Mid-Term Exams

- **Understanding your grade**
  - The number printed on your answer sheet is the number *correct* (out of 27).
  - Quadruple the number correct to learn your grade (out of 100 points)
  - The mean score was 75.
    - 8 people got 100 (I rounded down to 100 for those who went over)
    - Two had perfect exams
- **How will your life turn out?**
  - What's *possible*: 300 + mid-term grade
  - What's *probable*: (2 x mt) + ((2 x wkbk) [max = 200])
    -

Total = 37 slides

Sociology 201:
Social Research Design

16. Experiments I

Total = 37 slides

Preview

- *Workbook assignments due: 8.2(40 pts)*
- Experiments
  - Review deductive model
  - Classical experiment
  - Internal invalidity

Total = 37 slides

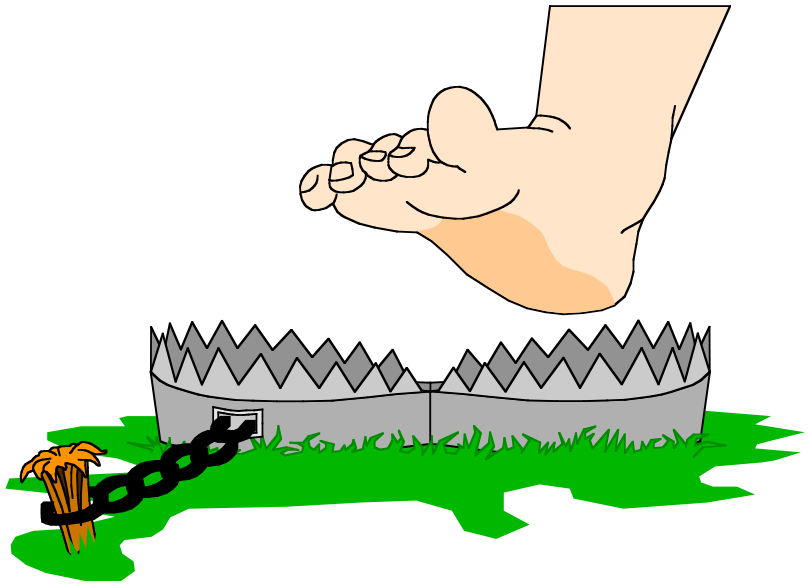
Review deductive model--"traditional" image of science

- Theory
- Hypothesis
- Operationalization
- Observation: hypothesis-testing

The logic of the experimental model

- **aims to avoid a number of weaknesses in day-to-day explanations**

- We'll begin with a simple example to demonstrate the need for such logic and the procedures that go with it

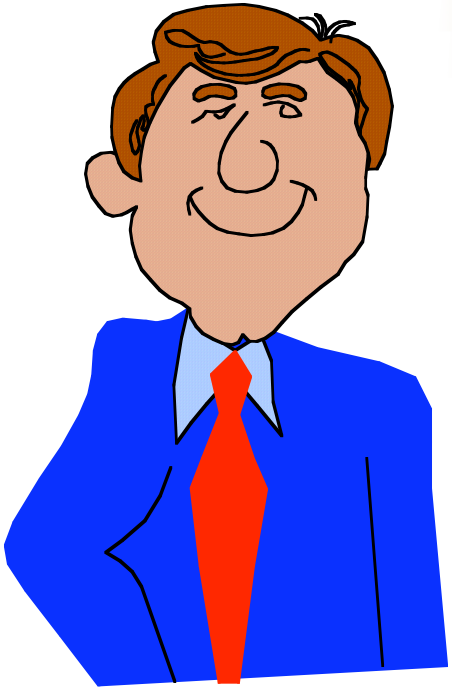


Total = 37 slides

prove *that Vitamin C prevents colds?*

Vitamin C ? No cold

“I took Vitamin C and didn't catch a cold.”

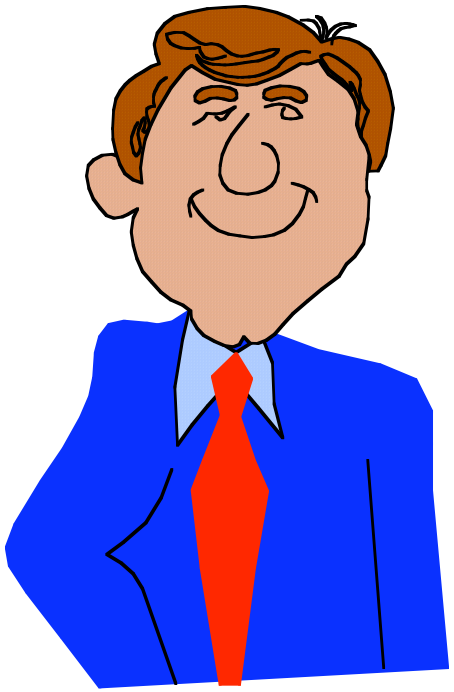


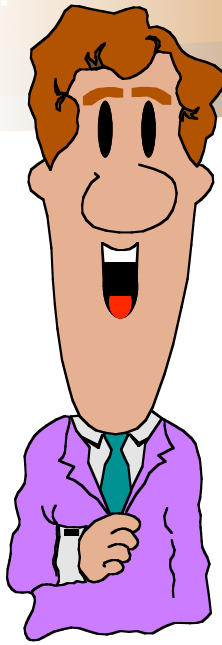
?

