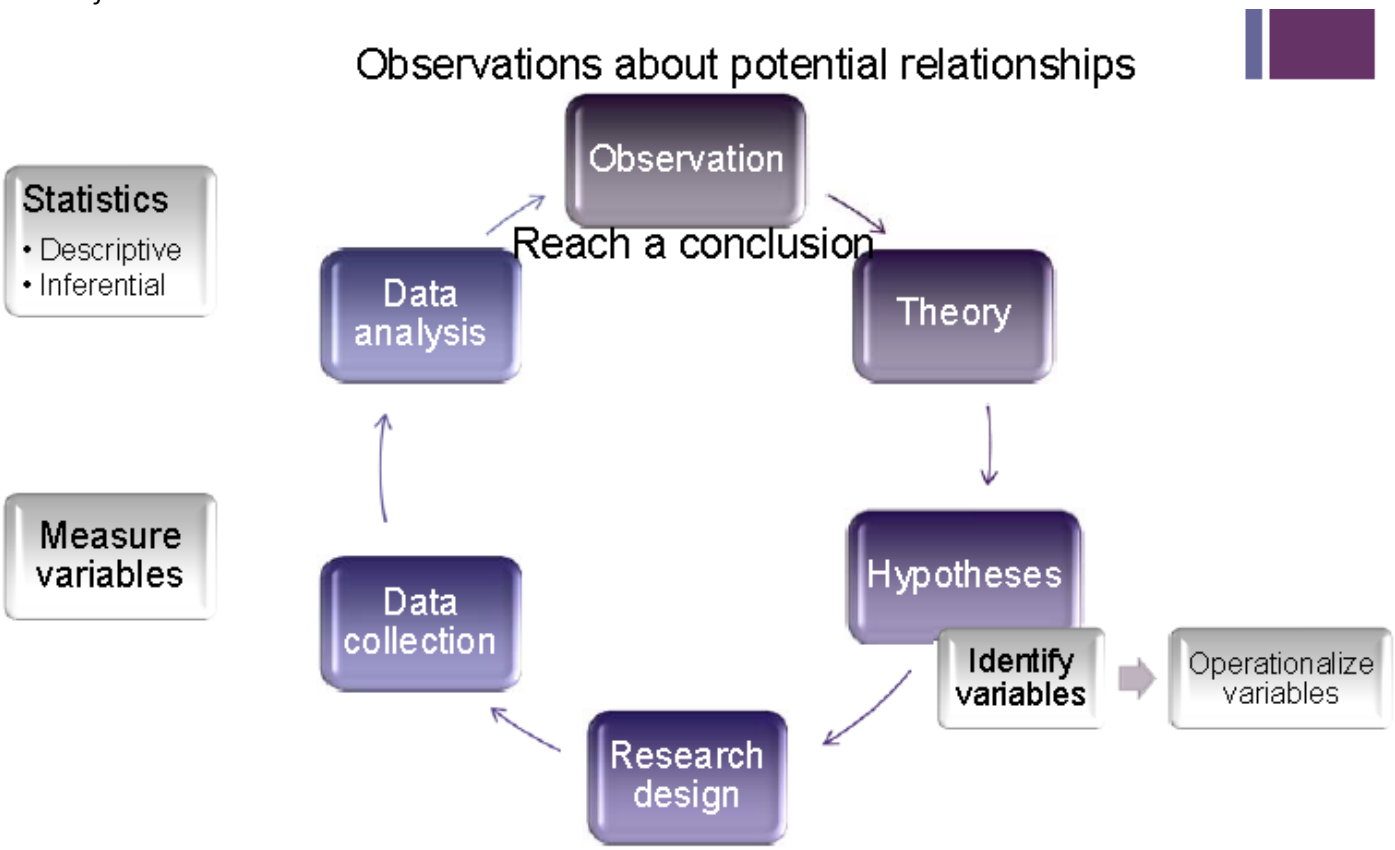
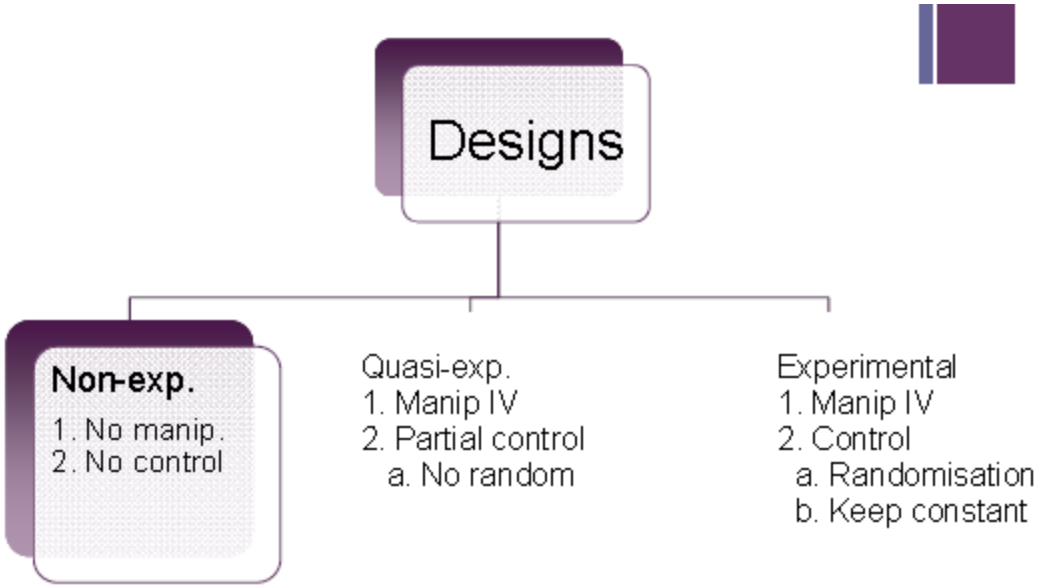
Introduction Summary

