BOSTON UNIVERSITY

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PS 211: Introduction to Experimental Design

Fall 2025 · Section C1

Discussion 12: Correlation, Poster Finalization, & Presentation Prep

Outline for Today

- **Attendance:** please sign your name at the front within the first 2 minutes.
- **Quick Review:** Correlation (Lecture 16)
- **Overview of Presentation Next Week**
- **Poster Submission:** Turn in your completed poster draft (PDF or image) on **Blackboard**
  - One submission per group
  - Due **20 minutes into class**
- **Practice Speaking:** ~20 min of run-throughs with your group
- **Worksheet:** Correlation practice

Quick Review: What is Correlation?

- Correlation = a **systematic association** between two **numeric** variables
- Pearson's *r* ranges from −1 to +1
  - Measures **direction** (positive/negative) and **strength** (small/medium/large)
  - r ≈ .10 (small), .30 (medium), .50 (large)
  - Outliers can dramatically change r
  - R^2 tells you the % variance that two variables share

Quick Review: Important notes about correlation

- Correlation **does not equal causation**
  - We typically use correlations in **observational** (non-experimental) research
  - We cannot assume causation because:
    - We did **not manipulate an IV** (no experiment)
    - Other variables (third variables) may explain the relationship
    - We do not know the **direction** of the effect (which variable influences which)
- r close to 0 does **not** always mean “not related” — relationship may be non-linear

Poster checklist

- Title
- Group members' names
- Introduction – broad to focused: background literature with citations, research question, hypothesis
- Methods – participants, IVs, DVs, procedure, design (within/between)
- Analysis plan – correct statistical test, calculate degrees of freedom, correct effect size, result statements
- Limitations – 1-3 that cannot be resolved by your experiment
- References – cited in APA or another style
- **Submitted to Blackboard by 20 min into class**

What's Coming Next: last discussion!

- **Next Week (Discussion 13):**
  - **Poster Presentations in class**
  - Focus on clarity and reasoning
  - Each group member should contribute to the presentation
  - You will talk through your poster in ~3-5 minutes, at the front of the class
    - If you take longer than 6 min, I will stop you
    - That way we have enough time to do review questions in class

Poster Presentation Final Rubric

- The poster presentation is a part of your discussion participation grade. I will grade based on:
  - **Poster Visual Organization**: Logical layout, readable text, appropriate level of detail
    - Clear separation between Introduction, Methods, Analysis Plan, Limitations
    - Everything on the checklist (previous slide) is included
  - **Verbal Clarity**: Explain your reasoning clearly (not too much detail, not too little)
    - Natural "broad → specific" flow when you talk through your poster
    - Your explanations match what is written on the poster
  - **Accuracy**: Hypothetical result statements match the design and hypotheses
    - Correct statistical test and correct degrees of freedom
    - Correct effect size choice (Cohen's d or η^2)
  - **Speaking & Group Participation**: Even division of speaking time
    - Smooth transitions between group members
    - Good pacing (~3-5 minutes, not over 6)

Goals for Today

- Submit your **poster draft** (PDF or image) to Blackboard by 20 min into class
- Practice your **poster presentation** with your group
  - Explain your design in plain language
  - Make sure every group member can explain the analysis plan
  - Practice staying within the ~5-minute window
- Ask questions so you feel confident presenting next week
  - During downtime, work through the **Correlation Worksheet** in your group

During downtime: correlation worksheet

1. Interpreting scatterplots: draw a scatterplot (axes, scatterpoints, and trend line) that:

(a) Has a positive, strong relationship. (b) Has a negative, strong relationship. © Has a positive, weak relationship. (d) Has an r = 0 but clearly has some other nonlinear relationship

2. Identifying outliers: look at scatterplot from (1a). If we place an outlier below the trendline, will the r value become more positive or more negative?

3. If the r value for (1a) is 0.50, what does that tell you about the variance in the data?

4. Correlation vs. causation: "A researcher found r = .55 between **daily screen time** and **anxiety symptoms**. a. Give **two possible third variables** that might explain this correlation.
   b. Explain why we **cannot** conclude that screen time causes anxiety. Your answer must be a full sentence, clearly show understanding, and cannot just say "correlation does not imply causation."

5. Pick two variables from everyday life (e.g., sleep hours & mood; caffeine & alertness). a. Predict whether the relationship is **positive**, **negative**, or **none**.
   b. Predict whether the correlation is **small**, **medium**, or **large**.
   c. Explain why.