

# Stat 101L: Lecture 20

## Randomization

- \* Randomization tends to spread the effects of uncontrolled outside variables evenly across the treatment groups.
- \* Randomization reduces the chance that an uncontrolled outside variable will bias the results.

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## Replication

- \* Within an experiment.
  - must have several experimental units in each treatment group.
  - can assess the natural variation in the response for units treated the same.

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## “Replication”

- \* Repeating the entire experiment.
  - This is especially important if the subjects in an experiment are not a random sample from a population.
  - Are the results of the entire experiment repeatable?

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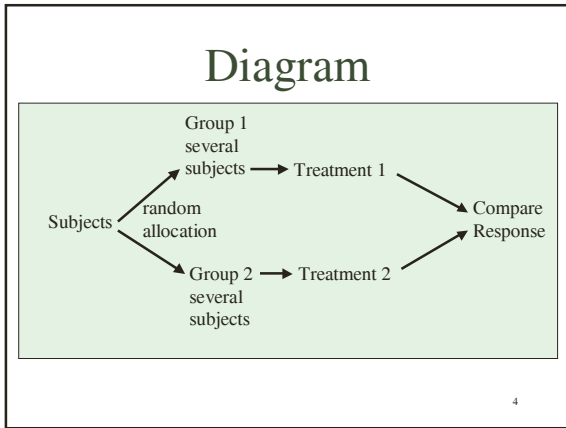
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### Block

- \* There may be attributes of the experimental units that can't be controlled but may affect the response.
- \* Group similar experimental units into blocks and then randomize the assignment of treatments within each block.

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### Blocking

- \* Math ability
  - very high, high, average, low, and very low.
  - assign, at random, students from each math ability group to each treatment.

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## More Ideas

- \*Control “treatment”.
- \*Blinding.
  - Single blind and double blind.
- \*Placebos.

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## Multiple Factors

- \* Factors
  - can use calculator (yes, no)
  - can use a formula sheet (yes, no).
- \* Treatments
  - calculator and formulas, calculator but no formulas, formulas but no calculator, no calculator and no formulas.

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## Confounding

- \* Sodium and blood pressure.
  - All subjects on the low sodium diet had their blood pressure measured by a registered nurse using a standard manual cuff and stethoscope.
  - All subjects on the high sodium diet had their blood pressure measured using an automated cuff and digital readout.

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