

Certified Inspector General Auditor Course

Heuristics and Cognitive Biases

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Course Objectives

1. Understand how Heuristics can affect problem-solving and judgment
2. Identify several types of cognitive biases
3. Recognize how these cognitive biases affect objectivity in conducting evaluations, inspections, investigations, and/or audits
4. Gain tools to combat cognitive biases in our work



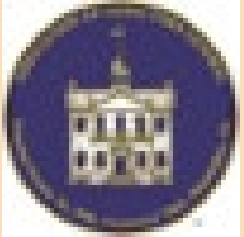
Heuristics and Cognitive Biases

Nobel-prize winning economist and cognitive psychologist **Herbert Simon** originally introduced the concept of **heuristics** in human decision-making during the 1950s.

A **heuristic** is a mental shortcut that allows you to:

- *solve problems* and
- *make judgments* quickly.

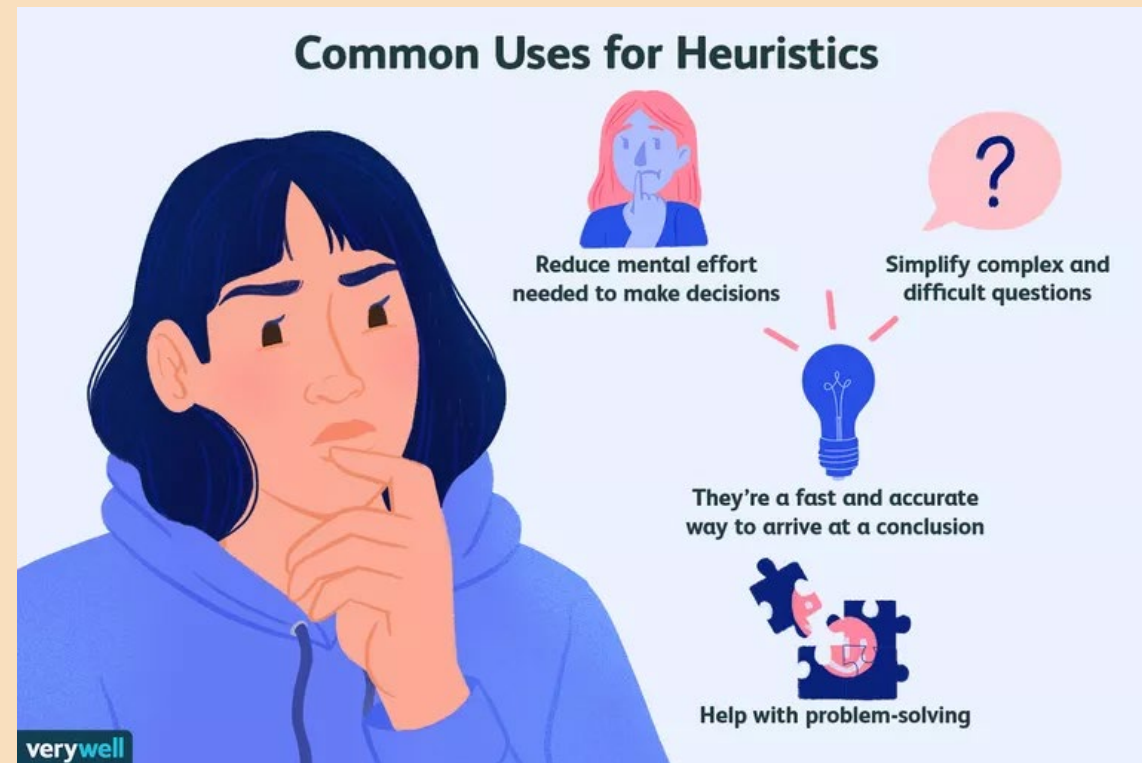
These **rule-of-thumb** strategies shorten decision-making time and allow you to function without constantly stopping to think about your next course of action.

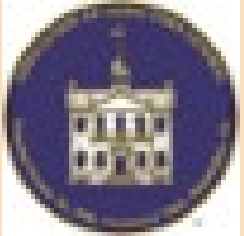


Heuristics and Cognitive Biases

The accuracy of these mental shortcuts may be influenced by:

- amount of time to make the decision,
- amount of information you have at your disposal,
- overall intelligence, and
- accuracy of perceptions.





Heuristics and Cognitive Biases

In 1972, psychologists Amos Tversky and Daniel Kahneman presented their research on **cognitive biases**.

- They proposed that **these cognitive biases** influence how people think and the judgments people make.
- Tversky and Kahneman linked **heuristics** to **cognitive biases**.



