

## Temptation and Self Control

Behavioral Economics Spring 2017  
Columbia University  
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1

## Temptation and Self Control

- One of the most successful and influential areas in behavioral economics
- Lots of work:
  - Theoretical: Gul, F. and W. Pesendorfer (2001) "Temptation and Self-Control." *Econometrica* 69, 6 1403-1435.
  - Empirical: Ashraf, N., D. Karlan, and W. Yin (2006). Tying odysseus to the mast: Evidence- from a commitment savings product in the Philippines. *Quarterly Journal of Economics* 121 (2), 635.
  - Policy: Richard H. Thaler & Shlomo Benartzi, 2004. "Save More Tomorrow (TM): Using Behavioral Economics to Increase Employee Saving," *Journal of Political Economy*, vol. 112(S1)
- Popular for (at least) 3 reasons

2

## 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

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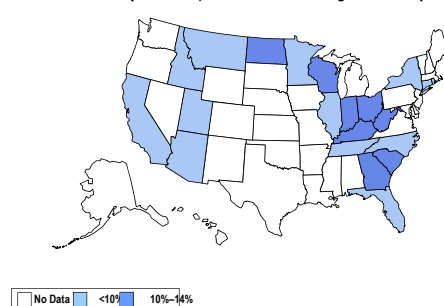
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### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

