Heuristics and Biases II

AEM 4140: Behavioral Econ and Managerial Decisions

Announcements

- Group member names due this Friday.
- Make sure to pay $40 course fee for lab.

Last Time

- Contrast Effect
- Base Rate Neglect
- Law of Small Numbers
- Correlation Neglect
- Gambler's Fallacy and Hot Hand Fallacy
- Conjunction Fallacy

Projection Bias

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  - U(coat, cold) > U(coat, warm)
  - U(coat, cold) > V(coat, cold | warm) > U(coat, warm)

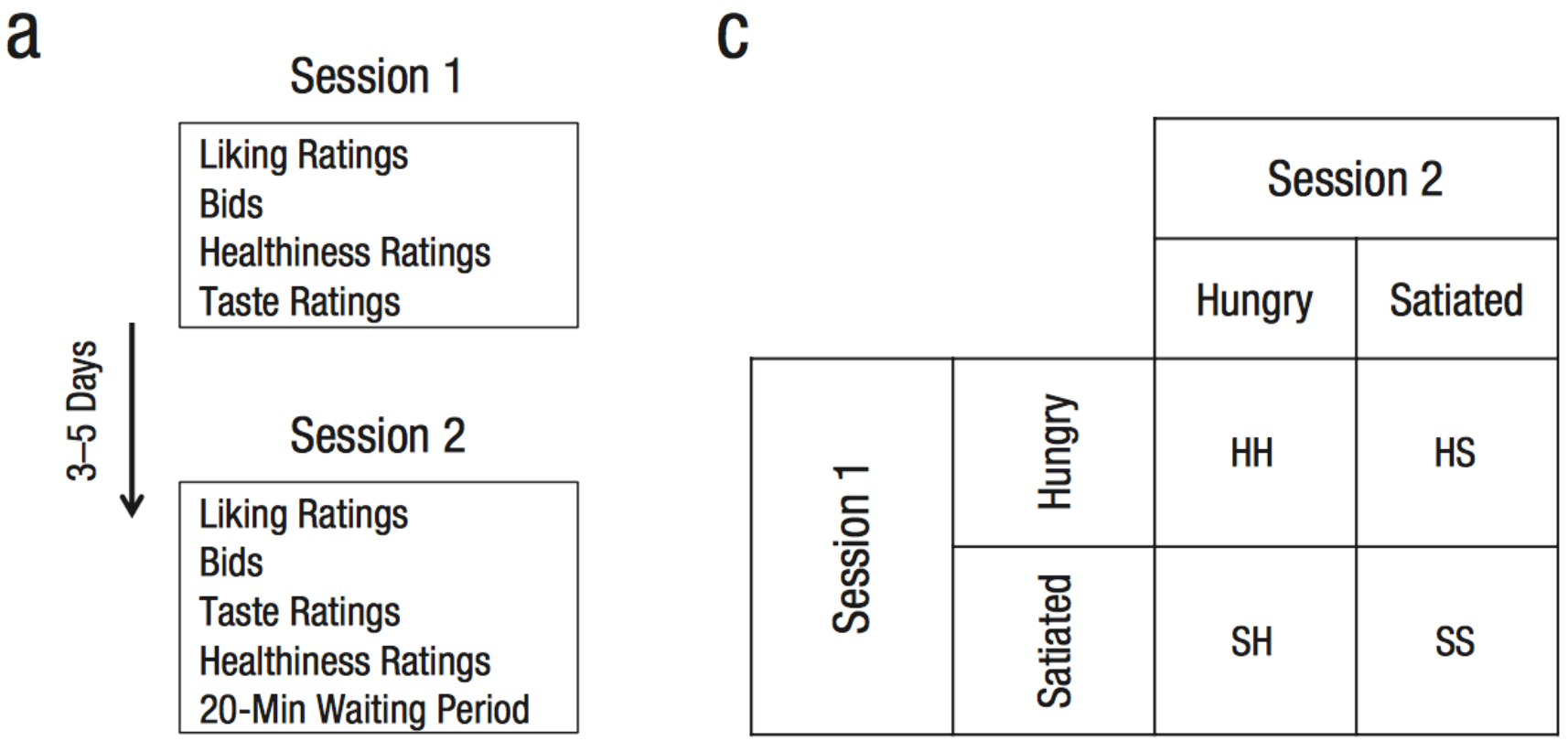
Projection Bias

- 200 employees at different firms
- Asked to choose between healthy vs unhealthy snack in 1 week
- Varied expected future hunger and current hunger by asking (about) before/after lunch

