Two-lecture 'course' on
Individual dynamic decision-making under risk and ambiguity
John Hey

Schedule:
March 30th, 2023
Polo delle Scienze Sociali – Via delle Pandette, Firenze
10:00-12:00 - Building D5, Room 1.11
14:00-16:00 - Building D5, Room 0.11

Syllabus

Pre-requisites
I will assume familiarity with the basics of Expected Utility Theory (EUT), and, in particular, with its assumptions. For an easy reference you could look at Wikipedia. The key axioms are: Completeness, Transitivity, Independence of Irrelevant Alternatives and Continuity. It would also be helpful if students were familiar with one or more non-EUT theories, for example, Rank-Dependent Expected Utility Theory. Again Wikipedia is helpful. I do not know if I will have time to explore theories of decision-making under ambiguity, but it would no harm if students read the survey by Etner et al (2010) in the Journal of Economic Surveys.

Introduction
This course will discuss how to experimentally investigate theories of Dynamic decision making, mainly under Risk and, if we have time, under Uncertainty/Ambiguity. We define a situation of Risk as one where the outcome is uncertain but in which probabilities can be attached to the various possible outcomes (and the decision-maker (DM) uses these probabilities when taking decisions); we define a situation of Uncertainty/Ambiguity as one in which probabilities do not exist, or the DM does not believe that they exist.
We distinguish between static and dynamic decision problems; in the former, the DM takes one decision, gets a payoff, and dies; while, in the latter, the DM has to take two or more decisions sequentially before dying, and the payoff to the DM depends upon the decisions that he or she has taken. One might argue that essentially all problems confronted in real life are dynamic.

How dynamic decision problems might be tackled
There are two intuitively plausible ways that such problems might be tackled, assuming that the DM considers the various decision stages: (1) the Backward Induction Method; (2) the Strategy Method. Their names tell you the methods. In (1), the DM works backward, deciding what decisions to take at the final decision stages (which are simple static decisions) and then deciding what to do at the earlier stages given the future decisions. In (2), the DM lists all possible strategies (decisions at each stage) and chooses the best strategy. The course will illustrate these methods in the lectures.
We will also show that, if the DM satisfies all the axioms of Expected Utility Theory, then the two methods lead to exactly the same decisions. The course would end here if all people behaved according to EU. But they do not. For example, if the DM has Rank-Dependent Expected Utility preferences, then, in general, the two methods lead to different decisions.

How experiments can help us understand what people do
Many experiments have been carried out to investigate how people tackle dynamic decision problems. The early simple experiments looked at whether subjects were rational (for example, Bone, Hey and Suckling); later experiments tried to classify subjects into different types: naive, resolute and sophisticated, according to the way that they seemed to be solving the problems.

References
Many of these are to my own work with others. I list them in chronological order.
"Do People (Want to) Plan?", Scottish Journal of Political Economy, 52, 122-138, 2005.
"Do People Plan Ahead?" [with John Bone and John Suckling], Applied Economics Letters, 10, 277-280, 2003.
"Do People Plan?" [with John Bone and John Suckling], Experimental Economics, 12, 12 -25, 2009.
"Naïve, Resolute or Sophisticated? A Study of Dynamic Decision Making" [with Gianna Lotito], Journal of Risk and Uncertainty, 38, 1-25, 2009, doi:10.1007/s11166-008-9058-5.
"Strategies in Dynamic Decision Making – An Experimental Investigation of the Rationality of Decision Behaviour" [with Julia Knoll], Journal of Economic Psychology, 32, 399-409, 2011.
"The Explanatory and Predictive Power of Non Two-Stage-Probability Models of Decision Making Under Ambiguity" [with Noemi Pace], Journal of Risk and Uncertainty, 2014, 49, 1-29.