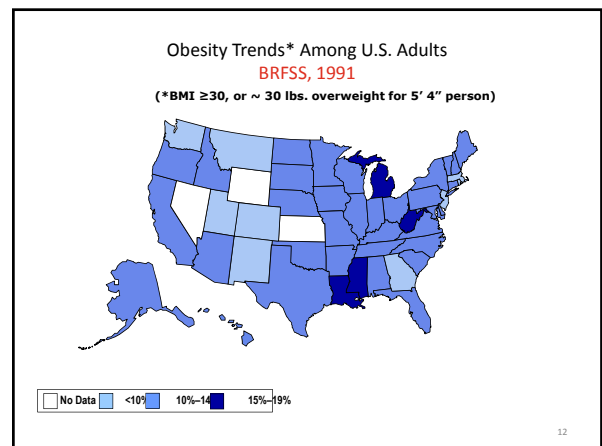
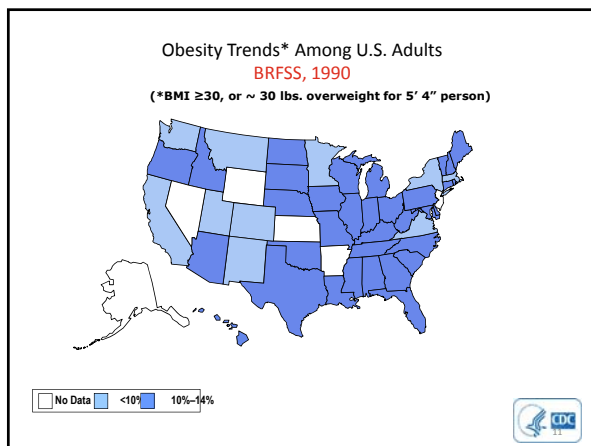
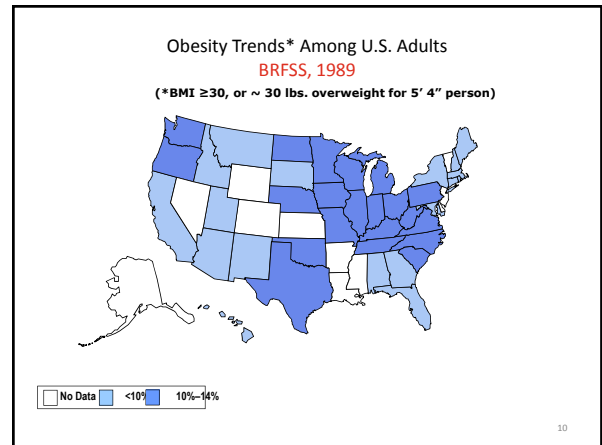
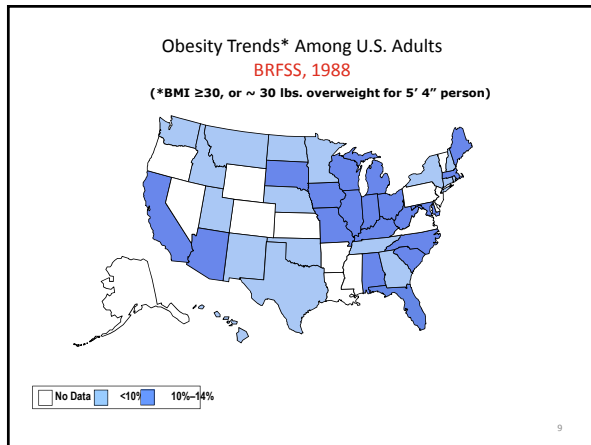
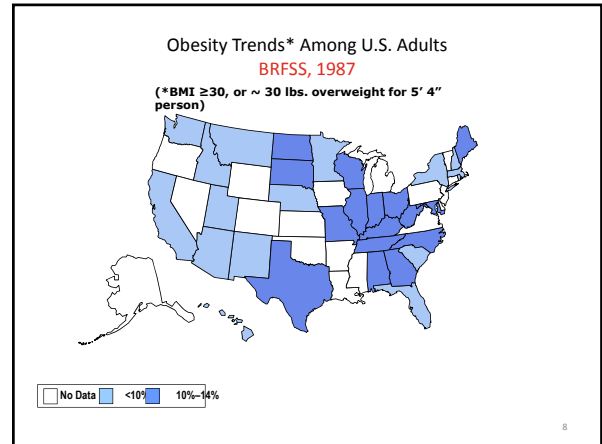
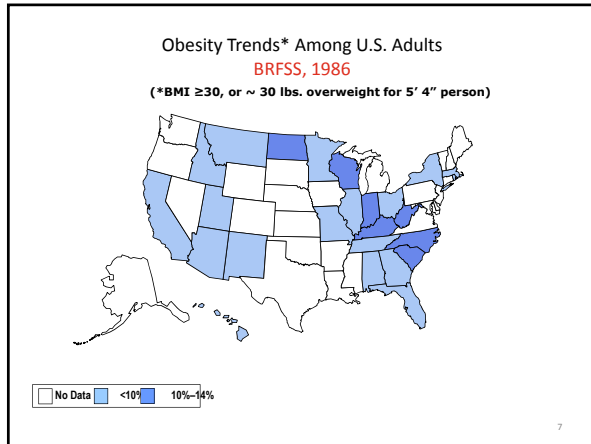
- Americans are fat