Vitamin C → No cold

Total = 37 slides

“My friend also took Vitamin C and didn't catch a cold.”

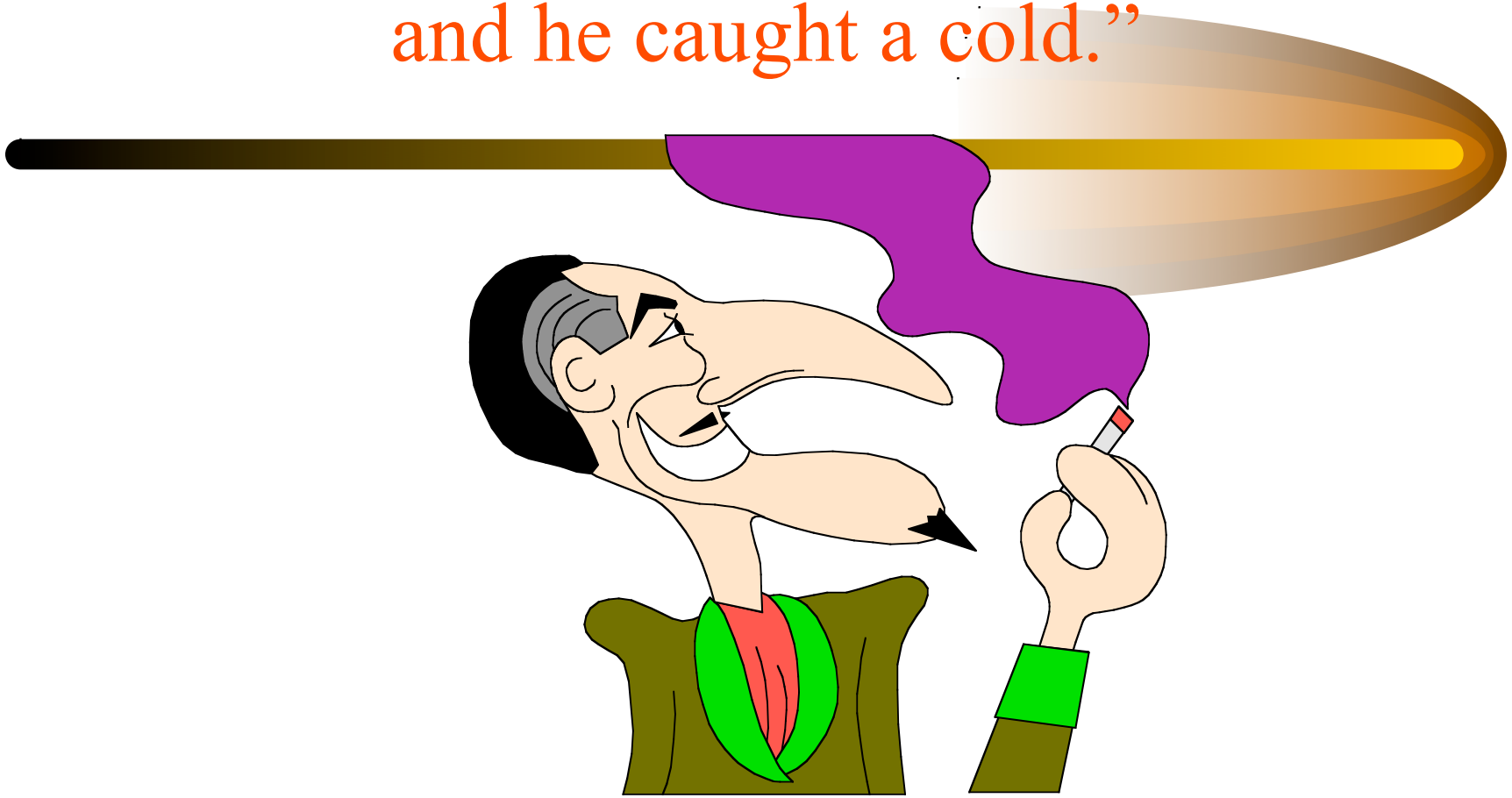




Vitamin C ? No cold

Total = 37 slides

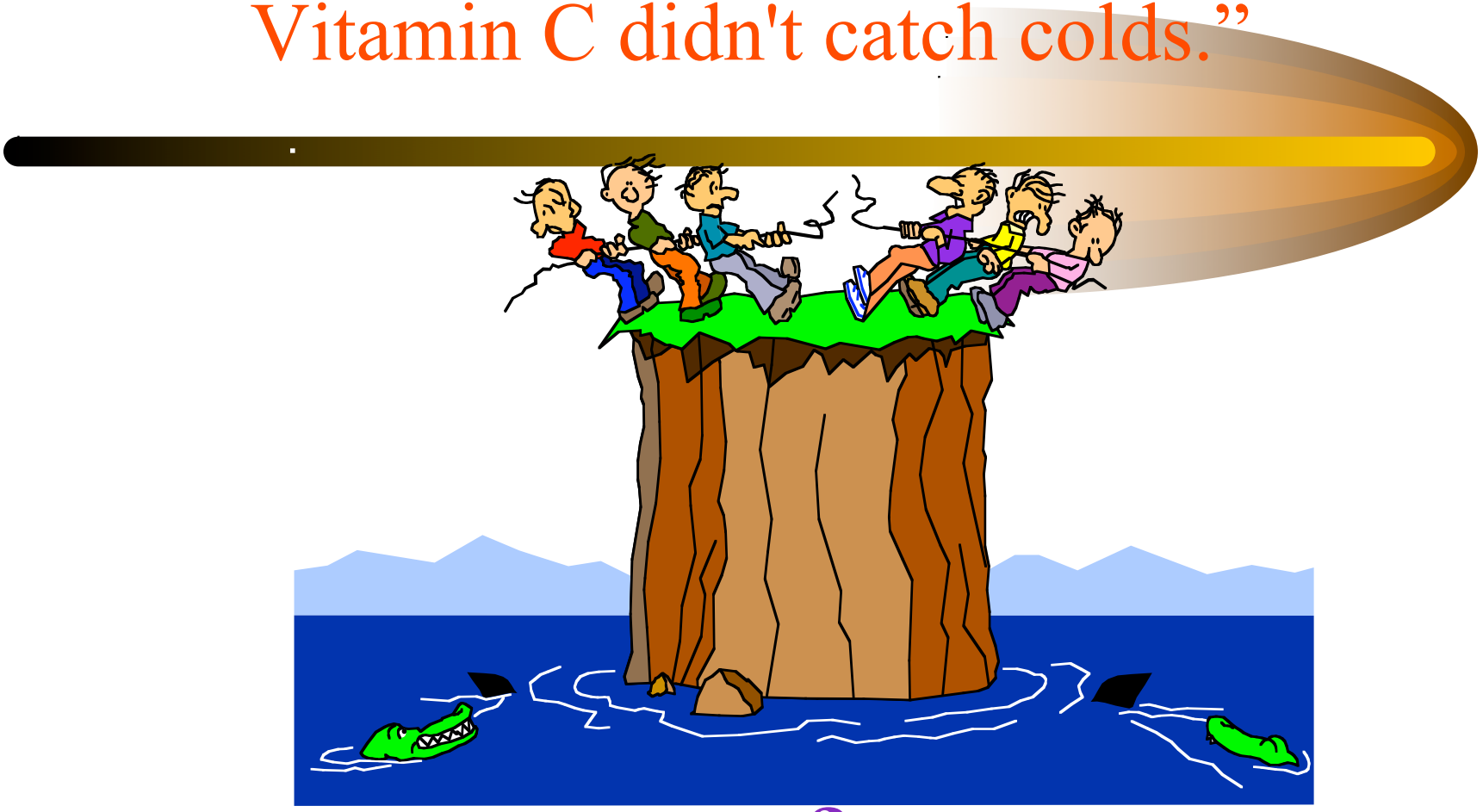
