

Logic Puzzles and Games

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First: A Game

- I have a rule for a sequence of 3 numbers
 - (positive integers)
- Discover the rule by:
 - Give me a sequence
 - I will tell if it is valid or not
 - Why did you choose that sequence?

Start!

- Sample valid sequence:

2 4 8

Pulling a Lucas...

Human Irrationality and Bias

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Confirmation Bias

- Tendency to...
 - Perform tests that confirm hypothesis
 - Seek out confirming evidence
 - Avoid contradictory evidence
 - Assign larger weight to confirming evidence

The “Game”

- On the failure to eliminate hypotheses in a conceptual task
 - Wason, P. C. (1960)
- Initial sequence 2, 4, 6
- 23/29 failed the first guess of the rule
 - Tested sequences that confirmed hypothesis
 - Rarely tested disconfirming sequences

Examples

- Psychics
- Astrology
- Dreams of the future
- Prayer

Why are we biased?

- Mental Heuristics
- Confirmation is cognitively easier
- Avoid cognitive dissonance

- *Smart people believe weird things because they are skilled at defending beliefs they arrived at for nonsmart reasons*

- Michael Shermer

What can we do?

- Analyze held beliefs
- Be around those with different beliefs
- Science!
 - Peer review
 - Competing scientists

Other Crazy Biases

- **Better than average**
 - 70% think they are better than their average peer
- **Omission Bias**
 - Taking the wrong action is worse than not taking the right action
- **Gambler's fallacy**
 - Independent random events are not independent
- **Selective perception**
 - Expectations affect your perception
- **Zero-risk bias**
 - Better to reduce risk to zero (5% to 0% better than 50% to 25%)