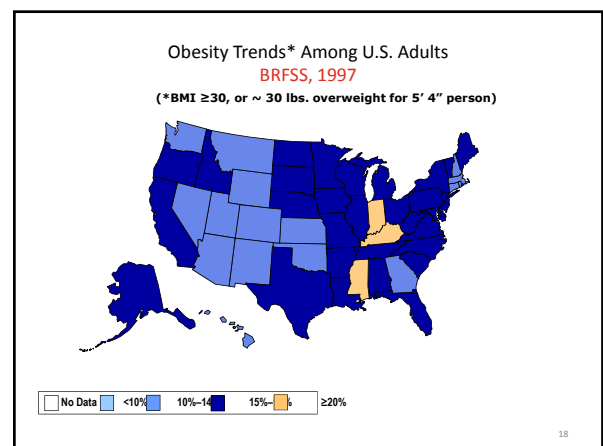
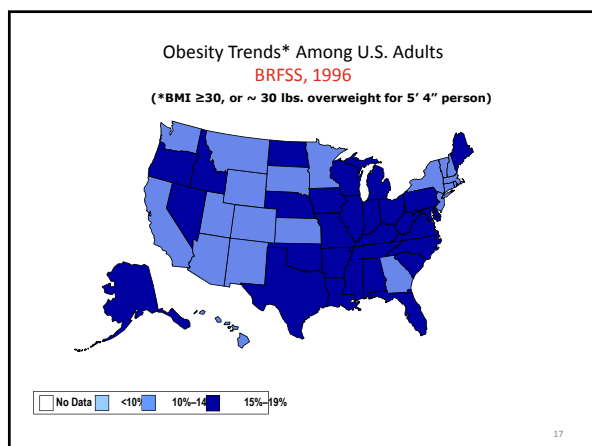
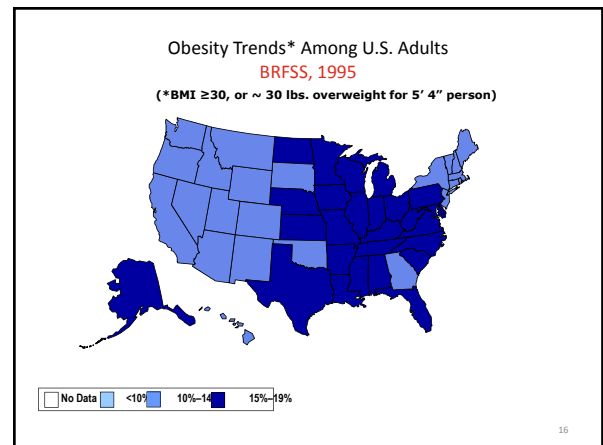
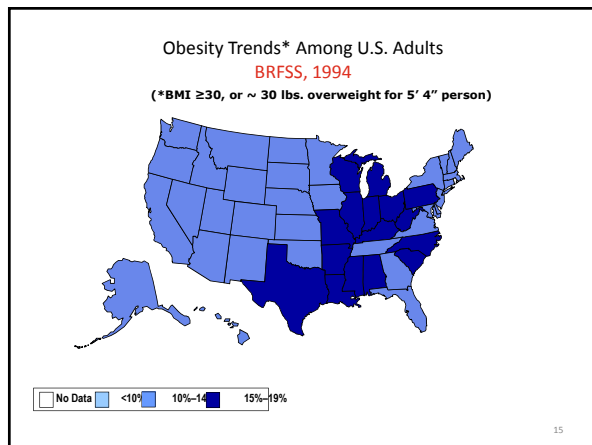
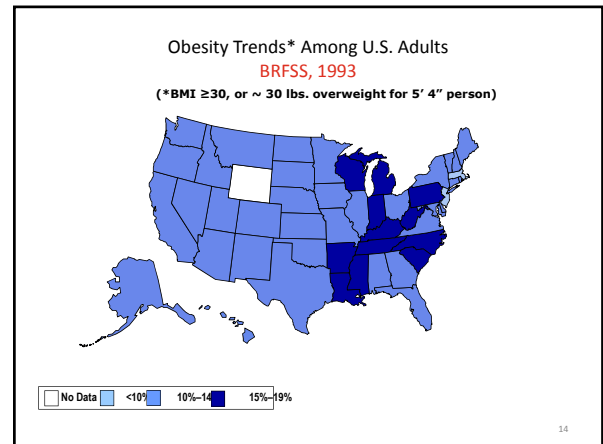
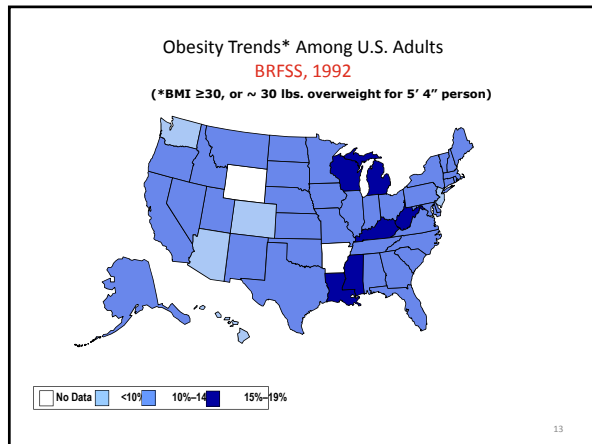
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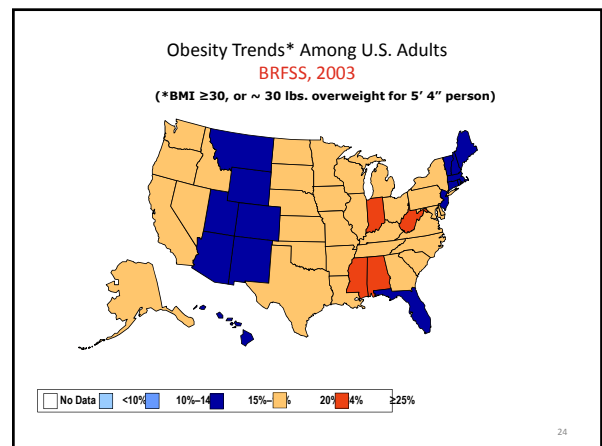
