STA305 H1S - Summer 2021: Design and Analysis of Experiments

Experimental Design Activity

Ramya Thinniyam

Case Study Example: Washing Detergents

A company wants to compare two washing detergents (Brands A and B) to determine which best keeps colors from fading. Twenty new, identical red t-shirts will be used in the trials.

⋮

⋮

The rest of the experiment design is up to you to decide!

Considerations for your Experimental Design

Identify the elements that are appropriate for your design:

- Question(s) of Interest
- Target Population (can narrow down based on Question of Interest)
- Sample (sample size)
- Experimental Unit
- Factors and their levels, Treatments
- Response variable(s) and measurement units
  - Objective OR
  - Subjective response
- Between or Within Subjects Design
- Repeated Measures design?
- Nuisance Variables
- Apply the Principles of an Experiment:
  - Control
  - Blocking: how are blocks formed
  - Randomization
  - Replication: how many replicates in each treatment, replicated on experiment level?
- Other Considerations:
  - Blinding: single or double blind
  - Balance
  - Control group
  - Placebo
- If a Principle/Consideration was not included, explain why
- JUSTIFY your choices!
  - Practical in terms of the problem or
  - Statistical justifications

Group ACTIVITY

- In your group (same group as Mini-Project):
  - Join your group's Breakout Room number on Zoom. *For example, if you are Group # 1, join Breakout Room # 1*.
  - **Turn on your webcam and microphone** so you can participate and your group members can see/hear you. **You can also share the whiteboard**.
  - With your group members, discuss all the points based on the guidelines given.
  - Come up with the best possible (and realistic) experiment for this scenario.
  - Be prepared to answer follow up questions and justify your choices.
  - If you would like the instructor to come to your room, use the "Ask for Help" button.
  - Make note of each of your group members participation and contribution. You will be evaluating your peers later.
- As a whole class:
  - When time is up for the group discussion, leave the breakout room and join the main session
  - Everyone - mute your webcam and microphone.
  - When it is your group's turn, turn on your webcam and microphone and share whiteboard (if needed)
  - Answer the question that is asked / present that part that is asked
  - If other students (from a different group) have questions/comments, use the "Raise your Hand" reaction and then unmute to speak.
- As an individual:
  - Complete the Quiz questions relating to this activity and experimental design on Slido. Quiz questions will be done live during this lecture (time permitting) or next lecture.
  - Complete the Peer Evaluation rubric for all members of your OWN GROUP on slido.com.
  - The event code will be displayed during the lecture and the poll will be open for a few hours after the lecture is over/at the next lecture. Type of your evaluation and copy and paste it into Slido.
  - The Peer Evaluation rubric is available on Quercus.

You will earn marks for the Quiz and based on the evaluations that your group members give you!