framework to help future surgeons make better decisions.

The book is divided into a preface, ten chapters, and a short annotated bibliography. It begins with an introduction to surgical decision making, then covers specific aspects of it, and ends with chapters on ethics and the future of medicine. The writing style is casual, clear, and straightforward. The book requires general familiarity with clinical medicine, but little surgical expertise and no formal decision theory.

In the introductory chapters de Dombal explains the relevance of decision-making principles to surgeons. He shows that, with the possible exception of their urgency and finality, surgical decisions resemble other decisions that have been assessed using formal decision theory. In Chapters 3–7 he discusses how to weigh evidence and apply formal decision analysis in pre- and postoperative decisions. To make the theory more broadly understandable, he introduces the concepts of probability and Bayesian analysis without resorting to any of the classical mathematics. Simply written chapters also introduce the student to utility theory and risk–benefit analysis. Finally, a section entitled 'Practical implications' gives critical advice about how to 'review your own competence', with poignant reminders for many young surgeons who have been faced with a difficult decision in the middle of the night.

For its intended purpose, there are relatively few shortcomings. Perhaps the most serious of these is the lack of discussion of the psychology of judgment and decision-making biases, topics that could help motivate the need for the book. In addition, although the book correctly emphasizes the necessity of accurate history taking and physical examination, it does not emphasize the use of ancillary diagnostic tests, a subject that frequently bewilders the surgical trainee. A challenge for a second edition of the book might be to try to explain the relevance of likelihood ratios and receiver operator characteristic curves to diagnostic test analysis. But this would require some mathematics. Finally, a second edition might expand the annotated bibliography, perhaps with a few selected journal articles to supplement the classic works currently described, and to introduce more advanced topics.

We can strongly recommend this book for medical students and surgeons-in-training. We believe it should be an integral part of the trainee's formative library, to accompany more clinical works, like Cope's *Early Diagnosis of the Acute Abdomen*. We even can offer a testimonial. One of us, a surgical oncologist, is already using the book for classroom teaching.

Creativity and Modelling

THE CRAFT OF DECISION MODELLING, Patrick Rivett, New York: Wiley, 1994, ISBN 0-471-93962-5, 304 pp.

Review by Peter Wakker, University of Leiden

Patrick Rivett was trained as a mathematician, and was one of the main initiators of Operations Research in the United Kingdom. He is an experienced consultant and a radio and TV broadcaster. In short, he has all the qualities needed to write a thorough as well as entertaining work on decision making. The present book is meant for teachers and graduate students in decision making, and concentrates on modeling. Rivett writes (p. 3): 'We shall therefore operate in the no man's land between the managers and executives who are faced with decision-making problems and the specialists in mathematics ... management science.'

The modeling part of decision-making is the most important part, but it is difficult to pin down tangible knowledge. Thus the book contains a most entertaining description of many experiences and lessons from modeling in practical cases, but it will not be easy to describe or test knowledge of students who have read the book. When the author points out that examples ('Lives') at the end of a chapter need not relate to the preceding material, it does not seem to distress him (p. 5): 'It is hoped that this approach will illustrate that rich weaving of theory, concepts, ideas, and problem formulation which form the fabric of professional life and that in so doing we shall show not only what is the attitude of mind of those who do this sort of thing but also why it is what it is.'

The examples are all entertaining and demonstrate creativity rather than routine. As a consequence, there is no simple way to describe 'the message' of the book. Let me only give two of the many entertaining examples. One concerns the optimal sizes of parishes (p. 121). A bishop of the Church of England requested the OR group in his local university to investigate the optimal size of parishes. It was conjectured that the probability of church attendance would be determined by the inverse of the square of the distance. The team was surprised to discover, however, that most worshippers did not attend their nearest church. It was concluded that not distances should be optimized but instead the variety of styles of churchmanship. A routine approach by distance-optimizing techniques would not have given a good solution to the problem, but understanding and creativity did.