“My other friend didn't take Vitamin C and he caught a cold.”



Vitamin C ? No cold

Total = 37 slides

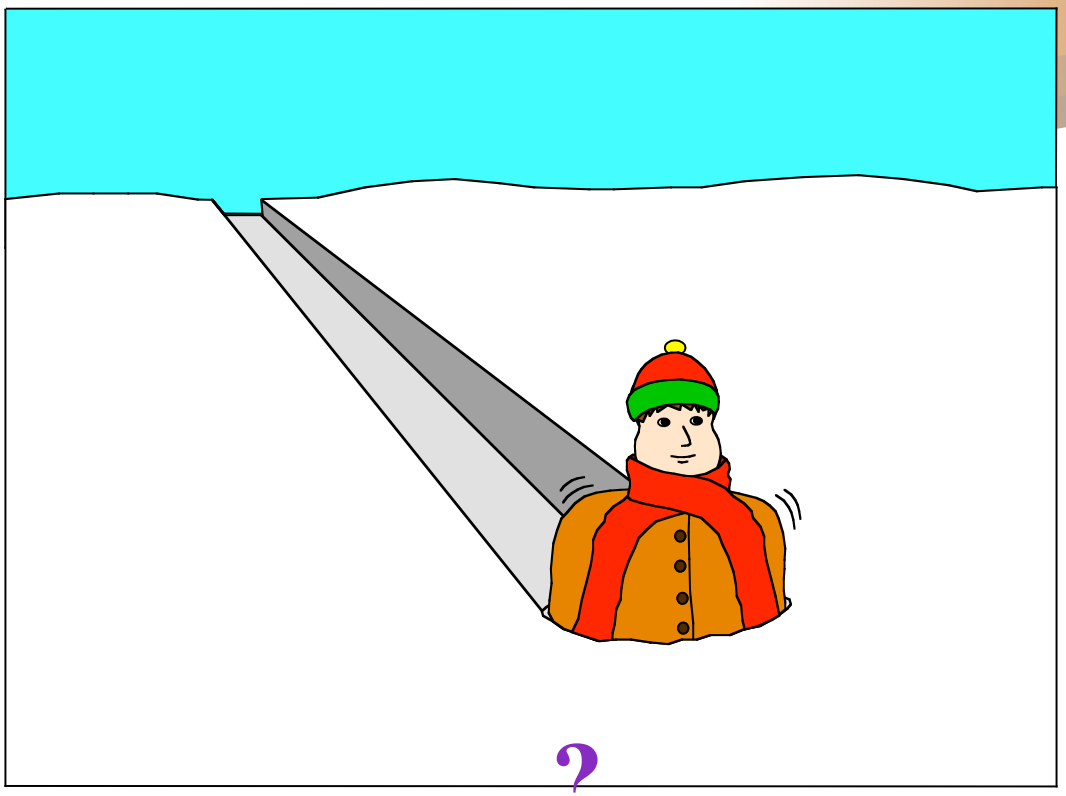
“Seventy percent of those who took Vitamin C didn't catch colds.”



