

profited greatly, and earlier than other parts of cognitive science, from interaction with computer science. At first, the types of 'problems solved' in the laboratory were strongly constrained by the limited amount of available computer programs. A huge variety of simulation models has developed since; throughout the chapter, the authors make reference to these.

As is also reflected by the chapter, our insight in problem solving and reasoning has increased most with respect to specific tasks. A few dozens of these are analysed in the review. They range from well-defined problems such as match-stick patterns and cryptarithmic (DONALD + GERALD = ROBERT) and linear syllogisms ($a > b$, $b > c$; $c > a$?) to the composition of text with its multiplicity of interacting constraints. For understanding the behavior in these tasks, it is essential that both the knowledge structures and the internal processes of the problem solver are known in detail. Protocol analysis still constitutes a major methodology here.

Obviously, our understanding is best where an expert deals with a relatively simple problem. He or she may then rely on highly organized existing knowledge which enables concepts for representing at different levels of abstraction, means of finding the essential features, and ways of applying ready-made methods for its solution. In contrast, novices must engage in constructing and searching the problem space including representations of initial state, goal state, operators, constraints, transformations, and intermediate states. Much less is known about acquiring the problem-solving skill, about solving more complex problems, and about the qualities of effective problem solvers outside their field of expertise.

In spite of its fluent style and clarity, I would hesitate to recommend the chapter as a text for teaching purposes. It is abundant with dry summing-up and it often lacks the thought-provoking comment and the stimulating treatment of an important controversy that may get a student going. I hit on a few outdated phrases, e.g. on STM-LTM transfer (p. 595) and non-informative passages, e.g. on inconsistencies, individual differences, and training effects (p. 661). But these do not decrease my admiration for the complete and highly structured presentation and for the thorough treatment of the impressive body of empirical work as well as computer-simulation modeling.

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Volume 2, chapter 10, pp. 673–738.

Decision Making – by Paul Slovic, Sarah Lichtenstein and Baruch Fischhoff.

The authors are well-known for many contributions to the experimental study of choices between gambles. The importance of that study became clear

in the early fifties, when the normative foundations were laid for expected utility, and it was discovered that expected utility could not explain the many 'inconsistencies' in actual decision making. The most famous discovery of the authors may have been the 'preference reversal phenomenon', described concisely on p. 725, and considered today as one of the most profound challenges of decision making. After the introduction, the second section describes the structuring of the relevant aspects of decision problems, the third section considers several decision theories (single- or multi-attribute, (S)EU, prospect-, probabilistic-, regret-, ...), the fourth section deals with information processing (bounded rationality, ...); section five, the final section, deals with applications of decision theory. The chapter presents a balanced overview of the psychological literature on decision making, stressing experimental results.

Of course, not all aspects of decision making can be covered equally thoroughly in the 65 pages of this chapter, within a Part on Cognition. The chapter pays most attention to the most important aspect of decision making, the processing of information in risky situations. Less attention is given to related work in economic literature, such as Machina (*Econometrica*, 1982) on 'nonexpected' utility, Yaari (*Econometrica*, 1987) on a way to transform objective probabilities into subjective ones without violating monotonicity or transitivity, Karni and Safra (*Econometrica*, 1987) on preference reversal. There are some minor inaccuracies; for example the definition of risk aversion on p. 693 is incorrect.

Concerning recentness of references, among about 300 references we counted 24 dated later than 1982, and six later than 1984.

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Volume 2, chapter 11, pp. 739–811.
Attention – by Richard M. Shiffrin.

It is a great profit to have a chapter written by one of the leading experimentalists in the field. Richard Shiffrin is such an authority. Background, paradigms and data, therefore, are reviewed from first hand. A backlash can be the focussing on relatively few paradigms and theoretical orientations, mainly those for which a writer strived a scientific life long. For the greater part Shiffrin restricted the area of attentional phenomena to a comprehensive and thorough review on perceptual strategies and mechanisms involved in visual search tasks. The paradigms are nicely explained and many of the key experiments of the past two decades are figured out in detail to demonstrate the explanatory value of the differentiation between controlled and automatic information processing. The price, however, is, and the author