Heuristics and Cognitive Biases

While mental shortcuts – **heuristics**– can often be surprisingly accurate, they can also lead to errors in thinking and play a major contributing role in **cognitive biases**.

Cognitive biases can be caused by a number of different things

- emotions,
- individual motivations,
- limits on the mind's ability to process information,
- social pressures, and
- Heuristics (mental shortcuts).



Heuristics and Cognitive Biases

- A **cognitive bias** is a **flaw** in your reasoning that leads you to **misinterpret** information from the world around you and come to inaccurate conclusions.
- These **biases** influence what information you pay attention to, what you remember about past decisions, and which sources you decide to trust as you research your options.
- 188 cognitive biases have been studied. A few have a disproportionately large influence on the ways we do business.

Types of Cognitive Biases

- ▶ Attribution Bias
- ▶ Anchoring Bias
- ▶ Availability Heuristic Bias
- ▶ Representative Heuristic Bias
- ▶ Confirmation Bias
- ▶ Dunning–Kruger effect

*Cognitive Bias vs. Logical Fallacy

Interpreting Behavior (*most people are terrible at updating their initial guess*):

- ▶ 3 Drivers of Behavior
 - Individual
 - Social Influence
 - Situational Constraints

Attribution Error/Bias

Interpreting Behavior:

*Lee Ross coined the term “fundamental attribution error” in a 1977 paper: We tend to see **others** as internally motivated and responsible for their behavior.

People have a **cognitive bias** to assume that a person's actions depend on what "kind" of person that person is rather than on the social and environmental forces that influence the person.

Attribution Error/Bias

Interpreting Behavior:

- ❑ Western cultures tend to attribute behavior to the individual, while Eastern cultures often first attribute behavior to social environment.
- ❑ *“We judge others by their actions, and ourselves by our intentions.”*
— Stephen Covey

Attribution Error/Bias

- ▶ Is an interviewee angry because he is bad-tempered or because something bad happened?
- ▶ Is the payroll incorrect because the clerk is dishonest or the equipment/software is defective?
- *What are some individual, social influence, or situational constraints that could have caused Bob to be late for work?*

Attribution Error/Bias

- ▶ Misattribution:

https://www.youtube.com/watch?v=3aW35dU_ZJg

Attribution Error/ Bias

- You leave the office at 6:30 pm after a long day. You see Tracey standing next to a SUV with tinted windows with a bat in hand poised to break the window.

Questions:

1. Take a minute to come up with 3 reasons for Tracey's behavior. Rank the reasons based upon least most likely to least likely.
2. For each of the 3 possible reasons, explain what you would do in response.

Attribution Error/ Bias



Anchoring bias

Calculate the following:

	Equation	Guesses
Group 1	$8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 =$	
Group 2	$1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 =$	

Anchoring bias

- ▶ Economist subscription: (when presented with 3 options)
 - \$59 web only,
 - \$125 for print,
 - \$125 for web & print

Which option would you choose? Why?

Anchoring bias

- Economist subscription: (When presented with 2 options)
 - \$59 web only,
 - \$125 for web & print

Which option would you choose? Why?

Anchoring bias

- ▶ Anchoring bias– occurs when people rely too much on pre-existing information or the first information they find when making decisions.
- ▶ What are common areas where we encounter anchoring?

