to the dominant neoclassical school in economics. Later the label of behavioral economics was picked up by economists who sought to reform the dominant neoclassical view of the day along the lines set out by Simon. But much more visibly, *behavioral economics* was appropriated by Daniel Kahneman, Richard Thaler, and Eric Wanner in the newly created behavioral economics program at the Alfred P. Sloan foundation in 1984.

In addition, the brief introduction thus far already suggests that economics and psychology are not the stable and well-circumscribed entities that the rationale of behavioral economics wants them to be. For instance, Samuelson's revealed preference embraced psychologists' new theory of behaviorism but at the same time denounced psychology as explaining inner states of mind. More generally, Dorothy Ross (2003), among others, has reminded us that the disciplines recognized in the twentieth century as different scientific projects, based on the methods used, questions asked, and theories advanced, emerged from older branches of knowledge by a process of negotiation and separation between overlapping areas of interest.

But even in the twentieth century, the boundaries between economics, psychology, and the other social and human sciences have not been stable and well defined. For instance, judged by received training, noneconomists who have won the Nobel Memorial Prize in Economics besides Kahneman, include political scientist Simon, and a whole range of physicists and engineers, including in-between cases such as Vernon Smith, who received a BA in electrical engineering and an MA and a PhD in economics. Or consider Colin Camerer, currently one of the leading behavioral economists,

who holds a PhD in behavioral decision research. The same is true for psychology. Foremost postwar mathematical psychologists, such as R. Duncan Luce, Patrick Suppes, and David Krantz, received degrees in engineering or mathematics before migrating to psychology. In addition, these postwar scientists were labeled economists or psychologists flexibly and depending on the occasion. Conditional on the situation, Simon called himself a political scientist, an economist, a psychologist, and a mathematician. Mathematician Jimmie Savage has been claimed to be an important economist by economists and to be an important psychologist by psychologists.

Even on the level of individual publications, the standard divisions are problematic. John von Neumann and Oskar Morgenstern's *Theory of Games and Economic Behavior* (2004 [1944]) has been described as a major contribution to their field by economists, psychologists, biologists, and mathematicians. Mathematical psychologists Krantz, Luce, Tversky, and Suppes conceived their three-volume *Foundations of Measurement* (1971, 1989, 1991) to extend the work of economist Gérard Debreu. However, at the same time, they described it as a contribution to the empirical sciences in general, that is, to physics, economics, psychology, and others, and thus as a contribution to the "methodology" of science. Although it has been fundamentally ingrained in twentieth-century science, the distinction between the different disciplines that scientists have employed has been anything but stable or clearly defined.

A second reason for the problematic nature of the division between psychology and economics is that if there is one constant in economics and psychology it has been the attempt to cross the alleged boundary between the two disciplines and to make this boundary disappear. For instance, attempts to unify the behavioral and social sciences in the United States have been a constant theme in the National Science Foundation's recurring reports from committees on Basic Research in the Behavioral and Social Sciences. Or consider the case of behavioral psychology. In the late 1950s, Ward Edwards created behavioral decision research, a new field in psychology that applied economic theories to psychological problems. Three decades later, Kahneman and Tversky introduced an adjusted Edwards program into economics. Another example is Simon. He tried to use the insights he gained originally in political science to alter economic theorizing, which eventually led him to produce a new theory in psychology. And the well-known 1952 Santa Monica conference on "The Design of Experiments in Decision Processes," organized by mathematician Robert Thrall and

psychologist Clyde Coombs is often cited as a major event in the history of game theory in economics, in the history of mathematical psychology, and in the history of experimental economics. As much as the division between economics and psychology has been a recurring preoccupation of economists in particular, so has the crossing and dissolving of the boundary been a constant.

Yet, despite the convoluted history of economics and psychology, and of the constant attempts to cross and dissolve the economics-psychology boundary, we should not throw economics and psychology aside as accidental labels of overlapping or indistinguishable scientific projects. Despite all the nuances that may be cited, economics and psychology are useful categories subsuming contrasting scientific traditions. A main line of argument running through this book is that to understand the history of behavioral economics, the difference between the epistemologies of economics and psychology, in particular, is crucial.

