What We Will Cover in This Section

- Overview.
- Model.
- Techniques.
  - Partial correlation.
  - Multiple regression.
  - Factor analysis.

The Essentials of the Correlational Technique
**Why the Correlation?**

1. Determine the strength of the relationship between two or more variables.
2. Determine the direction of the relationship.
   - Positive.
   - Negative.

**Correlational Model**

![Venn Diagram with Shared Variance]

**Typical scatterplot**

![Graph showing a scatterplot with Performance (Criterion) on the y-axis and Selection Test (Predictor) on the x-axis.]
Correlation Coefficient

- Ranges from –1.00 to +1.00
  - The number indicates the strength of the relationship.
  - The sign indicates whether the relationship is positive or negative.
- Does NOT indicate causality.

Applications

1. Prediction.
   - Who is going to be the better employee?
   - Who is most likely to be a terrorist?

2. Association
   - Testing and measurement.
   - Intelligence research.

Regression

![Graph showing regression analysis between selection test (predictor) and performance (criterion).]
Factors that Affect the Correlation Coefficient

1. Measurement scales
   - Should be interval or ratio.
2. Reliability of the measures.
3. Homogeneity of variance.
   - Usually caused by sampling problems.
4. Restriction of range.
   - Usually caused by measurement problems.

Examples…

- Restriction of Range.
- Non-continuous groups.
- Outliers
Non-continuous groups

Outlier problem

Correlational Techniques
Partial Correlation

A

B

Partial Correlation

Multiple Regression

Multiple Predictors → Single Criterion

How can we find the best mathematical combination of depression scores, social contacts, and drug use to predict suicidal tendencies.

Multiple Regression Coefficient

1. Indicated by R.
2. Is always positive.
3. Interpreted the same as r.
4. Same limitations for the first-order relationships.
5. Still cannot conclude causality.
Factor Analysis

Statistical techniques for identifying interrelationships between items with the goal of identifying items that group or cluster together.
Uses of Factor Analysis

1. Data reduction.
2. Scale development.

Research Considerations

1. Number of participants.
   - Minimum of 100.
   - Try to have about 30 respondents per variable.
2. Same issues as applied to the correlation coefficient.

Identifying Factors

- Orthogonal (uncorrelated factors) vs. Oblique (correlated factors).
- Number of factors.
The End