Belief, Desire, and Rational Choice

Course organiser:
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Course description

This course is an introduction to formal models of belief, desire, and rational choice. It has roughly three parts. The first introduces the core ideas of Bayesian epistemology, where belief is treated as an attitude that comes in degrees. In the second part, we turn to formal models of desire, drawing on utility theory in economics and value theory in philosophy. The third part takes a closer look at how beliefs and desires guide rational choices, going through some basic issues in decision theory.

Classes consist of a one-hour lecture plus a one-hour tutorial.
Lecture notes with exercises will be made available each week, and are the only required reading.
No prior knowledge of the material is expected. Familiarity with basic propositional logic will be helpful.
You can look at year’s lecture notes at umsu.de/bdrc/bdrc.pdf, but note that the content will slightly change for this year.

General background reading:

• Brian Weatherson: Lecture Notes on Decision Theory (2015)
• Michael Strevens: Notes on Bayesian Confirmation Theory (2017)
• Lara Buchak: “Decision Theory” (2016)
• Katie Steele and H. Orri Stefánsson: “Decision Theory” (2015)

(Click on the titles to open the documents!)
Assessment

The worksheets for each week will contain problems. You should try to answer them and hand in your solutions at the start of the following lecture. 50% of your mark is based on these exercises.

Some worksheets will also contain questions that call for more open-ended philosophical discussion. You should choose one of these for your final essay, which will determine the remaining 50% of your mark.

Provisional syllabus

Week 1: Modelling rational agents

How beliefs and desires are related to choice; why beliefs and desires are graded; decision matrices; expected utility; modelling.

Background reading:

- Alan Hájek: Pascal’s Wager (2017)
- Alisa Bokulich: “How scientific models can explain” (2011)

Week 2: Belief as probability

Basic rules of probability; Bayes’ theorem; some applications.

Background reading:

- Ian Hacking: An Introduction to Probability and Inductive Logic, ch.s 3–7 (2001)

Week 3: Probabilism

Why degrees of beliefs should conform to the principles of probability theory.

Background reading:

Week 4: Further constraints on rational belief

How permissive is epistemic rationality? Frequency and chance; indifference; evidential probability.

Background reading:
- Ian Hacking: *An Introduction to Probability and Inductive Logic*, ch.15 (2001)
- Christopher G. Meacham: “Impermissive Bayesianism” (2014)
- Nick Bostrom: “The Doomsday Argument, Adam & Eve, UN++, and Quantum Joe” (2001)

Week 5: Utility

Utility as desirability; other conceptions of utility; utility and credence; basic desires.

Background reading:
- Simon Blackburn: *Ruling Passions*, ch.6 (1998)

Week 6: Preference

Deriving utility measures from a preference ordering; ordinal and cardinal utility; utility and credence from preference.

Background reading:
- Samir Okasha: “On the Interpretation of Decision Theory” (2016)

Week 7: Separability

Values and subvalues; additivity; discounting.

Background reading:
Week 8: Risk

Why maximize expected utility? Attitudes towards risk; localism.

Background reading:

- Lara Buchak: Risk and Rationality, ch.4 (2013)

Week 9: Conditional decision theories

Newcomb’s problem; Evidential Decision Theory and Causal Decision Theory.

Background reading:


Week 10: Game theory

Solving games; Nash equilibria; normal and extensive form; evolutionary game theory.

Background reading:


Week 11: Bounded rationality

Normative and descriptive models; preferences that simplify maximizing expected utility; reducing computational costs; non-expected utility theories; imprecise credence.

Background reading:

- Saemus Bradley: “Imprecise Probabilities” (2014)