Cognition: Methods and Models

PSYC 2040

L12: Judgment and Decision-Making

+ Review!

recap: Apr 26/28, 2023

- what we covered:
  - social cognition
- your to-dos were:
  - *finish:* L11 quiz/assignments
  - *submit*: project milestone #5
  - *do/block time for*: practice assessment 2

questions in decision-making

- how do people evaluate information?
- how do people make choices/decisions?
- what factors influence these decisions?

heuristics vs. biases

- heuristics: “rules of thumb” / mental shortcut
- biases: systematic errors of judgment (driven by heuristics)
- three key heuristics:
  - representativeness
  - availability
  - adjustment and anchoring

activity

- class will be divided into three groups
- groups will close their eyes until they are called

group 1 ranks

- Consider all first-year graduate students in the U. S. today. Please rank order the following nine fields of specialization based on the percentage of these students who are now enrolled in each of the programs.

Group 1: Rank the professions from most to least common!

Business Administration

Computer Science

Engineering

Humanities and Education

Law

Library Science

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group 2 description

- Tom V. is of high intelligence, although lacking in true creativity. He has a need for order and clarity, and for neat and tidy systems in which every detail finds its appropriate place. His writing is rather dull and mechanical, occasionally enlivened by somewhat corny puns and by gashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to have little feel and little sympathy for other people and does not enjoy interacting with others. Self centered, he nonetheless has a deep moral sense.

Group 2: How similar is Tom W. to the typical graduate student in each of the following nine fields of graduate specialization?

Business Administration

Computer Science

Engineering

Humanities and Education

Law

SEE MORE

group 3 description

- Tom V. is of high intelligence, although lacking in true creativity. I le has a need for order and clarity, and for neat and tidy systems in which every detail finds its appropriate place. His writing is rather dull and mechanical, occasionally enlivened by somewhat corny puns and by Hashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to have little feel and little sympathy for other people and does not enjoy interacting with others. Self centered, he nonetheless has a deep moral sense.

group 3: ranks

The preceding personality sketch of Tom V. was written during Tom's senior year in high school by a psychologist, on the basis of projective tests. Tom V. is currently a graduate student. Please rank the following nine fields of graduate specialization in order of the likelihood that Tom V. is now a graduate student in each of these fields.

Group 3: Rank the professions for Tom!

Business Administration

Computer Science

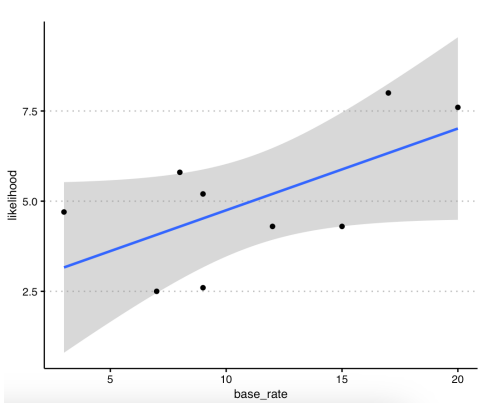
Engineering

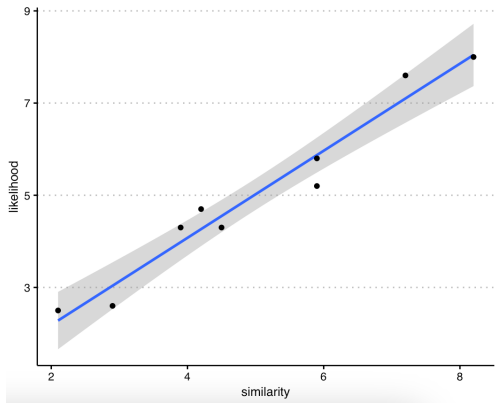
Humanities and Education

Law

representativeness heuristic

- people use the similarity of an event/example to the parent population and how stereotypical it is to judge its frequency and probability





ESTIMATED BASE RATES OF THE NINE AREAS OF GRADUATE SPECIALIZATION AND SUMMARY OF SIMILARITY AND PREDICTION DATA FOR TOM W.

