one should pay close attention to how one models negotiation situations. The results are either a unique equilibrium with immediate and efficient agreement or multiplicity of equilibria where a lot can happen. The author concludes with a motivated and stimulating view of the direction bargaining theory could be heading. Abandoning rationality to incorporate experimental evidence and psychological factors seems a challenging but difficult road to take.

To conclude, despite the reported minor omissions, this book successfully synthesizes a large part of the vast game-theoretic literature on bargaining. Its scope is somewhat narrow, but this is more than compensated for by a clear analysis of great depth. Furthermore, the book is very clearly written and logically ordered, and it skillfully addresses many complicated topics. This book provides a very good survey of the literature and is suitable for a course on bargaining theory for (under)graduates. It contains a large number of nice applications and should be compulsory reading for economists and political scientists who want to become familiar with this field.

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D Microeconomics

Utility of Gains and Losses: Measurement-Theoretical and Experimental Approaches. By R. Duncan Luce. Mahway, N. J. and London: Lawrence Erlbaum, 2000. Pp. 331. ISBN 0–805–83460–5. *JEL 2001–0051*

In recent decades, economists have become increasingly aware that the model they traditionally use to model decision making under uncertainty, subjective expected utility, does not describe these decisions well. Psychologists have presented evidence that an important reason why people deviate from subjective expected utility is that choices are among increments (gains) or decrements (losses) of wealth and not among absolute amounts of wealth as subjective expected utility postulates. Inspired by these empirical findings, formal models have been developed, primarily by mathematical psychologists, that incorporate sign-dependence, i.e., the distinction between gains and losses. Duncan Luce is one of the main contributors to this new class of sign-dependent models. His latest book provides an overview of his current thinking.

There are at least two reasons why Luce's book should appeal to economists. First, psychologists have repeatedly shown that the distinction between gains and losses is important in such decision making under uncertainty. In particular, aversion to losses seems to do more to explain attitudes to risk than the traditional economic explanation, utility curvature. Notwithstanding this evidence, economists have largely ignored the impact of sign-dependence. Luce's book shows how it can be modeled and may help economists to build more descriptive models of economic behavior under uncertainty.

A second reason why Luce's book is important is that it is based on a different paradigm for decision making under uncertainty than the one traditionally adopted in economics. Economic analyses are typically based on the framework developed by Savage (1954) in "The Foundations of Statistics." As Luce points out, Savage's paradigm has some drawbacks, including its static nature and the impossibility of modelling certain empirical phenomena within it. These problems make Luce's paradigm more appropriate in some decision contexts, for example in repeated choices and the evaluation of multi-stage lotteries.

Chapter 1 describes Luce's paradigm for decision making under uncertainty, followed by a discussion of the meaning of preferences and the axiomatic approach to modeling them. Chapter 2 discusses a number of elementary choice principles, based on three distinct concepts of rationality. Chapter 3 focuses on numerical representations of gambles with two-gain outcomes. Evidence shows that in evaluating gambles people deal differently with the best and the worst possible outcome. Luce characterizes two models that reflect this rank-dependence. Rank-dependence implies that people do not evaluate probabilities linearly, as in subjective expected utility, but transform probabilities. Luce gives an excellent discussion of the modeling of probability transformation, and he characterizes through an intuitive condition what he considers the most important probability transformation function.

Chapter 4 introduces a new empirical primitive, the operation of joint receipt. Joint receipt need not be additive, in the sense that receiving \$5 and \$7 need not be the same as the receipt of \$12. The operation of joint receipt leads to a value function V that is related to the utility function U over binary gambles through a plausible condition. Chapter 5 extends the model to general gambles of more than two gains. Luce gives three new axiomatizations of rank-dependent utility for general gains gambles based on easily understood conditions. Empirical data show that rank-dependency is more controversial for general gambles than for binary gambles. Some form of rank-dependence is important, but it is not clear what form the utility representation should take.

Chapters 6 and 7 study the mixing of gains and losses on the assumption (in ch. 6) that U and (in ch. 7) that V is additive over the joint receipt of such a mix. Empirical findings indicate that additivity of V is more descriptive than additivity of U. This leads to nonbilinear models of the utility of mixed gambles. Chapter 8 concludes. Errata are on Luce's website.

Luce's approach is mathematical and based on abstract algebra and the theory of functional equations, two fields of mathematics that are relatively unfamiliar to economists. However, there is no need to understand the intricacies of each proof to appreciate the results derived throughout the book. Most preference conditions are easily understood, and they are illustrated and motivated by extensive up-to-date reviews of the empirical literature. Luce has a direct and outspoken way of discussing other studies, which is refreshing. In some cases I do not share Luce's criticism, for example in his discussion of Tversky and Kahneman's work. In general, however, Luce gives a balanced account of the empirical literature, paying ample attention to studies and arguments that disagree with his own viewpoints. The wealth of studies discussed here makes the book a very useful reference.

Much progress has been made in modeling individual behavior under risk and uncertainty since von Neumann and Morgenstern axiomatized expected utility. The rank- and sign-dependent utility models, which form the central topic of this book, currently look like the most promising way to describe this behavior. Luce's book represents the state of the art on these models. The book is mathematically rigorous, gives an extensive overview of the empirical literature, and is likely to serve as a source of inspiration for future research.

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Equality of Opportunity. By John E. Roemer. Cambridge, Mass.: Harvard University Press, 1998. Pp. vii, 120. \$29.95. ISBN 0–674–25991–2. *JEL 2000–1307*

Equality of opportunity is one of the ethical slogans often invoked in debates about public policy, but also one that conveys a lot of ambiguity, misunderstanding, and confusion. In this short and provocative book, John Roemer argues that in fact most people agree with some version of equal opportunity, and that most debates are not about the principle per se, but only about details of implementation, especially the definition of the individual circumstances that shape opportunities. He claims that the book provides the reader with a formal definition of equality of opportunity that should be consensual and, depending on how the details are filled out, is compatible with a broad array of policy options. This definition would thereby be useful in clarifying the real bones of contention, which Roemer contends are less about social policy than about how to delineate the sphere of individual responsibility.

In a nutshell, the definition is the following. Individual outcomes depend on circumstances and effort, and an equal opportunity policy seeks to reward effort and to neutralize the effect of circumstances. Roemer leaves it to the political body to choose the notions of outcome and circumstance. Then, according to his definition, the population has to be partitioned into groups with similar circumstances, and for an individual, belonging to a certain group is all that represents her circumstances. The main innovation in Roemer's proposal is to dispense with a direct