Research Methods (P365)

Correlational Research

What We Will Cover in This Section

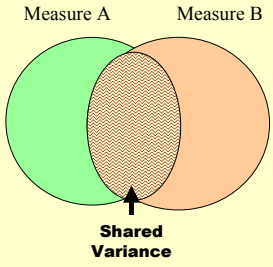
- Overview.
- Model.
- Techniques.
  - Partial correlation.
  - Multiple regression.
  - Factor analysis.

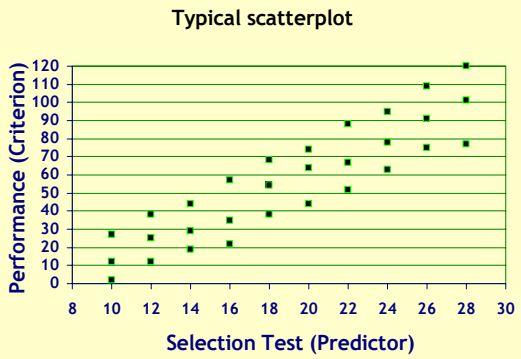
The Essentials of the Correlational Technique

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



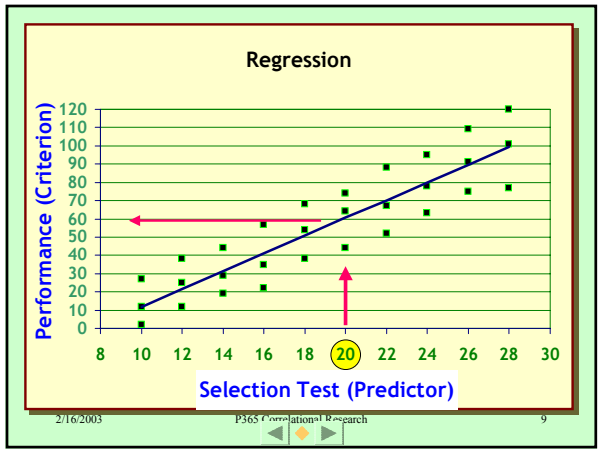


Correlation Coefficient

- 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.

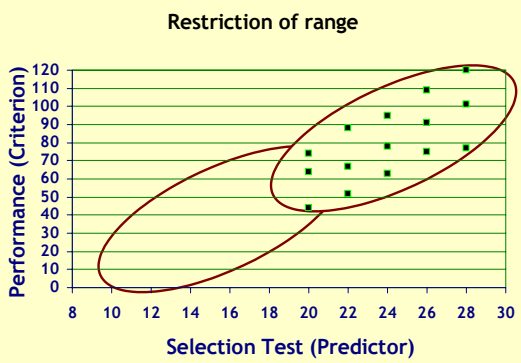


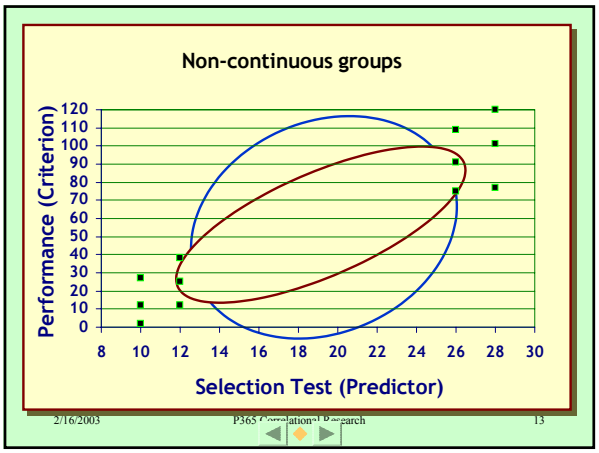
Factors that Affect the Correlation Coefficient

