

Failures of Utility Maximization

Behavioral Economics:
ECON 1820: Brown University
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Failures of Utility Maximization

- Choice difficulty
- Too much choice
- Leaving money on the table
- Endowment effect
- Status quo bias
- Framing effects
- Preference reversals
- Asymmetric Dominance/Compromise Effects
- Random Choice

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Choice Difficulty

- Basic Idea: People may dislike making difficult comparisons
- May behave in such a way as to avoid having to make such comparisons

Example: Tversky and Shafir (1992)

- 80 Subjects
- Each subject filled out a questionnaire
- Paid \$1.50 for doing so
- Two treatments:

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25%



75%

Example: Tversky and Shafir (1992)

- 80 Subjects
- Each subject filled out a questionnaire
- Paid \$1.50 for doing so
- Two treatments:



25%
53%



75%



47%

Example: Tversky and Shafir (1992)

- Clear violation of IIA
 - If money was chosen in the 'big' choice set, should also have been chosen in the smaller choice set
- Interpretation: Stay with the money in order to avoid the 'difficult choice' between the different types of pen
- Taken as an example of 'decision avoidance'

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Too Much Choice

- Example: Iyengar and Lepper [2000]
- Set up a display of jams in a local supermarket
- Two treatments:
 - Limited choice – 6 Jams
 - Extensive choice – 24 Jams
- Record what proportion of people stopped at each display
- And proportion of people bought jam conditional on stopping

Iyengar and Lepper [2000]

- Slightly more people stopped to look at the display in the extensive choice treatment:
 - 60% Extensive choice treatment
 - 40% Limited choice treatment
- Far more people chose to buy jam, conditional on stopping, in the Limited choice treatment
 - 3% Extensive choice treatment
 - 31% Limited choice treatment

Iyengar and Lepper [2000]

- Again: Clear Violation of IIA
 - If 'don't buy' was chosen in the 24 jam set, should also have been chosen in the 6 jam set choice
- Interpretation:
 - Large choice sets are 'demotivating'
 - People do not want the effort of making a decision
 - Therefore 'opt out' of making a choice altogether

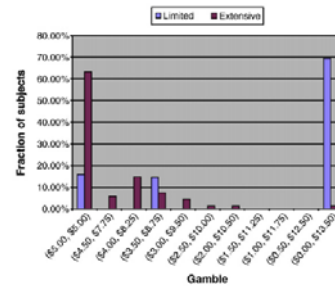
Other Examples

- Iyengar and Kamenica [2010]
 - Subjects offered choice between Lotteries
 - 120 subjects, 2 Conditions

Gamble #	If heads	If tails
Extensive condition		
1	\$5.00	\$5.00
2	\$4.50	\$7.75
3	\$4.00	\$8.25
4	\$3.50	\$8.75
5	\$3.00	\$9.50
6	\$2.50	\$10.00
7	\$2.00	\$10.50
8	\$1.50	\$11.25
9	\$1.00	\$11.75
10	\$0.50	\$12.50
11	\$0.00	\$13.50
Limited condition		
1	\$5.00	\$5.00
2	\$3.50	\$8.75
3	\$0.00	\$13.50

Iyengar and Kamenica 2010

- Results



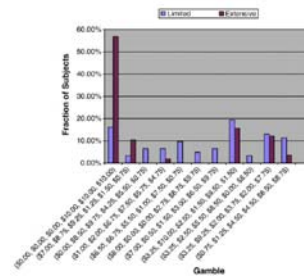
Iyengar and Kamenica 2010

- Risk Aversion or Simplicity?

Extensive condition						
Gamble #	If □	If □	If □	If □	If □	If □
1	\$0.00	\$0.00	\$0.00	\$10.00	\$10.00	\$10.00
2	\$1.50	\$0.25	\$8.75	\$7.00	\$0.75	\$1.25
3	\$4.25	\$5.50	\$9.75	\$8.50	\$0.00	\$0.75
4	\$1.00	\$2.00	\$6.75	\$7.50	\$5.75	\$4.75
5	\$5.50	\$1.00	\$0.75	\$6.50	\$7.50	\$6.75
6	\$0.00	\$0.00	\$8.75	\$2.75	\$9.75	\$8.00
7	\$9.75	\$3.00	\$7.00	\$6.50	\$0.50	\$1.50
8	\$9.50	\$1.50	\$1.50	\$2.50	\$3.25	\$10.00
9	\$5.50	\$8.50	\$3.25	\$0.00	\$8.50	\$2.50
10	\$9.25	\$7.75	\$3.75	\$2.00	\$3.25	\$2.00
11	\$1.25	\$4.50	\$8.50	\$8.75	\$4.50	\$0.75

Iyengar and Kamenica 2010

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Leaving Money on the Table

Which of the following would you choose?

