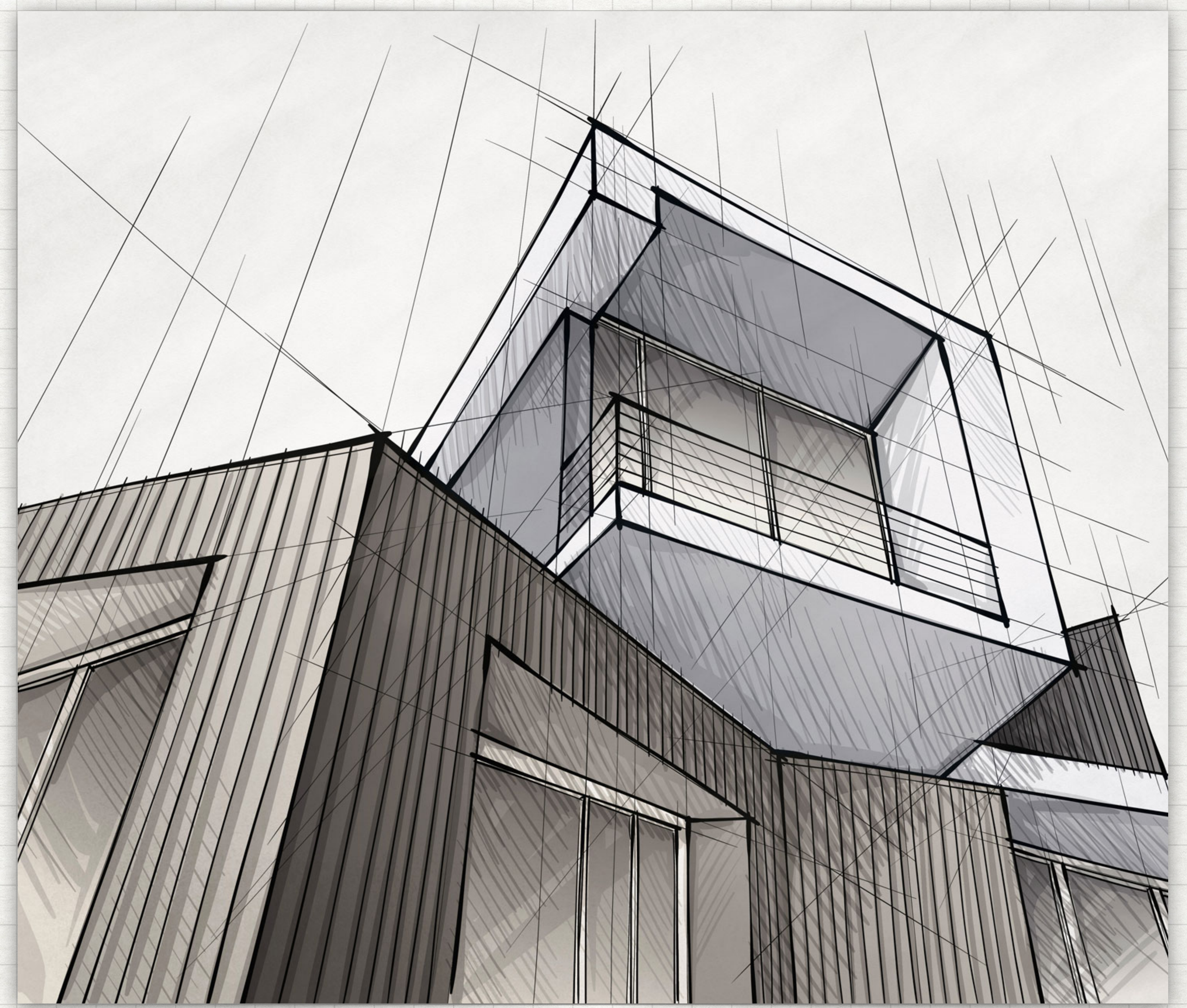