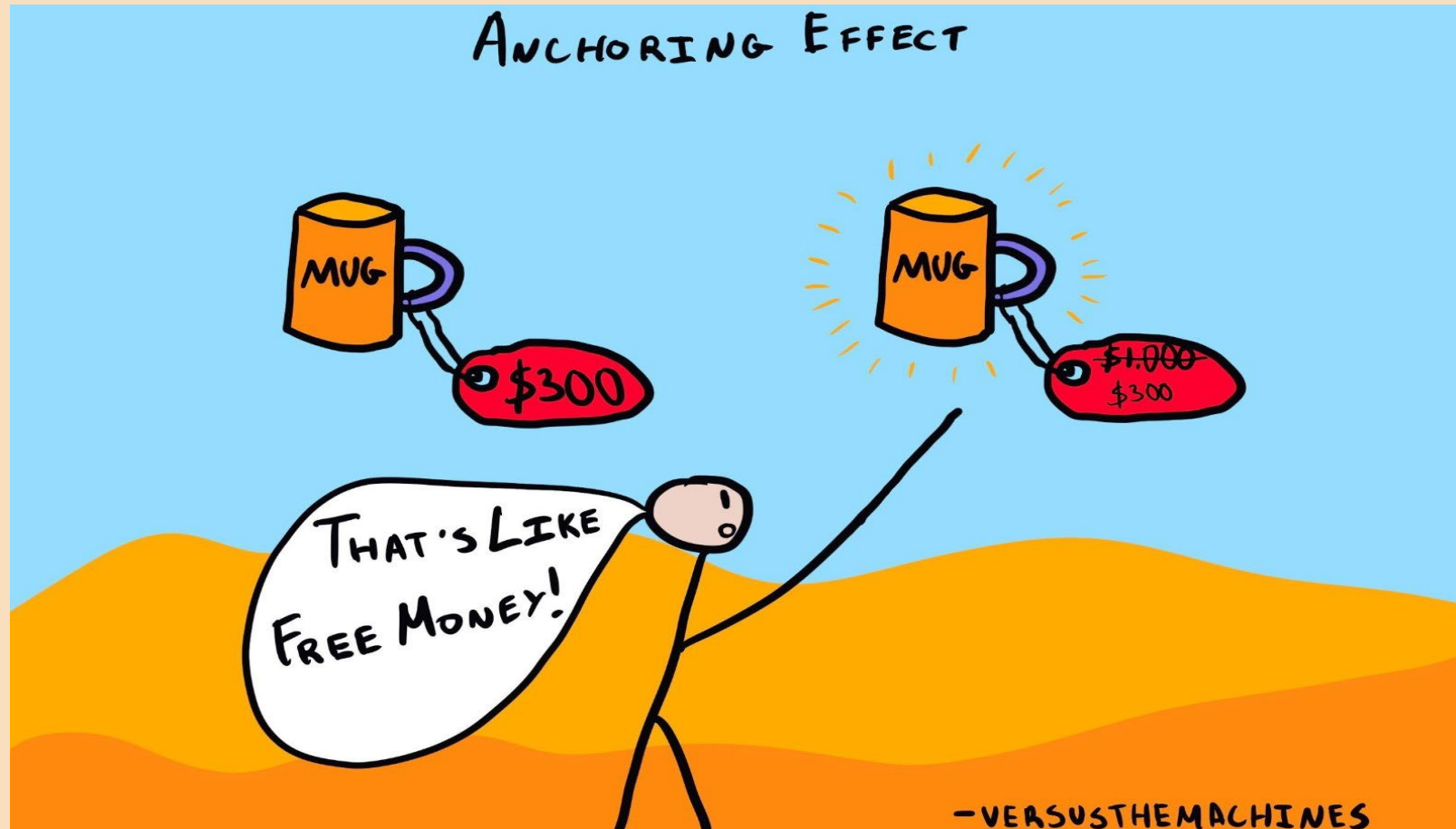
Anchoring bias

T-shirt purchase exercise (when each group is presented with 1 option at a time)

Group 1	Group 2	Groups 1 & 2
\$1,000	\$100	\$25
\$100	\$1,000	\$100

Anchoring bias

Mug purchase



Anchoring Effect and Fundraising

When asked if they would make an annual contribution to “save 50,000 offshore Pacific Coast seabirds from small offshore oil spills,” some guests were first asked:

- “Would you be willing to pay \$5...?” The average donation was \$20.
- “Would you be willing to pay \$400...?” The average donation was \$143.
- With no anchoring question, the average donation was \$64.

Anchoring bias

▶ Anchoring Effect and Justice System

56 mock jurors were presented with a hypothetical case where the plaintiff was arguing that her birth control pill caused her ovarian cancer. She was suing the Health Maintenance Organization (HMO) for prescribing her the pill. In the high anchor group, the plaintiff asked for \$5 million in damages; in the low anchor group, she asked for only \$20,000. The question was: is this anchor going to affect the jurors' perception of causation?

- ▶ Jurors in the low anchor condition were 26.4% confident that the HMO caused the injury, whereas jurors in the high anchor condition were 43.9% confident that HMO caused the plaintiff's injury.

In one study, judges were presented with a hypothetical case involving a shoplifter who had just been caught for the 12th time. The judges were asked to sentence the shoplifter, but only after the prosecutor made a sentencing demand. **The judges were told ahead of time that the prosecutor's demand was totally arbitrary and random.**

- ▶ Even so, the judges who received the low anchor (i.e., the prosecutor demanding a shorter sentence) landed on a shorter average sentence than the judges in the high anchor condition.

Anchoring bias

- ▶ Could Anchoring impact how we assess the validity of the complaint or the credibility of the complainant?
- ❑ Motivation of the Whistleblower?
- ❑ Credibility of the Witness that embellishes?
- ❑ Credibility in relation to others we know?
- ❑ Our familiarity with the issues/persons involved?

Availability heuristic

The availability heuristic involves making decisions based upon how easy it is to bring something to mind.

- ▶ Shark Attacks
- ▶ Plane Crashes
- ▶ Estimating your likelihood of winning the lottery.

