Psychology @ FIC

Research Methods and Ethics in Psychology

Science/Empiricism

Goals of the Scientific Method:

? Description and Measurement

? Understanding and Prediction

? Application and Control

? Types of Explanation □ Theories

Steps in the Scientific Process

1. Observation ☐ The art of looking
2. Develop hypothesis (if/then)
3. Test hypothesis using empirical method
    ? **Design study** ☐ complexity, variability and reactivity
    ? collect data
4. Analyze data & interpret findings
5. Findings support/refute theory?
6. Test again - (new?) hypotheses
   ? Replications
    ? Publication

Types of Research

? Descriptive Research
  ? Accurate & systematic measurement
  ? Increases awareness of multiple variables
? Correlational/Non-experimental Research
  ? Association between variables
  ? Predict relations between variables
? Experimental Research
  ? Establish **cause and effect** relations

Three Descriptive Approaches

? Naturalistic Observation
  ? Observing others--people watchers?
? Case Study
  ? One of, Case Study Research
? Surveys
  ? Tools: Questionnaires or interviews

Random Sampling: Generalizability

The population:
A large number of people

Random sampling:
Pick people from the population

A representative sample:
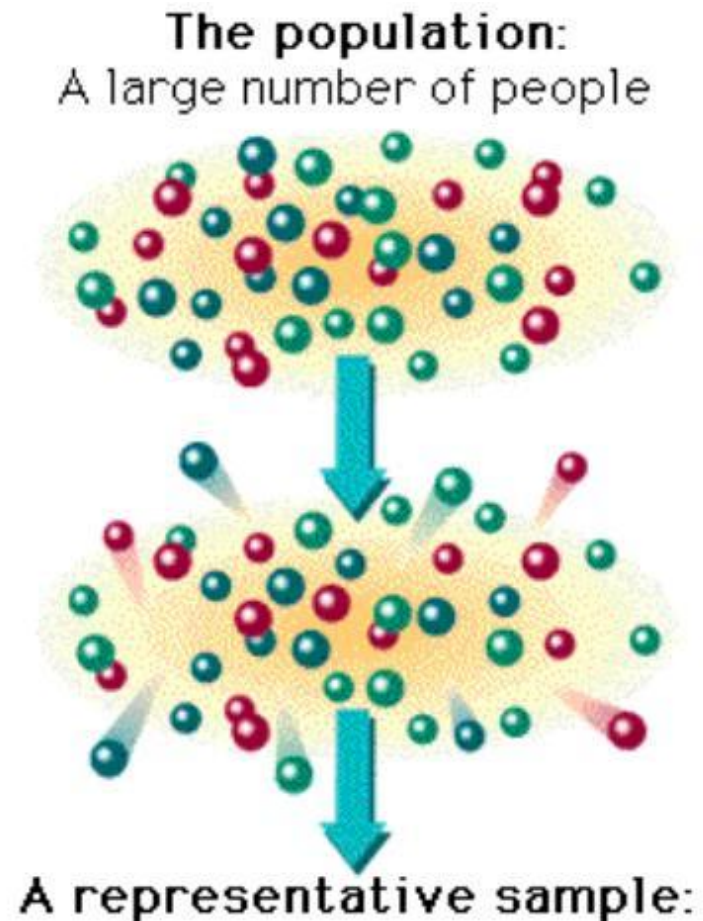
Correlation

? **Correlation**: Two variables are said to be correlated when variations in the value of one variable are synchronized with variations in the value of the other

  ? *Positive correlation*: both variables increase or decrease together

  ? *Negative correlation*: as one variable increases, the other decreases

Correlation

? **Correlation coefficient**: Measure of the direction and strength of a correlation (r)

? **r ranges**
- ❖ -1.0 (perfect negative correlation)
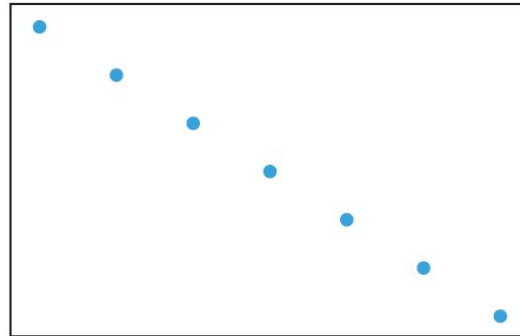- ❖ +1.0 (perfect positive correlation)
- ❖ 0 as no correlation

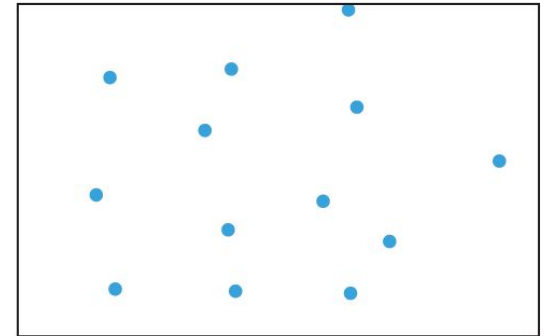Let's take a closer look.