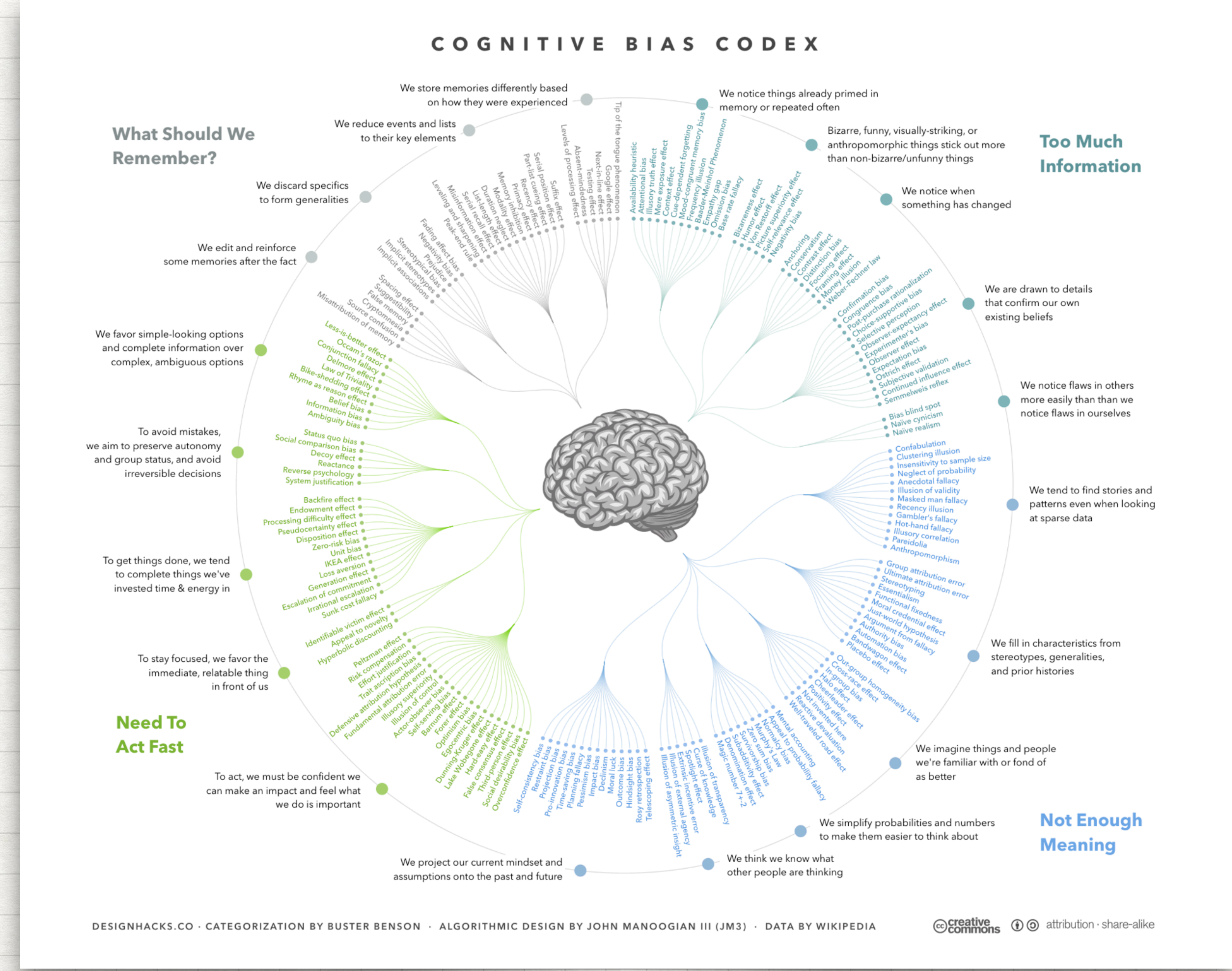
CS 007: SESSION 2

