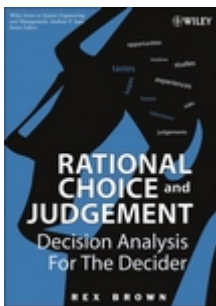


## Improving Decisions Through Formal Analysis

A review of



### **Rational Choice and Judgement: Decision Analysis for the Decider**

by Rex Brown (with the assistance of Pascal Paschoud)

Hoboken, NJ: Wiley, 2005. 245 pp. ISBN 0-471-20237-1. \$83.95

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Reviewed by

[Gordon Pitz](#)

Do you have trouble making choices? Would you like help dealing with the uncertainties and conflicts that pervade important decisions? Decision analysis might have something of value to offer, especially if you happen to be a company president considering a relocation of your manufacturing plant or the head of a government agency thinking of contracting out operations to a private firm. But even if you are merely worried about the purchase of a new couch for your living room, you might find useful ideas in *Rational Choice and Judgement: Decision Analysis for the Decider*, Rex Brown's treatment of the decision analysis approach to problem solving.

The practice of decision analysis is based on formal theories of decision making, such as game theory, subjectively expected utility, multiattribute utility, and Bayesian updating of probabilities. Nevertheless, although the underlying mathematics can be intimidating, Brown's book presents the methods of decision analysis in a way that makes few demands on the reader's mathematical background. The intended audience includes students and professionals in public policy, business management, and systems engineering. Now, this is

a group that probably includes few psychologists. So why might readers of *PsycCRITIQUES* have any interest in the book? Well, Brown's stated goal in writing the book is to enhance a person's thinking about problems and thereby improve the overall rationality of his or her decisions. Surely psychologists, too, have an interest in enhancing thinking and improving rationality. The book's prologue is a transcript of a discussion between a father and daughter concerning a decision about caesarian delivery. The father, of course, is Brown himself. But surely this is a topic from the mainstream of applied psychology.

The methodology of decision analysis is summarized by Brown as a “quantified GOO” approach to decision making. *GOO* stands for the goals, options, and outcomes that characterize a decision problem. In other words, decision analysis begins with decomposition of a problem into its component parts, which are given a quantitative assessment and then recombined to provide a recommended choice. The analysis uses the decision maker's own judgments of what is important and what is likely to happen. It emphasizes a multipath approach whereby one explores the limitations of the analysis and assesses the implications of making changes in the input before accepting any recommendation.

The problem of quantifying a person's preferences and opinions is one with which psychologists are familiar, for it lies at the heart of much psychological measurement. What is less familiar to most psychologists is using the quantifications to suggest optimal decisions. Decision analysis is a technology that has been widely used in the business community and in government agencies. Brown has many years' experience using decision analysis in areas ranging from the auto industry to environmental protection to national defense. In recent years, the technology has been used increasingly for medical decisions, although other applications to purely personal problems are rare.

A complete quantitative analysis of a problem is a time-consuming affair. The methods are not easy to use, and they usually require guidance from someone who has had extensive practice in their use. Indeed, the purpose of the book is to provide students with a thorough training in the methods, which they can then use as a foundation for developing their own expertise. Brown makes it clear that the procedure is recommended only for decisions for which the expenditure of time and effort is worth the potential returns.

Brown does describe a more qualitative approach that is restricted to the more obvious aspects of the GOO analysis. For example, simply thinking clearly about the distinction between goals and outcomes might be a valuable exercise. Reviewing systematically one's values and listing the uncertainties that are inherent in a problem might clarify a decision maker's thought processes. It remains an open question whether experience in thinking like a decision analyst can lead to long-run improvements in one's own decision processes. Brown claims that it has done so in his case, but one would like to see a well-designed study to investigate this question.

For a psychologist, then, the book may be of less interest as a practical manual for decision making and more important as a source of ideas that address theoretical and applied

psychological questions. It is also likely that psychologists have contributions to make toward the practice of decision analysis, given that the validity of the analysis depends entirely on the accuracy of the process in representing the decision maker's values and beliefs.

## **Connections Between Decision Analysis and Psychology**

For many years, a few psychologists have been interested in the applications of psychological theory to decision analysis and in applications of decision analysis to the psychology of decision making (e.g., von Winterfeldt & Edwards, 1988). Many others might derive profitable lessons from the practice of decision analysis. For example, there is some evidence that using a GOO decomposition and evaluating goals and objectives separately can reduce apparent conflicts between decision makers. The method is worth investigation as a contribution to conflict resolution.

Other lessons can be found in the format of the analysis. For example, the theory behind decision analysis makes clear how important it is to consider uncertainties when making choices, something that many decision makers are reluctant to do. A less obvious point is the critical relation between the importance of a preference and the range of possible outcomes. For example, a person confronted with choice among several jobs might assert that the benefits package is an important consideration. Yet if the benefits offered in connection with all available jobs differ very little, that factor should have little relevance to the final decision.

Psychologists might also make contributions to the practice of decision analysis. For example, a common concern among decision analysts is reconciling the output of analysis with the gut feelings of the decision maker. This is an issue that deserves some investigation by psychologists.

## **Pitfalls and Limitations**

Before decision analysis can be promoted as a way to enhance the rationality of human decision making, some of the limitations to the approach need to be addressed. In all fairness, Brown clearly recognizes these limitations. First and foremost, there is a need for empirical demonstration of the superiority of decisions made with the quantitative GOO approach over decisions made without such assistance. There is some documentation of the value of decision analysis in medical settings. Unfortunately, it is almost impossible to obtain such evidence when the analysis concerns one-of-a-kind, major decisions. It is impossible to know in these cases what would have happened in the absence of the analysis.

Compounding the problem is the recognition that using a good decision process does not guarantee a satisfactory outcome. Brown points out that there are pitfalls to the procedure itself. Using a quantified approach may encourage the decision maker to ignore elements that are less easily quantified, and it may lull the decision maker into an inappropriate trust in the outcome of the analysis.

The justification usually offered for decision analysis is a rational rather than an empirical one. Proponents of the methods assume, first, that unaided human decision making is subject to systematic biases and errors. This assumption has been extensively debated (see Stanovich & West, 2000, for a summary of the debate), but let us take the assumption as true for sake of argument. The second assumption is that formal methods of analysis can eliminate or at least reduce the frequency of such errors. This assumption, too, is far from self-evident. Gigerenzer, Todd, and the ABC Research Group (1999) provided examples of tasks for which a simplified heuristic solution appeared to outperform a more comprehensive analysis.

The arguments I have raised have been central to discussions among psychologists and others of the rationality of human judgment. A study of the practice of decision analysis, then, has a great deal to contribute to this debate. Finally, though, I must note that Brown's book provides the most thorough and accessible treatment of decision analysis that I am familiar with. It provides many examples derived from real cases. It includes assignments and project descriptions that, if followed carefully, should provide a student with all of the background necessary to begin working with the methodology. It is probably best used as a textbook rather than a source of independent instruction, for readers will need guidance in completing some of the exercises. The student will not be an expert on completing the book, but the book does provide a comprehensive tool kit that will be useful to anyone who seeks further practice in using the technology.

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