		Future Hunger	
		Hungry	Satiated
Current Hunger	Hungry	78%	42%
	Satiated	56%	26%

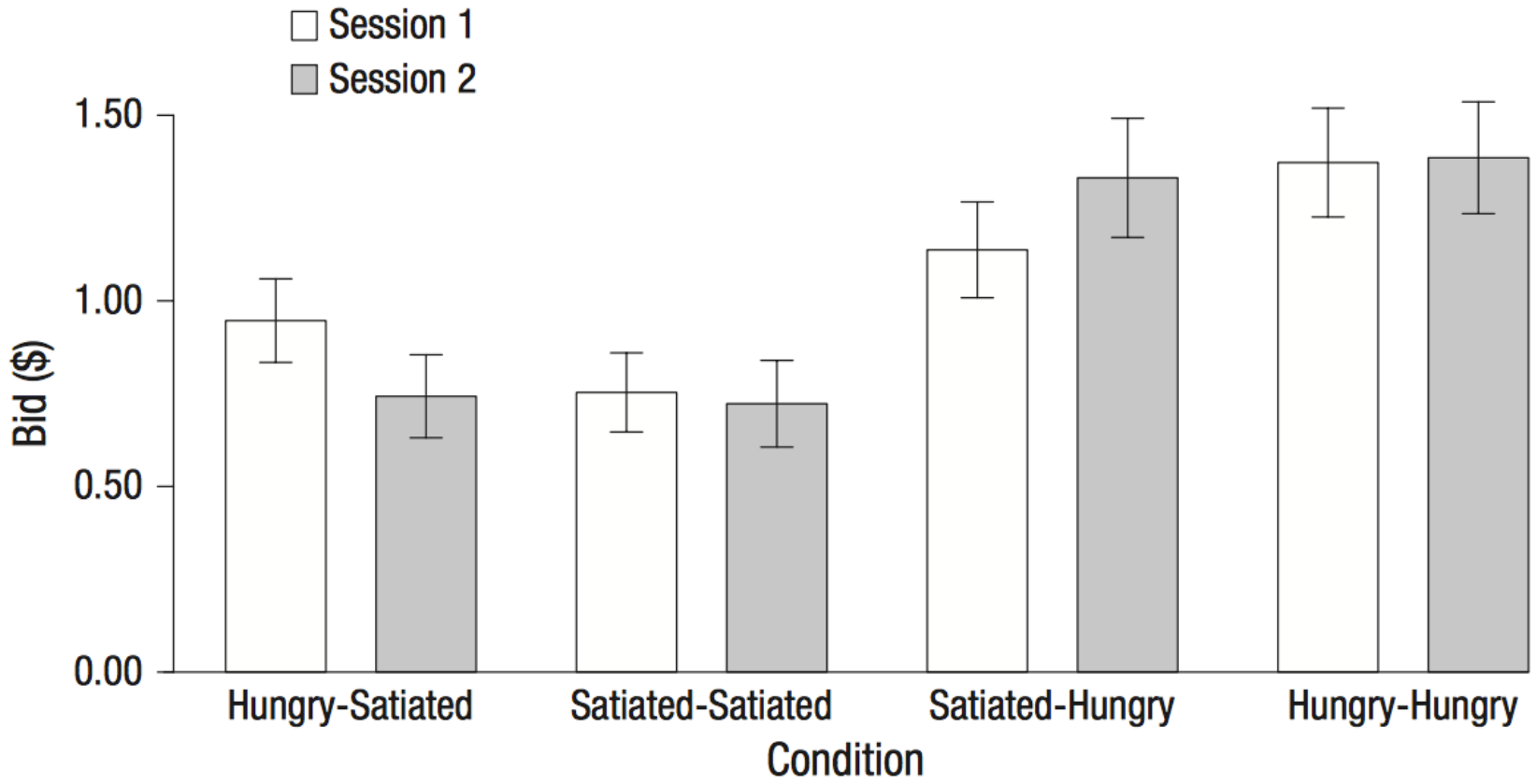
Read and van Leeuwen (1998)

Projection Bias



Fisher & Rangel (2014)

Projection Bias



Fisher & Rangel (2014)

Projection Bias

- Clothes (Conlin et al. 2007)
  - The more valuable an item is to you now, the more valuable you think it will be in the future.
  - For cold-weather items (like coats) a person's expected future value for the item is higher when the temperature is low.
  - The colder the temperature on the order date, the more likely people are to order cold-weather items, and hence the more likely they are to return those items.
  - The colder the temperature on the return date, the more likely people are to keep cold-weather items.