PERSONAL FINANCE FOR ENGINEERS



CS 007

PREDICTABLY IRRATIONAL



*"Predictably Irrational" is the title of a book by Dan Ariely

* DesignHacks.co: 188 Known Cognitive Biases

BEHAVIORAL FINANCE

How many of you think you are rational with your money?

(show of hands)

ANCHORING

MENTAL ACCOUNTING

CONFIRMATION & HINDSIGHT BIAS

GAMBLER'S FALLACY

YOU ARE NOT RATIONAL

HERD BEHAVIOR

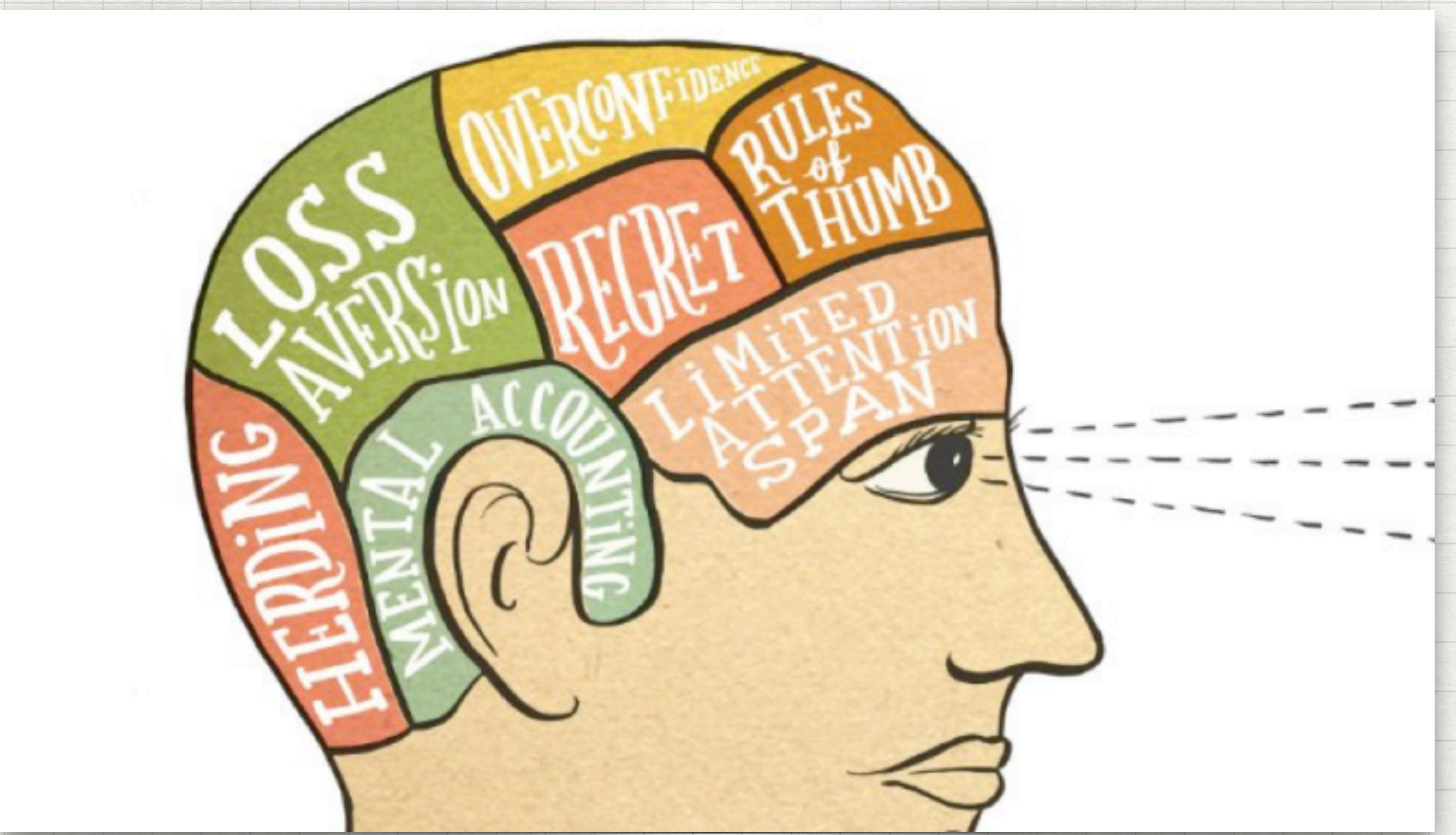
OVERCONFIDENCE

OVERREACTION & AVAILABILITY BIAS

LOSS AVERSION

WHY BEHAVIORAL ECONOMICS?

- A number of economic frameworks assume that humans evaluate financial decisions consistently & rationally
- **Daniel Kahneman & Amos Tversky** (1960s)
- 2002 Nobel Memorial Prize in Economic Sciences
- Prospect Theory

