The Basics of Behavioral Economics

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How we fell in love with economics

- Samuelson’s philosophy
  - Explained long festering conundrums
  - Simple beauty and organization
  - Makes sense
How economists fell in love with behavioral economics

- Kahneman and Tversky’s prospect theory
  - Explained long festering conundrums
  - Maintained a lot of the simple beauty of mainstream economic models
  - Added realism and regularity
We do something like optimize

- We don’t have all the information we need
- Once we recognize patterns, we use them
- We are subject to biases
The challenge of behavioral economics

- How do people screw up and why?
- In contrast to microeconomics, behavioral models can seem like a hodgepodge.
- What is systematic and how can it be used by decision-makers, policymakers, businesses
  - Two types of models:
    - Behavioral
    - Procedural rationality
Marginal Thinking

• What is the standard story?
  – Maximize utility of consumption subject to a budget constraint
    \[ \max_{x_1, x_2} U(x_1, x_2) \text{ subject to } p_1 x_1 + p_2 x_2 \leq w \]
  – Suppose you had to pay $1 per chicken wing
    • Eat until the next wing provides less than $1 worth of enjoyment
    • Diminishing marginal utility consumption guarantees you will stop
  – Suppose the wings were free?
    • Eat until the next wing would yield negative utility
The Sunk Cost Fallacy

Table 2.—The Effect of Paying Half-Price Controlling for Sociodemographic Variables

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Treatment Effect</th>
<th>Z-Statistic</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of slices eaten</td>
<td>-1.128</td>
<td>-2.92</td>
<td>0.004***</td>
</tr>
<tr>
<td>Dollars per slices eaten</td>
<td>-0.576</td>
<td>-2.61</td>
<td>0.009***</td>
</tr>
<tr>
<td>Overall taste rating</td>
<td>0.688</td>
<td>1.64</td>
<td>0.100*</td>
</tr>
<tr>
<td>Taste rating of first slice</td>
<td>0.876</td>
<td>2.11</td>
<td>0.035**</td>
</tr>
<tr>
<td>Taste rating of last slice</td>
<td>0.462</td>
<td>1.03</td>
<td>0.304</td>
</tr>
<tr>
<td>Plate waste</td>
<td>-0.308</td>
<td>1.88</td>
<td>0.060*</td>
</tr>
</tbody>
</table>

Results are derived using a minimum distance matching estimator (Abadie et al., 2004). Matching is based on age, gender, height, and number of members in the party. Standard errors correct for heteroskedastic treatment effects. $n = 63$. * $p < 0.10$. ** $p < 0.05$. 
The Concorde Paradox

• A Supersonic Jet
  – 1962 British and French government venture
  – Originally budgeted for $448 million
  – By 1964 $900 million
  – By completion more than $2.7 billion
  – By 1973 they knew it was a loser—what to do?
    • Only 100 passengers
    • Only ever sold 14 planes
Going to the Theater

- Season tickets at the Ohio University Theater
  - $15 for 10 shows
  - Some charged $13 or $8
  - The full price group attended more often
  - All groups were just as likely to miss in the last half of the season

- Does transaction utility diminish over time?
Defaults

(Johnson and Goldstein 2003)
Default Choices are Powerful

- They can lead people to . . .
  - Donate organs (Johnson and Goldstein 2003)
  - Make investments (Choi et al 2003)
  - Select insurance plans (Kahneman, Knetsch & Thaler 1991)

- Defaults are most often . . .
  - Binary, infrequently made, unfamiliar, and entail little initiative (Thaler and Sunstein 2008)

- Can practical defaults be developed for . . .
  - Multi-choice, frequent, familiar situations that necessitate an active choice?
School Lunch Veggie Offer versus Served

(Just and Price 2013)
Foundational Results

• No true common theme
  – Reference based judgment
  – Limited attention
  – Misperception
  – Anxiety or emotion driven results
  – Social influence
Reference Based Decisions
Framing Effects

- Framing affects the answer (Tversky and Kahneman)

Imagine that the U.S. 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 estimate of the consequences of the program are as follows:

- If Program A is adopted, 200 people will be saved (72%)
- If Program B is adopted, there is a $1/3$ probability that 600 people will be saved and another $2/3$ probability that no people will be saved (28%)
- If Program C is adopted, 400 people will die (22%)
- If Program D is adopted, there is a $1/3$ probability that nobody will die and $2/3$ probability that 600 people will die (78%)
Reference Points and Decisions

- Framing matters:
  - 75% Fat Free vs. 25% Fat
- Gains not as valuable as wiping out a loss
- Status quo is important
- The endowment effect
  - Willing to pay half as much as willingness to accept
  - Implication for contracts
  - MBGs
Sunk Cost Fallacy