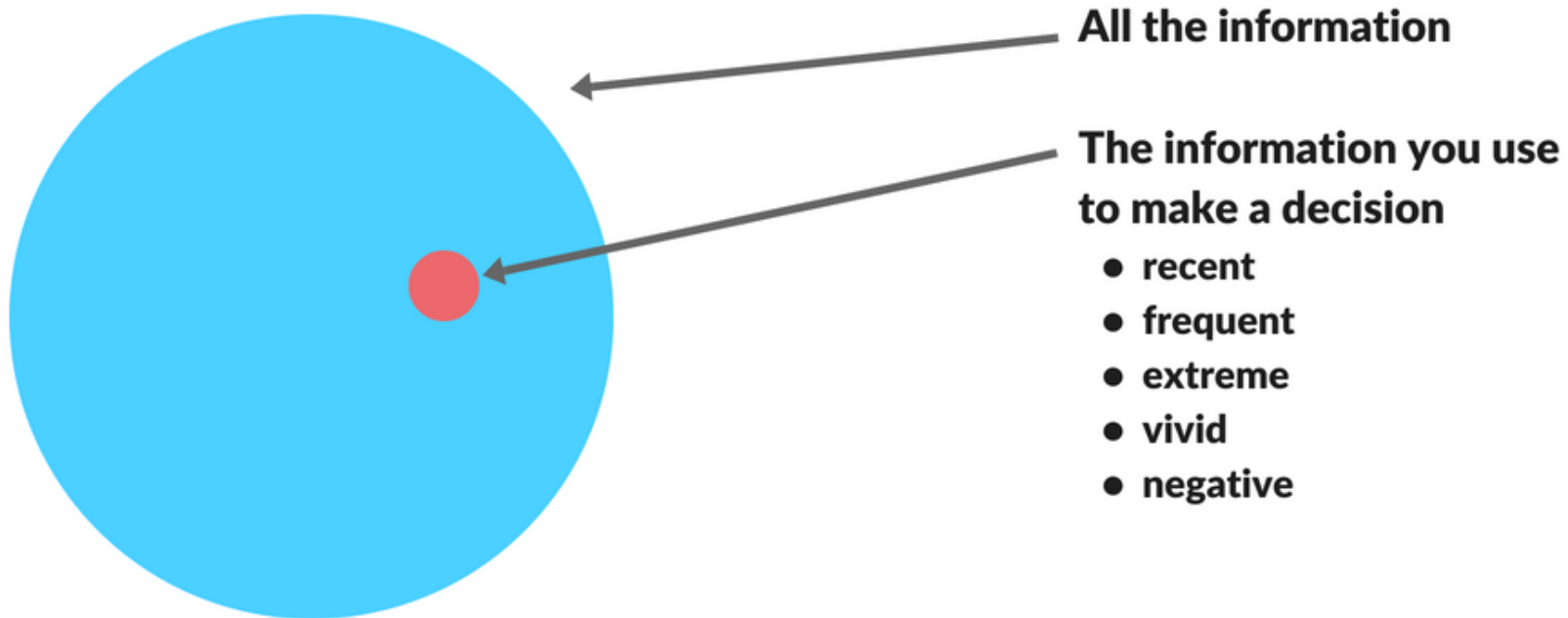


Availability heuristic

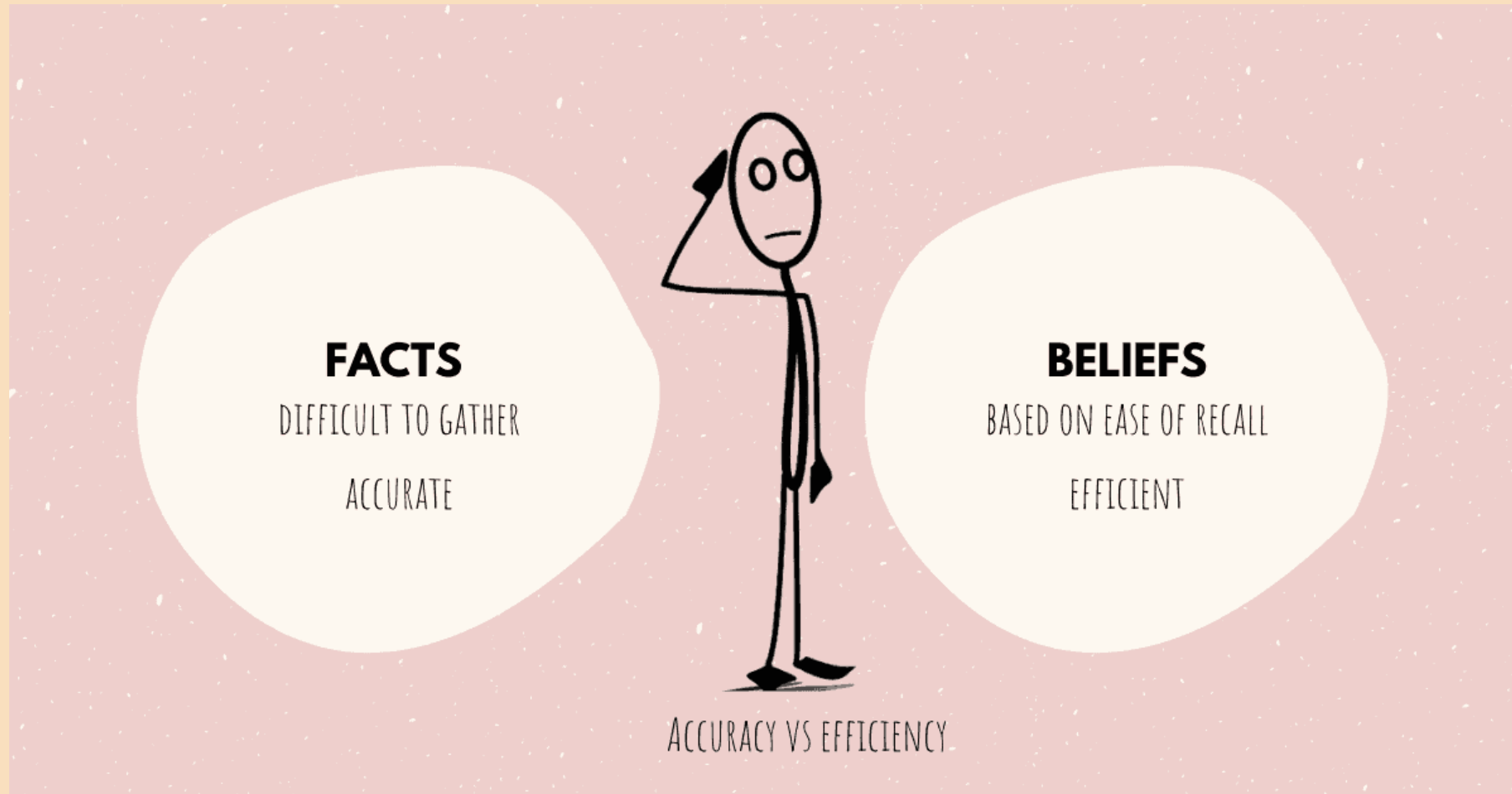
Which job is more dangerous—being a police officer or a logger?

Availability heuristic

The availability heuristic



Availability heuristic



Representative Heuristic Bias

- ▶ These decisions tend to be based on how similar an example is to something else (or how typical or representative the particular case in question is). In this way, representativeness is basically stereotyping.