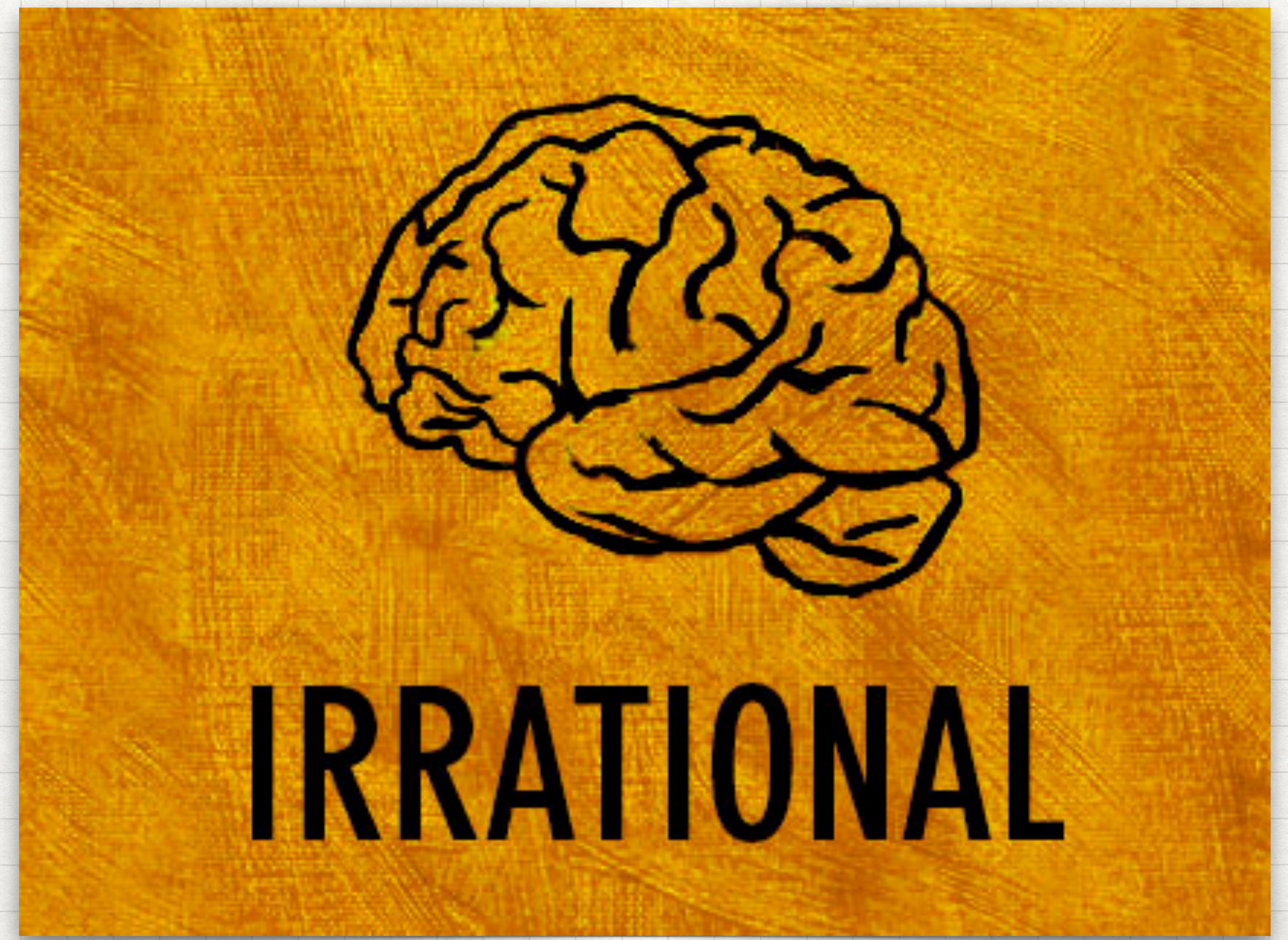


THREE THEMES IN BEHAVIORAL ECONOMICS

- **Heuristics**
  Humans make a vast majority of their decisions using mental shortcuts or rules of thumb.

- **Framing**
  Humans use anecdotes & stereotypes to understand & respond to events