Three Kinds of Correlations
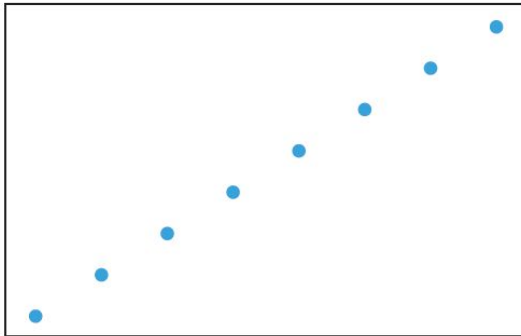
$r = 1$
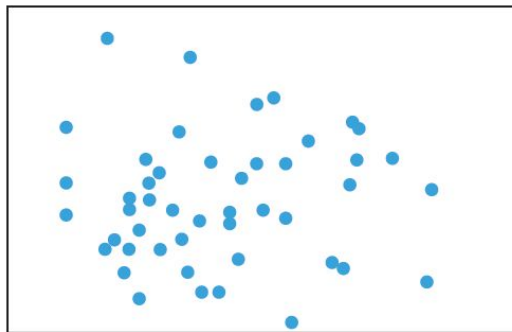(a) Perfect Positive Correlation

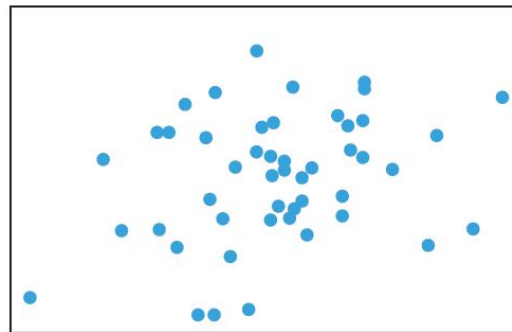$r = -1$
(b) Perfect Negative Correlation
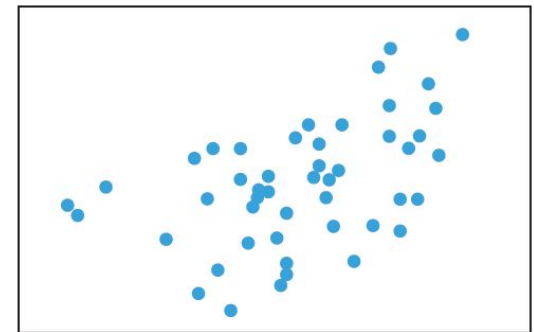
$r = 0$
(c) No Correlation

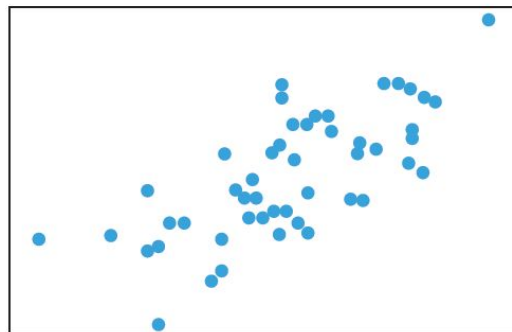# Positive Correlations of Different Strengths

$r = .0$

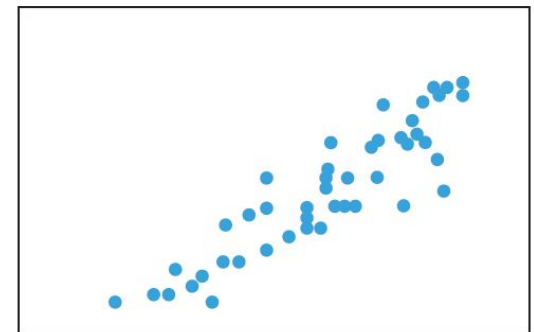$r = .30$

$r = .50$

$r = .70$

$r = .90$

▲ Figure **2.8** **Positive Correlations of Different Strengths** These graphs illustrate different degrees of positive correlation between two variables. When there are few exceptions to the rule $X = Y$, then the correlation is strong and r is closer to 1. When there are many exceptions to this rule, the correlation is weak and r is closer to 0.