The second example is from the UK mining industry (p. 170). When at a certain time it became difficult to sell small-sized coal, much effort was put into producing more large-size coal. However, the problem was not one of product mix but of total sale: the decrease of sales of small-size coals was only a first symptom of a general decrease of coals sales, which had not been foreseen by forecasters. As usual, after describing the example, the author gives a moral of the story. Here the moral is that people tend to see in a situation what they want to see and tend to tell others what they want to hear.

I made several notes of nice citations gathered in the book, such as

- If you're so smart, how come you ain't rich?
- The more variables you need to describe something the less you know about it.
- No man can ever step twice into the same river.

The spirit of the book can be best described by the author's words from the preface: 'Model building ... is fun'.

Learning to Decide

TEACHING DECISION MAKING TO ADOLESCENTS, Jonathan Baron and Rex V. Brown (Eds), Hillsdale, NJ: Erlbaum, 1992, ISBN 0-8058-0497-8, 340 pp.

Review by Paul C. Price, University of Michigan

The mere thought of trying to teach decision making to adolescents is enough to send many of us scurrying for the security of our laboratories. Issues of content, pedagogy, institutional implementation (e.g. how to introduce new programs into inherently conservative school systems), and evaluation are daunting enough. But then there are the adolescents themselves. Would any group be *less* receptive to a course on decision making?

Fortunately, there are those who feel that teaching decision making, especially to adolescents, is important enough that they have rolled up their sleeves and begun. In *Teaching Decision Making to Adolescents* a diverse group of researchers and teachers describes a variety of programs that they have devised, implemented, and, to some extent, evaluated. They share their successes and failures in a volume that should interest both those who actually want to teach decision making and those who simply want to know how the results of laboratory research have been applied to the problem.

The programs described in *Teaching Decision Making to Adolescents* can be characterized along two important dimensions. The first is domain generality versus specificity. Some programs, such as the decision-making component of the more general *Odyssey* curriculum, are intended to teach skills that can be applied to 'whatever challenges [students] might face beyond the confines of the course' (Adams and Feehrer, Chapter 4). Others focus on the unique aspects of social decision making and problem solving (Elias *et al.*, Chapter 8; Williams, Chapter 11). Still more specific is a program designed to help student nurses develop the judgment and decision skills they will need most on the job (Shanteau *et al.*, Chapter 9). There is no explicit consideration, however, of the relative merits of domain-general versus domain-specific approaches.

The second dimension is the extent to which the program emphasizes informal qualitative versus formal quantitative methods of decision making. One program teaches eight loosely associated steps, or frames, that focus on the role of emotion in social problem solving (Elias *et al.*, Chapter 8). The GOFER course, based on Janis and Mann's conflict theory, introduces the use of balance sheets, but appears to de-emphasize concepts such as expected value and multi-attributes utility (Mann *et al.*, Chapter 3). Yet another program relies heavily on the quantitative aspects of subjective expected utility and multi-attribute utility theories, primarily as a means of developing qualitative intuitions (Baron and Brown, Chapter 5; Laskey and Campbell, Chapter 6). There is even one program that is unabashedly normative and statistical from start to finish (Swets, Chapter 12). Again, there is little consideration of the relative merits of these alternative approaches.

Perhaps a more pressing question than which approach is best is whether any of them works at all. Certainly, adolescents taught the principles of good decision making in the classroom can reproduce, and sometimes apply, those principles on written tests administered immediately afterward. But can they, and do they, apply those principles when making their own decisions outside the classroom, months or years after learning them? Unfortunately, *Teaching Decision Making to Adolescents* fails to provide even a tentative answer to this question, although Baron and Brown make some interesting suggestions for doing so in Chapter 5.

Also, as Baron and Brown argue persuasively in an introductory chapter, the difficulty of evaluation, and even some initial null results, should not discourage researchers and teachers from developing and implementing decision-making programs. One reason is that,