4	2
3	13
20	11
15	8
8	10

Leaving Money on the Table

Which of the following would you choose?

4+6+10-11-23+9	2+3+6-11-14+9+10
3+9-17-99+102-6+15	6+18-19-55+70
20-27+7-19+2+3-5	11+2-5+7-8-9+10
15-5-5+6+16+17-20-9	8+9+10-11+8+2+6-32
8+8+9-13-9-6+7	10-9+17-23+10+2+15

Caplin, Dean and Martin [2011]

- 22 Subjects, 657 choices
- 6 treatments
 - 2 complexity levels: 3 or 7 operations
 - 3 choice set sizes: 10, 20, 40 options

Caplin, Dean and Martin [2011]



Caplin, Dean and Martin [2011]

Failure rate		
	Complexity	
Set size	3	7
10	7%	24%
20	22%	56%
40	29%	65%

Average Loss (\$)		
	Complexity	
Set size	3	7
10	0.41	1.69
20	1.10	4.00
40	2.30	7.12

Caplin, Dean and Martin [2011]

- Violation of Rationality **IF** we assume that more money is preferred to less
- Interpretation: It takes effort to understand the objects in a choice set
- Subjects may not exercise the effort to fully understand all the available options
- For example, may only consider a subset of available options
- **This may be the rational thing to do**

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Endowment Effect

- Kahneman, Knetsch and Thaler [1990]
 - 44 subjects
 - 22 Subjects given mugs
 - The other 22 subjects given nothing
 - Subjects who owned mugs asked to announce the price at which they would be prepared to sell mug
 - Subjects who did not own mug announced price at which they are prepared to buy mug
 - Experimenter figured out 'market price' at which supply of mugs equals demand
 - Trade occurred at that market price using Becker-DeGroot-Marschak procedure

Endowment Effect

- Kahneman, Knetsch and Thaler [1990]
- Prediction: As mugs are distributed randomly, we should expect half the mugs (11) to get traded
 - Consider the group of 'mug lovers' (i.e. those that have valuation above the median), of which there are 22
 - Half of these should have mugs, and half should not
 - The 11 mug haters that have mugs should trade with the 11 mug lovers that do not
- In 4 sessions, the number of trades was 4,1,2 and 2
- Median seller valued mug at \$5.25
- Median buyer valued mug at \$2.75
 - Willingness to pay/willingness to accept gap

Endowment Effect

- Violation of rationality in the sense that value of object changes with ownership
 - E.g. If seller, choose {mug} from {mug, \$4}
 - If buyer, choose {\$4} from {mug, \$4}
- Interpretation: Subjects place extra valuation on an object simply because they own it
- Related to 'Loss Aversion'
 - Losses loom larger than gains

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Status Quo Bias

- Idea: more likely to choose an object because it is the 'status quo'
- What is a 'status quo'?
 - Something that you have chosen before
 - The way things currently are (status quo bias)
 - What happens if you do nothing (inertia/omission effect)

Example: Madrian and Shea [2001]

- Observe behavior of workers in firms that offer 401k plans
 - Tax free pension savings
 - Generally considered to be a Good Thing
- Two types of plan:
 - Opt in: if no action is taken when joining firm, then do not take part in the plan
 - Opt out: if no action is taken when joining firm, then are automatically enrolled in scheme
- Compare uptake in different plans

Madrian and Shea [2001]

- Many more employees take part in 401k plan under automatic enrollment
 - 86% Opt out
 - 37% Opt in
- Effect reduced with tenure
- Also, people are more likely to take up the default fund, and invest the default amount

Madrian and Shea [2001]

- Interpretation: Violation of rationality, as choice over {enroll, not enroll} is dependent on initial position
- Status quo bias: stick with what you are initially given
- Possible explanations:
 - Inertia
 - Suggestion
 - Loss Aversion

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Framing Effects

- Framing effects refer to changes in the choices people make based on ‘inconsequential’ changes in the options
- We describe these as violations of rationality because we think really of these are the same object
 - Under one frame x is chosen from A
 - Under another y is chosen from A
- Depends on the definition of ‘inconsequential’

Bushong et al. [2010]

- Students presented with a series of snack foods,
- Selling price for each of these goods elicited using the Becker-DeGroot-Marshak mechanism.
- Three conditions that varied in how the snack foods were described.
 1. Written description.
 2. Picture of snack food
 3. Open container of the snack food.
- Average bidding prices were not significantly different in the first two treatments, but were much higher in the third (\$1.16 vs \$0.71)