Experiments: Logic & Definition

? A research method in which the investigator **manipulates** a variable under **controlled conditions** and observes whether any changes occur in a second variable

Variables: IV and DV

? Independent Variable: Manipulated
  ? Called that because we vary it independently of the other factors - to see if it has an effect on the other variable of interest

? Dependent Variable: Measured
  ? Called that because it is hoped that it will vary as a result of the impact of the independent variable
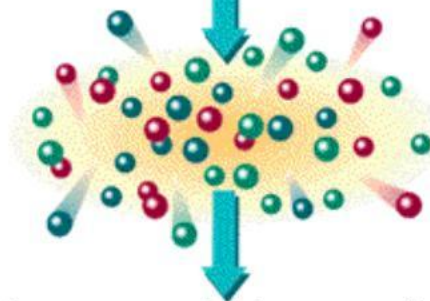
Elements of an Experiment

? Other Variables
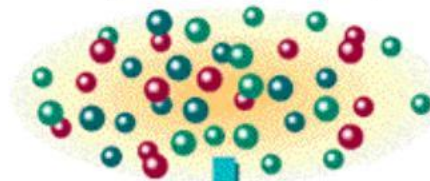 ? Extraneous
  ? Confounding
? Experimental Group
? Control Group
? Random Assignment *(Random Sampling?)*
  ? VERY IMPORTANT

Random Assignment: Equivalent Groups

The population:
A large number of people

Random sampling:
Pick people from
the population

A representative sample:
Subjects for the experiment

Random assignment:
Assign subjects
to groups

Experimental group
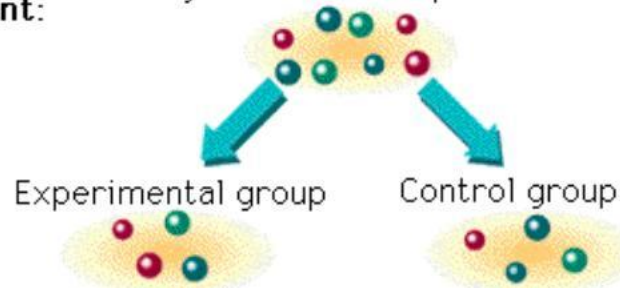
Control group

Elements for <u>Inferring Causation</u>

- ? Random assignment
    - ? Equivalent groups
- ? Control of all other factors
    - ? Operational definitions
- ? Temporally ordered
    - ? I.V. $\rightarrow$ D.V.

Limitations of Experiments

? Sampling bias
  ? Limits generalizability
  ? Experimenter Bias
  ? Placebo Effects
  ? Demand Characteristics

? Lab to Life?

Statistics

- Why?
- Central Tendency
    - mean
    - median
    - mode
- Variability
- Inferential Statistics
- Statistical Significance

Brief History of Ethics

? The Nuremberg Code
  ? 1948

? The Tuskegee Experiment
  ? 1932 – 1972
  ? US Public Health Service

? Development of APA Code of Ethics
  ? first published in 1953

Ethics – Humans in Research

Designing an Ethical Study
? obtaining informed consent
  ? deception
? allowing subjects to withdraw
? data confidentiality
? debriefing subjects
  ? dehoaxing
  ? desensitizing

Ethics

? Animals in Research

  ? protection through regulations

  ? what have we learned from animals?
    ? Examples: - Roger Sperry's work on split-brain
                 - Biofeedback
                 - Schanberg's work with newborn rats

Summary

- Question ⬜ hypothesis (prediction)
- Choose a research method, design the study
  - Descriptive?
  - Correlational/Non-experimental?
  - Experimental?
- Need to consider
  - IV, DV ⬜ operational definitions
  - Limitations of chosen method
  - Ethics

Focus questions:

? What is the scientific method?

? Why can theories be proven wrong but not right?

? What makes human beings especially difficult to study?

? What are the properties of a good operational definition?

- ? How do people respond when they know they're being observed?
- ? Why is it important for subjects to be "blind"?
- ? Why is it important for experimenters to be "blind"?
- ? What are the two major kinds of descriptive statistics?
- ? What are two measures of variability?
- ? How can we tell if two variables are correlated?

- ? What's the difference between a positive and a negative correlation?
- ? How can correlations be measured?
- ? What does it mean for a correlation to be strong?
- ? Why can't we use natural correlations to infer causality?
- ? What is third-variable correlation?

- ? What are the main features of an experiment?
- ? Why can't we allow people to select the condition of the experiment in which they will participate?
- ? Why is random assignment so useful and important?
- ? What is the difference between a population and a sample?
- ? What is good about random sampling?
- ? What are the three features of ethical research?
- ? What are psychologists expected to do when they report the results of their research?