- ▶ While **availability bias** has more to do with memory of specific instances, **representative bias** has more to do with memory of a prototype, stereotype, or average.
- ▶ The problem with this is that people often overestimate the similarity between the two things they are comparing.

Representative Heuristic Bias

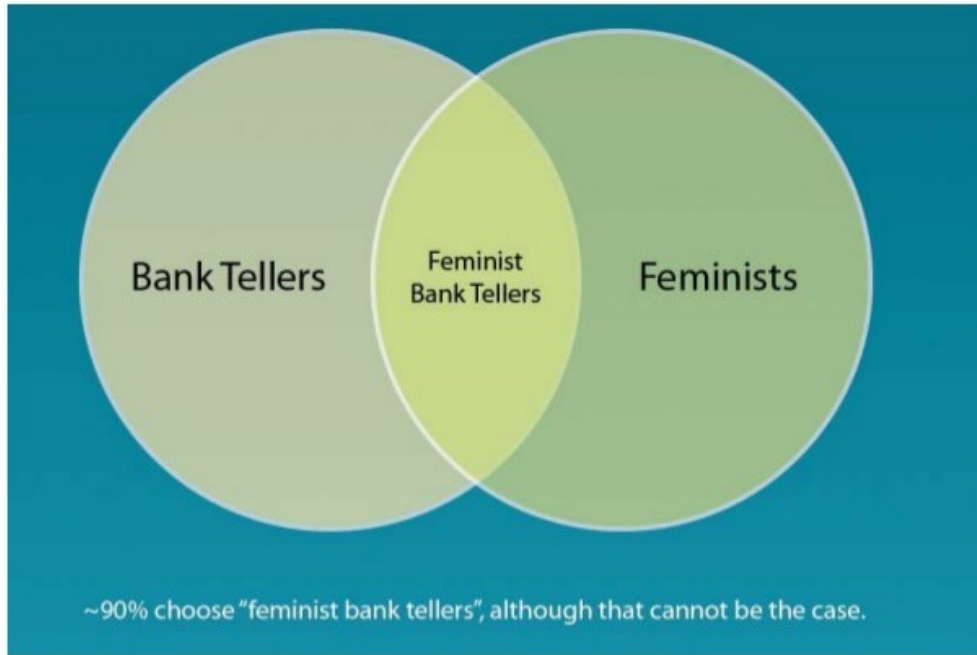
- Consider Laura Smith. She is 31, single, outspoken and very bright. She majored in economics at university and, as a student, she was passionate about the issues of equality and discrimination.