Vitamin C ? No cold

Total = 37 slides

“Last year all of our family caught colds; this year we took Vitamin C and nobody did.”



?

Vitamin C → No cold

Total = 37 slides

What would you need for proof?

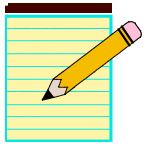
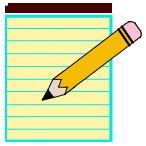
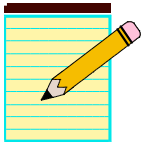
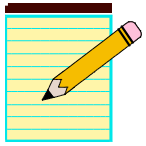
Vitamin C  No cold

Total = 37 slides

Anticipating experiments

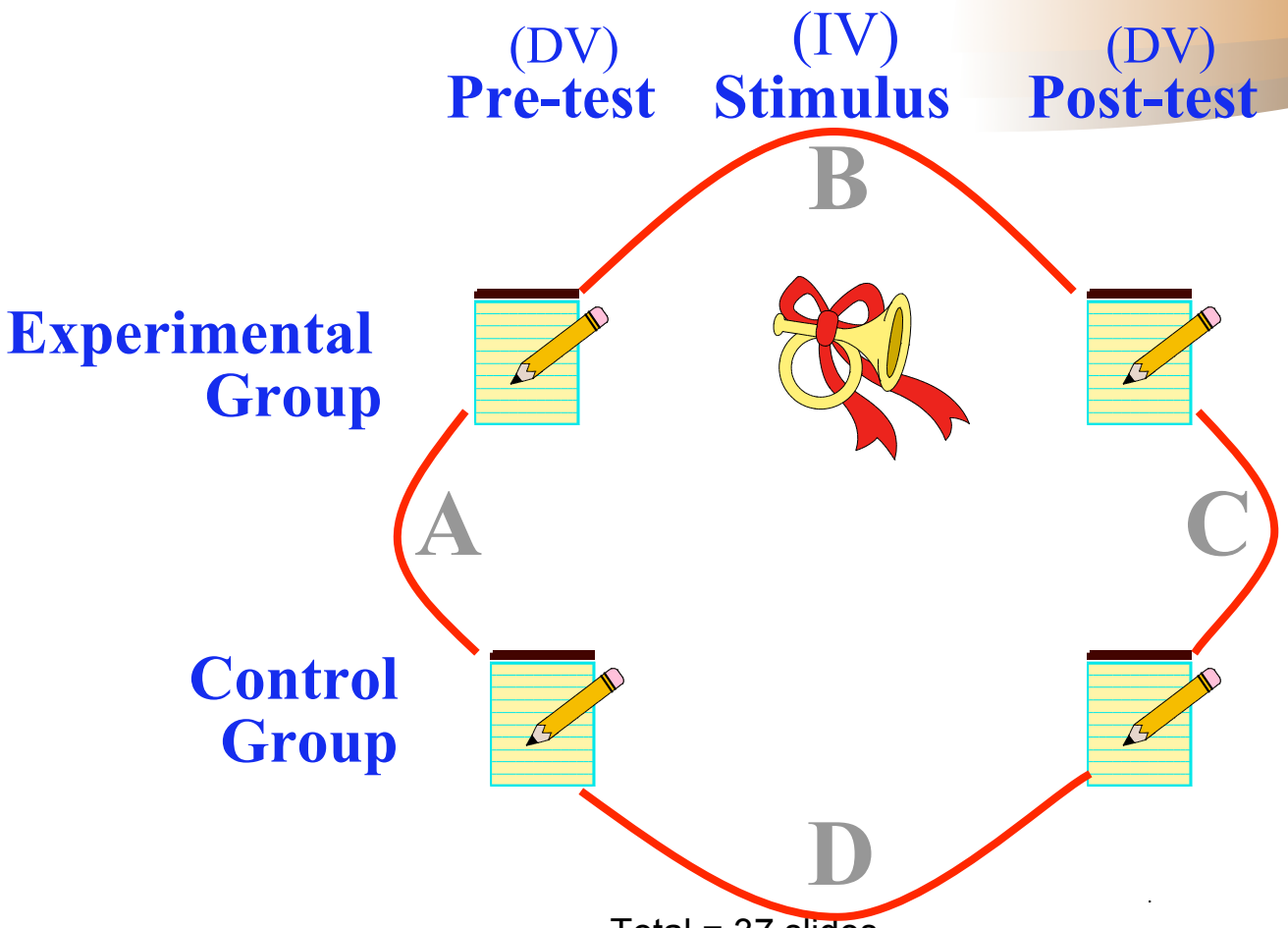
- Several of the comments so far point to the need for before and after measurements (*pre*- and *post*-)
- Some comments reflect on the need for what we call *control* groups.

