ENR 8150 Advanced Environment, Risk, and Decision Making

Spring 2015
Kottman Hall 460, TR 12:45-2:05

Course Instructor: Dr. Robyn Wilson, 316D Kottman Hall
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Office hours by appointment only

Course Description: When we think about improving decision making for the environment, we typically look to the fields of education and marketing for insight into changing behavior at the individual level. A wealth of research in psychology and behavioral economics, however, shows that neither education nor outright persuasion will necessarily lead to more thoughtful or more informed choices. The overall goal of ENR 815 is to explore research in these fields and to deepen your understanding of decision making under risk and uncertainty. The first half of the course will focus on the literature from judgment and decision making that indicates how individuals process information, as well as highlight potential errors in information processing that may lead to uninformed and/or biased decisions under risk and uncertainty. The second half of the course will focus on applications from the decision aiding literature meant to improve decision making in complex, risk-laden and multi-objective contexts. Both basic literature and applications from environmental contexts will be covered.

Prerequisites: Graduate standing or permission of instructor

Course Objectives:
This course is designed to help students…

1. Develop an understanding of the theory that underlies judgment and decision-making in multi-objective, risk-based environmental policy and management contexts.
2. Develop an understanding of the decision analytic techniques designed to improve decision-making in these contexts.

Course Format: Classes will combine discussion and group activities. An interactive approach such as this makes your attendance a crucial component of achieving success in this course.

Assignments and Exams:

1. **Final Paper** –A 10-15 page, double-spaced paper will be due toward the end of the term. The goal of this paper is to apply concepts and lessons from this course to a real-world risk-based decision making problem, both in terms of understanding why this problem exists from the perspective of information processing and potential errors in judgment and decision making, and how we might work to resolve it through the use of decision analytic techniques. The paper will be graded out of 100 and be worth 35% of your final grade.

   The first half of the paper will require that you identify a multi-objective, multi-stakeholder environmental problem and describe why this problem exists from the perspective of individual decision making and action. It is critical that human behavior (that is actions

or a lack of action) resulting from flaws in information processing be at the core of the issue, but that the "poor" decisions by individuals accumulate to cause societal or collective problems. The second half of the paper should focus on how this problem could be addressed or resolved given your knowledge of how individuals make decisions (e.g., employing structured processes that help people avoid biases in their decision making, etc.).

2. **Memos** – Three 1-2 page single-spaced memo will be required over the first several weeks of the course. These memos are an opportunity for you to develop the ideas for your final paper, practice applying course concepts to a real-world problem of interest, and receive initial feedback on your ideas. Each memo will be graded out of 10 points and they will be averaged to account for 20% of your final grade.

   In Memo 1 (due 1/30), you will outline your potential topic of interest and any relevant applications you might draw from the first section of the course (Introduction to Risk). As described previously, these should be applications that help to explain "poor" decisions or behaviors among individuals leading to a larger-scale collective social problem. In Memo 2 (due 2/15), you will outline any additional applications from the second section of the course (Information Processing). In Memo 3 (due 3/8), you will outline any additional applications from the third section of the course (Errors in Information Processing). These memos should be well written (in terms of complete sentences, correct grammar, etc), but do not need to follow a formal paper structure (intro, conclusion, etc). It should be your thoughts and reflections on the readings and the course concepts as they relate to your paper topic. How might risk perception be playing a role in "poor" decision making for this particular problem? What role are emotion vs logic playing in the decisions and resulting behaviors you observe? What errors in processing might be leading to these "poor" or uninformed decisions?

3. **SDM Workshop –** Students will participate in a structured decision making workshop at the end of the term. The work for this particular assignment will largely occur in-class, but you will be responsible for turning in your efforts to document your participation in the exercise (this will require some time outside of class). The workshop assignment will be graded out of 100 and worth 20% of your final grade, with a portion of your grade dependent on individual effort and a portion on group effort.