Is it more likely that Laura works at a bank? Or, is it more likely that she works at a bank AND is active in the feminist movement?

- Jurors may make judgments about guilt based on how closely a defendant matches their prototype of a "guilty" suspect or how well the crime represents a certain crime category.

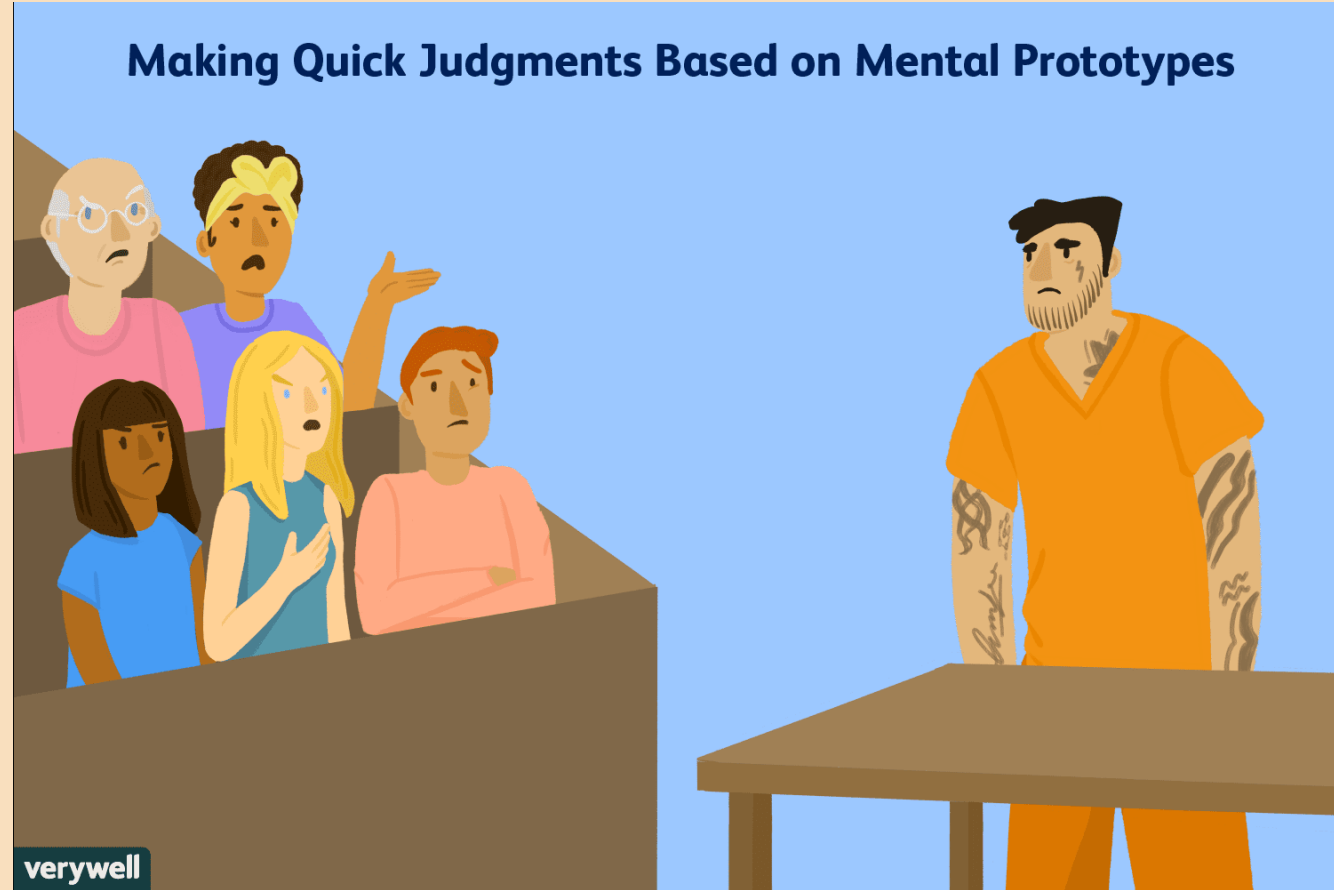
Representative Heuristic Bias

Representativeness heuristic - example



(Porter, 2008)