The Classical Experiment

	(DV) **Pre-test**	(IV) **Stimulus**	(DV) **Post-test**
Experimental Group			
Control Group			

Total = 37 slides

Comparisons



Total = 37 slides

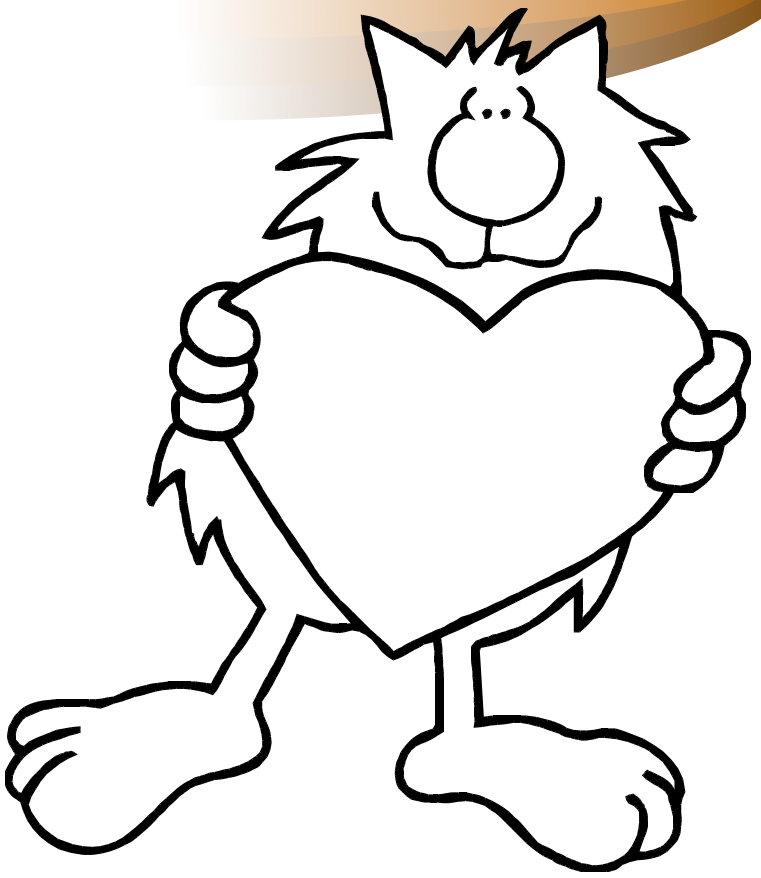
Problems of Internal Invalidity

- Let's suppose we want to improve prison morale
- We decide we could do it with conjugal visits

Total = 37 slides

Let's suppose:

- We measure morale among prisoners: average = 1/10
- We run the program of conjugal visits
- We measure morale again: average = 3/10
- Can we conclude the program improved morale?



Total = 37 slides

History

- Something may happen in the outside world
- Maybe the prison kitchen gets a new chef

Total = 37 slides

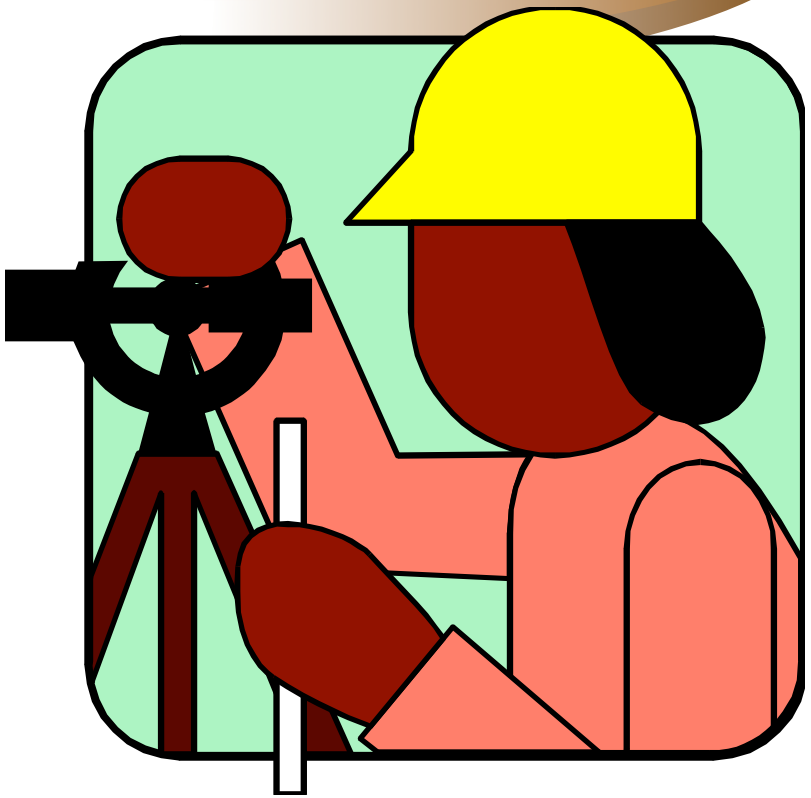
Maturation

- May get tired, bored, wiser, older, etc.
- Prisoners may get reconciled to being in prison
- They may learn how to play the game better