Projection Bias

- Cars (Busse et al. 2014)
  - The choice to purchase a convertible or a four-wheel-drive is *highly* dependent on the weather at the time of purchase
  - Consumers overvalue warm-weather vehicle types (e.g., convertibles) when the weather is warm and sunny at the time of purchase and
  - Consumers overvalue cold-weather vehicle types (e.g., four-wheel-drive vehicles) when the weather is cold and snowy at the time of purchase
  - Controlling for seasonal sales patterns, a location that experiences a temperature that is 10F degrees higher than normal will experience a 2.7% increase in the fraction of cars sold that are convertibles.

Projection Bias

- Addiction (Giordano et al. 2001)
  - Studied heroin addicts who came to a clinic for a maintenance dose of Buprenorphine (BUP)
  - Made choice between extra BUP dose or extra cash on a visit schedule for 5 days later
  - Half given the choice right before receiving BUP and half given choice right after given BUP
  - Those who made the choice before receiving the BUP valued the future BUP dose by almost twice as much as those who made the choice after receiving BUP

Attribution Bias

- When judging the value of a new product, you are often overinfluenced by the state in which you consumed it
  - If you try a new restaurant when hungry, you might overrate the quality of the food and be more likely to return even though the food might be only mediocre.
  - When vacationing in Florida for the first time, you might underrate the quality of the vacation if it rains and be less likely to return than if it had not rained.

Attribution Bias

- Subjects satiated (drink 3 cups of water) or thirsty (drink ½ cup of water)
- Mix milk, sugar, Orange juice together and drink it
- 1-3 days later, ask them how much would you like to drink the mixture again?
- Those in 3 cup treatment were less likely to want to drink again compared to ½ cup treatment.

Haggag et al. (2019)

Attribution Bias

- Visitors to a Florida theme park
- Poor weather affects how enjoyable the trip is
- But visitors then misattribute the influence of this temporary weather to the fixed quality of the vacation destination
- They are less likely to return and recommend the trip to others

Haggag et al. (2019)