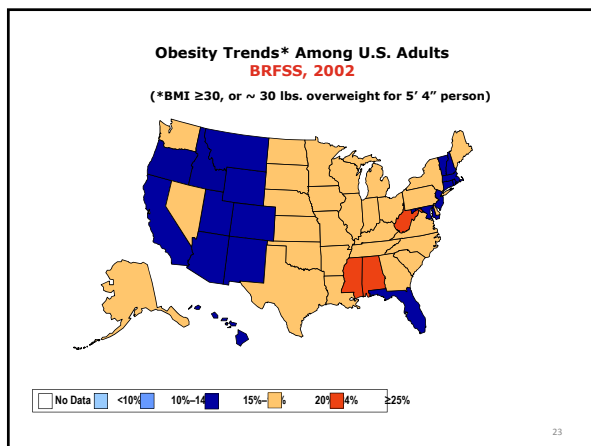
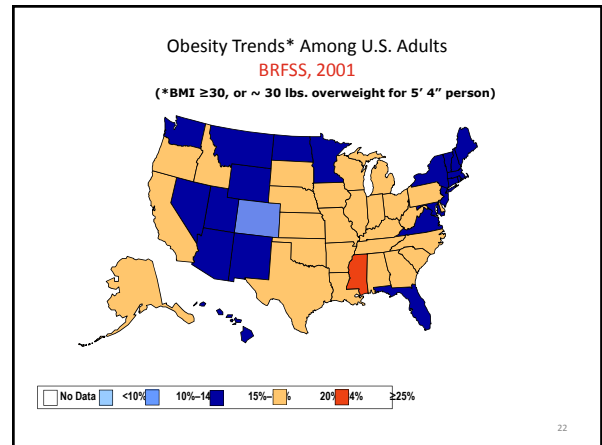
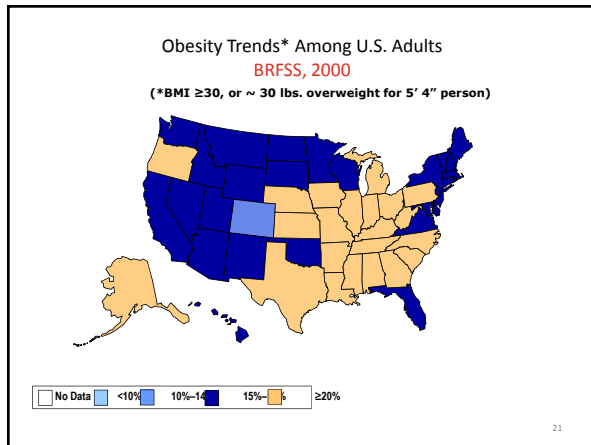
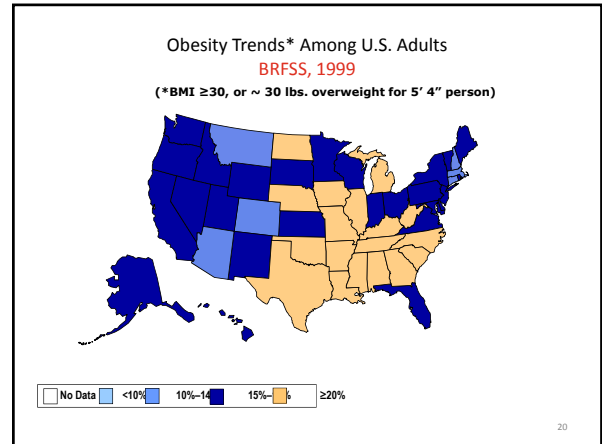
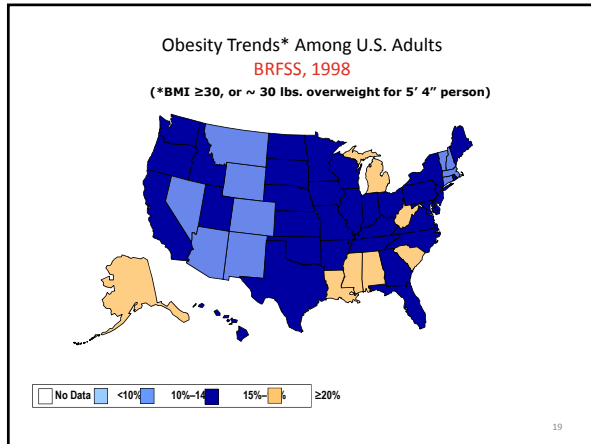
Obesity Trends\* Among U.S. Adults  
BRFSS, 1985  
(\*BMI  $\geq 30$ , or  $\sim 30$  lbs. overweight for 5' 4" person)

