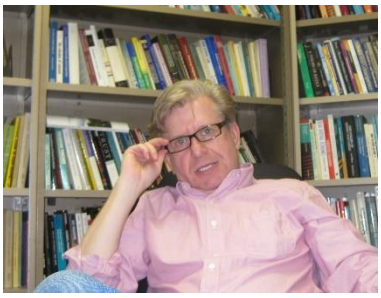
GVPT 289D--HOW TO MAKE BETTER DECISIONS
Spring 2022



Professor Piotr Swistak, Department of Government and Politics and the Applied Mathematics, Statistics and Scientific Computation Program

Instructor: Professor Piotr Swistak, TYD 1140 G, tel. 405-4149, email: pswistak@umd.edu.
Office hours: Mondays and Tuesdays: 12:00pm-1:00pm in TYD 1140 G or send me an email and we will schedule a meeting on any other day that works for you—in person or on Zoom.
Lectures: LEF 2205 Mondays and Wednesdays 3:00pm – 3:50pm.
(in person, but recordings will be made and posted.)

Teaching Assistants: Maryam Jameel (Section 0105 and 0106), Max McKitrick (Section 0103 and 0104) and Yiyi Zhou (Section 0101 and 0102). They will hold their office hours on Zoom: Maryam on Thursdays 12:00pm-12:45pm, Max on Tuesdays 1:00pm-1:45pm, and Yiyi on Mondays 2:00pm-2:45pm. You can contact them at mjameel@terpmail.umd.edu , mmckitri@umd.edu and yzhou116@umd.edu .

"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so." (Mark Twain) This class is about what we "know for sure that just ain't so" and how we can fix it.

One problem with decisions is that we rarely, if ever, find out if our decisions were good or bad. Was choosing your major, for instance, a good decision or could you have made a better one? I don't think most of us would ever know the answer to this question. So, is it possible that we regularly make bad decisions but don't know that we do? And, if so, how can we fix something if we don't know it is broken?

In fact, we do regularly make bad decisions. This has been shown in many experimental studies some of which will be covered in this class. What is more, for some types of decision problems we are hardwired to make mistakes. This means that we are bound to go wrong regardless of how much we know or how smart we are. So, what can we do to remedy this problem? Quite a bit, as it turns out.

What follows are a few examples of some decision problems and more general topics that will be covered.

EXAMPLE 1: One rule of rational decision-making is that our choice should not be affected by irrelevant factors. If we prefer A over B we should choose A over B no matter what is the context they are presented in. Do you think our choices satisfy this condition? And if they don't—which, actually, is the case—can you see how it can be used to manipulate what you buy in a supermarket or what you vote for in a referendum?

EXAMPLE 2: Suppose you are asked to choose one of the following two options (A) get 1m (1 million dollars) for sure and (B) get 1m with probability 0.89, 2.5m with probability 0.1 and 0 with probability 0.01. And suppose that you are also asked to choose one from a pair of two other options: (C) get 1m with probability 0.11 and 0 with probability 0.89 and (D) get 2.5m with probability 0.1 and 0 with probability 0.9. Is there anything wrong with choosing A and C? And, what would you say about choosing A and D? Similarly, would you find anything wrong with choosing B and C or B and D? In an experimental study Maurice Allais (1988 Nobel Prize in economics) has asked people to make such choices. The outcome of this experiment—it became one of the most conspicuous studies in economics—is known as Allais Paradox. Can you guess what the nature of the finding is and why it is so important?

EXAMPLE 3: Objects of art, like paintings, are difficult to appraise. Selling prices at auctions can be much lower than expected but also much, much higher. Suppose you are selling a painting with the opening price of 1 million dollars and the bidding goes all the way up to 3 million and sells at that. Would you be happy with the sale? You may not be. What is unsettling here is that you do not know how high the highest bidder would have been willing to bid. Perhaps he would have gone all the way to10 million. So, by selling at 3 million did you really extract the painting's full value? William Vickrey (1996 Nobel Prize in economics) has proposed an ingenious solution to this problem which is now known as Vickrey's auction. It works as follows: The bidding proceeds as usual and the highest bidder wins. He does not pay, however, the price he offered but pays the price offered by the second highest bid. Can you see how this solves the problem? (Probably not. Nobel Prizes are rarely awarded for simple insights.) I will explain how and why it works in class.

READINGS: Excerpts from a number of sources will be posted on CANVAS/ELMS. They include: Itzhak Gilboa's *Making Better Decisions: Decision Theory in Practice*, Wiley, 2011; Reid Hastie and Robyn Dawes, *Rational Choice in an Uncertain World: The Psychology of Judgment and Decision Making*, Sage, 2010; Avinash Dixit and Barry Nalebuff *The Art of Strategy*, Norton, 2008; Kenneth Williams, *Game Theory a Behavioral Approach*, Oxford University Press, 2013, *Analyzing Politics* by Kenneth Shepsle, Norton, 2010; Avinash Dixit, Susan Skeath and David Reiley, *Games of Strategy*, Norton, 2015.