4. **Attendance and Participation** – The night before the 20 class sessions with assigned readings, you will need to submit three questions and one application you have drawn from the readings on the Carmen discussion forum. I will review these the morning before each class as a guide to our discussion for the day. This also gives me a chance to see how you are doing with the readings and for you to come prepared with questions for discussion. Your attendance and participation grade will be out of 100 points and worth 25% of your grade. Half of the points will come from the questions and applications you email me for each class (1 point for sending it, up to 1 point for quality), and half will be based on your attendance and participation in class (1 point for attending, up to 1 point for quality of participation during class).

Grading:
- **Memos**   **20%**
- **Final Paper**   **35%**
- **SDM Workshop**   **20%**
- **Attendance and Participation**   **25%**

The course syllabus, schedule, and assigned readings are subject to change. The syllabus can be made available in alternative formats upon request; students with disabilities are responsible for making their needs known to the instructor and for seeking available assistance in a timely manner.

Class Readings:

There are two required course textbooks:
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill.
- Gregory, R., L. Failing, M. Harstone, G. Long, T. McDaniels and D. Ohlson. 2012. Structured decision making: A practical guide to environmental management choices. Wiley-Blackwell: Hoboken, NJ.

The texts are available from most online retailers (and likely in the OSU bookstore). Other required readings in the form of journal articles are listed below and available on CARMEN.

Make-up and Late Assignments: In-class assignments and attendance/participation points cannot be made up. Late papers/memos will be accepted, but will be docked 5/1 points respectively for each day that they are late.

Academic Misconduct: It is expected that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct." The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:
- The Committee on Academic Misconduct web pages (http://oaa.osu.edu/coam.html)
- *Ten Suggestions for Preserving Academic Integrity*
(http://oaa.osu.edu/coamtensuggestions.html)
- *Eight Cardinal Rules of Academic Integrity*
(http://www.northwestern.edu/provost/students/integrity/rules.html)

Class Schedule and Readings

Introduction to Risk

Session 1 (1/13)– Defining Decision Quality

Session 2 (1/15) – Defining Risk
- Burgman, M. 2005. Ch. 1 & 2, pp. 1-41 *in* Risks and Decisions for Conservation and Environmental Management. Cambridge University Press: Cambridge, UK.
- Slovic, P. 1987. Perception of risk. *Science 236*, 280-285.

Session 3 (1/20) – Ecological Risk Perception
- Slimak, M. W., & Dietz, T. (2006). Personal values, beliefs, and ecological risk perception. *Risk Analysis, 26*(6), 1689-1705.
- Willis, HH, DeKay, ML (2007) The roles of group membership, beliefs, and norms in ecological risk perception. *Risk Analysis* **27**(5), 1365-1380.

Session 4 (1/22) – Cultural Cognition
- Kahan, D.M. 2008. Cultural Cognition as a Conception of the Cultural Theory of Risk. Handbook of Risk Theory, S. Roeser, ed., Forthcoming; Harvard Law School Program on Risk Regulation Research Paper No. 08-20; Yale Law School, Public Law Working Paper No. 222.

Session 5 (1/27)- Risk and Psychological Distance
- Zwickle, A. and R.S. Wilson. 2013. "Construing Risk." In J. Arvai and L. Rivers (Eds.). *Effective Risk Communication*. 272 p. London, United Kingdom: Routledge.
- Spence, A, Poortinga, W, Pidgeon, N (2011) The psychological distance of climate change. *Risk Analysis*, *32(6):* 957-972.

MEMO 1 DUE – Friday, January 30th, Midnight in the dropbox

How do individuals process information when making decisions?

Session 6 (1/29) - Dual Process Theory
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk and rationality. *Risk Analysis, 24*(2), 1-12.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist, 64*(6), 515-526.

Session 7 (2/3) – Affect and Emotions
- Forgas, J.P. Ch. 1 (Introduction) & Zajonc, R.B. Ch. 2 (Feeling and Thinking) pp. 1-58 *in* Feeling and thinking: The role of affect in social cognition. Ed. Joseph P. Forgas. Cambridge University Press, Cambridge, UK.

Session 8 (2/5)– Expected Utility and Bounded Rationality
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill: New York, NY. Chap. 7-8, pp. 77-93
- Simon, H. 1986. Alternative visions of rationality, pp. 97-113 in H.R. Arkes and K.R. Hammond, editors. *Judgment and Decision Making*. Cambridge University Press, Cambridge, UK.

