PSY 410 Winter, 1984
Decision Making R. Dawes

Course Outline

The first section of this course is a brief presentation of statistical and economic ideas of optimal decision making. The second is an analysis of our intuitive thought processes when attempting to make good decisions and judgements, with a particular emphasis on systematic cognitive errors and biases.

Handouts will be circulated prior to the lectures (with the exception of the first). The major text is Nisbett and Ross's book, Human inferences: Strategies and shortcomings of social judgement (about 300 pages), available at the University Bookstore. Students are also required, without class discussion, to read parts of Stech's monograph Political and Military Intention Estimation, which will be covered on the final examination.

There is a midterm examination on February 13th during class time, and a final on March 19th at 3:15 p.m. Twenty percent of each examination will be distributed in the prior class period. Eighty percent is live. The final and term paper are each worth 100 points, the midterm 50.

TOPICS

1/9 Probabilistic basis of decision making: gambling, future orientation (Dawes, Ch. 1)
1/11 Probabilistic basis of decision making: Basic probability theory (Dawes, Ch. 4)
1/14 Probabilistic basis of decision making: The law of large numbers and the "law" of small numbers (Dawes, Ch. 6 & 7)
1/16 Economic basis of decision making: maximizing expected utility as desirable and descriptive (handout)
1/18 Economic basis of decision making: the unseen hand and prisoner's dilemma (Messick and Brewer chapter)
1/21 Economic basis of decision making: rejecting dominating strategies (Dawes, et al, papers)
1/23 Economic basis of decision making: framing, the catch (Tversky and Kahneman Science article; Slovic, Fischoff & Lichtenstein book article)
1/25 Preface to human judgement (Nisbett and Ross [N&R] Ch. 1)
1/27 Heuristics: availability, representativeness, anchoring, and vividness (N&R, Ch. 2 & 3)
1/30 Sensation, perception, inference (N&R, Ch. 4, pp. 65-73)
2/1 Insensitivity to sample size and origin (N&R, Ch. 4, pp. 73-89)
2/4 Statistical analysis of 2 x 2 contingency (lecture only)
2/6 2 x 2 inference: Eddy example (N&R, Ch. 5; Dawes, Ch. 5)
2/8 Statistical vs. intuitive dependence, newspaper article about Dr. Rogers)
2/11 Review
2/13 Midterm examination
2/13 Causal inference and attribution theory (N&R, Ch. 6)
2/18 Dawes: the reduction of causality to statistical assertion, or constancy plus tautology: from f/m = a to f/a = c, which we call "mass" (lecture)
2/20 Linear predictability (Dawes, Ch.3)
2/22 Objections to linear models: cognitive (Dawes, Northwestern Talk; Einhorn, book chapter)
2/25 Objections to linear models: emotional (Meehl, 1984 APA Convention paper)
2/27 Ignoring base rates (N&R, Ch. 7, pp. 137-150)
3/1 The conjunction fallacy and scenario thinking (Tversky and Kahneman Psychological Bulletin article)
3/4 Regression and non-regressive prediction (N&R, ch. 7, pp. 150-166)
3/6 Self-attribution and resistance to change (N&R, Ch. 8 & 9)
3/8 Shallow psychology and prejudice (N&R, ch. 10; Dawes "shallow psychology" article)
3/11 Relevance of laboratory work: preference reversals (N&R, ch. 11)
3/13 Dawes: the value of uncertainty (lecture)
3/15 Review

Sections of Stech's monograph required: Chs. 1, 3, 4, pgs. 178-180 of ch. 5, chs. 7, 8.

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FINAL EXAMINATION

Name: _____

I. 30 points. On the left are a set of statements, on the right a list of concepts, names, or terms. Match one element from the list on the right with every statement on the left. (2 points for each correct match)

