THINKING ABOUT RATIONALITY

AUGUST 2017

QUICK SURVEY

TWO PROBLEMS:

1: (A) GET $900 FOR SURE OR (B) 90% CHANCE TO GET $1,000

2: (C) LOSE $900 FOR SURE OR (D) 90% CHANCE TO LOSE $1,000

WHAT IS BEHAVIORAL ECONOMICS?

A METHOD OF ECONOMIC ANALYSIS THAT APPLIES PSYCHOLOGICAL INSIGHTS INTO HUMAN BEHAVIOR TO EXPLAIN ECONOMIC DECISION-MAKING.

OK. SO WHY SHOULD I CARE? I HATED ECONOMICS IN SCHOOL

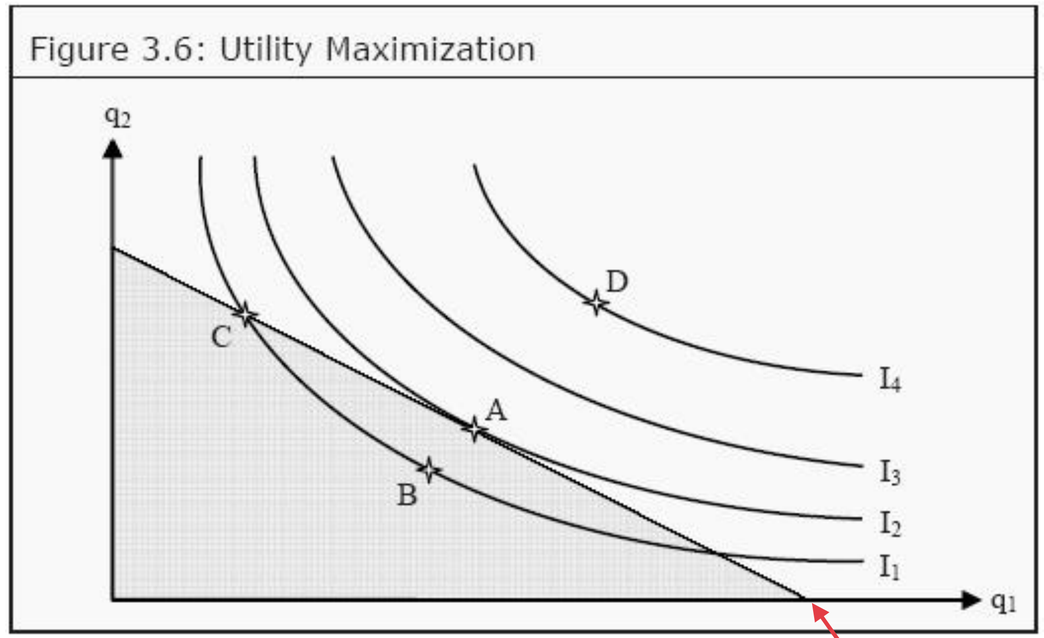
EVERYTHING YOU WERE TAUGHT ABOUT ECONOMICS IN SCHOOL WAS WRONG... WELL NOT EXACTLY, BUT THERE ARE IMPORTANT CONCEPTS THAT YOU CAN INCORPORATE INTO YOUR UNDERSTANDING OF HOW PEOPLE INTERACT WITH THEIR ENVIRONMENTS, INCLUDING DIGITAL!

LET'S START FROM THE BASICS

- Traditional economics believes that actors are rational and utility maximizing
  - Rationality - actors will make decisions that maximize their utility according to their preferences

Example?

- The point A is better than C since A is on a higher utility curve. You spend the same amount and get more utility from bundle A than bundle C.



