A Perspective on Judgment and Choice

Mapping Bounded Rationality

Daniel Kahneman
Princeton University

2002 Nobel Prize Speech

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Intuition and accessibility

- Intuition is often flawed, even for people who "know better." Why is this?
- 2 System View
  - System 1 = quick and intuitive
  - System 2 = slow and reasoned
    - Often checks up on the conclusions of system 1
    - Can't do this all the time because of limited cognitive resources

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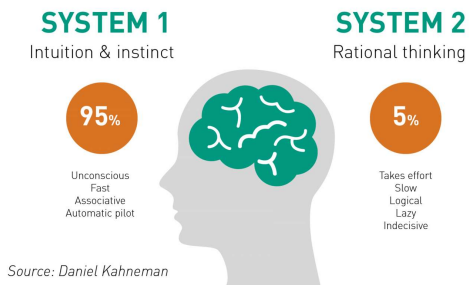

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System 2 processing is a limited resource

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Example

- A bat and a ball together cost $1.10. The bat costs $1.00 more than the ball. How much does the ball cost?
- *A bat and a ball together cost $1.10. The bat costs $1.00 more than the ball. How much does the ball cost?*
- Disfluency triggers system 2 processing

Alter, A. L., Oppenheimer, D. M., Epley, N., & Eyre, R. N. (2007). Overcoming intuition: metacognitive difficulty activates analytic reasoning. *Journal of Experimental Psychology: General, 136*(4), 569.

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Framing Effects

Imagine that the U.S. is preparing for outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the program are as follows:

- Kahneman, D. & Tversky, A. (1984). Choices, values, and frames. American Psychologist, 39, 341-350.

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Gain Frame

If Program A is adopted, 200 people will be saved. (72%)

If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved. (28%)

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Loss Frame

If Program A' is adopted, 400 people will die. (22%)

If Program B' is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die. (78%)

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Framing Effects

- Risk averse for gains
  - Prefer the sure thing
- Risk seeking for losses
  - Prefer the risky option
- In the Asian disease problem, the gain options are really the same as the loss options.

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Normative Principle: Invariance

- Two equivalent descriptions of the same choice should elicit the same preference.
- Decision makers violate this principle because system 1 passively accepts the formulation given.

Descriptive Theory:
Prospect Theory

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Changes or States

- Change = difference between current state and some reference point.
  - A comparison
- State = current state, not compared to anything
  - An absolute level

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Reference Dependence

- Choice 1
  - A. status quo
  - B. 50% chance to win $150, 50% chance to lose $100
- Would your choice change if your total wealth were lower by $100?

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Reference Dependence

- Choice 1
  - A. status quo
  - B. 50% chance to win $150, 50% chance to lose $100
- Choice 2
  - A. Lose $100 with certainty
  - B. 50% chance to win $50, 50% chance to lose $200

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Attribute Substitution

- A judgment is said to be mediated by a heuristic when the individual assessed a specified target attribute of a judgment object by substituting a related heuristic attribute that comes more readily to mind.

--Kahneman (2003, p. 707)

- Example:
  - You are supposed to judge probability
  - Instead, you assess similarity

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What are the sizes of the two horses as they appear in this image?

Note. Photo by Lenore Shoham, 2003.

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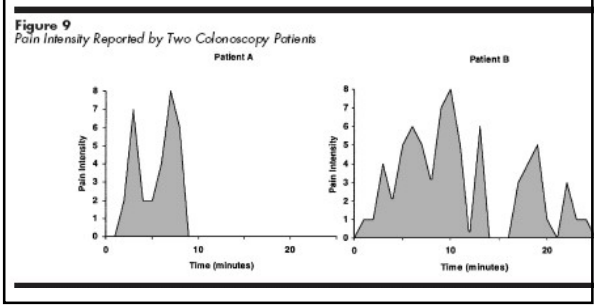
Prototype Heuristic

- Substitute a typical part for the whole.



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Redelmeier & Kahneman (1996)

- Patients undergoing colonoscopy
- Rate discomfort every minute.
- Give global assessment at the end.
  - Unrelated to duration of procedure
  - Strongly related to pain at
    - Peak (worst point)
    - End

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Are Heuristics Good for Us?

Bad	Good
• Cause Biases	• Adaptive
• Too simple	• Efficient
• Inaccurate	• Accurate

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Two Approaches

Heuristics & Biases approach	Fast-and-frugal approach
• Use heuristic to reduce effort	• Heuristics make use of an environmental cue
• Accept reduced accuracy	• Maintain high accuracy
	• Get reduced effort as a fringe benefit
• Kahneman & Tversky	• Gigerenzer

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Fast & Frugal Heuristics

- Simple strategies that ignore part of the available information
- Why would ignoring information be a good idea?
  - Uses only essential, not spurious info
- Simple, while still accurate

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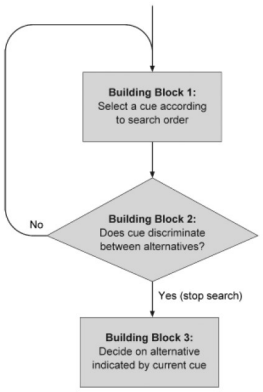
Example: Take the Best Heuristic



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Which city is larger?

Bamburg vs. Berlin

Do I recognize it?
Is it a capital?
Does it have a soccer team?
Does it have a castle?
Does it have a train station?

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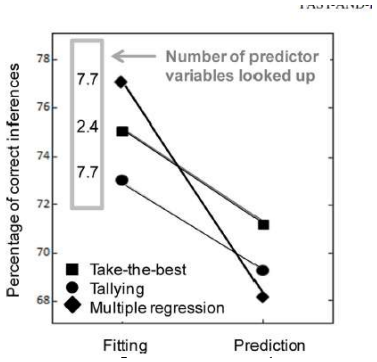

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Wrap-up

- Heuristic vs. Bias
- System 1 vs. System 2
- Framing Effects
- Reference Dependence
- Attribute Substitution
- Peak & End Effect
- Fast & Frugal Heuristics

Key Question:

- Are heuristics rational or irrational?

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