Economists from Adam Smith until at least those in the 1960s predominantly constructed their theories on what were alternatively called principles, characterizations, premises, or assumptions of economic behavior. We could call this an epistemology of generalized characterizations. These generalized characterizations were part of an interpretation of economics that sharply distinguished positive claims of the economy from normative value judgments regarding the economist's preferred economic policy. By contrast, the discipline of psychology that commenced in the 1860s with the work of Fechner, Wundt, and others was firmly grounded in an epistemology of directly refutable empirical claims. This epistemology provided the guidelines for conducting scientific, that is, descriptive psychology, within a widely employed normative-descriptive distinction. The psychologist would set up the experiment and determine the, say, brightness of two lightbulbs. Therefore, the brightness of the lamp bulbs formed the objectively given, that is the normative stimuli. Subsequently, the experimental subject's individual sensation of the relative brightness constituted the descriptive output of the experiment. The focal point of the behavioral economics that Kahneman and Thaler created in the 1980s was the replacement of economists' epistemology of generalized characterizations with the epistemology of directly refutable empirical claims of the psychologists. This was expressed by behavioral economists as an urge to trade economists' positive-normative distinction for psychologists' normative-descriptive dichotomy.

To understand how behavioral economists from the early 1980s onward sought to shift the main epistemological orientation in economics from

generalized characterizations to directly refutable empirical claims, we first need to appreciate the difference between the economic and the experimental psychological way of dealing with individual behavior as they carried over from nineteenth-century Europe to twentieth-century United States. These two different views became particularly clear when they clashed, as they did in psychologist Thurstone's attempt to experimentally test economists' indifference curve and in economists Friedman and Wallis's rebuttal of Thurstone's psychological experiments. Second, we need to go back to von Neumann and Morgenstern's *Theory of Games and Economic Behavior* (2004 [1944])¹ and its approach of basing social theory on behavioral axioms. In particular, we need to understand how von Neumann and Morgenstern's subtle view of the nature of the behavioral axioms upon which their theory of games was constructed related to the psychological and economic conceptions of human behavior. The brief introduction of these backgrounds constitutes the first chapter.

After the publication of the *Theory of Games and Economic Behavior* followed a period of some ten years during which economists, psychologists, and mathematicians discussed the interpretation of the behavioral axioms and the possible application of the axioms in their respective fields of research. Chapter 2 reconstructs the discussions between a number of main protagonists, and discusses in some detail the Savage–Maurice Allais dispute, which, in retrospect, constitutes the most relevant debate of this period. Subsequently, the second chapter shows which two interpretations along disciplinary lines the different discussions settled around in the mid-1950s and what the main distinction between the psychological and economic interpretations was.

The different incorporations of the von Neumann-Morgenstern axioms by psychologists and economists sowed the seeds for the criticisms of psychologists Daniel Kahneman, Amos Tversky, Paul Slovic, Sarah Lichtenstein, and, later, the behavioral economists. But it cannot be emphasized enough how different the psychological approach was from the economic approach. The third chapter shows how mathematical psychology and behavioral decision research of the 1950s and 1960s considered the axioms, and theories of decision making generally, to constitute two sides of the same coin. The axioms provided the foundations for a theory of measurement – as all measurement in the end is a decision by

¹ The first edition was published in 1944. References here are to the 2004 reprint of the second edition (1947).

human beings about which of two values is brighter, higher, larger, and so on – and a psychological theory of rational decision making by human beings.

This psychological program ran into problems when it turned out that behavior by human beings in experiments often systematically deviates from the normative theory. It invalidated not only the axioms as descriptions of rational behavior but also the measurement theory that lay at the basis of investigating experimentally decisions by individuals. This was the problem Tversky struggled with in the late 1960s. The fourth chapter discusses Tversky's work of the late 1960s and, based on an exposition of Kahneman's research of the 1960s, shows which solution Kahneman's research suggested for the problem with which Tversky was struggling. This fruitful integration formed the basis of their collaborative research of the 1970s, which is subsequently set out. Chapter 4 concludes by offering three explanations for Kahneman and Tversky's impact on psychologists and economists.

Yet Kahneman and Tversky's appealing theoretical stance and engaging rhetoric was received in different ways among economists. Chapter 5 argues that two main economic responses may be distinguished. Experimental economists working in the tradition of Vernon Smith accepted the experimental evidence of the psychologists, but took it as only emphasizing further the importance of the mechanism of the market in steering initially fallible behavior of economic agents to a competitive equilibrium. By contrast, a number of finance-oriented economists, led by Richard Thaler, accepted the Kahneman-Tversky program and started applying it to economic questions and to economic theory. Their main vehicle was psychologists' normative-descriptive distinction of human decision making that originated in experimental psychology and in the work of mathematician Savage. Although not completely incompatible, experimental economics and behavioral economics nevertheless constitute two very different ideas of what economics is and of how it relates to psychology. The latter group received a vital boost from the behavioral economics program started in 1984 at the Alfred P. Sloan Foundation and later at the Russell Sage Foundation under the directorship of Eric Wanner.

The sixth and final chapter shows that the conceptual and epistemological redefinition of economics Thaler took over from psychologists Kahneman and Tversky determined the boundaries within which behavioral economics would develop. Subsequently, Chapter 6 describes the most salient developments within behavioral economics of the 1990s and 2000s. More