Banan

Appl

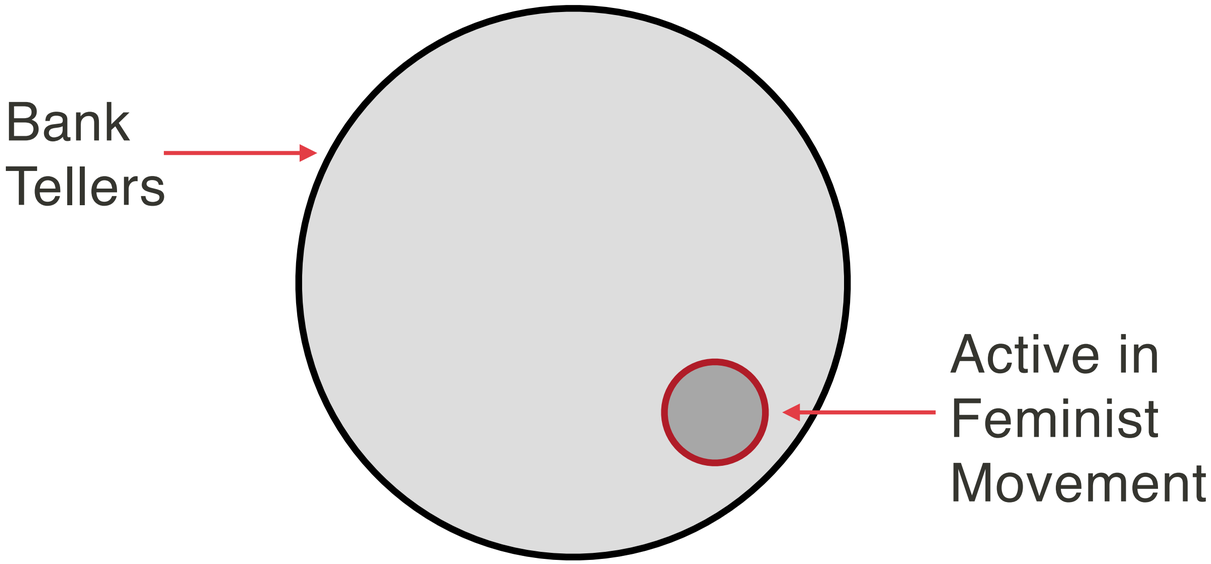
Budget Line

SIMPLE ENOUGH, WHAT'S SO COMPLICATED THEN?

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which is more probable?

1. Linda is a bank teller.
2. Linda is a bank teller and is active in the feminist movement.

80% of people surveyed chose option 2.



YOU GOT ME, I WANT ONE MORE TRY.

Here’s a choice between 2 buckets:

98% chance to win $520,000

or

100% chance to win $500,000

Which one do you choose?

Average decision weights assigned to different probabilities

Probability (%)	0	1	2	5	10	20	50	80	90	95	98	99	100
Decision weight	0	5.5	8.1	13.2	18.6	26.1	42.1	60.1	71.2	79.3	87.1	91.2	100

possibility effect ***uncertainty effect***

Source: Daniel Kahneman, *Thinking, Fast and Slow*

ONE FINAL QUESTION, SOME OF YOU MAY KNOW IT

A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

Most people who answer this question substitute more than with an absolute statement “the bat costs $1.00”.

$1.05

+ $0.05

$1.10

WHAT'S GOING ON?!

I'M SORRY TO SAY, YOU'RE NOT RATIONAL.

BUT IT'S ALL GOING TO BE OK

WE'RE ALL IRRATIONAL. IT'S PART OF BEING HUMAN.

WHAT'S MORE IMPORTANT IS UNDERSTANDING WHERE AND WHY YOU DEVIATE FROM TRADITIONAL "RATIONAL" THOUGHT

I’VE STOPPED CRYING NOW. PLEASE EXPLAIN MORE

Econ

—

Consistently rational and narrowly self-interested agents who usually pursue their subjectively-defined ends optimally

Human

—

An agent that is subject to heuristics and biases including, but not limited to, anchoring, availability, loss aversion, emotion, halo effect, confirmation bias, overconfidence etc.

SO HOW DO I UNDERSTAND THE PRINCIPLE THAT I AM HUMAN?

System 1

—

This is the automatic, effortless processes that your brain uses to enable you to act more efficiently. System 1 is the originator of “impressions and feelings that are the main sources of explicit beliefs and deliberate choices of system 2.”

Behavioral economics is the story of system 1

System 2

—

This is who we believe we are, “the conscious, reasoning self that has beliefs, makes choices, and decides what to think about and what to do.”

