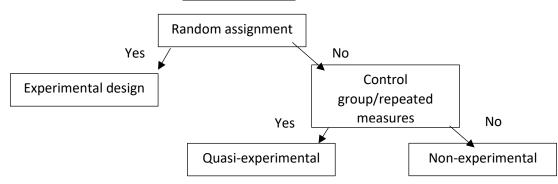
Contents

- Research methods
- 1. Experimental
 - 1.1 Features
 - 1.2 Criteria for establishing causality
 - 1.3 Extraneous variables
 - 1.4 Internal validity and external validity
 - 1.5 Between-subjects/independent-measures
 - 1.6 Within subjects/repeated-measures
- 2. Quasi-experimental
 - 2.1 Features
 - 2.2 Non-equivalent group designs (pre-existing groups)
 - 2.3 Within-subjects/pre-post designs
- 3. Non-experimental
 - 3.1 Features
 - 3.2 Problems
 - 3.3 Correlational designs
 - 3.4 Differential research
 - 3.5 Posttest-only non-equivalent control group (between subjects)
 - 3.6 One-group pretest-posttest (within subjects)
 - 3.7 Descriptive research
 - 3.8 Developmental research
- 4. Relationships and predictions (correlation and regression)
 - General linear model
 - Assumptions
 - Data transformations
 - o Preliminary data analysis
 - Correlation
 - Features
 - o Factors affecting correlation
 - Pearson's correlation/bivariate
 - Coefficient of determination
 - Cohen's d effect size
 - Regression
 - 1. Bivariate regression
 - 2. Multiple regression
 - 2.1 Research uses
 - 2.2 Preliminary considerations
 - 2.3 Regression equation
 - 2.4 Multiple correlation coefficient
 - 2.5 Adjusted R2
 - 2.6 Standard multiple regression
 - 2.7 Standard multiple regression
 - 2.8 Sequential/hierarchical multiple regression
 - Group differences (ANOVA)
 - o Features of ANOVA
 - The underlying model

- o Assumptions
- o Logic
- o Effect size
- o Power
- o One-way ANOVA
- o Priori and post-hoc comparisons
- 1. Error rates
- 2. Priori vs post-hoc
- 3. Priori comparisons
- o Factorial ANOVA
- 1. Two-way ANOVA
- 2. Three-way ANOVA
- o Repeated measures ANOVA
- 1. Features
- 2. Logic
- 3. Calculations
- 4. Sphericity assumption
- 5. Mixed designs
- Sampling and surveys
 - Sampling
 - 1. Population
 - 2. Sample
 - 3. Sampling
 - Survey
 - 1. Constructs and operational definitions
 - 2. Self-report measures
 - 3. Reliability and validity
 - 4. Administering surveys and scales
- Qualitative research
 - Principles
 - Questions/aims that can be addressed
 - o Forming a question
 - o Types of designs
 - o Data collection methods
 - o Analysing data

Research methods



- Correlation
- Descriptive
- Differential

1. Experimental

1.1 Features:

- Can assess causality (clear cause-effect relationship) because: uses random assignment
 of subjects to groups = control extraneous variables (therefore high internal validity)
- Manipulates the IV to measure the changes in DV by creating ≥2 conditions
- Makes comparisons across groups/time-points to find differences
- Extraneous variables are controlled to rule out alternative explanations or to prevent them from becoming confounding variables = clear conclusions

1.2 Criteria for establishing causality:

- IV must come before DV
- Must be a relationship between IV and DV
- Other possible causes/variables must be ruled out
- E.g. randomly allocate people to groups that will be roughly the same

Confounding variable

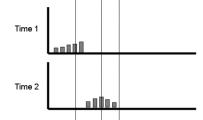
(e.g. depressive

- **1.3 Extraneous variables -** variable that the researchers aren't interested in
- Confounding variable an extraneous variable that affects DV and varies systematically with IV (affects both), and gives an alternative explanation for their relationship (limits internal validity)
- Types:
 - Environmental e.g. Time of testing, rooms/experimenters
 - o **Participant** e.g. Gender, age, IQ
 - Time-related e.g. Weather changes, becoming fatigued
- Controlling: making the experimental and control conditions the same
 - Keep variables constant same conditions/measures for everyone
 - Control environmental variables e.g. All subjects have the same instructions, experimenter, test room
 - Control participant variables e.g. Restricting age range, gender
 - o Balance/match across each level of IV make both groups the same on IV
 - Control environmental variables equally balance them across conditions e.g. equal number of participants from each treatment group tested in 2 rooms

- Control participant variables —equally represent them in each treatment group e.g. same number of males in each treatment
- Control time-related variables equal number of participants experience a treatment early (e.g. 10) and late (e.g. 10)
- o Random assignment better with large samples
 - Control participant variables randomly assign people to treatment groups so the variables should be distributed evenly
 - Control environmental variables e.g. tossing a coin to determine which treatment to which room (harder to do)

1.4 Internal validity & External validity

- **1.4.1 Internal validity:** the degree to which the study accurately answers the question it was intended to answer (are the conclusions valid for the sample?)
 - Threats to internal validity: raise doubts about the conclusions/interpretation of results
 - o Environmental variables e.g. Time of testing, different experimenters
 - Assignment bias the assignment process produces groups that have different participant characteristics e.g. Use of intact groups
 - o *Threats over time* for repeated measures, longitudinal studies
 - History other events that happen during the study e.g. Sporting competition, school programs
 - Maturation natural changes in the participants e.g. Height/weight
 - Instrumentation technical issues/researcher skill e.g. Better skilled
 - *Testing effects* fatigue or practice
 - Regression toward the mean extreme scores on first testing tend to be less extreme on second testing (regress towards our own mean)



- **1.4.2 External validity:** extent to which the findings can be generalised beyond the scope of a particular study
 - Types:
 - Sample to general population
 - 1 study to another
 - From a study to a real word situation
 - Threats to external validity limits the generalisability of results
 - Generalising across participants/subjects how representative is the sample of the target population
 - Selection bias the sampling procedure favours some individuals (that aren't representative) over others
 - Volunteer bias volunteers aren't perfect representatives of the general population who aren't volunteers (more educated, smarter, higher social class, motivated, sociable, conventional, female, altruistic)
 - College students have certain characteristics
 - Participant characteristics results from participants with a set of characteristics might not be generalisable to people with other characteristics
 - Cross-species generalisations the results from animals are more generalisable to humans when they have similar mechanisms/processes in interest
 - Generalising across features of the study can the results be generalised to other procedures
 - Novelty effect participants respond differently that they normally would as participating in research is a new experience