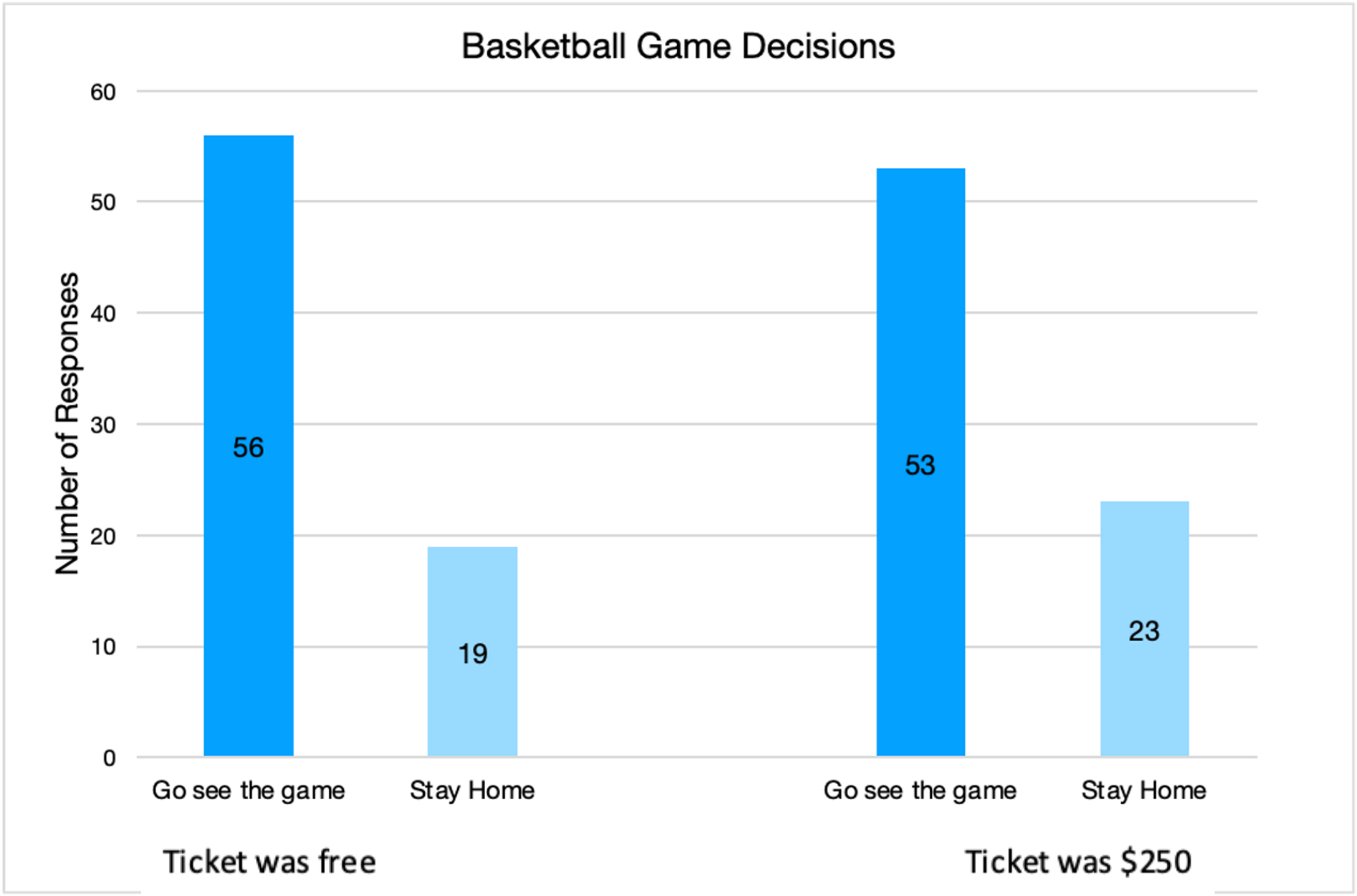
Sunk Cost Fallacy

- A sunk cost is a cost that has already been incurred and is unable to be recovered
  - Paid in the past and no longer relevant for the future
- People often believe that sunk costs justify additional expenditures
  - Car or home repairs
  - Relationships
  - Exercise