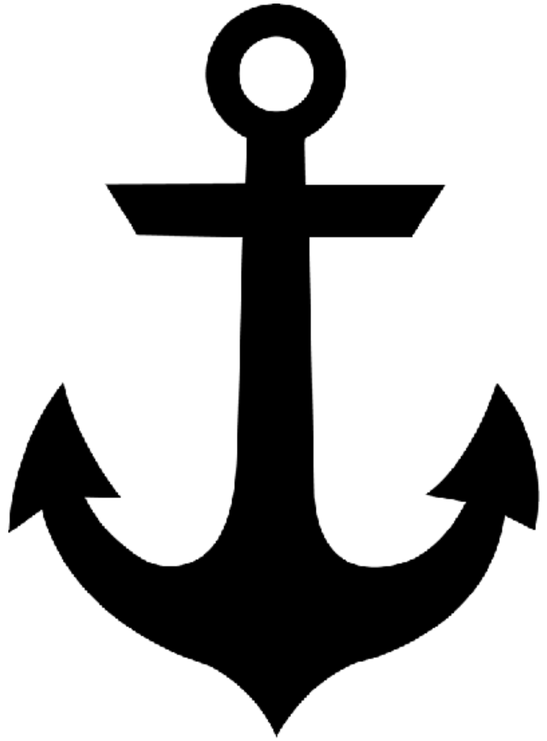
Note: There are not actually two parts of your brain with dedicated functions rather this allows us to better understand how the brain works.

CORE PRINCIPLE

WYSIATI

WHAT YOU SEE IS ALL THERE IS

THAT MAKES SOME SENSE BUT I WANT SOME EXAMPLES



ANCHORING EFFECT

ANCHORING EFFECT

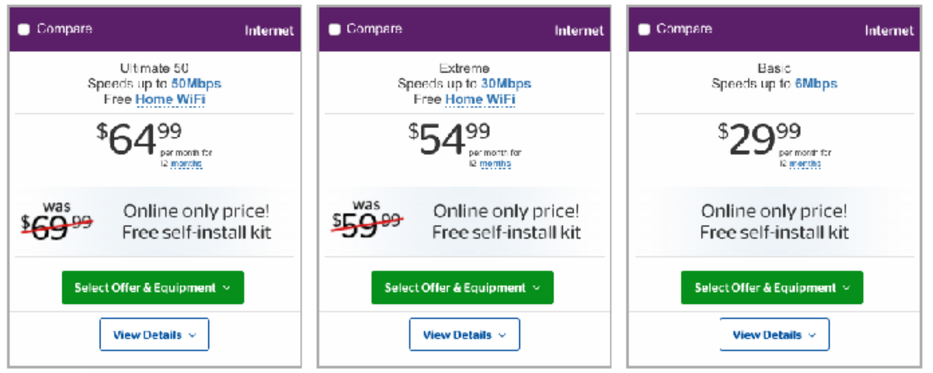
Definition

—

Anchoring is a cognitive bias that describes the common human tendency to rely too heavily on the first piece of information offered (the "anchor") when making decisions. This bias actually affects both systems in different ways

System 1 - anchoring can used to *prime* individuals into a choice

System 2 - anchoring can be used as an *adjustment* tool from which to move



ANCHORING EFFECT EXAMPLES

Exploratorium Donations

Visitors to the exploratorium were asked about their willingness to make an annual contribution “to save 50,000 offshore Pacific Coast seabirds from small offshore oil spills, until ways are found to prevent spills or require tanker owners to pay for the operation.”

Average Donations:

- No Anchor - $64
- Low Anchor ($5) - $20
- High Anchor ($400) - $143

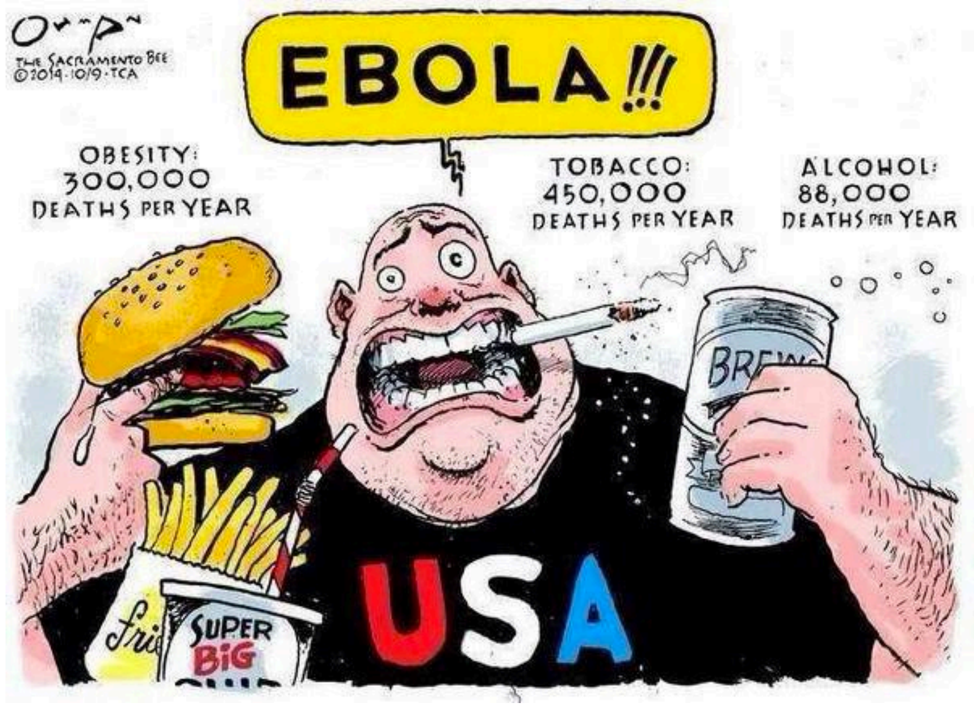
Campbell’s Soup

A shopping market in Iowa put out a promotion for 10% off Campbell’s soup. On some days, the sign said “Limit of 12 per Person” and on other days it said “No Limit per Person.”

On days when the limit was enforced, shoppers purchased an average of 7 cans which was *twice as much* as when there was no limit.

*Rationing could have a small effect but the possibility of 12 cans as a possible purchase certainly had a larger effect