1. "Because linear models don't predict very well, intuitive judgement must do better."
2. "Because they don't have the respect for life we do, we are forced to kill more of them than they kill of us in order to bring them to the bargaining table."
3. "Dust must have gotten in apparatus."
4. "Her grades aren't up to her aptitude. She's an underachiever."
5. "I am the sort of person who panics on exams."
6. "I do not view human irrationality as confined to mentally ill patients or even to the milder maladjustments we see in outpatient psychotherapy, but rather as par for the course."
7. "I know that there are many more Democrats in this town, but he must be a Republican, because he dresses well, and Republicans dress well."
8. "It is from the <u>variation</u> in their propaganda that we predict the major <u>unstable</u> variables in their plans."
9. "Just over half the women in the highest risk group are likely to develop cancer between the ages of 40 and 59."
10. "Nothing bad will happen to me when I'm driving because I'm a superior driver."
11. "There is no controversy in social science which shows such a large body of qualitatively diverse studies coming out so uniformly in in the same direction as this one."
12. "We are clearly superior people; we need not fear we have chosen the wrong course; we are unanimous."
13. "We should clearly distinguish differing hypotheses and then test the evidence against them rather than hoping the evidence <u>per se</u> will lead us to hypothesize the truth."

a. belief persistence
b. clinical vs. statistical prediction
c. confusion of inverse probabilities
d. the conjunction fallacy
e. FBIS
f. fundamental attribution error
g. groupthink
h. "hydraulic" model of causation
i. ignoring base rates
j. irrational syllogism
k. the "just the facts" (jigshaw) fallacy
l. non-regressive thinking
m. Paul Meehl
n. regression to the mean
o. self-attribution
p. self-fulfilling prophecy
q. self-negating prophecy
r. self-serving attribution
s. shallow psychology
t. strong inference
u. the Ultra syndrome

14. "We consider ourselves distinguished from the ape by the power of thought. We do not remember that it is like the power of walking in a one-year-old. We think, it is true, but we think so badly that I often feel it would be better if we did not." (B. Russell)

15. "You have the information; they don't. You will become unable to learn from anyone who does not have these [security] clearances." (H. Kissinger)

II. 5 points. If the probability of flunking a particular course given one has done no reading is .30 and three times as many people do no reading as flunk, what is the probability that someone who flunks has done no reading?

III. 5 points Consider two bets:

A. probability of .8 to win $5
B. probability of .2 to win $20

Which has the higher expected value (2 points). If people prefer one to the other, but are willing to pay more for the other, which are they likely to prefer (3 points).

IV. 10 points. In a particular hotel fire, you expect 50 deaths when you, the fire chief, arrive at the scene <u>if</u> you follow standard procedure. A radical innovation gives you, according to your best estimate, a 50-50 chance of saving 20 of those 50 or allowing 20 more to die. If you frame the question <u>that</u> way, are you--according to Tversky's and Kahneman's prospect theory of framing--more likely to stick with standard procedure or try the innovative one? Why? (5 points). How might you frame the problem to reverse your decision? (5 points).

V. 10 points. The 1977 (Senator) "Church" Senate Intelligence Committee cited errors arising from information gathering that was "too separate" from the decision making ("policy") and the knowledge of the decision makers <u>and</u> errors arising from information gathering that was "not separate enough." From Stech cite and briefly elaborate an example of each type of error (5 points each).

VI. 20 points. The "revealed preference" approach to decision making begins with the <u>assumption</u> that people maximize expected utility and then <u>infers</u> their utilities from the actual choices they make. Hence, choice "reveals" preference (utility). Do you think this approach is a good one? If so, why? If not, why not?

VII. [Take home]

VIII. 5 points extra credit. If $P(S|D)$ [the probability of the symptom given the disease] is .8 and $P(S|\overline{D})$[the probability of the symptom in absence of the disease] is .3. What must $P(D)$ be for $P(D|S)$ to equal .4?

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Take-Home Question

Imagine you are a lawyer defending an innocent man accused of a child murder following molestation. Your client is 35, has never been married, does not date, and is a "pillar of the community"--in church and boy scouts. Moreover, he has been in therapy to attempt to overcome his social/sexual shyness with women. The evidence against him is flimsy; in fact, he has two friends who have testified that he was with them at the time of the crime. He was originally suspected, however, because he fits a "personality profile" of such sex criminals. The prosecution has called several psychologists and psychiatrists as witnesses who have stated after interviews and/or Rorschach tests that the man is similar to sexual offenders with whom they have had experience. Moreover, over your objections, a woman with whom he unsuccessfully (and awkardly) attempted to set up a liaison has been permitted to testify by the judge. How do you counter <u>to the jury</u> (not to me) the input of this testimony?

20 points. Do <u>not</u> bring answer or even notes to class.