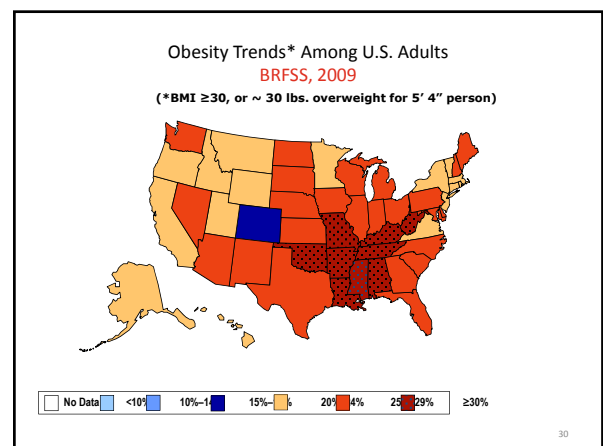
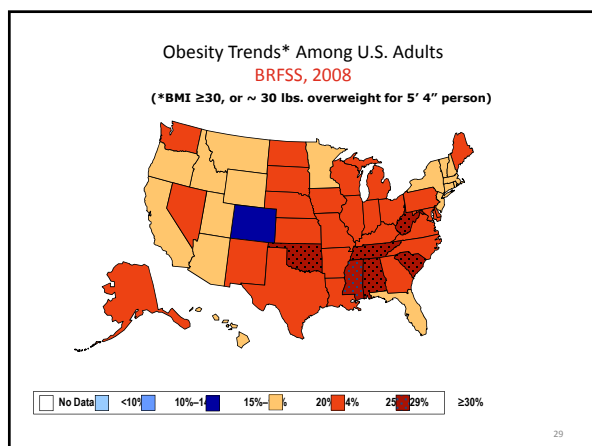
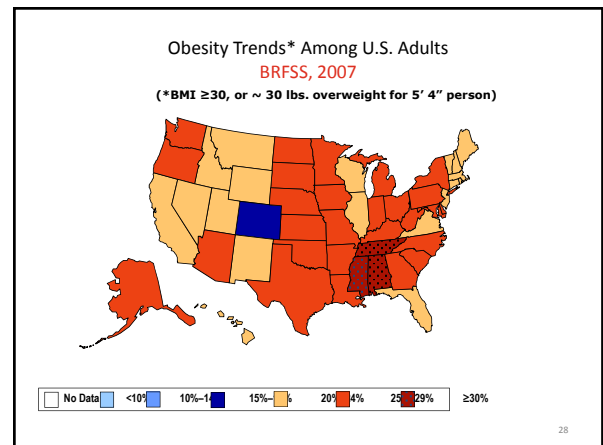
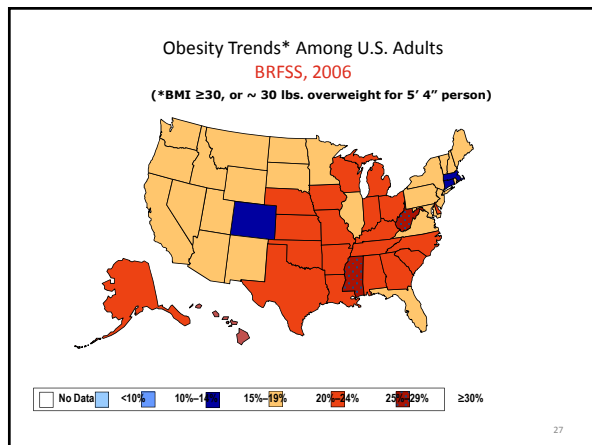
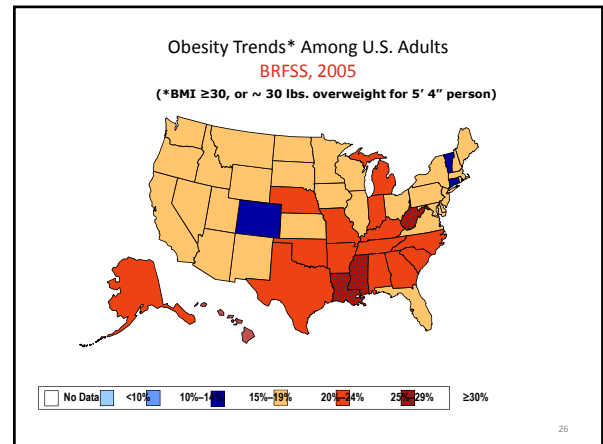
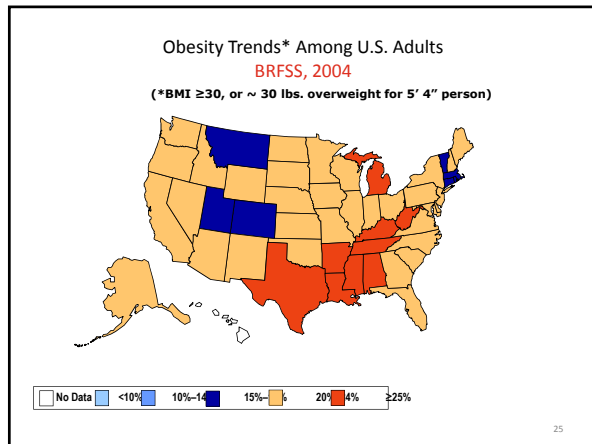