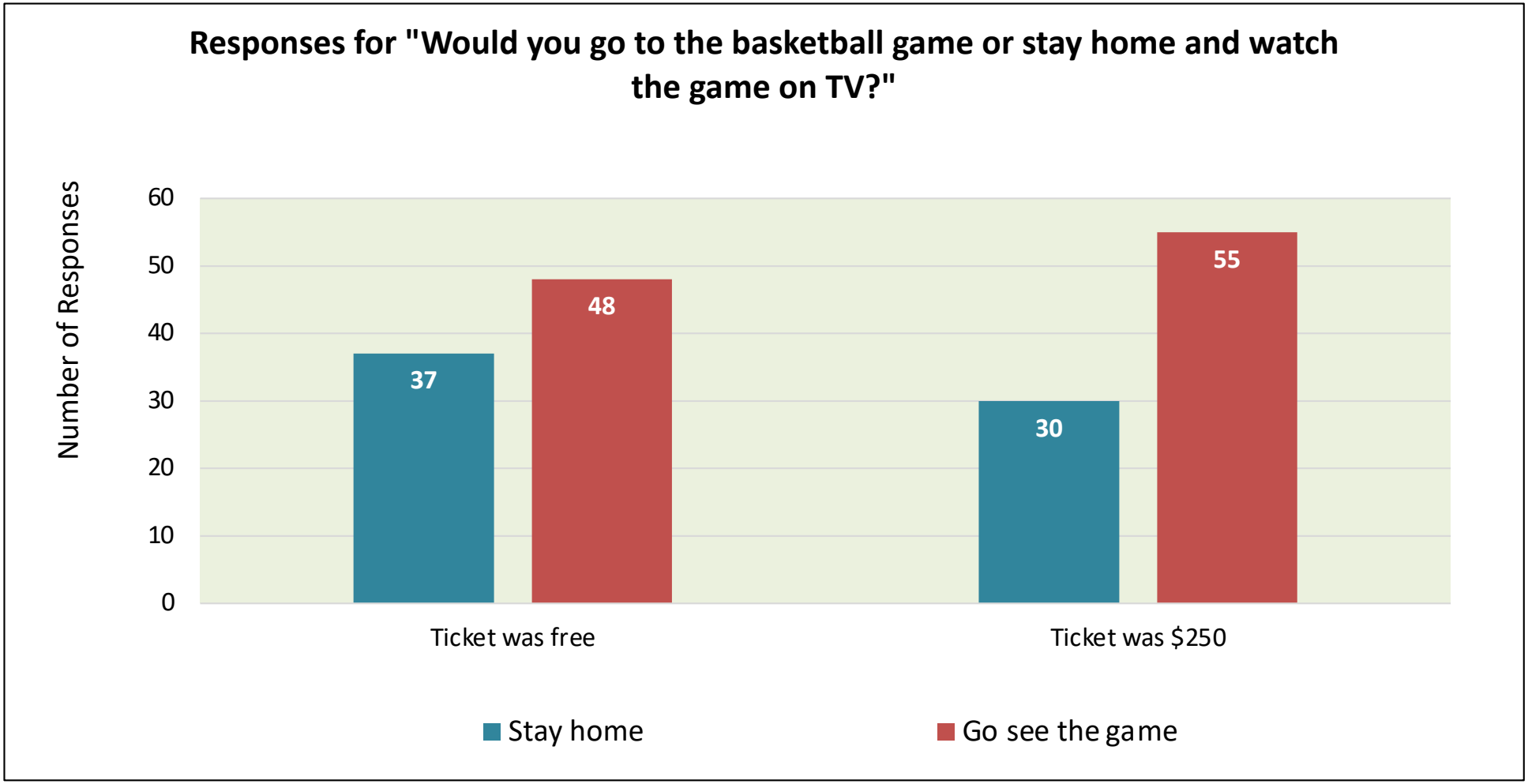
Sunk Cost Fallacy

- Imagine that you obtained a front-row ticket to a professional basketball game you want to go to. **You received this ticket for free (low cost) / You paid $250 for this ticket (high cost)**. However, a terrible storm is going to hit on the day of the game which means that travel to the game will be extremely cold, very slow, and potentially hazardous.
  - Go see the basketball game (in spite of the unpleasant and hazardous travel conditions)
  - Stay home and watch the game on TV

