Econ 211

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Different Belief Biases

- Last lecture: belief biases are about things that are external to the decision-maker
  - Eg, belief in hot hands or the gambler's fallacy
- This lecture: beliefs biases are about things that are internal to the decision-maker
  - Overconfidence: biased belief in your ability
  - Projection bias: biased belief about your utility

Projection Bias

Motivation: Breakups

- Asked of people in romantic relationships: *Imagine that you and the person you're involved with break up within the next week. Using a scale from 1 to 7, where 1 is not happy and 7 is very happy, how do you think you would feel on a typical day two months from now?*
- Asked of people with recent breakups: *Using a scale from 1 to 7, where 1 is not happy and 7 is very happy, how happy would you say you are these days, on a typical day?*
- Average responses:
  - Anticipating breakup: 3.9
  - Recent breakup: 5.4
- Any potential problems with this design?
  - Unincentivized responses; experimenter demand effect; self-image; framing differences; renormalization of happiness scale

Source: Gilbert, Pinel, Wilson Blumberg, and Wheatley (1998)

Interpretation

- People may be underestimating how adaptable their preferences are
- What other situations might have the same failure to predict your own resilience/adaptability?
  - Moving to a new state
  - Losing your job
  - Getting bad grade or performance review
  - Severe medical issue
  - Winning the lottery
- This failure to predict one's adaptability is a specific example of a more general bias:
  - *Projection bias*: the tendency to overestimate the degree to which future tastes will resemble current tastes

Shopping Lists

- Another manifestation of projection bias: current surroundings or state of mind have an undue impact on your planned consumption in the future
- Field experiment at grocery store
  - 135 people entering grocery store without a shopping list
  - Asked to fill out questionnaire with intended purchases
  - Some subjects chosen at random for "taste test" of a muffin (real purpose was to make some people less hungry)
  - After shopping, copies of receipts were collected
- Results: What was the percentage of items in shopping cart that were unplanned purchases?
  - Hungry shoppers: 51%
  - Sated shoppers: 34%
- Explanation? Hungry people buy more because they think they will be more hungry in the future

Source: Gilbert, Gill, and Wilson (1998)

Planning Ahead

- In the previous experiment, it is possible that hungry people are buying more because they are going to consume it right away
- We can get around this with a design that separates the purchasing and the consumption
- Experiment with 200 office workers:
  - Workers asked to pick a snack to be delivered one week later
  - Snacks could be either healthy or unhealthy (not described as such to participants, of course)
  - Choices made right before or right after lunch
  - Snacks delivered right before or right after lunch
- Results: percent choosing unhealthy option:

	Consume after lunch	Consumer before lunch
Choose before lunch	78%	56%
Choose after lunch	42%	26%

Source: Read and Van Leeuwen (1998)

Winter Clothes

- OK, so projection bias seems to affect small purchases with tempting items like food, but will it affect purchases of more expensive, practical goods?
- Data from 2.2 million catalog purchases of cold-weather gear
  - Note this is *not* an experiment
  - Also in data set: temperature deviation on day item was ordered, relative to historical average temperature for that day
  - Standard theory: current temperature deviations should not affect purchasing behavior, since gear would not arrive for several days
- Results: orders for winter gear went up on colder-than-normal days
- Any alternate explanations?
  - Possible that colder weather increases salience, ie helps you remember to buy that coat you need
  - Counter-argument: items bought on colder-than-normal days are more likely to be returned

Source: Conlin, O'Donoghue, and Vogelsang (2005)

Still Not Convinced?

- What are the two biggest purchases that most of us will ever make?
  - Car and house purchase
- Data: 40 million vehicle purchases across the US (again, no experiment)
  - Again, connected purchase behavior with abnormal weather in the area
  - Weather acts like a coin flip in a lab experiment
  - Keep in mind: the enjoyment of the car that day is miniscule compared to total lifetime of car
- Results:
  - Temperature 20 degrees above average increases fraction of cars sold that are convertibles by 8.5%
  - 10-inch snowstorm increases fraction of cars sold that have 4-wheel-drive by 6%

Source: Busse, Pope, Pope, and Silva-Risso (2012)

Still Not Convinced? cont

- Data: 4 million homes sold at least twice between 1998 and 2008
  - Connected purchase behavior with weather in the area on that day
  - Note: takes 30-60 days from purchase dates to actually getting keys
- Results:
  - House with swimming pool sells for 0.4% more in summer than in winter
  - That is a value difference of $1600 for the average house

Source: Busse, Pope, Pope, and Silva-Risso (2012)

Utility Functions

- We are going to formalize the idea of projection bias in a moment
- But first, we need to establish the idea of a utility function
- Suppose there are several options to choose from, say x, y, z, etc
- Then a *utility function* is a function which takes in an option and returns a number such that $u(x) > u(y)$ if and only if I prefer x to y
- Standard economic theory says that I will pick the option with the highest utility number
  - That is, I will *maximize utility*

Maximizing Utility

- Suppose I have utility function $u(x)$
- What is amount of x that maximizes utility?
- Need to find *first order condition* of $u(x)$ with respect to x:

$$u'(x) = 0$$

- Finally, solve this equation for x

Theory Behind Projection Bias

- Individual has consumption c in state s
- Utility is $u(c|s)$, ie utility of consumption (pool or no pool) depends on state (good or bad weather)
- Consumer tries to make prediction in state s' about utility in future state s: $\bar{u}_{s'}(c|s)$
- Classical model: $\bar{u}_{s'}(c|s) = u(c|s)$
- Projection bias model: $\bar{u}_{s'}(c|s) = (1-\alpha)u(c|s) + \alpha u(c|s')$
- Variable α determines your deviation from standard model
- Note that projection bias *embeds* standard model when $\alpha = 0$

Overconfidence

Motivation: Perceived Driving Ability

- College students asked to rate both their driving safety and driving skill relative to other people in experiment
- Even if people's estimate are noisy, the average self-ranking should be 50%
- Results:

Self rating:	Below 50%	50% to 80%	80 to 90%	above 90%
Safety	12.5%	27.5%	37.5%	22.5%
Skill	7.2%	46.4%	26.8%	19.5%

- What could cause these patterns?
  - Overconfidence
  - Don't want to admit weakness
  - Different conceptions of what skillful or safe driving means

Source: Svenson (1981)

Motivation: Entrepreneurs

- Relatively few new businesses are successful
  - More than 60% of manufacturing businesses close within 5 years
  - More than 80% of manufacturing businesses close within 10 years
  - Note: it is possible that this results from completely rational risk-reward decision
- Survey of 3000 new business owners were asked to asses the probability of their business succeeding:
  - 81% said their chances were 70% or better
  - One third said their business was certain to succeed

Source: Cooper, Wu, and Dunkelberg (1988)

What Might Cause Overconfidence?

- Consider the process of learning about one's ability from observing your own successes and failures
- Decision makers may ascribe too much credit to their success and explain failures as bad luck
  - This is a kind of *attribution bias*: failure to correctly attribute causes to their effects
  - This is also a *self-serving bias*: a bias that makes the decision-maker feel better about themselves
    - In turn assumes that ego enters the utility function
    - Also call this *ego defense*