- **Market Inefficiencies**
  Mis-pricing or non-rational decision making



ANCHORING

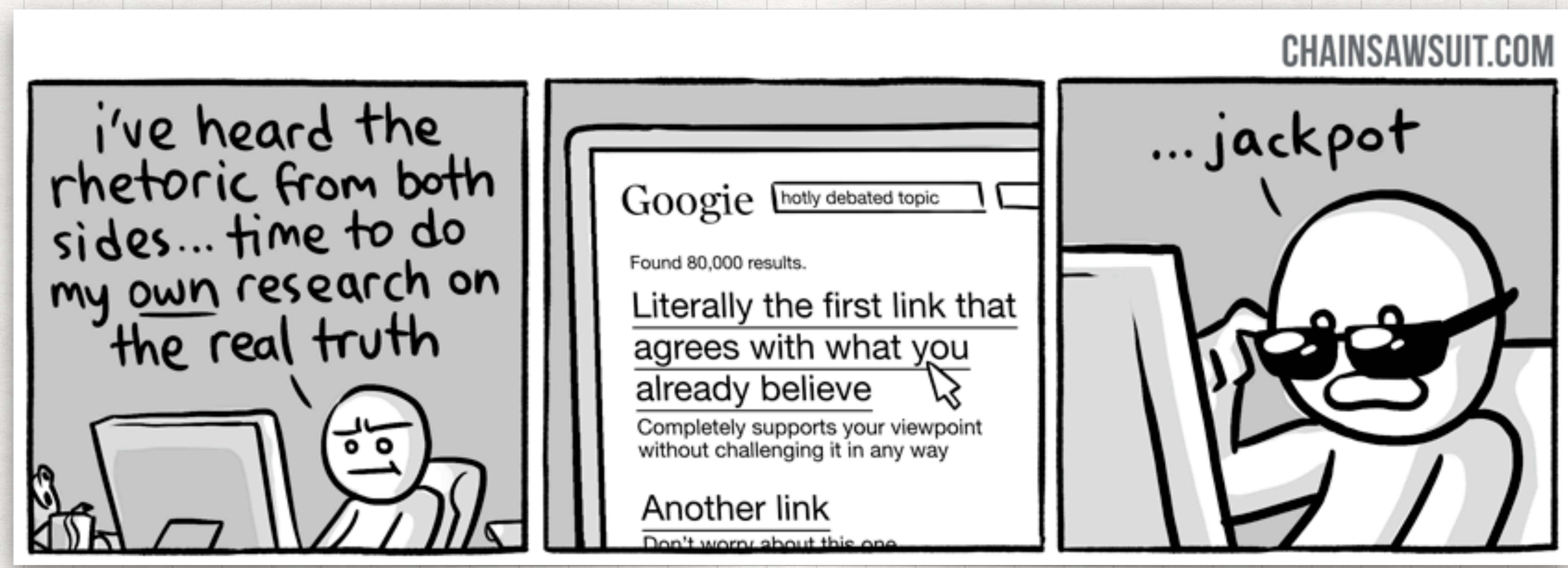
- People estimate answers to new & novel problems with a bias towards reference points
- **Tversky & Kahneman (1974)** (quick multiplication)
- **Dan Ariely** (social security numbers & prices)
- Common examples:
  - Price you bought a stock at
  - High point for a stock

MENTAL ACCOUNTING

- Money is fungible, but people put it into separate "mental accounts"
- Also known as "bucketing"
- Example: Lost Movie Tickets
- Example: "Found Money"
- Real world problems:
  Vacation Fund & Credit Card Debt

CONFIRMATION & HINDSIGHT BIAS

- Very different biases, but often conflated with each other.
- **Confirmation Bias**
  We selectively seek information that supports pre-existing theories, and we ignore / dispute information that challenges or disproves them.
- **Hindsight Bias**
  We overestimate our ability to predict the future based on the "obviousness" of the past.
- Combination of the two is particularly bad.



GAMBLER'S FALLACY

- We see patterns in independent, random chains of events.
- We believe that, based on a series of previous events, an outcome is more likely than odds actually suggest.
- Example: Dinner Party & Coin Flips
- Real odds might be 51/49, but we tend to jump to 80/20.
- Likely cause: the rarity of "independent events" in day-to-day experience.