Graduate specialization area	Mean judged base rate (in %)	Mean similarity rank	Mean likelihood rank
Business Administration	15	3.9	4.3
Computer Science	7	2.1	2.5
Engineering	9	2.9	2.6
Humanities and Education	20	7.2	7.6
Law	9	5.9	5.2
Library Science	3	4.2	4.7
Medicine	8	5.9	5.8
Physical and Life Sciences	12	4.5	4.3
Social Science and Social Work	17	8.2	8.0

representativeness: biases

- people ignore the base rates of occurrence of different events!
- people tend to incorrectly believe that local sequences carry the same characteristics that global sequences do (law of small numbers)
- people tend to forget that repetitions often regress to the mean

On each round of a game, 20 marbles are distributed at random among five children: Alan, Ben, Carl, Dan, and Ed. Consider the following distributions:

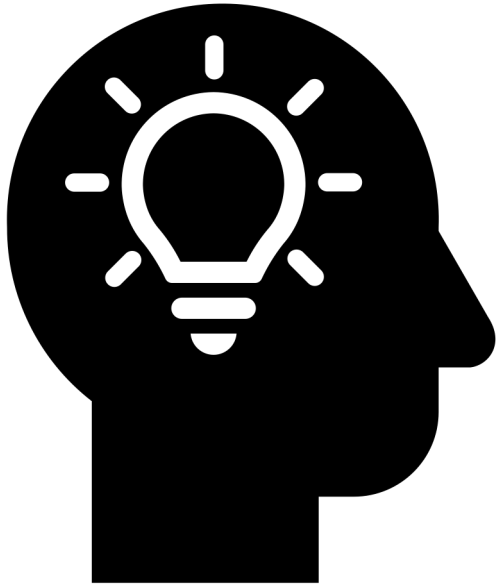
	I		II
Alan	4	*Alan*	4
Ben	4	*Ben*	4
Carl	5	*Carl*	4
Dan	4	*Dan*	4
Ed	3	*Ed*	4

In many rounds of the game, will there be more results of type I or of type II?

The uniform distribution of marbles (II) is, objectively, more probable than the nonuniform distribution (I), yet it appears too lawful to be the result of a random process. Distribution I, which departs slightly from an equitable partition, is more representative of random allocation. A significant majority of Ss (36 of 52, $p < .01$ by a sign test) viewed distribution I as more probable than distribution II. The presence of

availability heuristic

- people use the ease with which relevant instances come to mind to judge an event's frequency and probability
- activity: two groups
  - 10 seconds!



group 1

- write down all words that come to mind where:
- R is in the first position

group 2

- write down all words that come to mind where:
- R is in the third position

availability heuristic

- people use the ease with which relevant instances come to mind to judge an event's frequency and probability
- people were more likely to judge that R appears more in the first position than third position, even though the opposite was true

A typical problem read as follows:

"Consider the letter *R*.

Is R more likely to appear in ___ the first position?
___ the third position?
(check one)

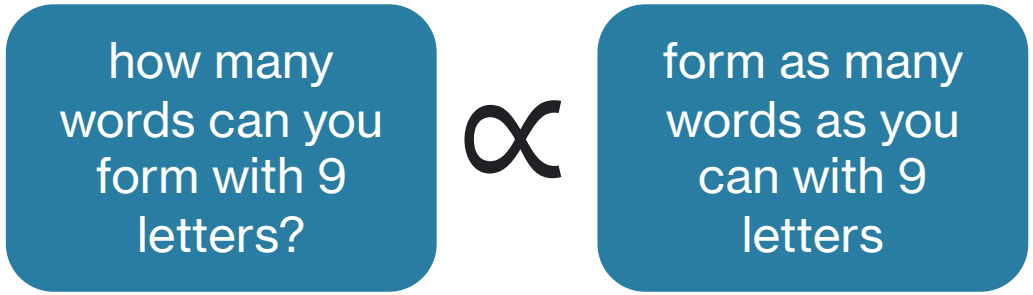
My estimate for the ratio of these two values is _____: 1."

