

Further Readings and History

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1. History leading to the behavioral approach

For further reading and deeper understanding, first some words on history. Moscati (2019) provided a more detailed account of the history of the behavioral approach, with risk and uncertainty central.

Huygens (1657) and Pascal (1660) proposed expected value maximization as a good criterion for decisions under risk, refined into expected utility by Bernoulli (1738). However, Keynes (1921), and to a lesser extent Knight (1921), pointed out that probabilities are often unknown for decisions under uncertainty, so that we cannot just use probability theory. Keynes' student Ramsey (1931) and de Finetti (1931) gave good arguments, through preference foundations, that probabilities then can still be used for rational decision making, be they subjective. Savage (1954) perfected these arguments. The first part of his book (Chs. 1-5) is, I think, the greatest contribution in all of decision theory. Early counterarguments by Allais (1953) and Ellsberg (1961) at first received little attention. When the first experimental paper on risk, Preston & Baratta (1948), and some followups did not use expected utility but instead probability weighting to model risk attitude, this was at first mostly taken to be just a modeling mistake.

Then started what I call the naïve period. People understood the fundamental importance of Savage's ideas, giving a key to rational decisions, and with proper enthusiasm started applying them. Inspiring works include Raiffa (1968) and Keeney & Raiffa (1976). The field of decision analysis (Howard 1968) was based on this approach. However, in those days it was not well understood how profoundly the normative theories deviate from actual decisions and that much more work is needed to connect well with human perception. The behavioral approach brought better understandings in this regard. Kahneman & Tversky (1979) is usually taken as the

birth of the behavioral approach. Before, it was understood that irrationalities exist but they were thought to be too volatile and erratic to fit any model or systematic study for economic purposes. Kahneman & Tversky (1979) showed that modeling, quantitative measurements, and predictions of irrationalities are possible after all, and thus provided a breakthrough: the first rational model of irrational behavior. The first mature behavioral model was Tversky & Kahneman (1992), solving theoretical problems of Kahneman & Tversky (1979) by using Quiggin's (1982) insights and, importantly, extending to the important context of ambiguity using insights discussed next.

Ambiguity theories, the behavioral generalizations of Savage (1954) when probabilities are unknown, also started in the early 1990s, initiated by Gilboa (1987), Gilboa & Schmeidler (1989), and Schmeidler (1989). Before, no-one had been able to develop decision models with behavioral foundations for ambiguity, but Gilboa and Schmeidler introduced them. Tversky & Kahneman (1992) used them but added empirical realism.

The behavioral approach started for risk and ambiguity, the topic of this course, but has since spread into many other domains. The field is still spreading and developing today.

2. Further readings

For a thorough understanding of the topic of this course and the behavioral approach it is good to understand the classical approach well. I give some references. I usually ask my Ph.D. students, after they took my course here, to first study Raiffa (1968)¹ and then Keeney & Raiffa (1976)². Alternative texts include the concise Chs. 1-2 of Drèze (1987) and Kreps (1988) who provided a broader account, with very good conceptual explanations. Other works include Bunn (1984) and Clemen (1991)³.

¹ Skip Chs. 7 and 8. Skim Ch. 3 and §§4.11, 4.12, 4.13, 4.14, and 6.9.

² Ch. 3 is important, but only skim §3.2.3 & 3.2.4; §3.4 is important, especially §3.4.5. §§4.1-4.8 are important. §4.9-4.12: skim. §5.6, p. 243. skip. §§5.8-5.10. skim. §§6.7-6.11. skim. Chs 7 and 8, skim, but read §7.4 (company-consulting). §9.2.4. skip. §9.3. skim. §9.4: skip. §§9.5-9.8: skim. §10.3.2 skip. §10.3.3 skip. §10.4.3. skim. §§10.5-10.7 skim.

³ His first part has much material on modeling actual decision situations and there are many case studies.

Fishburn (1970) provided a valuable and efficient collection of the mathematics of classical decision models. Fishburn (1972) gave a didactical introduction into the mathematics of decision theory for non-mathematicians, and Fishburn (1981) provided a survey on theoretical models. Medical works close to the topic of this book include the accessible Sox et al. (1986) and the deeper and more technical Weinstein et al. (1980). Philosophical and methodological works include Broome (1991).

The behavioral approach is moving and developing today, and has been less crystallized. Textbooks are appearing now, including Angner (2012), Cartwright (2018), Earl (2022), Tomer (2017), and Wilkinson (2007), but they are not close to the material of this course and are all broader and less formal. Gilboa (2009) is closer and is philosophically oriented. I finally suggest some review papers, focusing on risk and ambiguity. Edwards (1954, on risk) and Chs. 2 and 13 of Luce & Raiffa (1957, on ambiguity) were written before the behavioral approach started, but contain many modern ideas and are of superb quality. On risk, surveys include Starmer (2000), Fehr-Duda & Epper (2012 on probability weighting), and Fox, Erner, & Walters (2015). For ambiguity, surveys include Camerer & Weber (1992), Etner, Jeleva, & Tallon (2012), Gilboa & Marinacci (2016), Hey (2014), Karni, Maccheroni, & Marinacci (2014), Machina & Siniscalchi (2014), Marinacci (2015), and Trautmann & van de Kuilen (2015).

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