PSY 260- RESEARCH METHODS-II

Control in Single-Factor Experimental Designs

Between-Subject Designs

- **Between-subjects design** is an experimental design where different participants are assigned to different conditions or groups.
- Each participant experiences only **one** level of the independent variable. This allows researchers to compare differences between groups.
  - Each participant is exposed to **only one** condition.
  - Comparisons are made **between** different groups.
  - Helps avoid carryover effects (since participants don't experience multiple conditions).
  - Requires **more participants** than a within-subjects design because each group is separate.

Varieties of Between-Subjects Designs

Matched Groups

- Identify a relevant characteristic (a matching variable) and randomly assign participants to conditions based on their standing (e.g., high, average, low) on this characteristic
  - High IQ vs. Low IQ…
  - High level of anxiety, Middle level of anxiety, low level of anxiety.

Varieties of Between-Subjects Designs

Nonequivalent Groups/Natural-Groups/Quasi-Experiments

- Different groups of participants based on naturally occurring attributes called **subject variables**
  - e.g., age, classroom, gender

Within-Subjects (Repeated Measures) Designs

- A **within-subjects design** (**repeated-measures design**) is an experimental design where the **same participants** experience **all** conditions of the independent variable.

- Instead of comparing different groups, researchers compare how each participant performs under different conditions.

  - Each participant is exposed to **all** levels of the independent variable.
  - Comparisons are made **within** the same individuals.
  - Reduces individual differences since the same people are tested in all conditions.
  - Risk of **order effects** (e.g., learning)

Mixed Design (Mixed Factorial Design)

- A **mixed design** is an experimental design that combines both **within-subjects** and **between-subjects** elements. This means:
- Some independent variables are **manipulated between subjects** (each participant experiences only one condition).
- Other independent variables are **manipulated within subjects** (each participant experiences all conditions).
  - Allows researchers to study both **individual differences** (between-subjects effects) and **repeated measures** (within-subjects effects).
  - Helps control for variability while still allowing for group comparisons.

Mixed Design (Mixed Factorial Design) Example;

- **Independent Variable 1 (Between-Subjects):** Sleep condition (Well-rested vs. Sleep-deprived).
  - Participants are assigned to **one of these two groups.**

- **Independent Variable 2 (Within-Subjects):** Caffeine intake (No caffeine vs. 100mg caffeine).
  - **Each participant** takes tests with and without caffeine.

- **Compare** performance differences within each sleep group (with vs. without caffeine) and between sleep groups (well-rested vs. sleep-deprived).

Any questions??