THAT WAS ONLY ONE. LET'S LOOK THROUGH SOME MORE



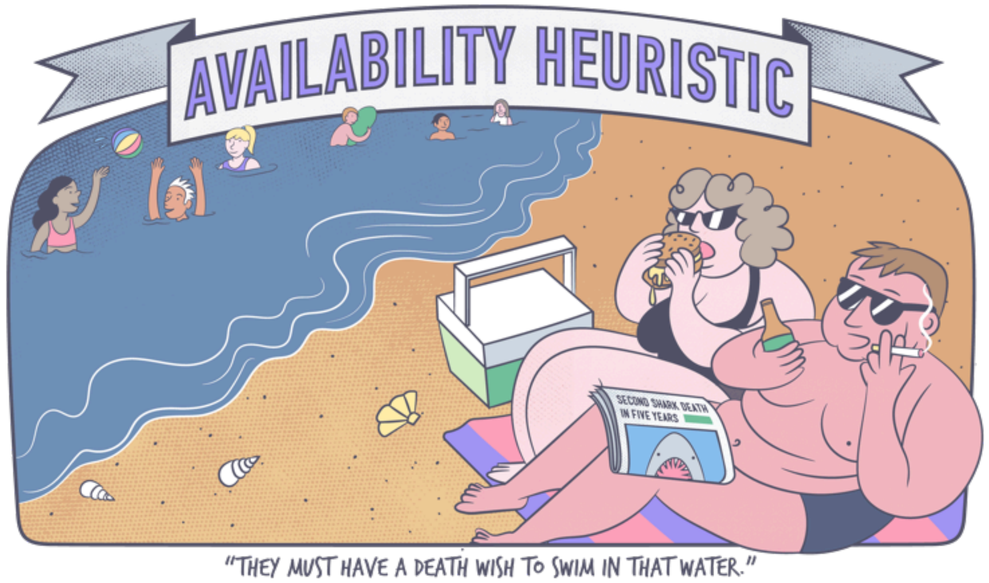
AVAILABILITY EFFECT

AVAILABILITY EFFECT

Definition

—

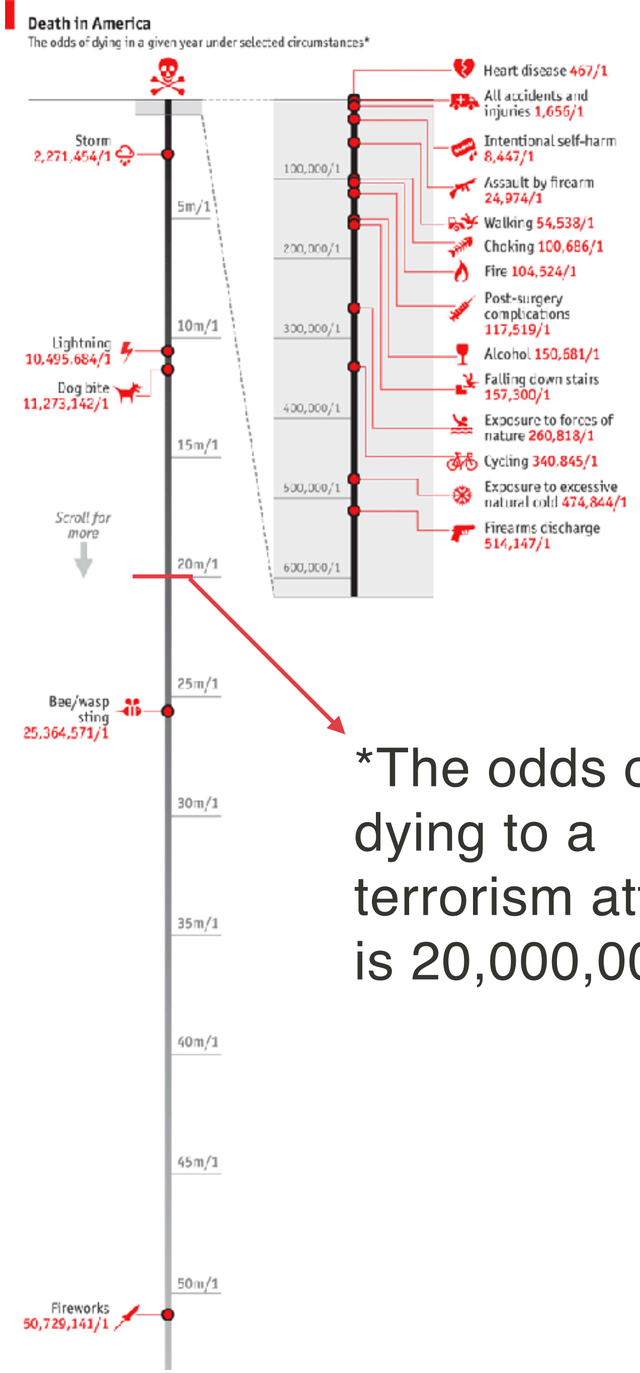
The **Availability** heuristic is a mental shortcut that relies on immediate examples that come to a given person's mind when evaluating a specific topic, concept, method or decision.



AVAILABILITY EFFECT EXAMPLES

Some common fallacies:

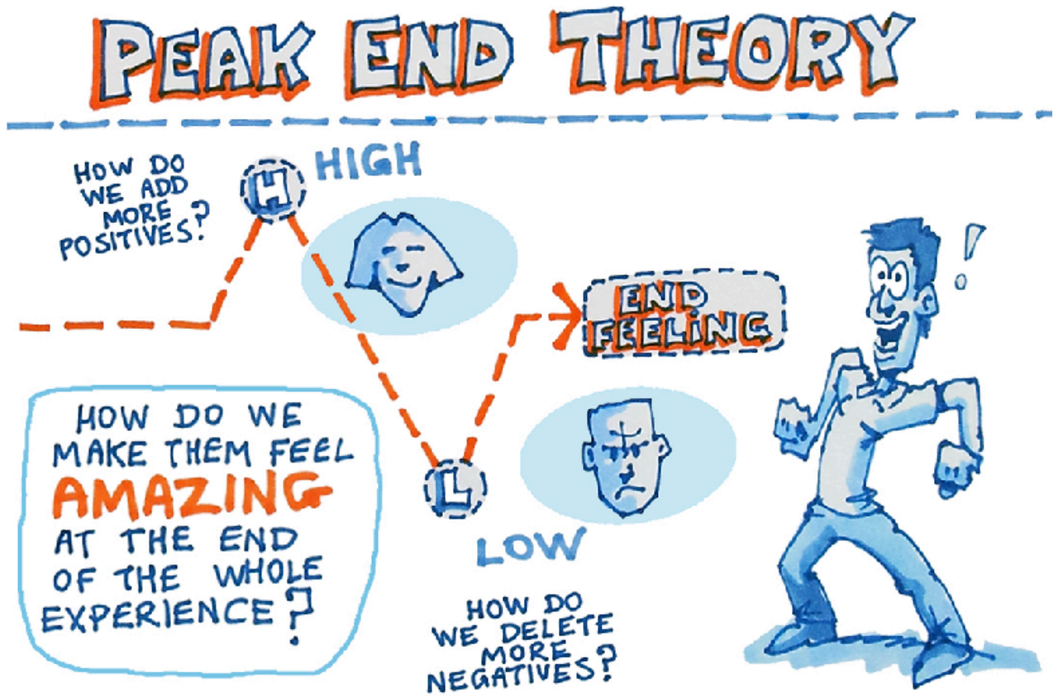
- Strokes cause almost twice as many deaths as all accidents combined, but 80% of respondents judged accidental death to be more likely.
- Death by lightning was judged less likely than death from botulism even though it is 52 times more frequent
- Death by accidents was judged to be more than 300 times more likely than death by diabetes, but the true ratio is 1:4