Bertrand et al. [2010]

- Field experiment in South Africa.
- A subprime consumer lender randomized both the advertising content and interest rate in direct mail offers to 53,000 former clients.
 - a photograph on the letter,
 - reference to the interest rate as special or low,
 - suggestions for how to use the loan proceeds,
 - a large or small table of example loans,
 - inclusion of the interest rate as well as the monthly payments,
 - a comparison to a competitors' interest rate,
 - mention of speaking the local African language,
 - and mention of a promotional raffle prize for a cell phone.
- Significant effect on loan take up. Individually, the inclusion of a photo and a table of example loans were the important determinants.

Bertrand et al. [2010]

- Evidence that people's choices are manipulable through 'gimmicks'
 - At least to some extent
- This is probably unsurprising
 - Think about advertizing
- Unfortunately, we are long on examples, short on unifying theories

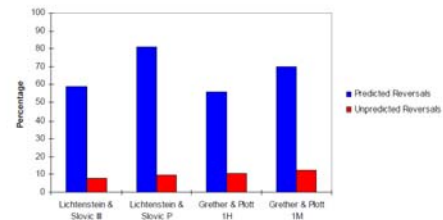
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Lichtenstein and Slovic [1971]

- Task involves two lotteries
 - Lottery a – 20% \$100, 80% \$0
 - Lottery b – 90% \$22, 10% \$0
- Two tasks
 - (1) Choose between a and b
 - (2) Elicit a value for a and b using BDM mechanism
- Preference reversal: choose b over a, but value a higher than b

Lichtenstein and Slovic [1971]



Lichtenstein and Slovic [1971]

- Violation of rationality assuming more money is better than less
- Interpretation: response mode affects people's valuation
- People are not very good at putting monetary value on things...

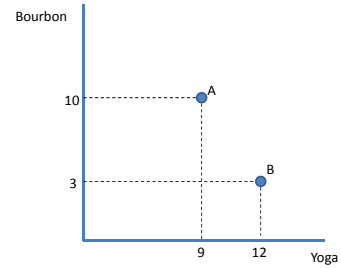
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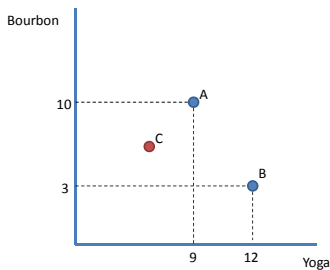
Huber, Payne and Puto [1982]

- Subjects were asked to choose between two types of beer.
 - \$1.80 per six pack, and had a quality rating of 50.
 - \$2.60 per 6 pack, but had a quality rating of 70.
- 43% of people chose the first option and 57% chose the second.
- Third option was added that was dominated by the first option
 - \$1.80 and a quality rating of 40
- Increase the proportion of people choosing this option to 63%

Asymmetric Dominance Effect



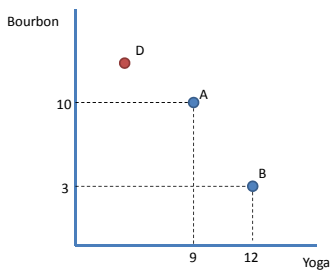
Asymmetric Dominance Effect



Simonsen [1989]

- Subjects were offered a choice between two types of calculator battery.
 - Lifespan of 12 hrs and a 2% probability of corrosion.
 - Lifespan of 14 hrs and a 4% probability of corrosion.
- 43% chose the second battery.
 - Subjects were then told about a third option,
 - 16 hr life expectancy and a 6% probability of corrosion
- Under this condition, 60% of people chose the 14 hr/4% battery.

Context Effects



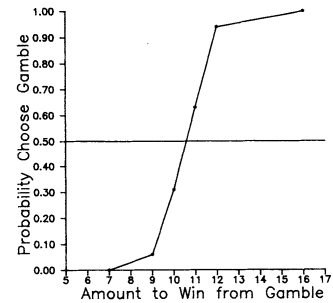
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Random Choice

- If a decision maker is maximizing a stable utility function they should always choose the same thing from any choice set

Nogee [1951]



Random Choice

- As the quality of the lottery is increased, the probability of choosing it increases
- But it increases smoothly, not discretely as the utility maximization model would suggest
- Reminiscent of perceptual experiments
 - Which of two weights is heavier?

Suggested Reading (2)

- Tversky, A., & Shafir, E. (1992b). Choice under conflict: the dynamics of deferred decision. *Psychological Science*, 3, 358-361
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