GRADING: Three short tests (50%), three homework assignments (30%) and participation in class sections (20%.)

PROBLEM SECTIONS: A good part of the section time will be spent in groups in which you will be solving problems or working on short projects. (Group membership will change every week and will be determined by a random mechanism.) Your participation in this "group learning" will be evaluated every week and used in grading your class participation.

An optional final exam is the only way to improve your grade.

FINAL EXAM (**TBA**) An optional way to improve your grade is by taking the final exam. Final exam will count for 50% of your test grade. For example, suppose your average test score is 86%. If you decide not to take the final exam, your class grade will be calculated with the 86% test average counting as 50% of your class grade. If, however, you take the final exam and score 94% on it, your class grade will be calculated with 0.5*86% + 0.5*94% = 90% counting as 50% of your class grade.

TIE-BREAKING

One notorious problem that leaves everyone upset are borderline grades. 89%, for instance, is a B+ while 90% is an A-. This feels unreasonable, to say the least, and in my opinion it is both unreasonable and unfair. To solve this problem, we will use two tie-breaking mechanisms: extra credit points for solving in-class puzzles (most during Friday problem sessions but some during lectures) and the final exam.

THE EXTRA CREDIT POINTS: Friday sessions will have regular in-class group competitions for extra credit points. At the end of the semester, class distribution of the extra credit points will be put into four categories. Students in the top category will get an extra 3%, added to their class grade, second highest, 2%, third highest, 1%, and lowest, 0%. To get extra credit percentage points you will need to have an above average number of points

PERCENTAGE GRADES WILL TRANSLATE INTO LETTER GRADES as follows: A for 90-94%, A+ for 95% up; and analogously for B (80's), C (70's) and D (60's).

CRIB SHEET: All testing is closed book but you ARE ALLOWED to have a **crib sheet—**a single standard size sheet of paper with whatever information you want to put on it (both sides.)

MISSING A TEST will **not** be **allowed** except for emergencies. Should any problem arise please let me know immediately.

LECTURES VERSUS READINGS: A good part of the material will not be contained in the readings and will only be presented in class. For this reason, you should not think about the readings as a substitute for what we do in class—consider them **supplementary**. Attending classes, for all I know from the past, seems necessary to do well in this course.

INSTITUTIONAL POLICIES

ACADEMIC INTEGRITY: The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/whatis.html.

MEDICAL EMERGENCIES: Campus Senate policy requires students who are absent due to illness/injury to furnish documentary support to the instructor. I require students to contact me by email or by phone prior to class time in which you indicate that you have an illness or an injury. You must provide written documentation verifying your illness/injury immediately upon your return to class. You will not be allowed to turn in missed assignments or make up quizzes, tests, papers, etc. if you have not provided this documentation. Documentation not presented to me in a timely manner will not be accepted. In addition, if it is found that you have falsified the documentation provided, I will refer you to the University's Student Conduct Office.

STATEMENT ON DIVERSITY AND INCLUSIVITY

The Government and Politics department deeply values the voices and perspectives of all people. We are committed to having a diverse department that recognizes and appreciates the differences in race,

ethnicity, culture, gender, sexual orientation, religion, age, abilities, class, nationality, and other factors. Our department prioritizes diversity and seeks to foster a diverse community reflected in its faculty, staff, and students.

Reporting Racism and Other Forms of Hate and Bias If you experience racism or other forms of bias in this class or any GVPT course, we encourage you to do at least one of the following:
· Please report the experience to the instructor or teaching assistant
· Report the experience to David Cunningham, the GVPT Director of Undergraduate Studies at dacunnin@umd.edu
· Report the experience to the GVPT Diversity, Equity, and Inclusion committee, led by Professor Antoine Banks at abanks12@umd.edu
Please also report all incidents of hate and bias to the Office of Diversity and Inclusion at https://diversity.umd.edu/bias/

SCHEDULE OF TOPICS AND TESTS

Week 1 (Jan 24 & 26)

Errors of Cognition and Errors of Reasoning

How is it that we readily admit to arithmetical shortcomings yet in other contexts we engage, with no hesitation, in long, complex arguments and we have full trust in the conclusions we make? How good is our perception and how good are our analytical skills?