*The odds of dying to a terrorism attack is 20,000,000/1

Source: http://reason.com/archives/2011/09/06/how-scared-of-terrorism-should

MAYBE I BELIEVE YOU.



PEAK-END RULE

PEAK-END RULE

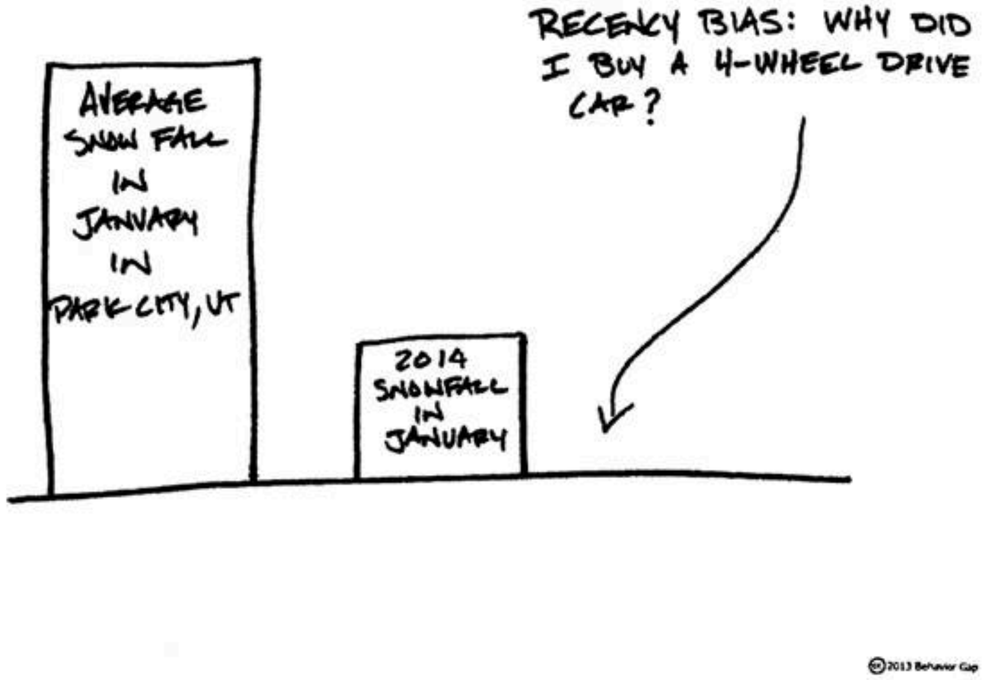
Definition

—

This is a combination of two biases.

- Memory Bias
  - We’re more likely to remember highly emotional moments in our life versus “average” events
- Recency bias
  - We are likely to remember the end moment or conclusion to an event

**The “Remembering Self” is stronger than the “Experiencing Self”



PEAK-END RULE EXAMPLES

Participants were subjected to two different versions of an unpleasant experience.

Trial 1: Submerge hand in 14°C water for 60 seconds

Trial 2: Submerge hand in 14°C water for 60 seconds at which the water is raised to 15°C for 30 seconds.

Participants preferred “Trial 2” due to the better memory of the experience.

Colonoscopy patients underwent a normal colonoscopy.

Trial 1: Undergo a colonoscopy procedure wherein the scope was left for 3 extra minutes creating a uncomfortable but not painful experience

Trial 2: Undergo a normal colonoscopy procedure

Patients described “Trial 1” as less unpleasant and were more likely to return for more procedures

STARTING TO BELIEVE ME NOW?

ATTRIBUTE SUBSTITUTION

ATTRIBUTE SUBSTITUTION

Definition

—

This occurs when an individual has to make a judgement that is computationally complex and instead substitutes a more easily calculated heuristic attribute.

