Temptation and Self Control

Behavioral Economics:
G6943: Columbia University
Mark Dean

Temptation and Self Control
• One of the most successful and influential areas in behavioral economics
• Lots of work:
• Popular for (at least) 3 reasons

1. Problems of temptation and self control seem to be ubiquitous
2. Correlated with socioeconomic outcomes
3. Something the standard model cannot capture

(1) Temptation and Self Control Problems Seem To Be Ubiquitous
• Americans are fat

Obesity Trends* Among U.S. Adults
BRFSS, 1985
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 1986
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)
<table>
<thead>
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<th>Year</th>
<th>Data Availability</th>
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Obesity Trends* Among U.S. Adults
BRFSS, 1999
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 2000
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 2001
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 2002
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 2003
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)

Obesity Trends* Among U.S. Adults
BRFSS, 2004
(*BMI ≥ 30, or ~ 30 lbs. overweight for 5’ 4” person)
(1) Temptation and Self Control Problems Seem to Be Ubiquitous

- Americans are fat (and are getting fatter)
- Americans smoke

- Americans are fat (and are getting fatter)
- Americans smoke (but less than they did)
- Americans take drugs

- Americans are fat (and are getting fatter)
- Americans smoke (but less than they did)
- Americans take drugs (but slightly less than they used to)
- Americans have a lot of credit card debt
(1) Temptation and Self Control Problems Seem to Be Ubiquitous

<table>
<thead>
<tr>
<th>Age of family head and family income²</th>
<th>Percent having a general purpose credit card</th>
<th>Percent having a balance after last month's bills</th>
<th>Median balance³</th>
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</thead>
<tbody>
<tr>
<td>1992 total</td>
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<td>62.6%</td>
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<tr>
<td>1993 total</td>
<td>65.5%</td>
<td>52.6%</td>
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<td>1998 total</td>
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<td>2003 total</td>
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<tr>
<td>2004 total</td>
<td>73.5%</td>
<td>58.2%</td>
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</tbody>
</table>

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- “Delay of Gratification in Children” by Mischel et al. (Science 1989)
  - ‘Self control’ measured in 35 young (4 years old) children
  - Children shown a worse and better reward (e.g. 1 marshmallow or 2 marshmallows)
  - Told that they could wait until the experimenter comes back, and get the better reward
  - Or press the bell and get the worse reward
  - Self control measured as length of time before bell is pressed
Temptation and Self Control Linked to Socioeconomic Outcomes

• Self Control at age of 4 correlated with later life outcomes
  – SAT verbal and quantitative
  – Parental ratings of coping ability as adolescents
• Only true for treatments in which rewards were exposed, not obscured

Self control at age of 4 correlated with later life outcomes – SAT verbal and quantitative – Parental ratings of coping ability as adolescents

• Results remain when intelligence controlled for
• In sibling study, significant results for
  – Smoking as a 12 year old
  – School performance
  – Antisocial behavior
• Cohort born in 1994, so no adult outcomes yet

Which way does causation run?
– Do self control problems lead to worse outcomes?
– Or do worse outcomes make it harder to exert self control?
• A recent literature has concentrated on the second possibility
  – Link between poverty and cognitive resources
  – Link between cognitive resources and self control

Mani et al. [2013] – link between poverty and cognitive resources
• Provide laboratory and field evidence that poverty affects decision making
• Hypothesize that the cognitive effort required to manage day to day activities when poor limit cognitive resources for other things
• Study how well Indian farmers perform on cognitive control and intelligence tasks before and after they are paid for the annual harvest
  – Pre payment farmers do worse
  – Seems not to be related to
    • Time available
    • Work effort
    • Stress
    • Nutrition
• But see Carvalho et al [2015].

“A gradient of Childhood self control predicts health, wealth and public safety” Moffitt et al [2011] PNAS
– 1037 children in New Zealand
– Self control measured via
  • Self reports
  • Observations by researchers
  • Reports by teachers and parents
– Combined in a single factor
Temptation and Self Control Linked to Socioeconomic Outcomes

• Depleted cognitive resources make it harder to exert self control
• Shiv and Fedorikhin [1999]
  - Subject enters room 1
  - Asked to remember a number to be repeated in room 2
  - Walks to room 2 via a tray of snacks
  - Containing 2 types of snack
    • Chocolate Cake
    • Fruit
  - Four treatments:
    • Available processing capacity
      • High (2 digit number)
      • Low (7 digit number)
    • Presentation mode
      • Real
      • Symbolic
  - Shiv and Fedorikhin [1999]

• Other evidence suggests that willpower is a depletable resource
• Galliot et. al. [2007]
  - Procedure
    • Measure glucose level
    • Watch video of woman talking (no sound)
    • One syllable words appear in bottom left corner of screen
    • Two treatments:
      • Glucose vs placebo
      • Watch normally vs Ignore words (requires self control?)
    • Glucose measured again
  - Result: “Self Control” reduced glucose
  - Fall in glucose level associated with worse performance in Stroop task
  - Participants were then told that the study had ended
  - Before they left, asked if they would help young woman
    • Participants the opportunity to help woman by volunteering time to complete various tasks (e.g., stuffing envelopes)
    • Asked to indicate the number of hours they were willing to help, ranging from 0 to 9