HERD BEHAVIOR

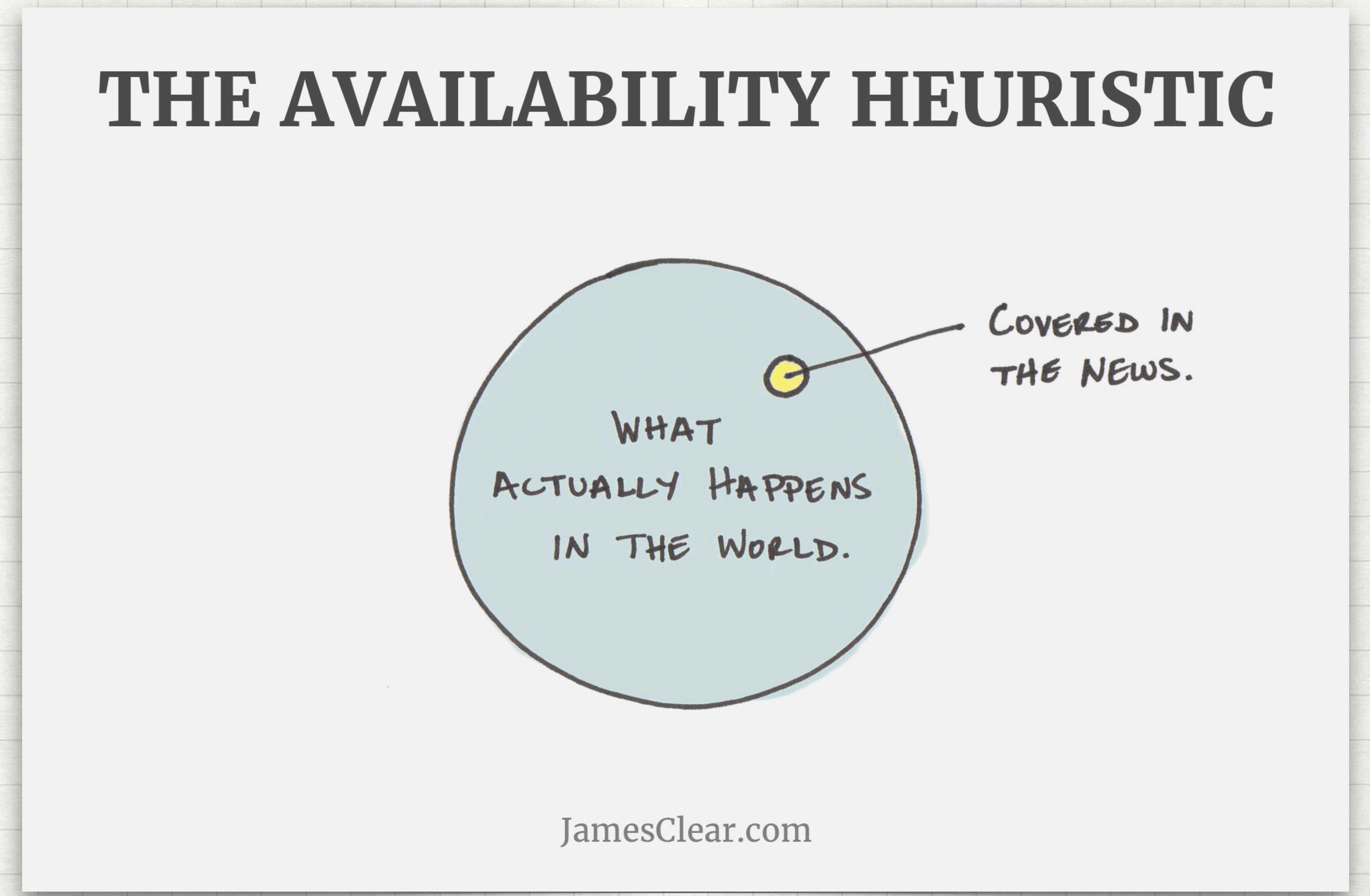
- We have a tendency to mimic the actions of the larger group
- Example: Building Psych Experiment
- Example: Empty Supermarket
- Crowd psychology may be a contributor to bubbles.
- Bucking the crowd creates stress & fatigue. It gets harder, not easier.
- Easier to be “wrong with everyone” than “right and alone”
- No gets fired for buying IBM?

OVERCONFIDENCE

- In “Behaving Badly” (2016), 74% of investment managers believed that they deliver above-average performance.
- Dunning-Kruger Effect. The more poorly you perform, the more you over-estimate your performance.
- Capability in one domain can lead to overconfidence in others.
- **Humility is a virtue.**

RECENCY & AVAILABILITY BIAS

- **Recency Bias**
  We overreact to recent events
- Example: Celebrity Illness
- **Availability Bias**
  We assume that the data we have been provided is representative of the entire data set.
- The combination is particularly bad.
- Studies show checking stock prices daily leads to more trading & worse results on average.
- Worse for engineers, because we are immersed in “game changers” & “it is different this time”



YOU HAVE $1,000 AND YOU MUST PICK ONE OF THE FOLLOWING GAMES

A	You have a 50% chance of gaining $1,000, and a 50% chance of gaining $0.

OR

B	You have a 100% chance of gaining $500.