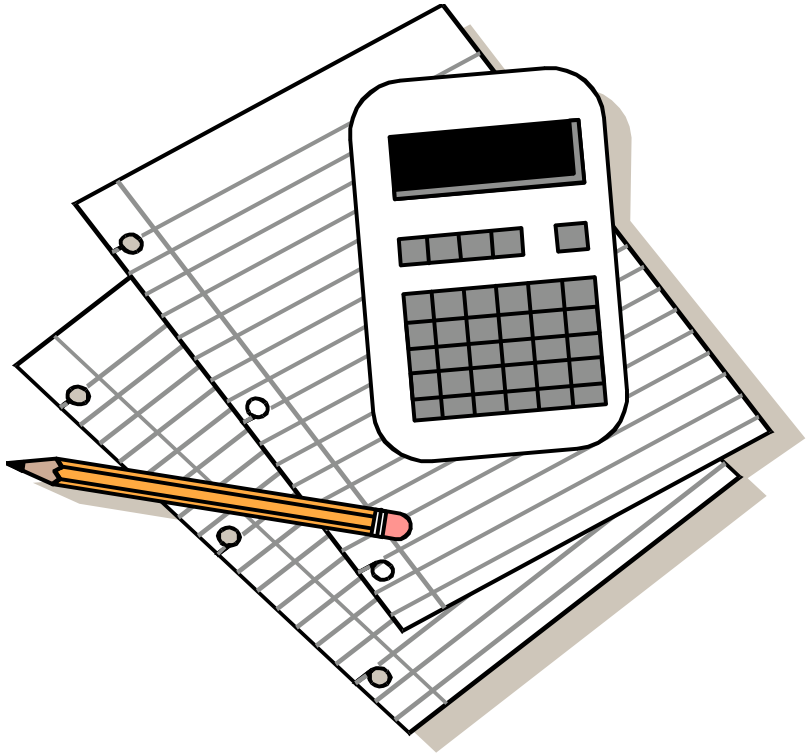
Total = 37 slides

Testing

- *Hawthorne Effect*
- Paying attention to prisoners' morale may improve it



Instrumentation

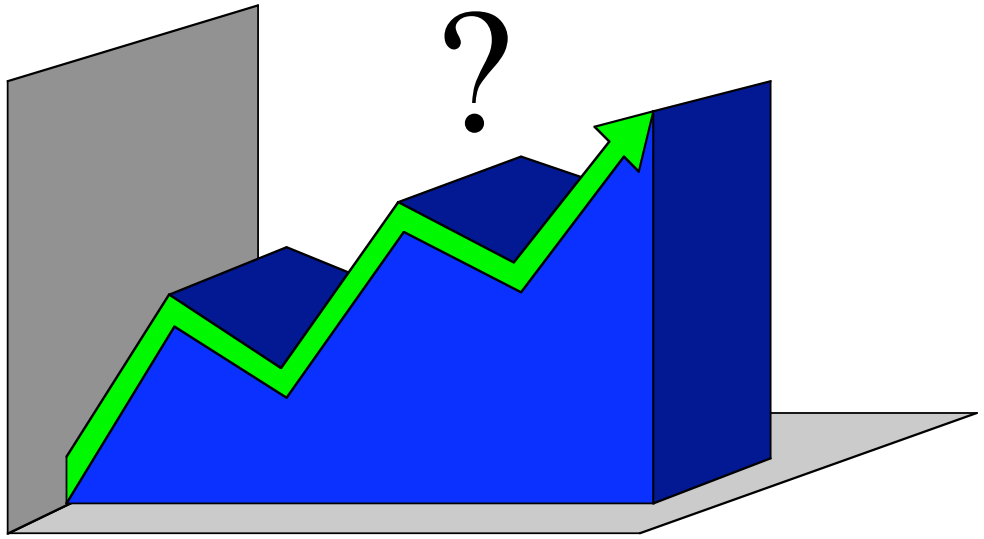


- Pre- and post-measurements may not be comparable
- May use two different questionnaires to measure morale

Total = 37 slides

Statistical regression

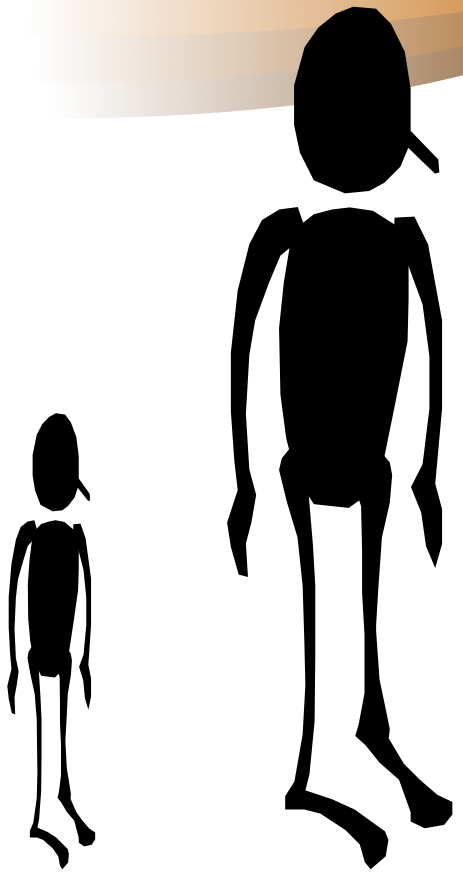
- Naturally drift away from extremes
- Started with 1/10; couldn't get much worse



