

The Course “Risk and Ambiguity” for Teachers: Didactical Considerations

Peter P. Wakker

This text will primarily interest teachers.

A theme throughout the course is how the behavioral approach turns economics into mathematical psychology: more psychological realism, more advanced maths, and, crucial, the maths fit with psychology (“*homeomorphism*”). Throughout, theoretical concepts are immediately connected with empirical reality.

The first meeting shows how to *teach preference axiomatizations in an exciting manner*, by using a supposedly failing consultant who later gets rehabilitated, and using the “experimental heaven.”

The first meeting presents measurement of subjective probabilities as a machine for mind-reading. The, mathematically trivial, exercises calculating expected value to describe, prescribe, and predict are essential to *connect theoretical concepts with empirical reality*, make them lively. I know from long experience that without such exercises *students don't get that connection*, and that many teachers are not aware of the conceptual difficulty of this step, which they made too long ago to remember.

The second meeting presents measurement of subjective utilities as a machine for heart-reading. The medical application makes tangible how expected utility can be applied *prescriptively* to improve decisions, using simple hypothetical decisions (such as used in utility measurements) to clarify complex real decisions.

The third meeting has an actual experiment (done in the preceding homework) to measure the students' own utility functions. This connection with *own attitude* further makes the concepts lively. The violations of expected utility found, get the students ready for nonexpected utility coming next. Then rank-dependent utility is introduced, slowly, following the “mathematical psychology” style of the course.

Fourth meeting: –

Fifth meeting: the rank dependent model is linked to the students' own behavior, making it lively.

Sixth meeting: prospect theory is the *peak of homeomorphism*, with every mathematical step justified by knowledge of psychological processes.

Seventh meeting: moving to current research and, therefore, less crystalized.

Haphazard line uncertainty-risk-uncertainty of course: the first meeting is on uncertainty, then virtually everything until meeting six is on risk, to only then turn to uncertainty. Why this seemingly haphazard line? Because *one better, from the beginning, take risk as a special case of uncertainty*. I know from experience that people who for too long worked on risk, are not really able to extend to uncertainty anymore. Most concepts are clearer in the general context of uncertainty than in the context of risk, where the presence of numerical probability triggers more irrelevant numerical operations than bring clarity. Thus, the common consequence version of independence, the sure-thing principle for risk, is more fundamental and important than the common ratio version, mixture-independence, which involves numerical operations using probability numbers.