In other words, we substitute hard questions for easier, related ones without even realizing it.

Remember Linda?

ATTRIBUTE SUBSTITUTION EXAMPLE

The Infamous Tom W

—

Tom W. is a graduate student at the main university in your state. Rank the following fields in order of likelihood, 1 being the most likely and 9 being the least likely.

- Business administration
- Computer science
- Engineering
- Humanities and education
- Law
- Medicine
- Library science
- Physical and life sciences
- Social science and social work

Part 2

—

Tom W. 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 flashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to feel little sympathy for other people and does not enjoy interacting with others. Self-centered, he nonetheless has a deep moral sense.

In which of these fields is Tom W more likely to be a student? How would you rank order these fields in terms of the likelihood that Tom W is a student in that field?

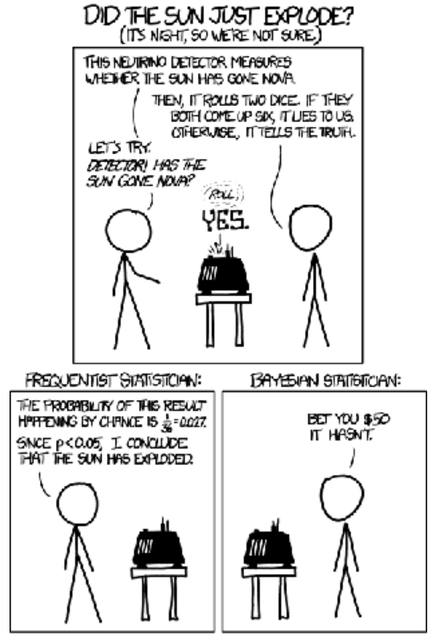
TOM W. RESULTS

Typical Results

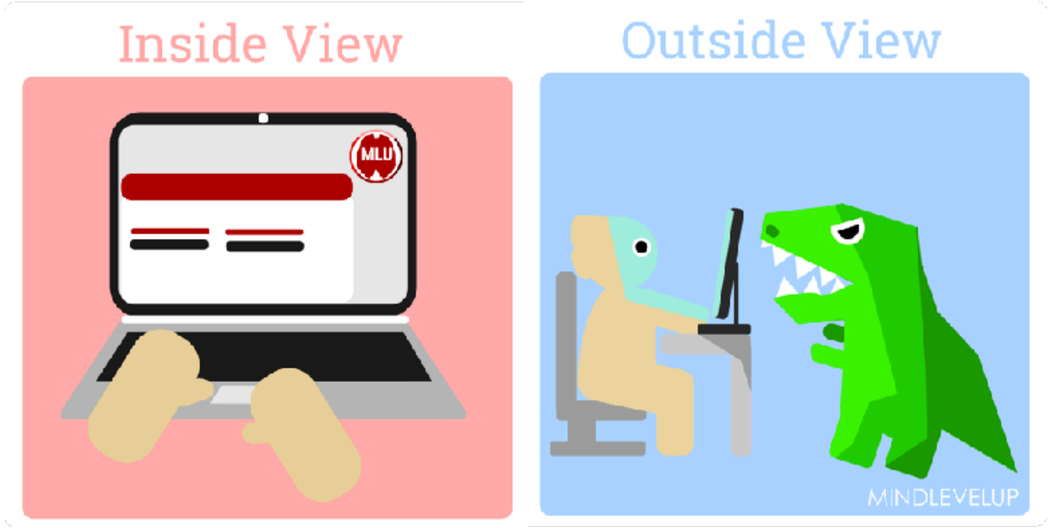
1. Computer science
2. Engineering
3. Business administration
4. Physical and life sciences
5. Library science
6. Law
7. Medicine
8. Humanities and education
9. Social science and social work

So what happened?

