Decision making

PSY 200

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Lecture 33

What every consumer should know before buying.

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Decision making

- We have to make lots of *choices*
  - course selections
  - elections
  - housing
  - job
  - cancer treatment

- What affects our choices?
- How do we make choices?

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It's difficult to do well

- Making good decisions is very challenging for most people
- The optimal way to do it (utility theory) involves evaluating the cost/benefit of all possible outcomes and weighting by the probability of each each outcome
  - Nearly impossible to do
  - how to characterize all alternatives?
  - Personal utilities are unknown even for you, personally
- Even when choices and utilities are clear, there are surprising properties of decision making

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High-Low money game

- The local radio station WASK (98.7) sometimes runs a high-low money game
- A caller guesses the amount of money in a "pot"
- If correct, the caller wins the money
- Otherwise, the radio DJ announces whether the guess was high or low
- Suppose previous guesses have been: $112.03 (high), $97.83 (high), $52.72 (low)
- You call in, what should you guess?

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High-Low money game

- To maximize utility ($), guess one penny lower than the previous high guess:
  - $97.82
- The true amount could be anywhere between $97.82 (one penny less than the lowest high value) and $52.73 (one penny more than the highest low value)
- Each possible value (to the penny) has a probability of

$$\frac{1}{4510}$$

- You may as well guess the choice that gives you the most money!
  - You are probably not going to win

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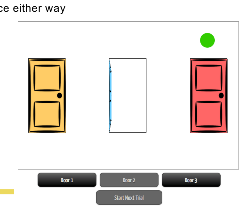
More confusion

- Even without utilities, probability is difficult to work with
- In the Monty Hall CogLab, you make a sequence of choices while trying to find a prize
- Choose one of three doors
  - Another door without the prize is opened
- You can now choose the other door or stay with your original choice
  - Seems like 50% chance either way



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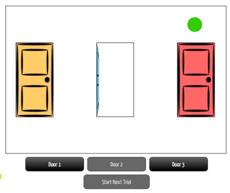
More confusion

- You will win more often if you switch
  - 66% win when you switch
  - 33% win when you don't switch
- To see, why suppose your initial pick did *not* have the prize
  - This will happen 66% of the time just by chance
- The program has to open the door without the prize
  - Thus, you win 66% of the time by switching to the other door



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Heuristics

- Since people are not good at making optimal decisions, they use other approaches
- These other approaches make people sensitive to a variety of influences
  - framing effects
  - risks
  - alternatives
  - loss aversion
- Effects are often related

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Framing effects

- Your decisions are influenced by the way a set of choices is presented
- The child custody problem
  - two versions, essentially the same
  - lead to different choices

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Version 1: award frame

- Imagine that you serve on the jury of an only-child sole-custody case following a relatively messy divorce. The facts are complicated by ambiguous economic, social, and emotional considerations, and you decide to base your decision entirely on the following few observations. To which parent would you **award** sole custody of the child?
- **Parent A:** average income, average health, average working hours, reasonable rapport with child, relatively stable social life
- **Parent B:** above-average income, very close relationship with child, extremely active social life, lots of work-related travel, minor health problems

64%

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Version 2: deny frame

- Imagine that you serve on the jury of an only-child sole-custody case following a relatively messy divorce. The facts are complicated by ambiguous economic, social, and emotional considerations, and you decide to base your decision entirely on the following few observations. To which parent would you **deny** sole custody of the child?
- **Parent A:** average income, average health, average working hours, reasonable rapport with child, relatively stable social life
- **Parent B:** above-average income, very close relationship with child, extremely active social life, lots of work-related travel, minor health problems

55%

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Framing effects

- So Parent B is the choice to *award* custody and to *deny* custody
  - but one necessarily precludes the other!
- Subjects are biased by the task at hand
  - focus on different characteristics depending on whether they are considering awarding or denying

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Framing effects

- Your decisions are influenced by the way a set of choices is presented
- The Asian disease problem
  - two versions, essentially the same
  - lead to different choices

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Version 1: Saving frame

- Imagine that the US is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:
- If program A is adopted, 200 people will be saved. 70%
- If program B is adopted, there is a 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved.

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Version 2: Dying frame

- Imagine that the US is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:
- If program A is adopted, 400 people will die.
- If program B is adopted, there is a 1/3 probability that nobody will die and a 2/3 probability that 600 people will die. 61%

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Choices and framing

- The two problems are essentially identical, except that the choices are phrased differently
  - 200 people saved = 400 people dead
  - 2/3 probability that no one is saved = 2/3 probability that 600 will die
- But the phrasing makes a difference in the choices of subjects
  - why?

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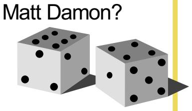
Risks

- Risk corresponds to those events that occur with probability
  - will I like the next movie starring Matt Damon?
  - will I live to be 50?
  - will the dice show double sixes?



