13.b - Control and Treatments

1) Questions on Assignment or Reading
2) Experiments vs. Surveys vs. Observations
3) Discussion: Statistical Significance
4) Notes: Control and Blinding
4) Assignment Time [Lengthy Assignment]
<table>
<thead>
<tr>
<th>Experiment</th>
<th>Observational Study</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher</td>
<td>Manipulates Variables</td>
<td>(treatment)</td>
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</tbody>
</table>
Experiment | Observational Study | Sample

Researcher
Manipulates Variables (treatment)

See if there is a difference between two treatments

Rarely allow for generalizations
Experiment

Researcher
Manipulates Variables (treatment)

See if there is a difference between two treatments

Rarely allow for generalizations

Observational Study

Sample

See if there is a difference between two (or more) groups

Measure a response variable and create a statistic
<table>
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<th><strong>Observational Study</strong></th>
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<tr>
<td>Researcher</td>
<td>See if there is a</td>
<td>Find/estimate a</td>
</tr>
<tr>
<td>Manipulates Variables (treatment)</td>
<td>difference between two (or more) groups</td>
<td>population parameter</td>
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<tr>
<td>See if there is a difference between two treatments</td>
<td>Measure a response variable and create a statistic</td>
<td></td>
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<tr>
<td>Rarely allow for generalizations</td>
<td>Only when we have a random sample of a population can we generalize our findings</td>
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Control

- sometimes to identify response to a treatment, we need a standard to judge the response against

Control (treatment)
- baseline measurement, often with factor levels of "zero"

Control Group
- experimental units that receive the control treatment

Blinding

- the process of blinding is intended to eliminate bias due to...
  outside or previous knowledge, expected results, subconscious behavior

Blinding
- a strategy of keeping treatments (factors and levels) unknown
- with blinding, we talk about two possible groups of influence
  a) those who could influence the results
     (subjects and "treatment givers")
  b) those who evaluate the results

Single-blind
- when all individuals in one class are blinded

Double-blind
- when everyone in both classes is blinded

Placebo
- a "fake" treatment made to look like a real treatment (often a control)

Placebo Effect
- the fact that subjects treated with a placebo still experience a "change"
Experimental Design

The best Experiments are usually...

Randomized
Comparative
Double-Blind
Placebo-Controlled

Assignment (Due Thursday, December 3)

1) Pg. 312, #12, 15, 17, 23, 24, 27, 28, 31, 33
2) Read Chapter 13, Pg. 299 - 303