- Representativeness
- Base-rate neglect



LET'S DO ONE FINAL ONE



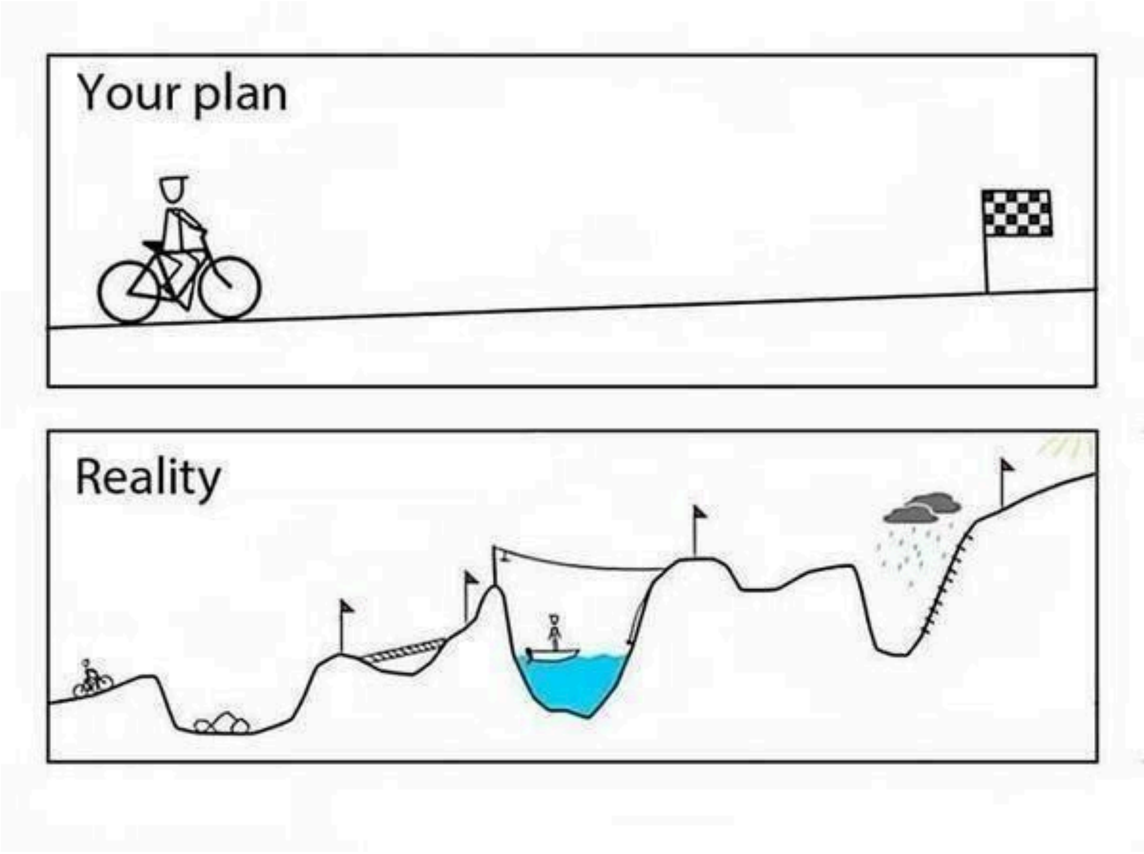
PLANNING FALLACY/ THE OUTSIDE VIEW

PLANNING FALLACY

Definition

—

The **Planning Fallacy** is a phenomenon in which predictions about how much time will be needed to complete a future task display an optimism bias and underestimate the time needed.



PLANNING FALLACY EXAMPLES

Worldwide Rail Projects Study

A 2005 study looked at rail projects between 1969 and 1998. In more than 90% of cases, the number of passengers projected to use the system was overestimated… planners, on average, overestimated how many people would use the new rail projects by **106%**, and the average cost overrun was **45%**.

Scottish Parliament Construction

- In July 1997, a proposed Scottish Parliament building in Edinburgh was estimated to cost up to **£40 million**.
- In June 1999, the budget was £109 million.
- In April 2000, legislators imposed a “cap on costs” of £195 million.
- In November 2001, it was £241 million.
- In 2002, it rose twice to £294.6 million.
- In 2003, it rose three times to £375.8 million.
- When it was completed in 2004, the cost was **£431 million**.

THIS IS SO IMPORTANT AND RELEVANT, IT GETS AN EXTRA SLIDE!

Why it happens

—

Your situation is not unique.

Extrapolating initial success to long-term success is a poor method of knowing how long to account for.

Mitigation Tactics

—

Identify an appropriate reference class (find similar projects)

Obtain statistics of that reference class and generate a baseline prediction.

Use specific information about the case to adjust the baseline prediction.

Premortem

WHAT CAN I TAKE AWAY?

WHAT YOU SEE IS NOT ALL THERE IS

TAKE A STEP BACK, EVALUATE YOUR ACTIONS, AND UNDERSTAND THE REASONS WHY YOU DID WHAT YOU DID

BOOKS TO READ