Sunk Cost Fallacy



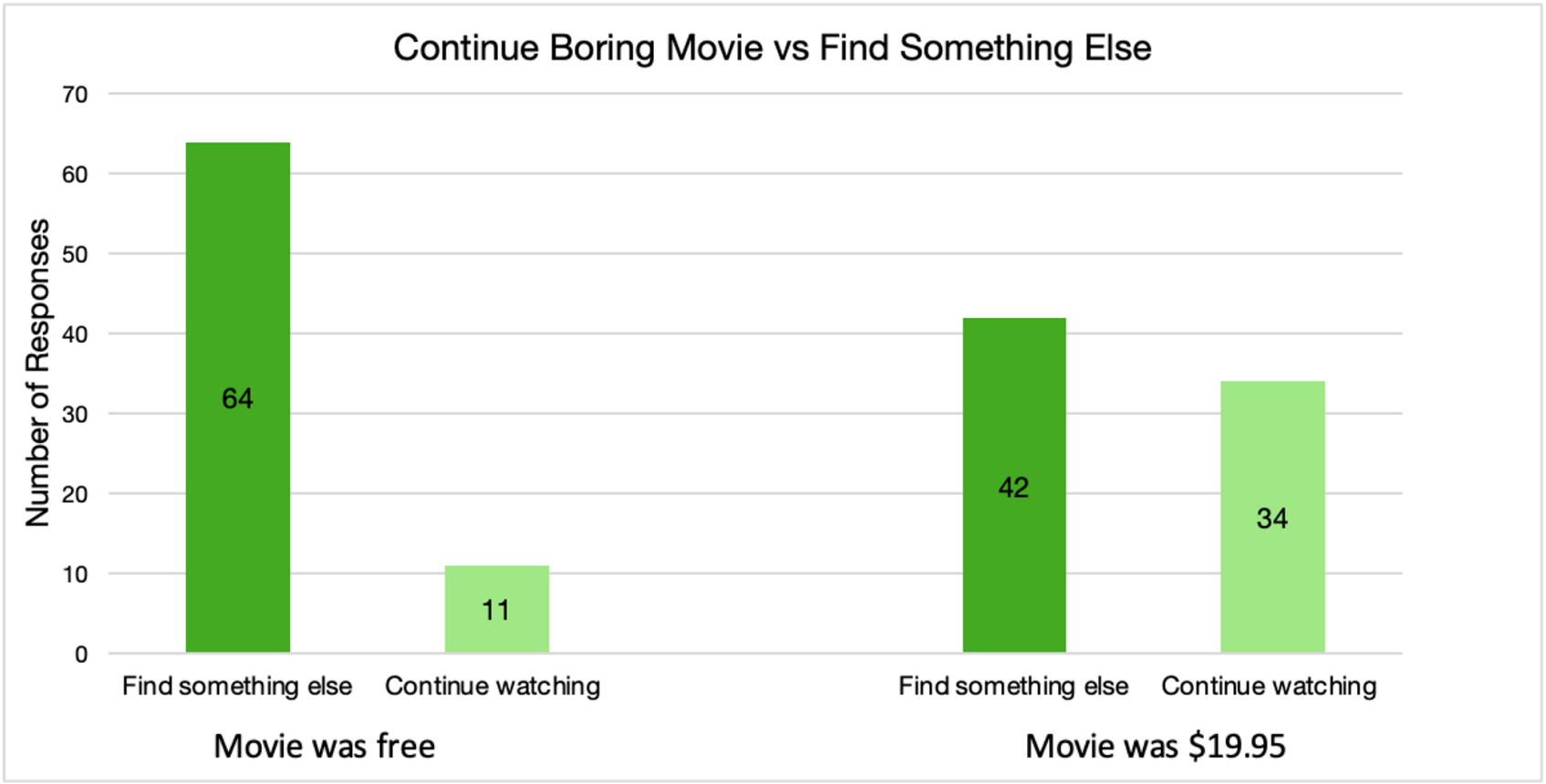
Sunk Cost Fallacy – Last Year



Sunk Cost Fallacy

- Imagine that you are on vacation with two close friends but that one day you feel sick, so you decide to stay in bed and watch a movie in the hotel room that the three of you are sharing as your two friends go out to visit a museum. One of your friends **found the movie that's playing for free (low cost) / paid $19.95 (high cost)**. However, after 5 minutes of watching the movie you realize that it is pretty boring.
  - Continue watching the boring movie
  - Find something else to watch on TV

Sunk Cost Fallacy



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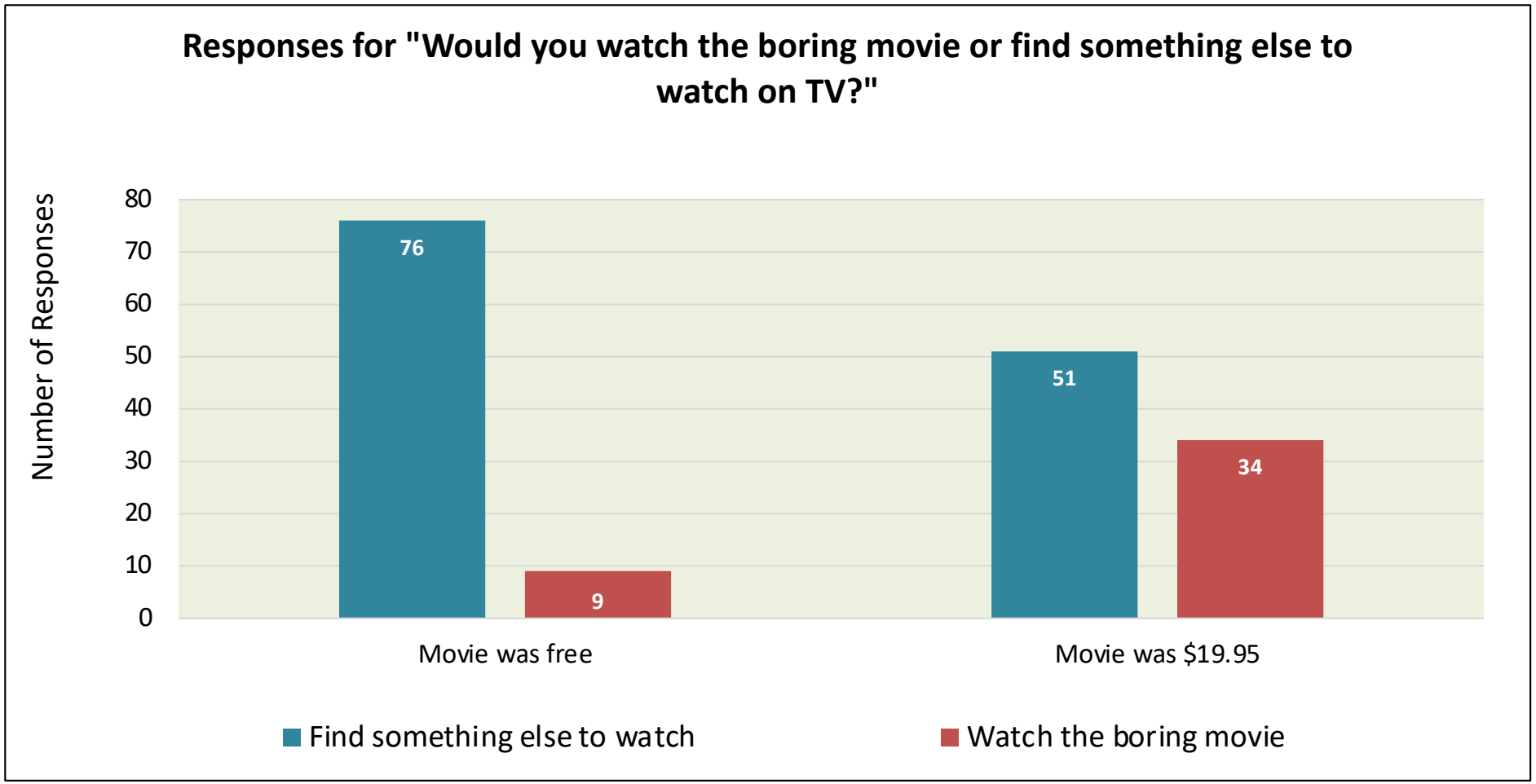


Sunk Costs and Business Decisions

- Research and development costs
  - Justifications for high prices based on large R&D costs don't make sense
  - These are sunk costs and the market price should be charged regardless of R&D costs
- Promoting one's brand name in marketing
  - Marketing costs like this are usually not recoverable
  - In other words, you can't demote your brand later for money

Planning Fallacy

- Your predictions about how much time will be needed to complete a task often underestimate the time needed
  - Can occur even with experience and knowledge that you are overly optimistic in your estimates
- Can also occur for underestimates of costs and risks of future actions
- Often does not occur for outside observers
  - These predictions are usually pessimistic

Planning Fallacy Business Example

Sydney Opera house took a decade longer than expected, and was scaled down compared to the original designs.