NOW, YOU HAVE $2,000 AND YOU MUST PICK ONE OF THE FOLLOWING GAMES

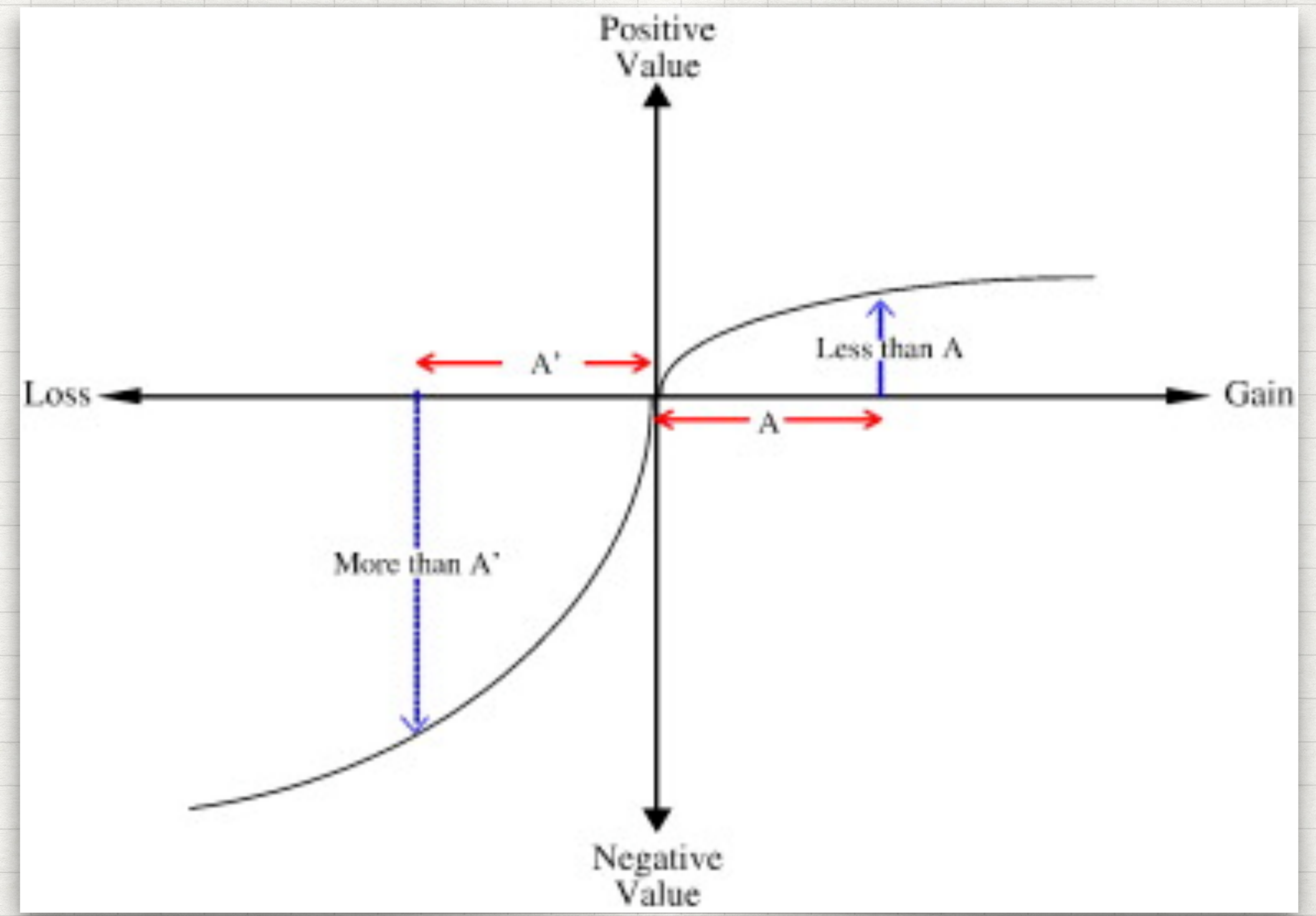
A	You have a 50% chance of losing $1,000, and a 50% chance of losing $0.

OR

B	You have a 100% chance of losing $500.

LOSS AVERSION (PROSPECT THEORY)

- **We hate losses more than we love winning**
- Average loss aversion across multiple studies is between 2:1 and 3:1
- Affects our views on a wide range of situations, including career decisions, dating, purchasing, investing and taxes.
- We even hate being responsible for decisions that could result in a loss
- Example: "Sunk Cost" mistakes with investments
- **Currently under debate!***