- A family pays $40 for tickets to a basketball game 60 miles away. There is a snowstorm the day of the game. They go, but would have stayed home if the tickets were given to them.
Mental Accounting

• Thaler:
  – Money is not fungible
    • Mental budgets
    • Sources matter:
      – Tax refund
      – Lower tax bill
  • Opening and closing accounts
    – Paid for tickets, and lost them
    – Given tickets and lost them
  • It’s not just money!
    – Compensating behaviors
Risk Behavior

- Preferences are complete and transitive
- Continuous
- Satisfy independence
  \[ A > B \text{ then } pA + (1 \text{ } pB) \]
# Stochastic Inferiority

<table>
<thead>
<tr>
<th>Gamble A:</th>
<th>Gamble B:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marbles</td>
<td>Money</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>90% white</td>
<td>$0</td>
</tr>
<tr>
<td>6% red</td>
<td>win $45</td>
</tr>
<tr>
<td>1% green</td>
<td>win $30</td>
</tr>
<tr>
<td>3% yellow</td>
<td>lose $15</td>
</tr>
</tbody>
</table>

60% Choose A

<table>
<thead>
<tr>
<th>Gamble C:</th>
<th>Gamble D:</th>
</tr>
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</table>

All Choose D
# Intransitivity

<table>
<thead>
<tr>
<th>Gamble A:</th>
<th>Gamble B:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 probability of winning $10</td>
<td>0.7 probability of winning $7.50</td>
</tr>
<tr>
<td>0.6 probability of winning $3</td>
<td>0.3 probability of winning $1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gamble C:</th>
<th>Gamble D:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 probability of winning $5</td>
<td>0.7 probability of winning $7.50</td>
</tr>
<tr>
<td></td>
<td>0.3 probability of winning $1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gamble E:</th>
<th>Gamble F:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 probability of winning $10</td>
<td>1.0 probability of winning $5</td>
</tr>
<tr>
<td>0.6 probability of winning $3</td>
<td></td>
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Majority choose $A > C > B > A$
Observed Indifference Curves

![Diagram of Observed Indifference Curves]

- Probability of highest value vs. Probability of lowest value

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22  Dyson  |  Cornell SC Johnson College of Business
Fundamental Concerns

► EUT implies that should be approximately risk neutral in small gambles
  – Otherwise, implies severe concavity, and hence risk aversion for more moderate stakes

► Let $(.5, x, .5, y)$ be a gamble with 50% chance of gaining $x$ and 50% chance of winning $y$.
  – If reject $(.5, 110, .5, -100)$, then reject $(.5, 2930, .5, -800)$
  – If reject $(.5, 125, .5, -100)$, then reject $(.5, \infty, .5, -600)$
Models: A More Fundamental Concern

Just and Peterson (2003, 2009) show this is relevant in continuous choice

- Any marginal decision involving risk as a small risk
- Just and Pope (2003) suggest missing constraints, or other misspecification
Problems with Nearly Everything

► The concavity problem is pervasive in nearly all problems we want to look at

► The problem is worse with all of the alternative models (Nielson 2001)
  – Probability weighting exaggerates the problem

► Maybe concavity is not a good explanation for at least some risk response
Judgment Biases

• Psychologists have made a study of how individuals bias probability judgments.
  – Found several systematic biases.
  – These biases have been found outside the laboratory also.
Consider the following question from Amos Tversky and Daniel Kahneman.

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student she was deeply concerned with issues of discrimination and social justice, and she also participated in antinuclear demonstrations.

Please rank the following statements by their probability, using 1 for the most probable and 8 for the least probable:

(a) Linda is a teacher in an elementary school.
(b) Linda works in a bookstore and takes yoga classes.
(c) Linda is active in the feminist movement.
(d) Linda is a psychiatric social worker.
(e) Linda is a member of the League of Women Voters.
(f) Linda is a bank teller.
(g) Linda sells insurance.
(h) Linda is a bank teller and is active in the feminist movement.
Confirmation

How to test the hypothesis: If there is a “D” on one side of any card, then there is a 3 on its other side.

Flip the D and the 7
Notable Biases

• Overconfidence:
  – Confidence intervals are too narrow.
  – Unlikely events are considered impossible.

• Availability Bias:
  – People think things are more likely if they are easier to remember.

• The Law of Small Numbers:
  – Representativeness (like maximum likelihood).
  – Conservatism (slow learning).
How We Process Health Information

• Narrow health claims distract from more broad health measures (van Ittersum et al.)
  – Low fat, low calorie, low sugar, etc.