• DeWall et. al. [2012]
  - Procedure
    • Subjects either consume a glucose drink or placebo
    • Watch video of woman talking (as before)
    • Four treatments
      • Glucose vs placebo
      • Watch normally vs ignore words
    • Subjects listened to an interview:
      • Young woman described how her parents were recently killed
      • Only one to care for her younger siblings
      • Would have to drop out of college without help
    • Participants were then told that the study had ended
    • Before they left, asked if they would help young woman
      • Participants the opportunity to help woman by volunteering time to complete various tasks (e.g., stuffing envelopes)
      • Asked to indicate the number of hours they were willing to help, ranging from 0 to 9
  • Results:
    • Placebo condition
      - Those in depletion condition significantly less likely to help
    • Glucose condition
      - No effect
    • Looking within depletion condition, those who took glucose significantly more likely to help
    • Warning: Further results find similar effects even if drink is not drunk, just washed around the mouth
Temptation and Self Control

1. Problems of temptation and self control seem to be ubiquitous

2. Correlated with socioeconomic outcomes

3. Something the standard model cannot capture

(3) Something that the Standard Model Cannot Capture

- In the standard economic model of decision making, there is a single utility function that people maximize
- No room for ‘temptation’ or ‘self control’
  - No sense in which the DM might choose option \( x \), but wished they had chosen option \( y \)
  - No sense in which they exerted self control in order to choose \( x \) over the tempting alternative \( y \)
  - In choices over time, decision maker is assumed to be time consistent
    - Decisions maker at time \( t \) agrees with themselves at time \( t+1 \)
    - Even if tastes change
- Standard model has no way of starting to address is (important seeming) class of behavior

How Do We Spot Someone Having a Temptation/Self Control Problem?

1. We see them doing something naughty
   - i.e. we identify self control problems with certain activities
     - Smoking
     - Drug taking
     - Undersaving
     - Poor performance in a stroop task
     - Letting go of a hand grip
   - There is no ‘rational’ reason to take drugs, so anyone who takes drugs must be in the grip of a self control problem
   - This goes against standard economic methodology
     - Very proscriptive – maybe benefit of cigarette smoking is higher than long term costs for some people
       - Should someone with a week to live really not take heroin?

How Do We Spot Someone Having a Temptation/Self Control Problem?

2. They tell us that they want to do one thing, then do another
   - For example, tell us that they want to quit smoking, but then carry on smoking
   - Hard to interpret this data – why do we treat what they say more important than what they do?
     - In general, economists feel that they know how to deal with ‘self reports’, but know how to deal with choice
     - If someone says they want to do \( a \), but actually does \( b \), we would generally consider this evidence that they prefer \( b \) over \( a \)
     - Talk is cheap

How Do We Spot Someone Having a Temptation/Self Control Problem?

3. They change their mind
   - For example:
     - People repeatedly quit smoking, then restart
     - People take drugs when they are younger but not when they are older
     - People smoke when drunk, but not when sober
   - Hard to distinguish between temptation and changing tastes
     - Maybe drinking and cigarette smoking are compliments?
Two Approaches to Spotting Temptation and Self Control Problems

1. Preference for Commitment

2. Time Inconsistency in Discounting

Preference For Commitment

• Imagine we saw the following behaviors:
  • A gambler asks to be banned from a casino
  • A drinker asks to be given a drug that makes them violently ill if they drink
  • A diner pays to have a smaller portion of fries with their meal
  • In other words, choosing to reduce their choice set in the future
  • (all of these happen in real life)

• I would argue that these are signs of temptation/self control problems
  • Time t self is worried that time t+1 self will do something that they do not like
  • Therefore restricts options available to their t+1 self
  • E.g. at time t, removes the option to drink at time t+1
  • Such behavior would not be exhibited by someone who
    • Was perfectly happy with the amount they drank
    • Had changing preferences over drinking, but were happy to make a game-time decision
    • Stops talk being cheap

Time Inconsistency

• Imagine we saw the following behaviors:
  • A (very thirsty) decision maker chooses juice now over twice the amount of juice in 5 mins
  • Also chooses juice in 20 minutes over twice the amount of juice in 25 minutes.
  • This is ‘present biased preference reversal’
  • Arguably, this is also an example of a self control problem
  • Presumably, in 20 minutes, you would choose juice today over 2 times juice in 5 minutes
  • So your preferences now disagree with preferences in 20 minutes time
  • Assumes that now is the same as 20 minutes time in all other respects

Outline

• Lecture 1: Modeling Preference for Commitment
• Lecture 2: Modelling Time Inconsistency
• Lecture 3: Evidence
  • Commitment
  • Time preferences
  • Link between the two
  • Sophistication
  • Preference for flexibility