

# Research Methods

## Hypotheses and variables

- **Hypothesis** = prediction
- **Alternative hypothesis** = predicts a difference in results (There will be a significant difference...)
- **Null hypothesis** = predicts no difference in results (There will be no significant difference...)
- **Directional hypothesis** = predicts the direction results will go
- **Non-directional hypothesis** = does not predict the specific directions results will go
- **Variables** = anything that can change
- **Independent variable** = what the researcher manipulates or changes
- **Dependent variable** = what is being measured by the researcher
- **Extraneous variables** = anything that can influence the results
- **Standardisation** = controlling extraneous variables by keeping them the same across conditions
- **Confounding variables** = anything that does change the results
- **Cause and effect** = one variable affecting a change in another
- **Co-variable** = something that changes in relation to another variable

## Experimental design

- **Experimental design** = the way participants are allocated into conditions
- **Repeated measures design** = all participants take part in each condition
- **Independent measures design** = participants are different in each condition

## Experimental methods

- **Experiments** - measure the effect of an IV on a DV
  - Laboratory = controlled, artificial environment where the researcher manipulates the IV.
  - Field = natural environment where the researcher manipulates the IV.
  - Natural = IV not directly controlled by the experimenter but is naturally occurring.
- **Interviews** - uses self-report method to talk about their own thoughts, behaviours or experiences.
  - Structured = pre-determined questions
  - Unstructured = questions vary depending on the interviewee's answers
- **Questionnaires** - uses self-report method to answer a series of written questions
  - Open questions = no fixed responses so participants can respond how they wish
  - Closed questions = participants have to choose from a set of responses e.g. multiple choice or rating scales
- **Observations** - researcher watches the behaviour of the participants
  - Naturalistic = observing people in a real life setting
  - Controlled = observing people in an artificial environment
  - Overt = observing people with their knowledge
  - Covert = observing people without their knowledge
  - Participant = observing people while joining the group
  - Non-participant = observing people from a distance
- **Case studies** - collecting detailed information on one person or a small group of people to gain qualitative data.
- **Correlations** - measuring two co-variables to see if there is a relationship between them to gain quantitative data.
  - Positive correlation = when two variables travel in the same direction
  - Negative correlation = when two variables travel in the opposite direction
  - Zero correlation = when two variables show no relationship
  - Correlation coefficient = a score that measures the strength and direction of the relationship between two co-variables.
- **Longitudinal study** - a study that takes place over a long time period.
- **Cross-cultural study** - a study that takes place across different cultures.

# Research Methods

## Populations and sampling

- **Sample** = a group selected from a larger population
- **Target population** = entire set of people psychologists want to research
- **Representative** = accurate reflection of a larger group
- **Generalisability** = ability to draw conclusions that apply to a larger

## *Sampling Methods*

- **Random sampling** - using chance
- **Opportunity sampling** - using convenience
- **Self-selected sample** - using volunteers

## Types of data

- **Quantitative data** = data involving numbers
- **Qualitative data** = descriptive data involving words
- **Primary data** = information collected first hand
- **Secondary data** = information used but collected by another researcher

## Ethical Issues/guidelines

- **Ethics** - what is morally right or wrong
- **Protection from psychological harm** - participants should not be caused distress, discomfort or embarrassment.
- **Deception** - psychologists should not unnecessarily deceive participants by misleading them.
- **Informed consent** - participants should be informed about the study so they can make a choice about taking part.
- **Debriefing** - dealing with ethical issues by informing them of the aim at the end of the study to fully understand what has taken place. Counselling may be offered in some cases.
- **Right to withdraw** - participants can leave at any point or have their data removed from the study.
- **Confidentiality** - making sure participants are kept anonymous and unidentifiable.

## Reliability, validity and bias

- **Reliability** = how consistent or replicable something is (can it be repeated to get the same results?)
  - Internal reliability = making sure the measure is consistent within itself
  - External reliability = making sure it is consistent across situations
  - Inter-rater reliability = where two or more researchers agree on a set of results
- **Validity** = how true or accurate something is
  - Ecological validity = how far it can be generalised to real life
  - Construct validity = how far a variable is measured in relation to the whole concept
  - Population validity = how far the sample represents the target population
- **Bias** = when a study is influenced by the experimenter or the participants
  - Demand characteristics = cues from the study that give away the aim of the experiment, which causes the participants to behave differently to try to help the researcher.
  - Observer effect = participants acting differently because they know they are being observed
  - Social desirability bias = pressure to respond in a way they think is expected or acceptable
  - Gender bias = favours one gender over another
  - Cultural bias = favours particular cultures over others
  - Age bias = favours certain age groups over others
  - Experimenter bias = favours one psychological theory over another
  - Questioning bias = phrasing questions to favour one view over others

## Analysing data

### *Descriptive Statistics*

- **Measures of central tendency** = an average taken from a data set (mode, median, mean)
- **Measures of dispersion** = how spread out the scores are (range)
- **Standard form** = a way of writing very large or small numbers using the digits 1-9.
- **Significant figures** = the amount of digits that carry meaning (how accurate it is)
- **Normal distribution** = where data follows a “bell shaped” curve
- **Skewed distribution** - where data has an asymmetric curve to one side

### *Tables, charts and graphs*

- **Frequency table/tally chart** = records how often different measures occur
- **Bar chart** = presents data to represent frequencies of different categories
- **Pie chart** = presents data using proportions
- **Line graph** = presents data using a line to show changes in frequency
- **Histogram** = presents data to show changes in frequencies or sets of scores
- **Scatter diagram** = presents data by plotting scores to see if there is a relationship between two variables