Making Quick Judgments Based on Mental Prototypes



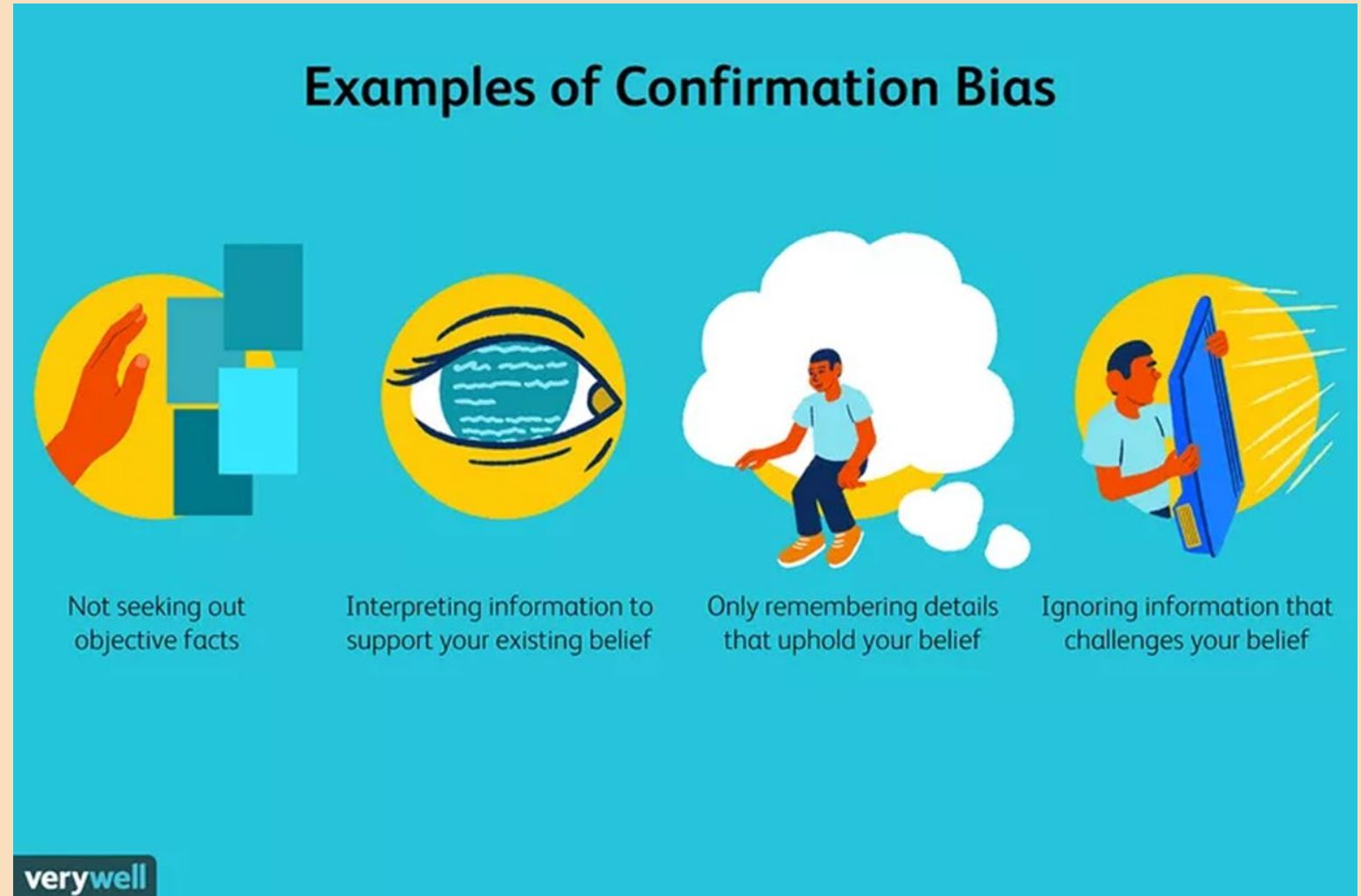
Confirmation Bias

► Guess the Pattern

Sequence	Fits My Rule?	What's the Pattern?
2, 4, 6		
---, ---, ---		
---, ---, ---		

Confirmation Bias

- ▶ In the 1960s, cognitive psychologist Peter Cathcart Wason conducted a number of experiments known as Wason's rule discovery task.
- ▶ He demonstrated that people have a tendency to seek information that confirms their existing beliefs.



