

## **HEURISTIC-DRIVEN BIASES**

### **WHAT WILL YOU LEARN?**

- ▶ What are heuristics?
- ▶ What is a heuristic-driven bias?
- ▶ What are examples of heuristic-driven biases?

## **WHAT ARE HEURISTICS?**

- ▶ Simple “rules of thumb” to help us make judgments or decisions

## **EXAMPLES**

- ▶ Do you think Dhruv is a common name?
- ▶ Are there more gun deaths caused by homicide or suicide in the U.S.?

## AVAILABILITY HEURISTIC

- ▶ Availability – the degree to which information is readily available.
- ▶ A rule based on this principle is called the availability heuristic.

## HEURISTIC-DRIVEN BIASES

- ▶ We rely on heuristics – rule of thumb – to draw inferences from the information at our disposal.
- ▶ Using these heuristics cause people to make predictable errors – heuristic driven biases.

## **SUMMARY**

- ▶ Heuristics are simple rules of thumb.
- ▶ Using these heuristics cause people to make predictable errors.

## **REPRESENTATIVENESS**

### **EXAMPLE 1: LIBRARIAN VS. PROFESSIONAL ATHLETE**

- ▶ What are the odds that Lisa is a librarian?
- ▶ What are the odds that Mildred is a professional athlete?

**EXAMPLE 2: BOWL A VS. BOWL B?**

- Should you bet that you will draw a white ball from bowl A or a red ball from bowl B?

**EXAMPLE 3: YOU AND I FLIPPING COINS**

- You go first, and you flip: H T T H T H
- I go next and flip: H H H H H H

## **WHAT IS THE REPRESENTATIVENESS HEURISTIC?**

- ▶ When people try to determine the probability that an object A belongs to a class B, they often use the representativeness heuristic.
- ▶ They evaluate the probability by the degree to which A reflects the essential characteristics of B.
- ▶ “Best fit” approximations – rely on stereotypes

## **BASE RATE NEGLECT BIAS**

- ▶ In Bayesian terms, underweight the base rate
- ▶ overweight the new information

## **SAMPLE SIZE NEGLECT BIAS**

- ▶ When judging the likelihood that a data set was generated by a particular model, people often fail to take the size of the sample into account.
  - ▶ People will tend to infer too quickly on the basis of too few data points.

## **LAW OF SMALL NUMBERS**

- ▶ People come to believe that a financial analyst with four good stock picks is 'talented' because four successes are not representative of a bad or mediocre analyst.
- ▶ Hot hands phenomenon: A basketball player who has made three shots in a row is on a hot streak and will score again.



## **GAMBLER'S FALLACY**

- ▶ If a fair coin generates five heads in a row, people say that “tails are due.”

## **SUMMARY**

- ▶ Representativeness heuristic
- ▶ Base rate neglect bias
- ▶ Sample size neglect bias
- ▶ Gambler's fallacy

## **ANCHORING AND CONSERVATISM**

### **EXAMPLE: BLACK VS. RED CHIPS**

- ▶ What probability would you assign to the event that the selected bag contains predominantly black chips?
- ▶ Would you use the new information about the drawing of chips to revise your probability that the selected bag contains predominantly black chips? If so, what new probability would you assign?

## **EXAMPLE: BLACK VS. RED CHIPS**

- ▶ Correct answer to the second question is 96.04%!
- ▶ 55 percent of those responding choose either 45 percent or 67 percent.
- ▶ Most are well below 96 percent. In fact, most are below 75 percent!

## **CONSERVATISM OR ANCHORING**

- ▶ People respond conservatively to the new information
- ▶ They do not adjust their beliefs sufficiently to reflect the new information.

## **FINANCIAL ANALYSTS AND EARNINGS ANNOUNCEMENTS**

- ▶ Analysts often do not revise their earnings estimates enough to reflect the new information.
- ▶ Positive earnings surprises tend to be followed by more positive earnings surprises, and negative surprises by more negative earnings surprises.
- ▶ Post earnings announcement drift!!!

## **TVERSKY AND KAHNEMAN: ANCHORING EXPERIMENT**

- ▶ Spin a wheel of fortune and get a number between 0 and 100.
- ▶ Estimate whether the percentage of the total membership of UN nations made up of African countries is higher or lower than your number.

## **TVERSKY AND KAHNEMAN: ANCHORING EXPERIMENT**

- ▶ On average, people who spun a 10 guessed only 25% of UN members were African nations while people who spun a 65 guessed that 45% were African.

## **SUMMARY**

- ▶ Conservatism and anchoring bias

## **OVERCONFIDENCE**

### **HOW GOOD A DRIVER ARE YOU?**

- ▶ 50 drivers were asked to rate their own 'skill, ability, and alertness'.
- ▶ Just under two-thirds said they were at least as competent as usual.
- ▶ Several described being 'extra good' or 100%.
- ▶ The interviews were conducted at the hospital!

## OVERCONFIDENCE

- ▶ People tend to overestimate the precision of their beliefs or forecasts.
- ▶ They tend to overestimate their abilities.

## QUESTION 1

- ▶ Driving south from Detroit, what is the first country you will come to when you leave the U.S.?
- ▶ Many people say they are at least 90% certain that the answer is Mexico! Often, they are 100% positive.

## QUESTION 2

- ▶ Which country derives more than 75% of its energy from nuclear power?
- ▶ Most people answer they are 70% sure that the correct answer is “none of the above.”

## QUESTION 3

- ▶ Approximately, how many microbes live in the typical person’s gastrointestinal tract?
- ▶ Most people seem 50% sure that they’ve got about 100 million microorganisms living inside their guts.



## QUESTION 4

- ▶ Was Adonis the god of love or vegetation?
- ▶ A quarter of the students were at least 98% sure that Adonis was god of love!
- ▶ Only 31% correctly identified Adonis as god of vegetation.

## QUESTION 5

- ▶ Do most of the world's cacao beans come from Africa or South America?
- ▶ Over a third were at least 98% certain that most chocolate originates in South America.
- ▶ Only 4.8% was right in picking Africa as the leading source of cacao.

## **OVERCONFIDENCE AND FINANCIAL JUDGMENT**

- ▶ Among American workers who say they are very confident that they will have enough money to live comfortably in retirement:
  - ▶ 22% are currently saving nothing for that goal
  - ▶ 39% have saved less than \$50,000
  - ▶ 37% has not even estimated how much money they will need to retire comfortably.

## **OVERCONFIDENCE: TRADING**

- ▶ Barber and Odean compare trading activity and average returns in brokerage accounts of men and women.
  - ▶ Men trade far more than women.
  - ▶ Those accounts that traded the most had average returns 7 percentage points lower than the accounts with the lowest turnover rates.

## **SUMMARY**

- ▶ Widespread phenomenon: Overconfidence
- ▶ Overconfidence can be hazardous to your wealth.