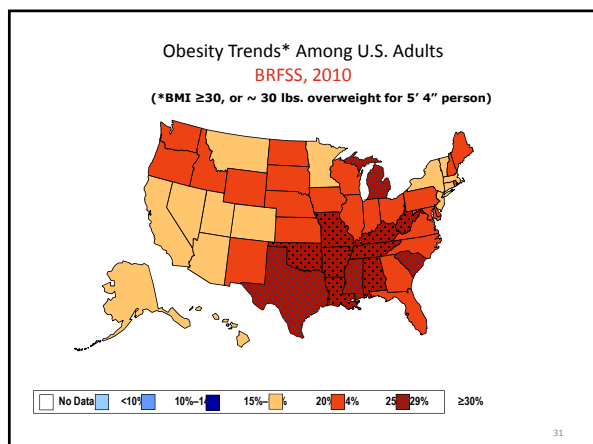
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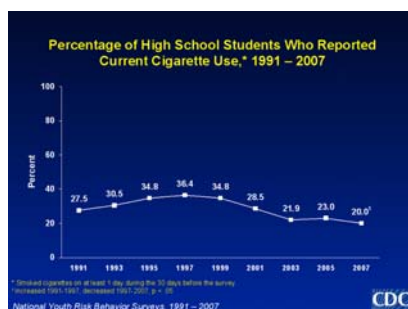


### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

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

32

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous



### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

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

34

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

Estimated U.S. Lifetime Substance Use Prevalence by 8th, 10th, and 12th Graders  
percentage who ever used

Lifetime Use	2002	2003	2004	2005	2006	2007	2008	2009	2010
ILLEGAL DRUGS - ALL	39.5	37.5	36.4	35.7	34.0	32.7	32.6	33.2	34.4
Marijuana	34.0	32.4	31.4	30.8	28.9	27.9	27.9	29.0	30.4
Cocaine	5.7	5.3	5.5	5.5	5.3	5.2	4.8	4.2	3.8
Crack	3.2	2.9	2.9	2.8	2.4	2.5	2.2	2.0	1.9
Heroin	1.7	1.5	1.5	1.4	1.4	1.3	1.3	1.4	1.4
Hallucinogens	7.6	6.9	6.3	5.9	5.7	5.8	5.6	5.3	5.8
Ecstasy	6.9	5.4	4.7	4.0	4.3	4.5	4.1	4.6	5.5
Tranquilizers	7.9	7.3	7.1	6.8	7.0	6.7	6.3	6.5	6.6
Amphetamines	13.1	11.8	11.2	10.3	10.1	9.5	8.6	8.6	8.9
Methamphetamine	5.3	5.0	4.5	3.9	3.4	2.5	2.5	2.2	2.2
Alcohol-other-than-marijuana	21.1	19.8	19.3	18.6	18.2	17.7	16.8	16.5	16.8
Alcohol	62.7	61.7	60.5	58.6	57.0	56.3	55.1	54.6	53.6
Tobacco	44.2	40.8	39.6	37.4	35.0	33.3	31.3	31.2	30.9

35

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

- 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

36

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous



37

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

Age of family head and family income <sup>1</sup>	Percent having a general purpose credit card	Percent having a balance after last month's bills	Median balance <sup>2</sup>
1992 total	62.4%	52.6%	\$1,200
1995 total	66.5	52.6	1,700
1998 total	67.5	54.7	2,000
2001 total	72.7	53.7	1,800
2004 total	71.5	56.2	2,100

38

### (1) Temptation and Self Control Problems Seem to Be Ubiquitous

- 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 (more than they used to AND have a balance at the end of the month)
- Americans wished they saved more
  - 76% of Americans wish that they

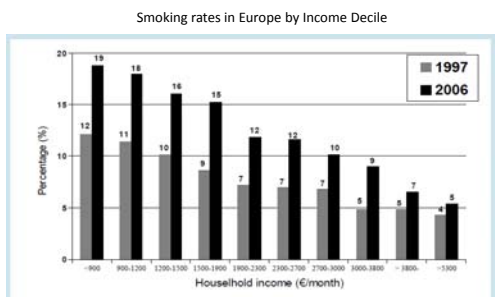
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### Temptation and Self Control

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

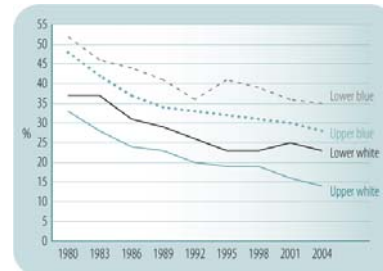
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### (2) Temptation and Self Control Linked to Socioeconomic Outcomes



