ImplicitifyAI

MULTIMODAL PSYCHOMETRIC ASSESSMENT

TEACHING RESOURCES

Foundations of Research Design

Topic: Research Methods
Slides: 4

Core design concepts: variables, validity types, and the trade-offs between experimental and observational designs.

Variables and operationalization

- An independent variable is manipulated or grouped; a dependent variable is measured.
- Operationalization specifies the concrete procedure used to measure a construct.
- Confounds are third variables that offer a rival explanation for an observed effect.

The four validities

- Internal validity: can the effect be attributed to the IV rather than a confound?
- External validity: do the findings generalize across people, settings, and time?
- Construct validity: do the measures and manipulations represent the intended constructs?
- Statistical conclusion validity: are inferences about covariation sound?

Experimental vs. observational designs

- Random assignment supports causal claims by equating groups in expectation.
- Observational designs reveal association but are vulnerable to confounding.
- Quasi-experiments lack random assignment but use design features to reduce threats.

Common threats to internal validity

- History, maturation, and testing effects across repeated measurement.
- Regression to the mean when groups are selected on extreme scores.
- Attrition that is differential across conditions.

Answer Key — Practice Items

Item-bank questions for the topic “Research Methods”.

1. Random assignment to conditions primarily protects which type of validity?

A. External validity
B. Internal validity
C. Construct validity
D. Statistical conclusion validity

Answer: Internal validity

Rationale: Random assignment equates groups in expectation, ruling out confounds and supporting causal (internal-validity) claims.

2. A researcher studies whether income predicts well-being using survey data with no manipulation. This is best described as:

A. A true experiment
B. An observational (correlational) design
C. A randomized controlled trial
D. A factorial experiment

Answer: An observational (correlational) design

Rationale: With no manipulation or random assignment, the design is observational and supports association but not strong causal claims.

3. Selecting participants because they scored extremely low and retesting them later risks which threat?

A. Maturation
B. Regression to the mean
C. Instrumentation
D. Demand characteristics

Answer: Regression to the mean

Rationale: Extreme scores tend to move toward the mean on retest regardless of any intervention.

4. The degree to which findings generalize to other people and settings is:

A. Internal validity
B. External validity
C. Face validity
D. Reliability

Answer: External validity

Rationale: External validity concerns generalization across populations, settings, and times.

5. Differential attrition across conditions is a threat mainly because it can:

A. Increase statistical power
B. Make groups non-equivalent by the end of the study
C. Improve construct validity
D. Eliminate confounds

Answer: Make groups non-equivalent by the end of the study

Rationale: If dropout differs by condition, the groups are no longer equivalent, reintroducing confounding.