Subjects were instructed to estimate the ratio of the larger to the smaller class. For half the subjects, the ordering of the two positions in the question was reversed. In addition, three different orderings of the five letters were employed.

Results. Among the 152 subjects, 105 judged the first position to be more likely for a majority of the letters, and 47 judged the third position to be more likely for a majority of the letters. The bias favoring the first position is highly significant ($p < .001$, by sign test). Moreover, each of the five letters was judged by a majority of subjects to be more frequent in the first than in the third position. The median estimated ratio was 2:1 for each of the five letters. These results were obtained despite the fact that all letters were more frequent in the third position.

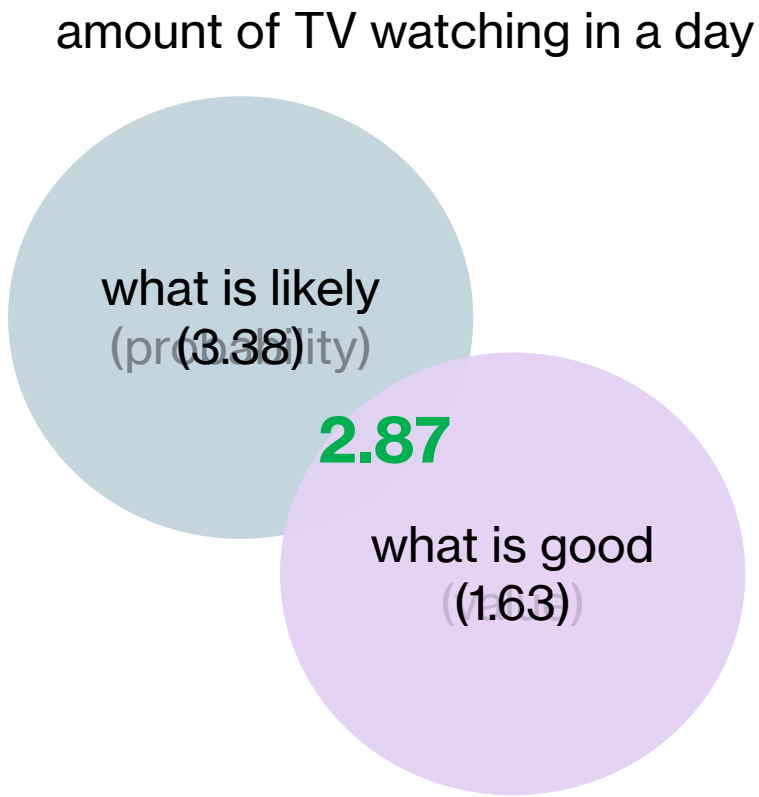
availability heuristic

- people use the ease with which relevant instances come to mind to judge an event's frequency and probability
- people are also sensitive to availability and can estimate their capacity to generate responses