Week 2 (Jan 31 & Feb 2)

Choice under Certainty: Theory of Preferences

I a study of voters' preferences in 2006/2007 members of a focus group were asked to choose one out of every two candidates from the set that included Obama, Clinton and Edwards. Here is what happened. When asked to choose between Obama and Edwards, a substantial majority chose Edwards; Edwards also got a sizable majority over Clinton; yet when the respondents were asked to pick one from the set of all three candidates, Edwards came in dead last. A graduate student of mine, who had related this study to me, observed that something must be wrong with the data. Was there or was there not? What do you think?

Related readings: Williams pages 47 and 49-50; Shepsle pp. 20-30.

Weeks 3 & 4 (Feb 7 – Feb 16) Hwk 1 posted

Choice under Uncertainty: Von Neumann-Morgenstern Expected Utility Theory

Suppose you are asked to choose one of the following two options (A) get 1m (1 million dollars) with certainty and (B) get 1m with probability 0.89, 5m with probability 0.1 and 0 with probability 0.0. And suppose that you are also asked to choose one from a pair of two other options: (C) get 1m with probability 0.11 and 0 with probability 0.89 and (D) get 5m with probability 0.1 and 0 with probability 0.9. Is there anything wrong with choosing A and C? And, what would you say about choosing A and D? Similarly, would you find anything wrong with choosing B and C or B and D? Maurice Allais has asked people to choose between A and B and C and D in an experimental study in 1950's. The result of this experiment became known as Allais Paradox. This is one of the most important and influential studies in economics. In 1988 Allais was awarded Nobel Prize in economics.

Related readings: Williams pages 61-70.

Week 5 (Feb 21 & 23) Hwk 1 due on Feb 21

Group Choice: Decision Rules and Their Properties

Three friends who want to spend an evening together but have different ideas what they should do face the defining problem of politics. Should they let the leader, or leaders, of the group decide? Should they all take part in the decision and solve the problem democratically, by taking a vote, for example? But if they want to vote on the three proposals how should they do it? Will all reasonable methods of voting result in the same outcome and if not are there some methods that are better than others?

In the 1912 US Presidential Election there was an interesting distribution of votes over the set of three major presidential candidates: Wilson, Roosevelt and Taft. Wilson won the election. But what would have happened had the US been using a different voting method to elect the President? Different countries and different organizations use different election methods. How should we decide which method is good which is bad and which one we should use? Deciding on how we decide is the most important act of democracy—its outcome is the society's Constitution.

Related readings: Shepsle pages 191-197.

Week 6 (Feb 28 & Mar 2) Test 1 on Mar 2

What Is a Fair Outcome of a Group Choice?

In one of my research projects we have asked students to solve the following problem: Jury in a competition consists of three jurors. Each of the jurors gives his recommendation on how to award the first, the second and the third prize to three finalists: A, B and C. A juror's recommendation is simply a ranking of candidates; for instance, CAB represents a recommendation to award the first prize to candidate C, second to A and third to B. Suppose now that you get the following recommendations from the three jurors: ABC, ABC and BCA. What would you consider to be the best, the most just allocation of prizes to the three candidates? I suggest that you make your own choice before reading on. If you feel strong about the choice you have just made consider this: ABC was chosen as the most just outcome by 84% of students in the US and 86% of students in Poland; in Japan, however, only 36% chose ABC—64% selected BAC as the most just allocation of prizes. So, what is the best allocation of prizes?

No matter how we decide, we should begin by agreeing that any fair rule of choice should have some basic properties. For instance, if all voters prefer A over B then B should not win the election when running against A. So, what are the most fundamental principles of a fair choice that we should insist on being preserved and which rules of voting have these properties?

Arrow's Theorem answers these questions. Many consider Arrow's finding to be one of the most important and influential results in economics and in political science. Arrow was awarded Nobel Prize in economics in 1972. He is the youngest person to have received this award.

Related readings: Shepsle pages 67-73.

Week 7 (Mar 7 & 9) Hwk 2 posted on Mar 7

Strategic Behavior, Misrepresentation and Manipulation

A common aspect of a group choice is a continuous effort of all involved in decision making to affect the outcome of the process in their favor. But can we affect an outcome of a democratic process of choice? What are the rules of choice that would prevent people from manipulating the system?

Related readings: Shepsle pages 90-110.