41

### (2) Temptation and Self Control Linked to Socioeconomic Outcomes



42

## (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

43

## (2) 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

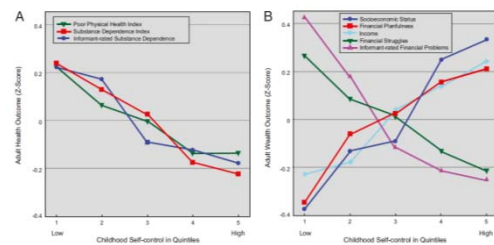
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## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

- “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

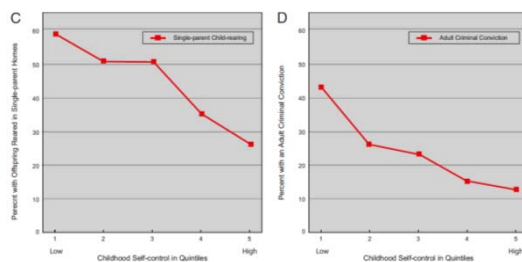
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## (2) Temptation and Self Control Linked to Socioeconomic Outcomes



46

## (2) Temptation and Self Control Linked to Socioeconomic Outcomes



47

## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

- 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 at the time of the paper

48



## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Other evidence:
  - Differences remain into (much) later life (Mischel et al 2011)
  - Meta studies show robust correlation between psychologically measured self control measures and a wide variety of behaviors (de Ridder et al. 2012)
  - Contemporaneously measured ability to delay gratification related with many behaviors
    - Obesity (Caleza et al. 2016)
    - Health related behavior, savings decisions and conduct in school for adolescents (Sutter et al. 2013)

49

## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Note however that these do NOT imply a causal link
  - It could be a third factor drives both measured self control and socioeconomic outcomes
  - See Kidd, Palmeri and Ansin [2013]
- Even if link is causal, 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

50

## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

Poverty to limited cognitive resources

- 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].

51

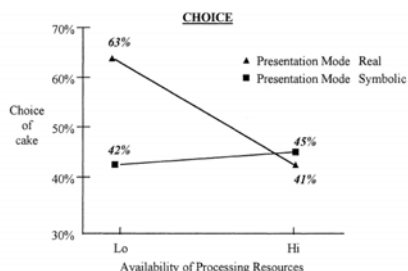
## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

Depleted cognitive resources to 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

52

## Shiv and Fedorikhin [1999]



53

## (2) Temptation and Self Control Linked to Socioeconomic Outcomes

- 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
      - Watch normally
      - Ignore words (requires self control?)
    - Glucose measured again
  - Result: 'Self Control' reduced glucose
    - Glucose levels dropped significantly for 'Ignore Words'
    - Not for 'watch normally' group

54

### Galliot et. al. [2007]

- Fall in glucose level associated with worse performance in Stroop task

Red	Blue
Yellow	Green
Blue	Yellow
Green	Red
Green	Green
Yellow	Blue
Blue	Red

55

### Galliot et. al. [2007]

- **Warning:** Recent meta-analyses and replications have cast doubt on the evidence that willpower is a depletable resource
  - Carter et al. 2015
  - Hagger and Chatzisarantis 2016

56

### 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**

57

### (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

58

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

- Loosely speaking "Doing something in the moment that is against your long run interests"

59

### 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?

60

### 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 as more important than what they do?
  - In general, we may feel that we don't 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

61

### 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?

62

### Two Approaches to Spotting Temptation and Self Control Problems

1. Preference for Commitment
2. Time Inconsistency in Discounting

63

### 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 dieter refuses to have chocolate in their house
- In other words, **choosing to reduce their choice set in the future**
- (all of these happen in real life)

64

### Preference For Commitment

- 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

65

### 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

66

## 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

67