Experimental Psychology

Internal & External Validity

---

What We Will Cover in This Section

- Overview
- Internal Validity.
- External Validity.
- Key Learning Points.

Validity Revisited

- In the context of measuring variables, validity implies that you are measuring what you say you are measuring.
- In the context of research methods, validity focuses on the extent that you can make correct conclusions based on the research design and implementation.

Internal Validity
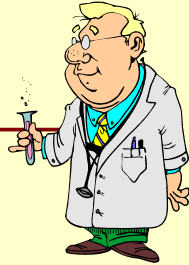
Internal Validity

- Traditionally refers to
  The accuracy of the research in concluding a relationship between the independent and dependent variables.
  - Can I unambiguously conclude that the independent variable alone caused a change in the dependent variable.

Confounding

Any variable other than the independent variable that could reasonably have caused changes in the dependent variable.

Experimental Confounding

Independent Variable	Dependent Variable
Group A Treatment plus Extraneous variable. Group B Treatment plus Extraneous variable.	Common outcome measure.

Threats to Internal Validity

1. History.
2. Maturation.
3. Testing.
4. Instrument Decay.
5. Statistical Regression.
6. Subject Selection.
7. Subject Morality
8. Interaction with selection.
9. Diffusion of treatment.

1. History

Any event that occurs between the first and second dependent measures that is not manipulated by the experimenter.

2. Testing

Participation in the pre-test may cause changes in the person.

- Reactivity
- Memory

3. Maturation

Changes in the individual over time that are not associated with the independent variable.

4. Instrument Decay

Changes in the measuring instrument over time.

- Observer gets bored.
- Test becomes obsolete.
- Machine wears out.

5. Statistical Regression

Occurs when participants are placed into groups based on <u>extreme scores</u>. Extreme scores tend to move(regress) toward the mean.

6. Subject Selection

Key Assumption

In experimental research there is RANDOM SELECTION from the population and RANDOM ASSIGNMENT to treatment conditions.

Target Population

Sample Frame

Random Sampling

Sample

Group 1   Group 2   Group 3

Randomization
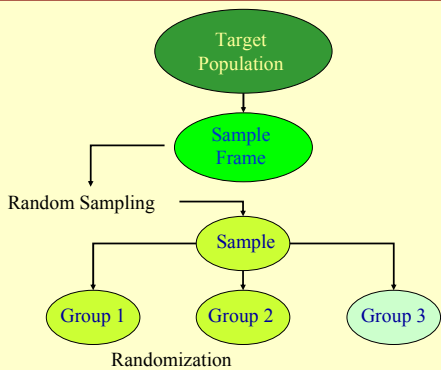
Selection Bias

1. When participants are not randomly selected from the population, this limits generalizability (External Validity).
2. When participants in one condition differ in some way from those in another condition you have confounding (Internal Validity).
   - Non-random assignment
   - Pre-existing groups.
   - Differential mortality.

7. Mortality

Occurs when participants drop out of an experiment at different rates.

8. Interactions with Selection

Occurs when there are systematic differences between or among selected treatment groups based on maturation, history, or instrumentation.

9. Diffusion of Treatment

Occurs when participants in one group become familiar with treatment of another group and copy that treatment.

Key Learning Point

Internal Validity is the most important property of an experiment. An experiment with low internal validity is compromised.

External Validity

External Validity

The extent to which research results can apply to a wide range of situations.

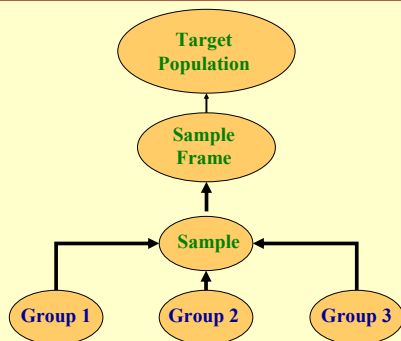KEY IDEA: **Similarity to the real world environment enhances external validity.**

Population Generalization

Applying the experimental results to a group that is different and broader than the experimental group.

Target Population

Sample Frame

Sample

Group 1   Group 2   Group 3

Environmental Generalization

Applying the experimental results to situation, setting, or environment that is differs from that of the original experiment.

Temporal Generalization

Applying the experimental results to people at a time that is different from the time when the original experiment was done.

Key Learning Point

Internal validity is a prerequisite for external validity.

The End