Week 8 & 9 (Mar 14 - Mar 30) Hwk 2 due on Mar 16

Decision Making in Strategic Situations (Game Theory)

Suppose a wealthy benefactor, of the Sergey Brin variety, wants to donate 100 million dollars to two universities he has attended—the University of Maryland and Stanford. Sergey prefers that the division of the money is settled by the interested parties rather than himself. All he is willing to do is to set the rules under which the two parties will negotiate the division. Sergey arranges a three-way teleconference with the presidents of the two universities—I will call them Mary and Stan (cheesy choices are easier to remember)—and explains how and what the two will be allowed to negotiate. To simplify the process of negotiations each side will have only one shot at proposing a division and one shot at accepting or rejecting the other's proposal. All divisions are to be comprised of whole millions only. More specifically, Sergey asks Mary and Stan to proceed as follows. Mary will go first and propose a division of 100 million to Stan. Stan can either accept or reject the proposed division. If Stan accepts Mary's proposal, the allocation becomes final and binding for all three parties. If Mary's proposal is rejected, Sergey reduces the stake to 90 million (think of a 10 million decrease being a penalty for not reaching an agreement or a cost of Sergey's time spent on prolonged haggling) and Stan gets his turn at proposing a division of 90 million to Mary. If Mary accepts the division, the allocation is made as proposed. If Mary rejects Stan's proposal, Sergey withdraws his offer altogether and both universities end up with nothing.

Suppose that Mary and Stan have just heard about the intended donation, and the negotiation rules, during a live three-way teleconference with Sergey. As the live feed continues Sergey expects them to promptly carry out the negotiation. As specified by the rules Mary is supposed to make an initial offer. Can you say what Mary will propose? Will Stan accept Mary's offer or will he turn it down and go on to split a smaller pie proposing his own division? How much money will they end up with?

Related Readings: Dixit and Skeath pages 45-55, 83-99, 105-113.

Week 10 (Apr 4 & 6) Test 2 on Apr 4

Gambler's Fallacy and Biased Samples

Psychologists studied videos from World Cups and European Championships between 1976 and 2012. They found that after three kicks in the same direction, keepers were more likely to dive the opposite way on the next shot. Goal keepers have so far failed to exploit this predictable pattern.

Related readings: Gilboa pages 72-76 and 77-79. Lecture Notes.

Week 11 & 12 (Apr 11 - 20) Hwk 3 posted on Apr 20

Fallacies Involving Conditional Probabilities and Bayesian Reasoning

In 1980's the best test for AIDS when applied to a person known to have this condition would correctly diagnose AIDS with probability 0.999; it will also mistakenly identify a person who did not have AIDS as having AIDS with probability 0.01. In 1987, the Secretary of Health and Human Services called for testing a large random sample of American population. It was estimated that 0.006 of the US population was infected. Many politicians joined in calling for a comprehensive mandatory testing. Did the data support such decision? What would you guess is the probability that a person who did not have AIDS would have been diagnosed with AIDS?

Related readings: Lecture Notes.

Week 13 (Apr 25 & 27) Hwk 3 due on Apr 27

Judgment and Choice Biases: Framing Effects, Endowment Effects and Sunk Costs Fallacies

In one of their experimental studies Kahneman and Tversky asked the following question. "Imagine that the United States is preparing for an outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Scientific estimates of the consequences of the programs are as follows:

> If Program A is adopted, 200 people will be saved.
> If Program B is adopted, there is a 1 in 3 probability that 600 people will be saved and a 2 in 3 probability that no people will be saved.

Which program would you favor? " 72% percent chose program A. A second group of respondents, however, was presented with the same situation but a different description of the alternative programs:

> If Program C is adopted, 400 people will die.
> If Program D is adopted, there is a 1 in 3 probability that nobody will die and a 2 in 3 probability that 600 will die.

Which program would you favor? In this case only 22% of respondents chose program C, while 78% chose program D. Obviously, C and A are identical (400 people dying is the same as 200 living) and so are D and B. The difference between 72% support and 22% support caused by the framing of the problem should make anyone pause. How manipulable are we?

Early experiments, like this one were fundamentally important for a behavioral revolution in economics that was about to happen two/three decades later. This revolution in no small part was triggered by the research of Daniel Kahneman and Amos Tversky (Kahneman was awarded Nobel Prize in 2002, Tversky died in 1996.)

Related readings: Lecture Notes.

Week 14 (May 2 & 4) Test 3 on May 4

Judgment and Choice Biases: Representativeness, Availability, Anchoring, and Bounded Rationalty

Tversky and Kahneman have asked subjects to estimate, without using any calculators or other means like pen and paper, the magnitude of "8 factorial," which means $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$. The problem was presented in two ways. Some were asked to estimate the product of $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$, and others were asked to estimate the product of $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$. The median judgment of the subjects presented with the numbers in the ascending sequence ($1 \times 2 \times 3 \times 4 \times$ ...) was 512, whereas the median estimate for those again presented with the descending sequence ($8 \times 7 \times 6 \times 5 \times$ ...) was 2,250. In both formats people underestimate the true factorial product, 40,320. What do you think is the nature of a common mistake we make in such situations?

Related readings: Lecture Notes.