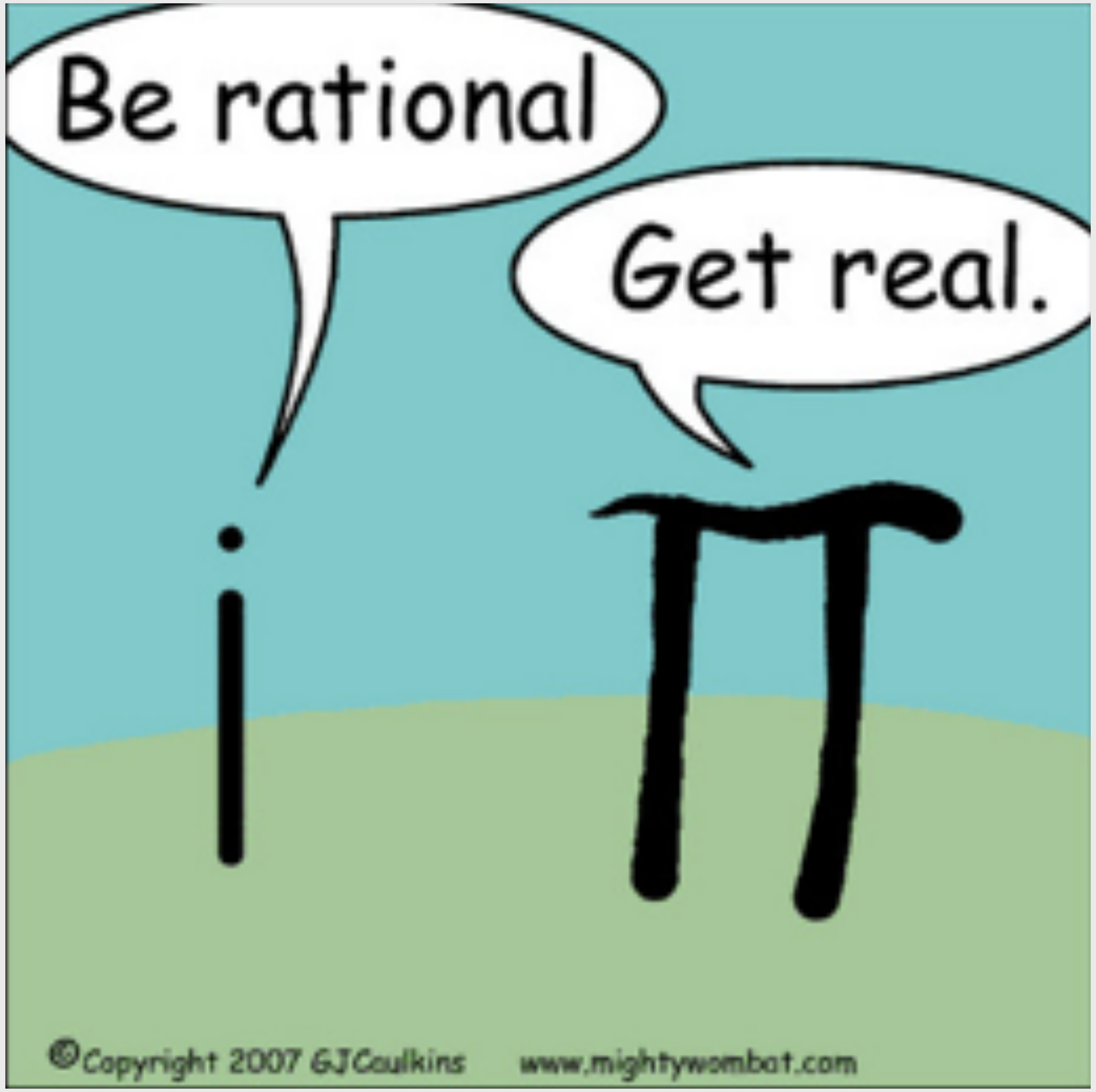


* https://blogs.scientificamerican.com/observations/why-the-most-important-idea-in-behavioral-decision-making-is-a-fallacy/?amp

IT'S OK TO NOT BE RATIONAL

IT’S OK TO NOT BE RATIONAL

- As Dan Ariely beautifully put it, the key is that humans are **predictably irrational**
- Know your own flaws, and you can set up systems to help account for them
- Self awareness is key
(yes, my Mom is a psychologist)



ADDITIONAL COURSES & MATERIAL

- Econ 178: Behavioral Economics
- Econ 278: Behavioral & Experimental Economics
- ACCT 618 (GSB): Market Efficiency & Informational Arbitrage
- Coursera / Duke: Behavioral Finance
  https://www.coursera.org/learn/duke-behavioral-finance

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QUESTIONS

NEXT WEEK: GETTING PAID

- Compensation
- Different models & methods
- Public vs. Private Companies
- Stock Options vs. Restricted Stock
- Understanding Equity Compensation
- Taxes