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
Performance (Criterion)
120
110
100
90
80
70
60
50
40
30
20
10
0
8 10 12 14 16 18 20 22 24 26 28 30
Selection Test (Predictor)
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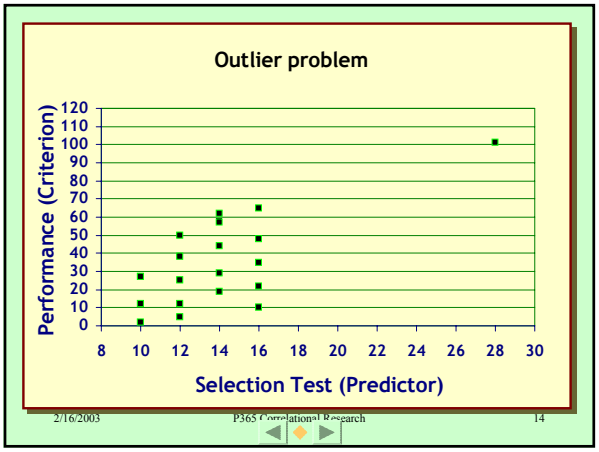
Outlier problem
Performance (Criterion)
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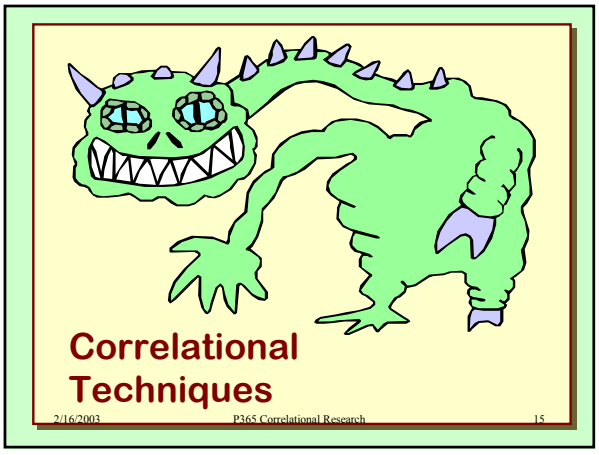
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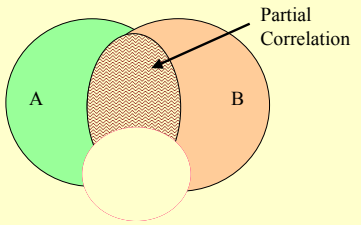
Partial Correlation



Multiple Regression

Multiple Predictors → **Single Criterion**

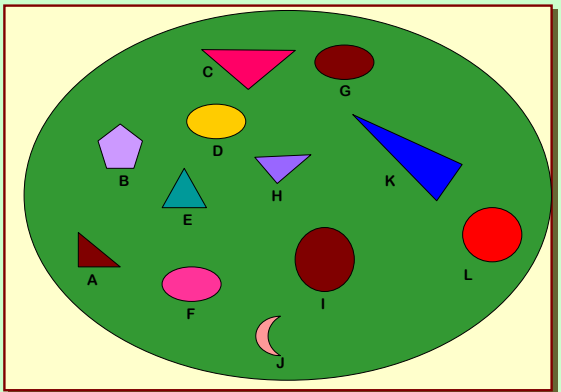
How can we find the best mathematical combination of depression scores, social contacts, and drug use to predict suicidal tendencies.

Multiple Regression Coefficient

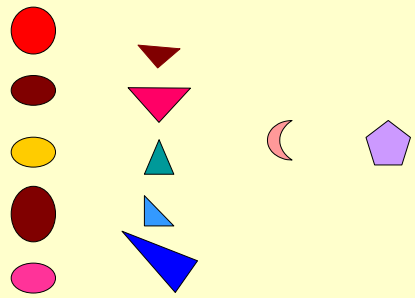
1. **Indicated by R.**
2. **Is always positive.**
3. **Interpreted the same as r.**
4. **Same limitations for the first-order relationships.**
5. **Still cannot conclude causality.**

Factor Analysis

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



Factor 1 Factor 2 Factor 3 Factor 4



Uses of Factor Analysis

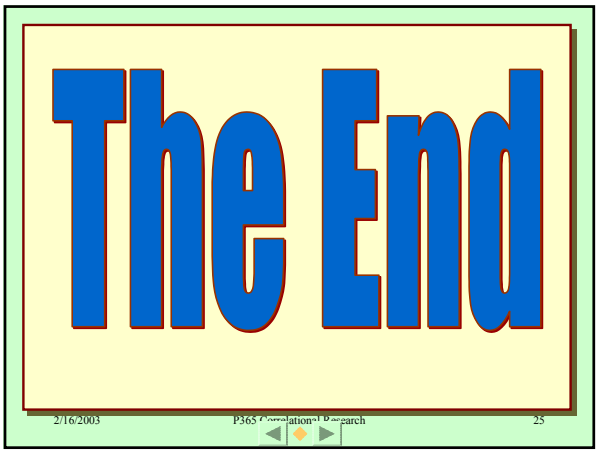
1. Data reduction.
2. Scale development.

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.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