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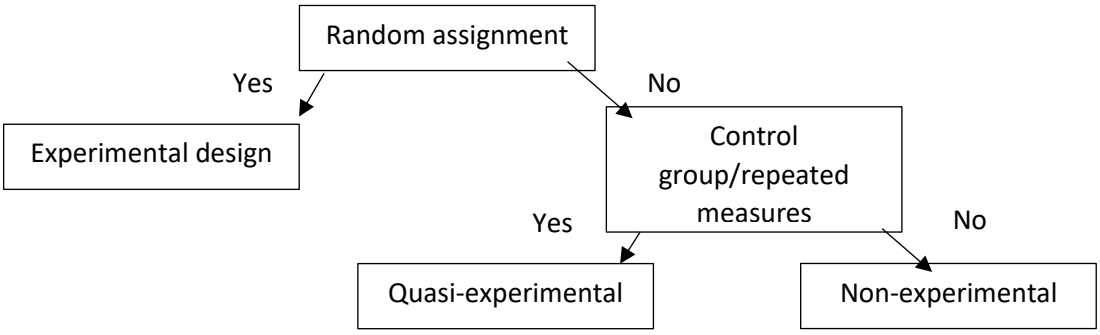
Research methods



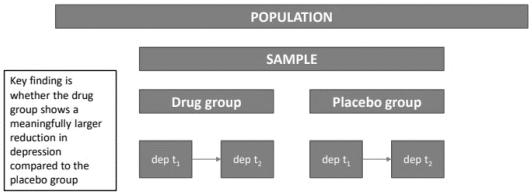
- Correlation
- Descriptive
- Differential

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

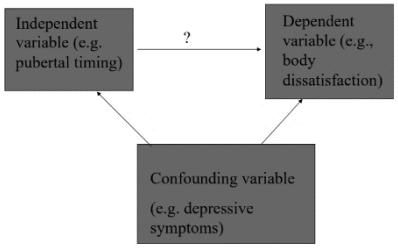
1.2 Criteria for establishing causality:



- 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

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
    - ***Participant*** e.g. Gender, age, IQ
    - ***Time-related*** e.g. Weather changes, becoming fatigued



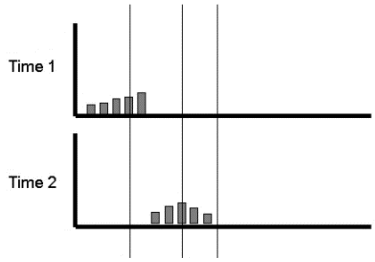
- ***Controlling:*** making the experimental and control conditions the same
    - ***Keep variables constant -*** same conditions/measures for everyone
        - ***Control environmental variables*** e.g. All subjects have the same instructions, experimenter, test room
        - ***Control participant variables*** e.g. Restricting age range, gender
    - ***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)
    - ***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
    - ***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
    - ***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