

Research Methods & Statistics

Design, Sampling, & Methods

Demand characteristics	Aspects of a situation that influence responses
Social desirability	Desire to be appear “good”
Hindsight Bias	Believe one knew it all along
Hawthorne Effect	Any change influences responses
Observer bias	Observer expectations affect data
Double-blind study	Neither participant nor observer know study conditions
Property	General concept investigated
Operational definition	Measurable definition of a property
Construct validity	Clear relationship between property & o.d.
Predictive validity	Does o.d. predict other measures?
Case study	In-depth study of individual or small group; often rare cases
Survey method	Less detail; more participants
Reporting bias	Those who choose to respond may differ in some ways
Population	All who might be studied
Sample	Subjects actually studied
Random sampling	Sample chosen from population by chance alone
Stratified sampling	Ensure certain characteristics (gender, ethnicity, etc.) represented in sample
Representative Sample	Sample accurately reflects features of the population
Illusory correlation	Apparent relationship between variables is false/misleading
Confirmation bias	Seek confirming evidence, ignore contradictory

Correlation	Indicates relationship between two variables
Scatterplot	Visual presentation of correlation
Correlational coefficient	$-1 \leq r \leq +1$ indicates strength of relationship
Third-variable problem	Cannot conclude direction of causation – infinite 3 rd variables

Experimental Method

Theory	General explanation of events
Hypothesis	Testable prediction
Manipulation	Intentionally changing a variable for some subjects
Independent variable	Variable manipulated
Dependent variable	Variable measured
Placebo effect	Expectations cause changes or improvement
Experimental / Control groups	Receive treatment (E) or no treatment/placebo (C)
Random assignment	Subjects assigned to E/C groups only by chance
Confounding variable	Variable that may influence data collected
Controls	Precautions to limit effects of confounding variables

Descriptive Statistics

Measures of central tendency	Describe center of distribution
Mean	Average; sensitive to extreme scores / outliers
Median	Middle score
Mode	Most common score

Variance	Difference between scores
Range	Distance from lowest to highest score
Standard Deviation	Average of how much each score differs from the mean
Frequency Distribution	Graph representing the frequency of each score value
Normal / Bell Curve	Symmetrical frequency distribution with mean, median, & mode all at peak
Positive / Negative Skew	Non-symmetrical distributions: mean pulled up (+) or pulled down (-)

Drawing Conclusions

Statistical Significance	Suggests data observed is not likely due to chance; $p \leq 0.05$
p-value	Indicates how likely data is to occur by chance
Effect size	Difference between exper. & control groups
Law of Large Numbers	Larger sample = Better
Internal Validity	Experiment has been conducted correctly
Replication	Copy experiment’s procedure: compare results
External / Ecological Validity	Whether results apply to real-life conditions

Ethical Guidelines

Informed consent – freedom from coercion – protection from harm – risk/benefit analysis – anonymity / confidentiality - **debriefing**