Total = 37 slides

Selection biases

- Control not comparable
- Maybe asked for volunteers for the program
- The others might not have wanted their spouses around
- Might have offered program as reward to good prisoners
- Or maybe use another (worse) prison as the control



Total = 37 slides

Experimental mortality

- People drop out
- e.g., The sexually frustrated prisoners go over the wall

Total = 37 slides

Causal time-order

- Improving morale might lead to a particular group being chosen for the experiment

Diffusion or imitation of treatments

- "Contamination"
- "Control" warden might decide it was a good idea and start doing it too

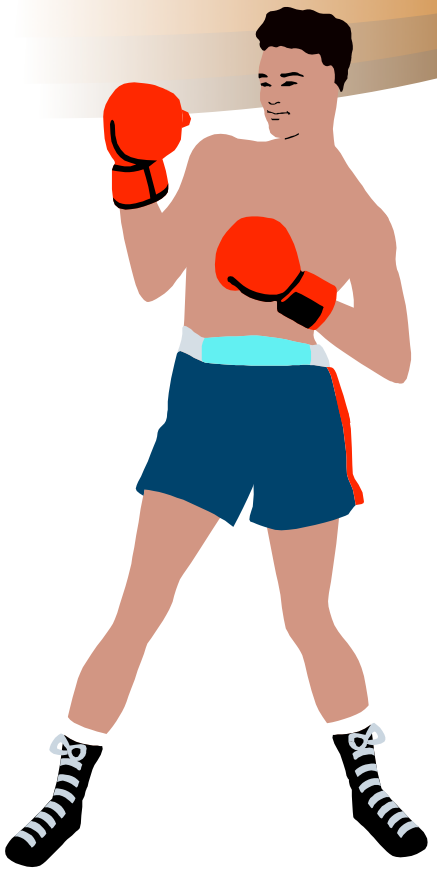
Compensation

- Feel sorry for controls
- "Control" warden might start having "beer and pizza night"

Total = 37 slides

Compensatory rivalry

- Controls may work harder
- "Controls" might organize to protest being left out and gain morale through their working together



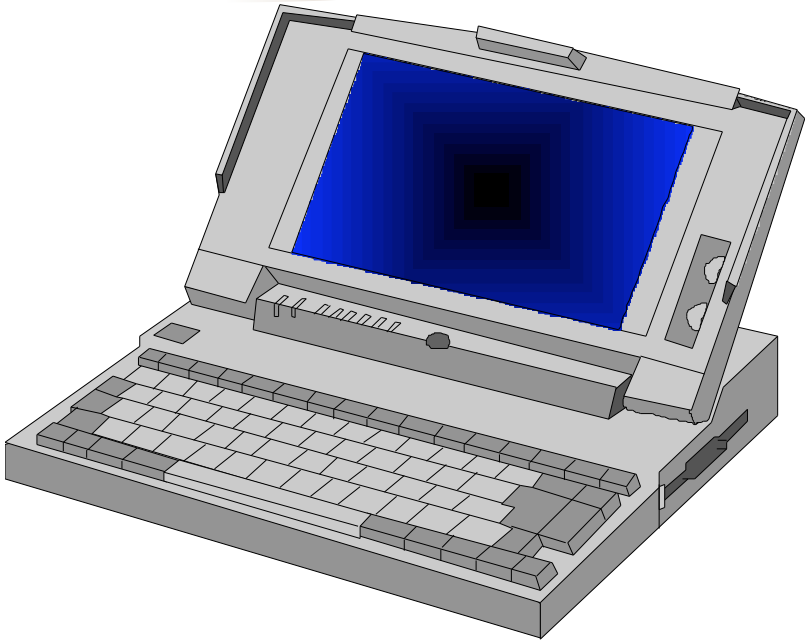
Total = 37 slides

Demoralization

- Controls may give up

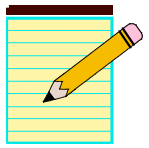
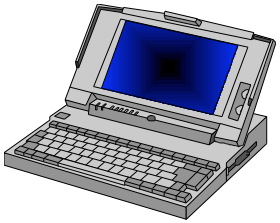
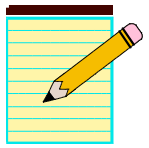
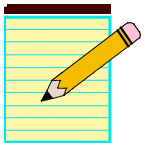
Discussion Example:

- Students have trouble with statistics
- Let's say we think that giving them personal computers will improve their ability to learn statistics
- Suppose we give computers to a class to use
- At the end of the semester we give a test and the students average 90% on it.
- Is this sufficient evidence? Why not?