Session 9 (2/10)– Descriptive Models of Decision Making
- *No readings*

Session 10 (2/12) – Information Processing and Decision Making Wrap-up
- Kleindorfer, P.R. 1999. Chap. 2, pp. 37-56 in Sexton, K., A. A. Marcus, K. W. Easter, and T. D. Burkhardt, editors, *Better Environmental Decisions: Strategies for governments, businesses, and communities*. Island Press, Washington D.C.

MEMO 2 DUE – Sunday, February 15th, Midnight in the dropbox

What are some of the common errors in information processing that lead to "bad" decisions?

Session 11 (2/17) – Probability Biases: Representativeness & Availability
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill: New York, NY. Ch. 10 & 11, p. 107-130
- Keller, C, Siegrist, M, Gutscher, H (2006) The role of the affect and availability heuristics in risk communication. *Risk Analysis* **26**(3), 631-639.

Session 12 (2/19) – Probability Biases: Anchoring, Randomness & Correlation
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill: New York, NY. Ch. 13-15, p. 145-173

Session 13 (2/24) – Decision Making Biases: Discounting, Loss Aversion & Probability Neglect
- Maguire, L. A., and E. A. Albright. 2005. Can behavioral decision theory explain risk-averse fire management decisions? *Forest Ecology and Management* 211:47-58.
- Wilson RS, Winter PL, Maguire LA, & Ascher TJ (2011) Managing wildfire events: Risk-based decision making among a group of federal fire managers. *Risk Anal* 31(5): 805-818.

Session 14 (2/26) – Decision Making Biases: Confirmation Bias & Selective Perception
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill: New York, NY. Ch. 1, pp. 15-21.
- Zhao, X., Rolfe-Redding, J., & Kotcher, J. E. (2014). Partisan differences in the relationship between newspaper coverage and concern over global warming. *Public Understanding of Science*.

Session 15 (3/3) – Social Biases: Attribution Errors
- Plous, S. 1993. The Psychology of Judgment and Decision Making. McGraw Hill: New York, NY. Ch. 16, pp. 174-188
- Kumagai et al. (2004) Research on causal attribution of wildfire: An exploratory multiple-methods approach. *Society & Natural Resources* **17**, 113-127.

Session 16 (3/5)- Social Biases: Ingroup Biases & Outgroup Homogeneity
- Tajfel, H (1974) Social identity and intergroup behaviour. *Social Science Information/sur les sciences sociales*.
- Bruskotter et al. 2009. Social and Cognitive Correlates of Utah Residents' Acceptance of the Lethal Control of Wolves. *Human Dimensions of Wildlife* 14(2): 119-132.

MEMO 3 DUE – Sunday, March 8th, Midnight in the dropbox

How can we help individuals and groups make better decisions?

Session 17 (3/10) – Foundations of Structured Decision Making
- Gregory et al. - pp. 1-68

Session 18 (3/12) – Decision Sketching
- Gregory et al. – pp. 47-68

SPRING BREAK (March 16-20)

Session 19 (3/24)- Objectives and Performance Measures
- Gregory et al. – pp. 69 – 121

Session 20 (3/26) – Alternatives and Consequences
- Gregory et al. – pp. 150-207

Session 21 (3/31) – Making Tradeoffs and Learning
- Gregory et al. – pp. 208-261

Session 22 (4/2) – SDM Wrap-up
- Gregory et al. – pp. 262-288
- Workshop Readings TBD

Final Paper Due - Monday, April 5th, Midnight in the Dropbox

Putting It Into Practice

Session 23 (4/7) – SDM Workshop
- *No readings*

Session 24 (4/9) –SDM Workshop
- *No readings*

Session 25 (4/14) – SDM Workshop
- *No readings*

Session 26 (4/16) – SDM Workshop
- *No readings*

Session 27 (4/21) – SDM Workshop

-   *No readings*

Session 28 (4/23): Wrap-up: Lessons Learned
-   *No readings*

SDM Workshop Materials Due – Sunday, April 26th, Midnight in the dropbox

Final Exam – Thursday, April 30, 2-3:45 – Reserved for workshop wrap-up or paper presentations