• When focusing on narrow claims, individuals may eat more than they intend
  – “I can indulge in more because this is healthier”
  – “I will eat dessert because the main course was healthier”
  – Compensation can quickly overwhelm health benefits
Immiserizing Compensation

- GMO labeling can overshadow measures of nutrition
  - Calories
  - Calorie density
  - Fat
- When we focus on narrow characteristics, we often fall prey to a health halo
Organics and GMOs

• Consumers believed products labeled organic to be (Lee et al. 2013)
  – Lower in calories
  – Better tasting
  – Lower in fat
  – Higher in fiber

• The products were, in fact, identical aside from the label

• The GMO label has nearly opposite effects
Growing Fear of Food

• GMOs are part of a growing group of foods consumers fear
  – HFCS
  – Foods that have been processed in any way
    • Including irradiation
  – Foods linked to large corporations (e.g., Monsanto)
  – Foods containing unfamiliar ingredients with long Latin names
  – Foods that are dangerous for vanishingly small populations
Temptation

- Temptation requires conflicting preferences
  - I want it for what it does right now
  - I don’t want it because of what it will do

- Temptation aversion (Gul and Pesendorf 2001)
  - When choosing, tempting items become the reference point
  - Avoid contexts where temptation occurs
Conflicting Evidence

• 1989 – USDA experiment in San Diego
• Cash out (now a dirty word among food policy researchers)
• A treatment group received cash instead of EBT
• Both groups spent more than the benefit on eligible food
• Those receiving EBT consumed 200 more calories per day -- CONTRADICTION
End of the Month Effect

• Spending on food in the first two days after receiving food stamps is about $5/person/day
• Spending the rest of the month is about $2/person/day
• Is that smooth?
• Should we increase disbursements?
• What might explain it?
Rationality $\rightarrow$ Consumption Smoothing
Discounting Provides One Explanation

• We give in to temptation because we are essentially procrastinating
• There is a malfunction in the way we process future tradeoffs, and we believe we will behave better in the future
• Today us, versus tomorrow us
• Alternative: Dual process models
  – Cold state: Rational
  – Hot state: Impulsive
  – Which rules: depends (Shiv)
Hot vs. Cold Decisions

**Cold State**

- We consider
  - Prices
  - Health information
  - Logic
- We buy
  - Smaller portions
  - Moderate foods

**Hot State**

- We eat for
  - Taste
  - Convenience
  - Size
  - Visual effect
  - This decision is an exception
- We buy
  - Bigger
  - More hedonic
Achieving Objectives

• The welfare approach:
  – Seek policies that maximize overall welfare while imposing the policy objective
    • Usually several equivalent policies (tax, caps on production, etc.)
    • Almost always suggests the most direct policy is the more efficient policy
      – Reduce emissions then tax emissions not production or consumption
Burden of Proof: We are restricting $C$ for the greater good

- The individual is maximizing
  $$\max_{x \in C} U(x|\theta)$$
- If policies broaden $C$ then potentially better off
- If policies narrow $C$ then potentially worse off
- Could have ambiguous impacts
- We justify restricting $C$ by arguing externalities
The Mismatch with Real World Policy: We are restricting $C$ for your own good.

- Nutrition policy
  - Sugar/fat taxes
  - Bans (Happy Meals, 20 oz sodas)
  - Restrictive guidelines
  - Zoning ordinances

- Safety policies
  - Seatbelts/helmets
  - Banning of goods

- Health Insurance
The Welfare Problem

Two Key Assumptions

• Preferences are represented by utility which embodies both wellbeing and choice

• The preferences are stable and invariant to the policies that are implemented

Two Key Behavioral Results

• Individuals do not maximize their wellbeing (DellaVigna and Malmendier 2006)

• Preferences are context dependent (Kahneman, Knetsch and Thaler 1990)
  – And can be influenced by policy!
Paternalism
The Advent of Nudging: We are going to mess with $U$ and leave $C$ alone

• “Libertarian paternalism is a relatively weak, soft, and nonintrusive type of paternalism because choices are not blocked, fenced off, or significantly burdened.” – Richard Thaler

$$\max_{x \in C} U(x|\Theta)$$

• The story
  – Perceived choice set
  – Reframing decisions (highlighting costs or benefits)
  – Taking account of rules of thumb
  – Suggesting social norms
The claims

- Big changes in behavior
  - Leaving the choice set alone
  - Operates on individuals own preferences
  - Guides individuals toward policy preferred outcomes
  - Individuals may not mind such nudges designed to improve their choices
  - Nudges are often inexpensive
What about with a nudge?
What about with a nudge?
The issue of welfare under nudging

- Admitting behavioral approaches undermines the story behind welfare economics
- We could improve on the individual’s selection
  - Some use this as an argument for paternalism
- Are we drawing attention to something better?
  - or drawing attention away from something better?
- We have no valid welfare measure
Thank you!