Original estimated cost was $7 million, but it ultimately cost over $100 million

Regression to the Mean

- Two psychologists, Kahneman and Tversky, were involved in training flight instructors for the Israeli air force in the 1960s.
- The instructors had noticed that when they praised pilots for doing well, the pilots always seemed to do worse directly afterwards
- The instructors also noticed that after pilots did poorly and they criticized them, the pilots always seemed to do better directly afterwards.
- The instructors concluded that they should only criticize pilots, and never reward them with praise.

Regression to the Mean

- Does this mean that you should pay your workers a fixed wage and punish them financially whenever they screw up?
- The same problem still occurs in business since programs like “the salesperson of the month” often get dropped. This can encourage the use of negative reinforcement, such as threatening to fire the worst salesperson of the month.

Regression to the Mean

- Statistically, if performance is to some degree random, exceptional performance either good or bad is likely to be the result of a draw from the tail of the performance distribution.
- Thus, it is likely that the next draw will be closer to the mean
  - A bad performance is likely to be followed by a better one
  - A good performance is likely to be followed by a worse one

Regression to the Mean

- Imagine that you are managing a baseball team so you have lots of data on actual performance.
  - How do you reward players?
  - How do you hire and fire players?
- Individual games, weeks, months, seasons, etc.?

Regression to the Mean

- Imagine that you are managing a baseball team so you have lots of data on actual performance.
  - How do you reward players?
  - How do you hire and fire players?
- You should not reward, punish, hire, or fire based on an exceptional performance. Rather look to long-term average performance.

General Phenomenon: Representativeness

- Like goes with like. Things that look like they go together should go together.
- Idea: 50-50 odds means that if you are flipping a fair coin
  - You should expect X, then O, then X, then O
  - Or at least balanced representation of each outcome, i.e., XXOO
  - XXXX is not 50-50

Representativeness

- Sometimes this heuristic is useful. Examples:
  - Bigger effects require bigger causes
  - Complex events come from complex causes
- Sometimes, over-application of the idea can be misleading. Counterexamples:
  - A pandemic can be caused by a tiny virus
  - Ecological disaster may stem from introduction of a single pesticide

False Conclusions

- In general, there are a large number of problems that have been demonstrated by psychologists to plague the interpretation of data and lead to false conclusions.

- False conclusions lead to decision errors that cost money. But, why do people tend to draw false conclusions? There are five broad types of problems.

Five Problems That Cause False Conclusions

- **1) Too much is made from too little.** People tend to misinterpret incomplete and unrepresentative data.
- **2) People tend to see what they expect to see.** People tend to have a biased evaluation of data.
- **3) People tend to see what they want to believe**.
- **4) People believe what they are told.** People trust secondhand information.
- **5) People imagine that others agree with them**. People believe in a false consensus consistent with their own beliefs.

Question

- Do you think you will make more money than the average person in this class when you are 45?
  - Yes
  - No

Question

- Do you think you are a better driver than the average person in this class?
  - Yes
  - No

The Lake Wobegon Effect (Overconfidence)

- This is called the Lake Wobegon Effect (overconfidence), after the mythical town where

  "The women are strong, the men are good looking, and all the children are above average"

- The Lake Wobegon Effect is an example of (3) from before, people seeing what they want to believe.
  - The desire to believe good things about ourselves
- We are usually poor judges of our own abilities and accomplishments.
- You will likely have to deal with bosses and employees who suffer from delusions about their own abilities.

Examples of Self-Serving Beliefs

- In a survey of one million high school seniors, 70% percent felt they were above average in leadership, and 99% in getting along with others.
- About 80% of people claim to be better than average drivers.
- 94% of Professors think they are better at doing their jobs than the average Professor.

Choice Strategies

Another source of decision errors comes from research on the psychology of choice that argues that individuals do not have unlimited cognitive capacity

Bettman, James R, Mary Frances Luce and John W. Payne, 1998. "Constructive Consumer Choice Processes," *Journal of Consumer Research*, 25(3), 187-217

The bottom line is that people use different choice strategies depending on how quickly the choice must be made.