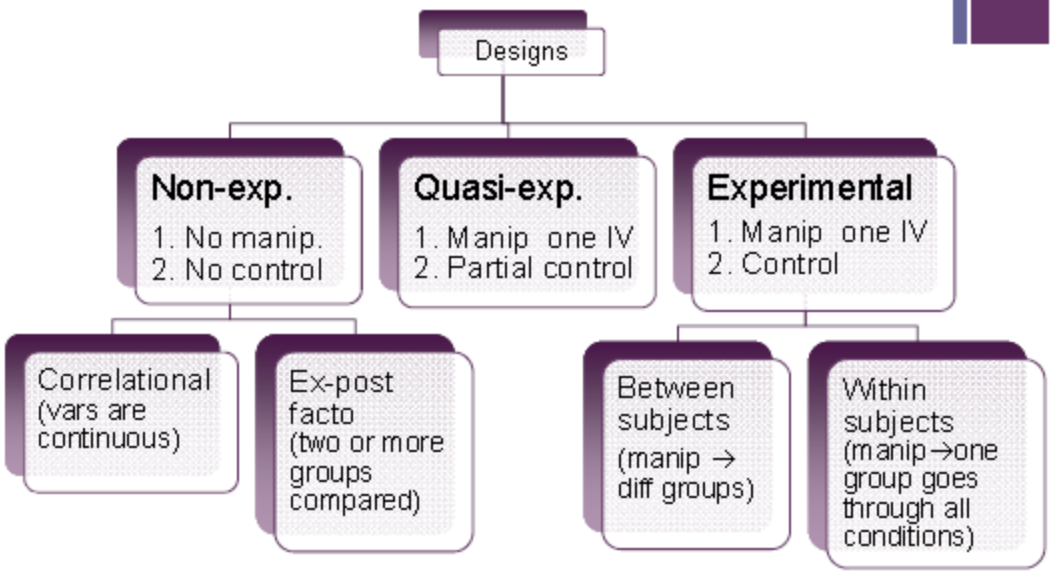
The Scientific Method:



- Falsifiable Leads to testable predictions.
    - Find an answer to say whether the theory is true or not.
- Supported by independent evidence.
- Complete: Accounts for all or most of the available data.
    - Can accommodate new data that has not been tested yet.
- Parsimonious: Simplest explanation without redundant factors.
    - Keep your theories and models as simple as you can.
- Theory → Testable Hypothesis:
    - Translate theory into a research question.
    - Questions are articulated in terms of variables.
    - Variables are operationalised.
        - Defined set of procedures for manipulation and/or measurement of variables of interest.
        - Detailed enough to allow replication.
- Research Design:
    - The quality of the answer we obtain to our research question depends on method.
        - If the result does not answer our question = bad method.
    - Statistics is just a tool.
        - It cannot replace good methodology.
    - Methodology
        - Manipulation of independent variable.
        - Control of all other (potential contaminant or extraneous variables).
            - Randomly assign participants to groups.
            - Keeping variable constant.



- Non-Experimental Design:
  - IV is not manipulated, but measured.
    - May use data from surveys, census information, self-report questionnaires.
    - May also use behavioural or physiological measures.
    - Look at relationships between variables.
  - Limitations:
    - Because the IV is not manipulated, we cannot infer that the observes relationship is casual.
    - May not be feasible to randomly assign participants.
- Quasi-Experimental Design:
  - Manipulation of IV.
  - Control of as many things as possible.
  - No randomisation.
    - Participants are not randomly assigned to conditions, but they are assigned to conditions established (manipulated) by the researcher.
  - Because IV is manipulated and there is some control of extraneous variables it is better than correlational.
    - No causality can be inferred.
    - Systematic differences between groups may remain.



- Between subjects:
  - Participants randomly allocated to conditions.
  - Comparisons of between groups performance.
  - Less powerful stats because more chance of error.
    - May require a larger sample.
- Within subjects:
  - All participants go through all conditions.
  - Compare every participant to themselves.
  - More powerful – rules out individual differences.
  - Problems:
    - Maturation effects.
    - Order effects.
    - Carryover effects.

- Number of IVs:
  - Increasing the number of IV's in a stud, increases our ability to develop a more complex understanding.
  - It also increases the complexity of the design.
- Factorial Design:
  - Specific nomenclature:
    - Use either number of variables to call the design #IV-way (so with 2 IVs → two-way) OR number of levels of each IV multiplied → 2x2 desgin
    - Indicate whether manipulation was between, within or mixed
      - Breakfast = weet-bix vs water + Topic = Stats vs person = 2x2
      - Breakfast = weet-bix vs water + Topic = Stats vs person + Citizenship = Mexican vs Aus = 2x2x2
  - When using between subject's designs: Increasing number of IV requires increase on sample (power issues).
  - When using within subject's design: Increasing number of IV's makes it increasingly complex to counterbalance.