Confirmation Bias

- ▶ Philosophers note that humans have difficulty processing information in a rational, unbiased manner once they have developed an opinion about the issue.
 - Political Issues/Candidates
 - Astrology
 - Doctors Providing Medical Care

Confirmation Bias

- ▶ Adam Grant– *Think Again* (2021)

The higher you score on an IQ test, the more likely you are to fall for stereotypes, because you're faster at recognizing patterns. And recent experiments suggest that the smarter you are, the more you might struggle to update your beliefs.

Confirmation Bias



The Dunning–Kruger Effect

- Named after researchers David Dunning and Justin Kruger.
- A type of **cognitive bias** in which people believe that they are smarter and more capable than they really are.
- Sometimes a tiny bit of knowledge on a subject can lead people to mistakenly believe that they know all there is to know about it.

Charles Darwin wrote in his book *The Descent of Man*, “Ignorance more frequently begets confidence than does knowledge.”



The Dunning–Kruger Effect

Compared to most people, how much do you know about each of the following topics--- more, less, or the same?

- ☐ Why English became the official language of the United States.
- ☐ Why women were burned at the stake in Salem.
- ☐ What job Walt Disney had before he drew Mickey Mouse.

Biases in the Real World– Does it Matter?

How can biases impact what we do:

- show an inclination for or against someone or something in a way that could be unfair to that person/entity or others (representative /confirmation bias)
- error introduced into sampling or testing by selecting or encouraging one outcome or answer over others (anchoring/confirmation bias)
- too quick to attribute the behavior of other people to something personal about them rather than to something about their situation (attribution bias).

Biases in the Real World– Examples

- Study suggests what women wearing heavier makeup are perceived as having less mental capacity and less moral status.
- People with Southern accents are consistently rated as sounding less intelligent by their Northern accented peers.
- Tarrant County, TX judge told a teen's mother it was no surprise the teen was caught committing a crime since he is a rapper.

<https://www.star-telegram.com/news/local/fort-worth/article251674878.html>

- The ABA Journal published an article about a study in which reviewers were given a writing sample to review and critique. The reviewers gave the memo supposedly written by a white man a rating of 4.1 out of 5, while they gave the **same exact** memo supposedly written by a black man a rating of 3.2 out of 5. The white Thomas Meyer was praised for his potential and good analytical skills, while the black Thomas Meyer was criticized as average at best and needing a lot of work.

Biases in the Real World– Examples

- **The Loss of the Mars Climate Orbiter** (September 23, 1999)– The Orbiter encountered Mars at an “improperly low altitude” and was lost. NASA described the systemic cause of this mishap as an organizational failure, with the specific, proximate cause being unchecked assumptions across mission teams. (confirmation bias, overconfidence effect, and availability bias).
- **The Sullivan Mine Incident** (May 18, 2006)– two mining professionals and two paramedics at the closed Sullivan mine in British Columbia, Canada, all specifically trained in safety measures, lost their lives by failing to understand a life-threatening situation that in hindsight was obvious. The first person to succumb failed to accurately discern an anoxic environment. After the first fatality, three other co-workers, all trained in hazardous operational situations, one after the other lost their lives in exactly the same manner, each apparently discounting the evidence of the previous victims' fate. (confirmation bias)

Biases in the OIG World

Greenbook: Quality Standards for OIGs indicate that we should be mindful of personal impairments.

Independence:

C. Personal Impairments

There are circumstances in which the inspector general and OIG staff cannot be impartial because their personal situations may create actual or perceived conflicts of interest. In such situations, the OIG staff who are affected by these circumstances should disqualify themselves from an OIG review and allow the work to continue without them. Personal impairments may include, but are not limited to, the following:...

- ❑ Preconceived ideas toward activities, individuals, groups, organizations, objectives, or particular programs that could **bias** the outcome of the work.
- ❑ **Biases** that may affect the objectivity of the OIG staff member in the performance work.

Biases in the OIG World

Greenbook:

Due professional care requires:

Objectivity – Evidence should be gathered and reported in a fair, **unbiased** manner in an effort to determine the validity of alleged improprieties or evaluate the likelihood of violations of statutes, rules, or regulations.

Biases in the Real World– Why Does it Matter?

What can you do to counter cognitive Bias?

- Develop insight and awareness.
- Consider alternatives/other perspectives or sources.
- Embrace uncertainty as an opportunity to sharpen your thinking skills and to learn from experience.
- Learn from errors.
- Play Devil's Advocate.
- Focus on the data/ test & retest.
- Discuss/vet graphs, charts, findings with co-workers.
- Avoid misattributions.
- Ask questions and listen to answers.
- Sort valuable information from worthless, useless, or outdated information.
- Anonymize information.
- Check your ego.



Questions or Comments