Module 4b – Experiments and Inference ("Producing Data")

Review Against All Odds: Unit 15

Experimental vs Observational

- Observational studies do not intervene or place "experimental controls" on a study.
  - Example: Public opinion surveys

- Experimental studies use "interventions" or "treatments" – usually in a controlled/artificial environment

Classical Experimental Design

- Three main components

- 1. ***Explanatory*** (Treatment) and ***Response*** (Outcomes) Variables

- 2. ***Treatment*** and ***Control*** Groups (with random assignment of individuals)

- 3. ***Pre-test*** and ***Post-test*** on the outcome measure

Classical Experimental Design Example

- Tutorial video to boost vocabulary
  - Tutorial is the treatment (received/did not receive)
  - Vocab evaluation test (outcome 1 to 100 points)

  - **Pre-test** on vocab evaluation
  - Randomly assign individuals to a "**treatment group**" to receive tutorial and "**control group**" to receive *placebo*
  - **Post-test** on vocab test and compare change in group results

- **Placebo**: A false treatment administered to account for "placebo effect"
- **Double Blind:** Neither the individual nor the treatment administrator should know which group is treatment vs control

Observational vs Experimental

- Disadvantage of Observational Studies:
  - Lack of control: Could be lurking variables and the context is not controlled or designed.

- Disadvantage of Experimental Studies:
  - Artificial setting: may not be generalizable to the "real world" (lacks external validity)

- ***Hawthorne Effect***: observing individuals can alter their behavior, compromising study results.