Choice Strategies

- Studies might ask hypothetical consumers to choose a car and then study the process used.

CONSTRUCTIVE CONSUMER CHOICE PROCESSES

TABLE 1

AN EXAMPLE OF A CONSUMER DECISION TASK

Car	Reliability	Price	Safety	Horsepower
A	Worst	Best	Good	Very poor
B	Best	Worst	Worst	Good
C	Poor	Very good	Average	Average
D	Average	Poor	Best	Worst
E	Worst	Very poor	Good	Best

NOTE.—Attributes are scored on seven-point scales ranging from best to worst, with best indicating the most desirable value for the attribute and worst indicating the least desirable value.

Choice Strategies

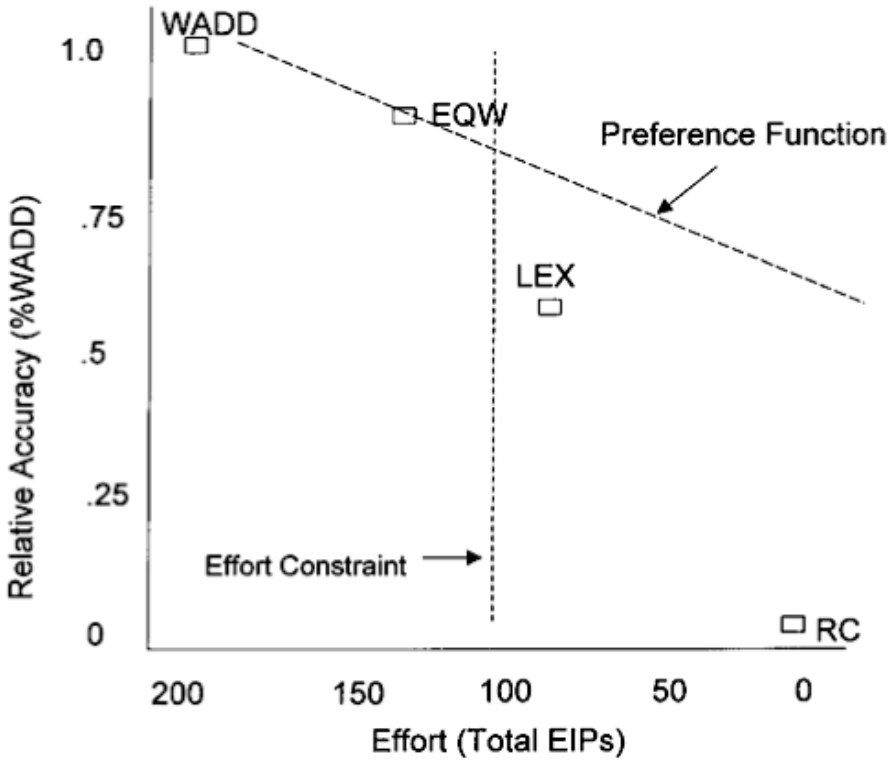
- The weighted adding strategy (linear utility) examines alternatives and is compensatory. Consumers pick the alternative which has the greatest sum of attributes times weights (values). It is accurate but high in cognitive effort--the standard. Less accurate and less effort strategies include:
- The lexicographic strategy implies the consumer uses the most important single attribute and chooses based on that alone.
- Satisficing implies the consumer evaluates alternatives sequentially in order and rejects any that fail to meet minimum thresholds for any attribute and then go on to the next alternative, choosing the first that meets the minimum threshold for all attributes.
- Equal weighting is the same as the weighted adding strategy but with equal weights.
- Random choice.

Choice Strategies

- How do we pick our strategies?
- We often tradeoff accuracy and cognitive effort
- Accuracy is measured by the weighted adding criterion (utility).
- Cognitive effort is measured by elementary information processes (EIPs).
- EIPs are: reading an item of information, comparing items of information, multiplying or adding information, eliminating information, etc.
- These steps can be counted and added up for any choice task and give a measure of EIPs for each strategy.

FIGURE 1

SELECTION OF STRATEGIES WITH CONSTRAINTS ON EFFORT



NOTE.—WADD = weighted adding; LEX = lexicographic; EBA = elimination-by-aspects; EQW = equal weight; RC = random choice; EIPs = elementary information processes.

Choice Strategies

- Factors that effect choice strategy include:
  - Problem size, time pressure, information completeness and format.
- What strategy would you use to pick a spouse if
  - You had as long as you liked to search?
  - You are on TV and have just met three candidates, and have ten seconds (one minute) to choose a spouse or you lose 10 million dollars so you can ask no questions (one question) in the remaining time?
- Obviously, you would use different strategies.