

Introduction to Research Methods in Psychology

Introduction to Research Methods in Psychology
Study guide – concise, organized, and easy to read

1. Why Research Methods Matter

Purpose

Example

Explain behavior Identify why stress leads to memory lapses

Predict outcomes Forecast how a new therapy will affect anxiety scores

Control variables Isolate the effect of sleep on reaction time

Build theory Develop a model of motivation based on empirical data

2. The Scientific Process in Psychology

1. **Observation** – Notice a phenomenon (e.g., people perform better on tests after a short walk).
 2. **Question** – Form a clear, answerable question (“Does a brief walk improve test performance?”).
 3. **Literature Review** – Summarize what previous studies have found; locate gaps.
 4. **Hypothesis** – A testable prediction (e.g., H_1 : Participants who walk for 5 min will score higher than those who sit).
 5. **Operationalization** – Define variables in measurable terms (walk = 5 minute treadmill at 3 mph; performance = number of correct answers).
 6. **Research Design** – Choose a method (experiment, survey, observation, etc.).
 7. **Data Collection** – Gather information using appropriate tools (questionnaires, reaction time software, physiological sensors).
 8. **Data Analysis** – Apply statistical techniques (t-tests, ANOVA, regression) to test the hypothesis.
 9. **Interpretation** – Relate results back to theory, consider alternative explanations.
 10. **Report & Replicate** – Publish findings; other labs attempt replication.
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3. Major Research Designs

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Psychology

Design	Key Features	Strengths	Limitations
Experimental	Random assignment, manipulation of independent variable (IV)	Strong causal inference; control over confounds	May lack ecological validity; ethical constraints
Quasi-experimental	No random assignment; natural groups	Feasible in real-world settings	Weaker causal claims; possible selection bias
Correlational	Measures relationship between variables (no manipulation)	Easy to conduct; can study variables that cannot be manipulated	No causation; third-variable problem
Cross-sectional	Data from different participants at one time point	Quick, inexpensive	Cannot assess change over time
Longitudinal	Same participants measured repeatedly	Tracks development, causal direction	Time-consuming; attrition
Case Study	In-depth analysis of a single individual or group	Rich qualitative detail	Limited generalizability
Survey	Standardized questionnaires or interviews	Large samples; flexible	Self-report bias; response rates

4. Variables and Their Types

Concept	Definition	Example
Independent Variable (IV)	Variable that the researcher manipulates or categorizes	Type of exercise (walking vs. sitting)
Dependent Variable (DV)	Outcome measured to assess effect of IV	Test score
Control Variable	Held constant to prevent confounding	Room temperature
Extraneous Variable	Uncontrolled factor that could influence DV	Participant's caffeine intake
Confounding Variable	Extraneous variable that varies with IV, threatening internal validity	If walking participants also receive more encouragement

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Concept

Definition

Example

Psychology

Moderator

Variable that changes the strength/direction of the IV?DV relationship

Age (effect of exercise may differ by age)

Mediator

Variable that explains *how* the IV influences the DV

Increased arousal mediates the effect