- Events that occur with certainty are without risk
  - the sun will rise tomorrow
  - I will be older tomorrow
  - I will give you an A if your grade is 90 or above

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Risk

- Humans sometimes prefer risky options over non-risky options
  - and vice-versa
- When the choices are perceived as losses
  - subjects tend to be *risk-seeking*
- When the choices are perceived as gains
  - subjects tend to be *risk-averse*
- Decision making is open to manipulation
  - subjects can contradict themselves

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Risk: monetary choices

- Assume yourself richer by $300 than you are today. You have to choose between
- A) a sure gain of $100. 72%
- B) 50% chance to gain $200 and 50% chance to gain nothing.
- Subjects tend to prefer the sure gain
  - risk averse with perceived gains

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Risk: monetary choices

- Assume yourself richer by $500 than you are today. You have to choose between
- A) a sure loss of $100.
- B) 50% chance to lose nothing and 50% chance to lose $200. 64%
- Subjects tend to prefer the risky option
  - risk seeking with perceived losses

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Notice

- Selecting A) in either situation means you end up with $400
  - $300 + $100
  - $500 - $100
- Selecting B) in either situation means you end up with either $500 or $300
  - $300 + $200 or $300 + $0
  - $500 - $0 or $500 - $200
- People do not just look at the "bottom line"
  - which is why businesses emphasize that approach

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Alternatives: version 1

- Imagine you are shopping for a new car and have narrowed down your choices to three models. According to a consumer magazine, the cars' ride quality (RQ) and gas mileage (GM) are rated as

Model	RQ	GM	
Asteroid	100	27	69%
Bravo	80	33	29%
Comet	**100**	**21**	2%

- Which car do you select?

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Alternatives: version 2

- Imagine you are shopping for a new car and have narrowed down your choices to three models. According to a consumer magazine, the cars' ride quality (RQ) and gas mileage (GM) are rated as

Model	RQ	GM	
Asteroid	100	27	19%
Bravo	80	33	79%
Clarion	**60**	**33**	2%

- Which car do you select?

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Notice

- Subjects hardly ever select the Comet or the Clarion
  - you might think they do not enter the decision making process at all!
  - but they do
- The comparison of Asteroid and Comet clearly favors the Asteroid
  - it is less clear for the Bravo and Comet
  - it is the reverse for Clarion

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Consumer beware

- Stores are very aware of this type of behavior
- Thus, they often stock merchandise for the sole purpose of influencing your purchasing behavior
  - usually towards a more expensive model
- Likewise companies make low-end models simply to bias you toward higher end models and against the competition

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Loss aversion

- Another general property of decision making is that people tend to be more sensitive to losses than to gains
  - thus people rarely take an "even-bet"
  - the loss of $10 is more significant than the gain of $10
- This is also why fans of sports teams think the referees treat their team unfairly
- In a game of basketball, each team will
  - have fouls called on them when they shouldn't have (a loss)
  - Commit fouls that are not called (a gain)
- But the gains don't count as much as the losses
  - So in a truly fair game *both* teams (and their fans) feel as if they were treated unfairly
  - of course one team wins, so it feels that it overcame the injustice

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Loss aversion

- The same phenomenon ruins many marriages/relationships
- When your partner does something for you (a gain) it doesn't count as much as when your partner does something against you (a loss)
  - Thus, you perceive your relationship as overall not being worth the trouble (even if your partner is good as often as bad)
  - That's why therapists suggest that in successful relationships people must learn to forgive

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Loss aversion

- By definition a choice is a loss or a gain depending on where you start
- As a result, loss aversion dramatically affects many types of choices by magnifying those characteristics of a choice that leads to a perceived loss
- Consider *choosing a job*

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Choosing a job: 1

- You have decided to leave your current job. It is located so far away from your apartment that it requires an 80-minute commute each way. But you do like the fact that your job involves much pleasant social interaction with your coworkers. Your search for a new job has given you two options and now you must choose between them. Which job would you prefer?
- Job A: Limited contact with others, commuting time 20 minutes.
- Job B: Moderately sociable, commuting time 60 minutes.

67%

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Choosing a job: 1

- You have decided to leave your current job. The job involves only a ten-minute commute, which you rather like. But your job leaves you isolated from coworkers for long periods of time. Your search for a new job has given you two options and now you must choose between them. Which job would you prefer?
- Job A: Limited contact with others, commuting time 20 minutes.
- Job B: Moderately sociable, commuting time 60 minutes.

70%

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Loss aversion

- In each case the subjects tend to choose the option that produces the *least loss*
  - keep sociable coworkers in version 1
  - minimizing commuting time in version 2
- Note, this means subjects are *not* just choosing what they perceive to be the best job overall (again, not looking at the bottom line)
  - but are instead choosing the best job relative to the current situation!
  - a very strange phenomenon!
- Note, some scientists suggest that "loss" is not the issue here; there are other situation-specific factors that explain these effects
  - It is true that there are some situations where loss aversion is not observed

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Conclusions

- Influences on decision making
- Framing effects
- Risk aversion (perceived gains)
- Risk seeking (perceived losses)
- Loss aversion

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Next time

- Problem solving
- Expertise
- Analogy
- Set effects
  - functional fixedness
- Insight
- *What does that "aha!" feeling mean?*

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