True Randomized Experimental Design: Two Essential Criteria

1. Independent variables must be manipulated (usually by experimenter, sometimes by context).
2. Participants must be assigned randomly to various conditions or groups.

Example: Asch Conformity Experiments

- Study: Would individuals conform to peer pressure even if they knew their peers were wrong?
  - Participants sat in room with confederates and had to say which line (A, B, C) matched the line in the other box.
- Independent variable manipulated by experimenter:
  - Whether there was any peer pressure to give incorrect answer or not
- Random assignment to control group or treatment group:
  - In treatment group, confederates answered incorrectly and the subject answered last.
  - In control condition, no pressure to give incorrect answer (no confederates were present)

Meanings of "Control" in Research

- Control condition in an experiment
  - Independent variable left out of this condition
- Controlled studies
  - Experiment is highly structured
- Controls used in a study or analysis
  - E.g., controlling for gender while examining relationship between education and income

Active vs. Attribute Independent Variables in Experiments

- Active independent variable(s):
  - The independent variable is "given" to the participants, usually for some specified time period.
  - It is often manipulated and controlled by the investigator.
    - E.g., presence or lack of peer pressure in the Asch conformity experiment
- Attribute independent variable(s):
  - A predictive, defining characteristic of individuals
  - Cannot be manipulated
    - E.g., gender of participants

Sample and Assignment Randomization

- Random sample:
  - A system for choosing participants from a population
  - A larger sampling population leads to better ability to generalize.
- Random assignment:
  - Our method for assigning participants randomly to experimental conditions.

Pitfalls in Assignment to Conditions

- Portacaval shunt study
  - Only the healthiest participants got the treatment because they would be more likely to survive and get better.
  - This biased the results, making the treatment seem more beneficial.
- Salk vaccine trial
  - A huge vaccine study for polio
  - Wealthy families were more likely to consent to study.
  - But incidence of polio was correlated with quality of living environment.
  - Allowing for self-selection into a study can affect the interpretation of results.