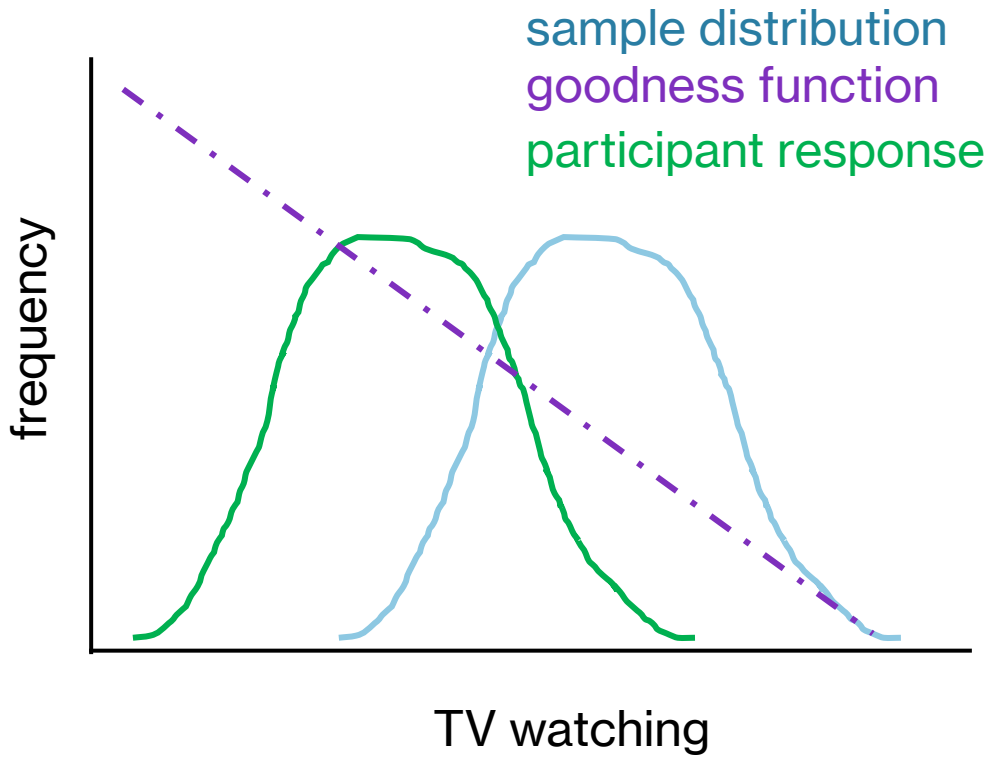
what comes to mind?

- Bear et al., 2020 have recently investigated this question
- "what comes to mind" depends on:
  - what is most likely (sample distribution)
  - what is generally good



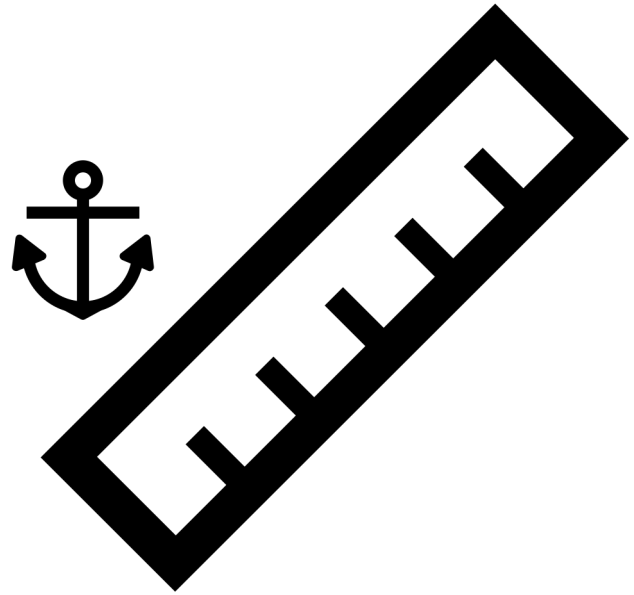
what comes to mind?

- Bear et al., 2020 have recently investigated this question
- "what comes to mind" depends on:
  - what is most likely (sample distribution)
  - what is generally good
- a multiplicative function



adjustment and anchoring

- people make estimates by starting with an initial value and adjusting it to yield a final decision
- activity: two groups
- type in your answer as soon as possible to the problem shown



group 1

- 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

group 2

- 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 x 9

big takeaways

- get in groups of 3 and report key takeaways from today
- takeaways document

review time!

- get in groups in and discuss any questions that are coming up
- 5 minutes and debrief

next classes (May 4/9)

- **before** class:
  - *work on:* practice assessment
  - *study for*: assessment 2!
  - *finish (optional):* L12 quiz/assignments + conceptual reflection
  - *fill out*: April/May survey (extra credit)
  - *fill out*: Memer survey
- **May 4**: Assessment 2
- **May 9**: project presentations + wrap-up!
  - send slides by Tuesday afternoon!