Total = 37 slides

Experimental Results

	Pre-test	Stimulus	Post-test
Experimental Group	 20%		 90%
Control Group	 20%		 70%

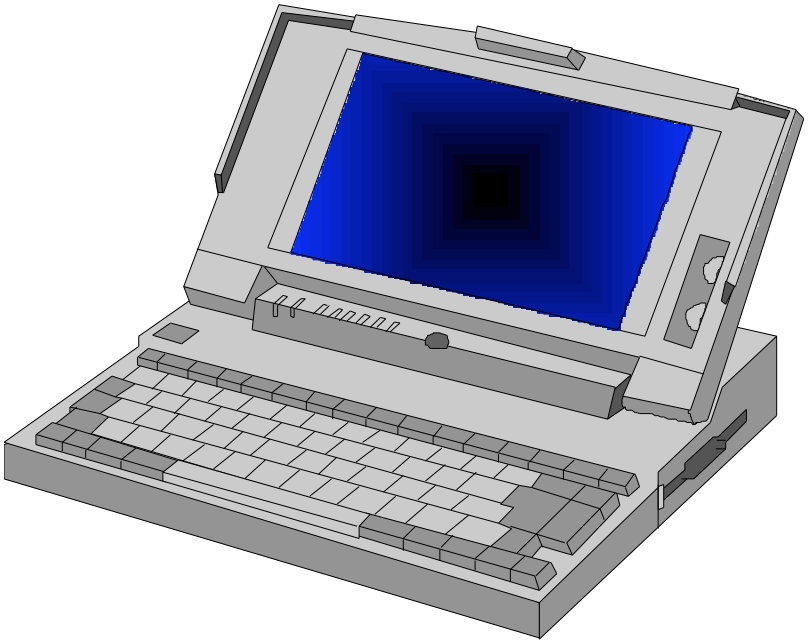
Are you satisfied the computers made a difference?

Total = 37 slides

Experimental Design

- Dependent variable [Ability at statistics]
  - How would we measure it?

Experimental Design

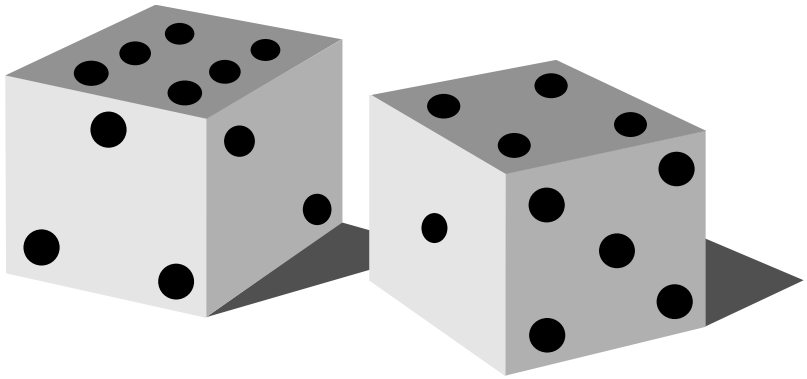


- Stimulus or Independent Variable [Personal computers]
  - Each student given a personal computer

Total = 37 slides

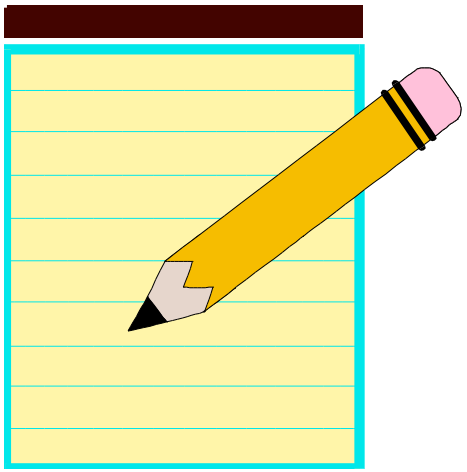
Experimental Design

- Experimental and control groups
  - Pick a random sample of statistics classes
  - Randomly assign to two groups
  - Experimental classes will get computers
  - Control classes won't

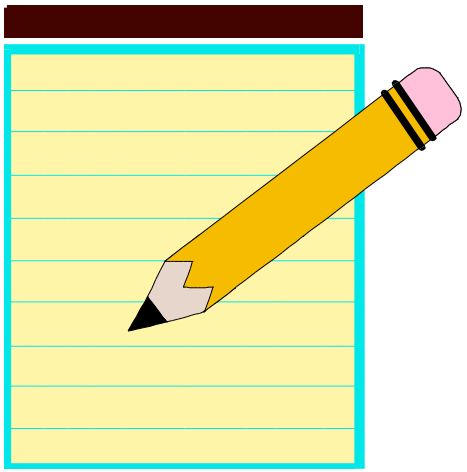


Total = 37 slides

Experimental Design



- Pre-testing and post-testing
  - Use the standardized examination before and



Total = 37 slides

Discuss Internal Invalidity

- History
- Maturation
- Testing
- Instrumentation
- Experimental mortality
- Selection biases
-

- Diffusion or imitation
- Compensation
- Compensatory rivalry
- Demoralization
- Statistical regression
- Causal time-order
-
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Total = 37 slides

Next Time

- Experiments II
- Review Chapter 8

Total = 37 slides