

Chapter 2 Psychological Research Methods & Statistics

Sec 1: What is Research?

Pre-research Decisions

1. Specific Question
2. Find Evidence
3. Sample – relatively small group out of the total population
 - Must represent population
 - Random Sample – each individual has an equal chance of being represented (drawing names out of a hat)
 - Stratified Sample – subgroups in the population are represented proportionately in the sample

Methods of Research

- A. Naturalistic Observation – psychologist observes the subject in a natural setting w/o interfering
- B. Case Studies – an intensive study of a person or group
 1. Most combine long-term observations w/ diaries, tests, and interviews
 2. Do not prove anything
- C. Surveys – information is obtained by asking many individuals a fixed set of questions
 1. Questionnaires

2. Interviews

D. Longitudinal Studies – psychologists study the same group of people at regular intervals over a period of years to determine whether their behavior and/or feelings have changed and if so, how

1. Very time consuming

E. Cross-sectional Study – data is collected from groups of participants of different ages and compared so that conclusions can be drawn about differences due to age

1. Less expensive than LS

2. Less time than LS

F. Correlation – measure of a relationship between two variables or sets of data

1. Positive or Negative Correlations

2. Describes relationships not causes

G. Experiments – enable investigators to control the situation and to decrease the possibility that unnoticed, outside variables will influence the results

1. Hypothesis – educated guess about the relationship between two variables

2. Variables – conditions & behaviors that are subject to change

- Independent – changed or altered to observe effects

- Dependent – changes in relation to the independent variable (measured)

3. Experimental Group – participants who are exposed to the independent variable

4. Control Group – treated the same way as the experimental group except that the experimental treatment (IV) is not applied (necessary in all experiments)
5. Replication

Ethical Issues

Ethics – methods of conduct, or standards, for proper & responsible behavior

1. Minimize misleading results, well-fare & confidentiality must be protected
2. Obtain signed, informed consent
3. Deception is used only when there is no other alternative
4. Animal use

Sec 2: Problems and Solutions in Research

Self-fulfilling Prophecy – a researcher's expectations influence that person's own behavior, and thereby influence the participant's behavior

Avoiding a Self-fulfilling Prophecy

1. Single Blind Experiment – participants are unaware of which participants received the treatment (placebo)
2. Double Blind Experiment – neither the experimenter nor the participants know which participants received which treatment

Milgram Experiment

- 1960s, Stanley Milgram wanted to determine whether participants would administer painful shocks to others merely because an authority figure instructed them to do so
- Studying the effects of punishment on learning
- Each time the learner made a mistake they would be shocked with increasing voltage for each mistake up to a dangerous level of 450 volts
- 65% of volunteers reached maximum severity
- Participants weren't aware they weren't administering the shocks (deception)
- Single Blind Experiment – participants were unaware that they were not administering shocks
- Experiment was replicated at Swathorne College where 88% administered the highest shock
- Ethical Concerns?
 - Human Subjects Committee – before start of any experiment today, experimenter is required to have plan reviewed by HSC for any possible ethical concerns

Placebo Effect – a change in a participants illness or behavior that results from a belief that the treatment will have an effect rather than the actual treatment

- Resembles medical therapy but has no medical effects

Statistics – a branch of mathematics that enables researchers to organize and evaluate the data they collect

Descriptive Statistics – listing & summarizing of data in a practical, efficient way, such as through graphs & averages

A. Distributions of Data

1. Frequency Distribution – way of arranging data so that we know how often a particular score or observation occurs

- Often converted to percentages, Part/Whole x 100
- Graphs
- Normal Curve – bell shaped curve, symmetrical, graph of normal distribution (IQ)

B. Measures of Central Tendency – numbers that describe something about the average score of a distribution

1. Mode – most frequent score, can have more than 1 mode (bimodal)
2. Median – middle score, divides the frequency distribution into two halves
3. Mean – average, sum of all scores/number of scores

C. Measures of Variance – measure difference or spread, how spread out scores are

1. Range – subtract lowest score from the highest score

2. Standard Deviation – describes an average distance of every score from the mean, depends on how spread out the distribution is

D. Correlation Coefficient – describes the direction & strength of the relationship between two sets of variables

1. Positive Correlation (+) – one variable increases, second increases

2. Negative Correlation (-) – one variable increases, second decreases

3. Can be any value between +1 & -1, including zero

4. -1 or +1 – strong & very rare, 0 is weak

5. Pearson's Correlation Coefficient (r)

Inferential Statistics – determines whether research data supports a hypothesis or whether results were due to chance

1. Statistical Significance – if a researcher's results are significant, they can state at a high level of confidence that their results are not due to chance

2. Probability – $p < .05$ (5%) – if the probability that their results were due to chance is less than 5%, then they are confident that the results are not due to chance